

# More Convenient and Easy to Use

# KHK®



Thank you for using KHK gear products, and we appreciate your selection of our products. We are pleased to introduce the publication of our new master catalog, KHK3011, updated with numerous new product information, including the J Series products (Semi-Standard Stock Gears). We hope it will be a handy guide and gear reference, as well as a product catalog.

KHK's mission is to offer quality products that builds Customer Trust and Satisfaction. We keep striving to build a corporate system that is highly appreciated and we hope, you are customers, will continue to select and use KHK products with pride and satisfaction.

Kohara Gear Industry Co.,Ltd.  
Toshiharu Kohara, President



ISO9001 Certificate



ISO14001 Certificate

# How to Use this Catalog

## Basic Search and Selection of Products

### 1. Select by Image

**SPUR GEARS**  
 m1 - 4 Page 38 | m1 - 5 Page 39 | m2 - 6 Page 39 | m2 - 8 Page 106 | m2 - 10 Page 108  
 m1 - 6 Page 200 | m2 - 1 Page 204 | m1 - 2 Page 210 | m2 - 1 Page 212 | m2 - 6 Page 216 | m1 - 4 Page 218  
 m2 - 1 Page 224 | m2 - 1 Page 228 | m1 - 2 Page 232 | m1 - 2 Page 236 | m1 - 3 Page 240 | m2 - 1 Page 244  
 m2 - 8 Page 248 | m2 - 1 Page 250 | m1 - 2 Page 254  
 m2 - 1 Page 260 | m1 - 4 Page 264  
 m1 - 4 Page 268

**Index Information**  
 Going No. Number  
 Product Photo  
 Page  
 Size  
 Feature Icons

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### 2. Select by Application

**Recommended Products**  
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**Machine Application Example**  
 QUAMAS QSP-02040  
 Lathe machine with output of  $\phi 100$  to 200 mm. Can be operated 24 hours a day by attaching a loader that produces 150 to 300 units per day. KHK gears (H-FRGD and MGS20) are used.

**Recommended Products**  
 m2 - 8 Page 248 | m2 - 1 Page 250

See Page 22

### 3. Select by Gear Strength

**Step 1** Approximate the type of gear, strength and torque load.  
**Definition of Bending Strength**  
 The allowable bending strength of a gear is defined as the allowable tangential force at the pitch circle based on the maximum allowable root stress of two meshing gears under load.  
**Definition of Surface Durability**  
 The surface durability of a gear is defined as the allowable tangential force at the pitch circle, which permits the force to be transmitted safely without incurring surface failures.  
**Step 2** Make a tentative selection based on the torque load using the printed version of the KHK catalog, or the Web catalog.  
**The KHK catalog is used for the tentative selections.** | **The Web catalog is used for the tentative selections.**  
**Step 3** After calculating the required strength using the actual conditions of usage, examine the selection made in Step 2.  
 The formal strength calculation can be performed using the various formulas. (Page 567) | If the Web catalog is used, the strength can be easily confirmed.  
 (B) Bending Strength Formula: In order to verify its bending strength, the transmitted tangential force at the working pitch circle,  $F_t$ , is set to around 50% of the allowable force at the working pitch circle.

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## Complete Data for Selecting Gears

**PRODUCT GROUP ICON** | **SERIES DESIGNATION** | **FEATURE ICON** | **DRAWINGS, SHAPES** | **Shape** (S2, S2K, S4, S4K) | **J Series** (Products having the letter "J" in their Catalog No.) | **PRODUCT NAME** | **SPECIFICATIONS** (Series Specifications. Specifications for spur and helical gears follow the new JIS standard.) | **DIMENSIONAL TABLE** (< Backlash > Indicates the circular linear backlash when the gears are set to the center distance.) | **STRENGTH CALCULATION** (The allowable torques shown in the table are the calculated values according to formulas such as JGMA. The calculations assume certain operating conditions. Therefore, the values should be used as a reference. The assumed conditions are shown on the first page of each product group (for example, page 35 for spur gears).)

**PRODUCT PHOTO**  
 Representative photographs of the series. Actual shape may be different with regards to a particular item. Please confirm the drawing and shape as specified in the table.

**DIMENSIONAL TABLE**  
 < Catalog Numbers >  
 Please order for KHK gears by specifying their catalog numbers.  
 < Bore >  
 The bore tolerances are indicated in the column headings.

**INDEX**  
 Indexed by type and sorted by colored tags.

**TECHNICAL REFERENCES**  
 Technical information will be introduced at various sections in the catalog.

**NOTES**  
 Contains additional information on precautions for product characteristics and technical hints for secondary operations. Technical hints for J Series are also provided in the J Series section. Please be sure to read first before selecting products.


**SS Steel Spur Gears**  
 Module 3


Catalog No.	Module	Pitch Diameter (mm)	Bore Diameter (mm)		Pitch Circle Diameter (mm)										Face Width (mm)			Remarks											
			A	B	30	35	40	45	50	55	60	65	70	75	80	85	90		95	100									
SS50-60 225	60	540	S2	25	80	180	186	30	15	45	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000
			S2K	25	80	180	186	30	15	45	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000
			S4	25	80	180	186	30	15	45	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000


## Helpful Icons to find product features quickly


- RoHS Compliant Product**
- Re-machinable Product**
- Finished Product**
- Heat Treated Product**
- Ground Gear**
- Stainless Steel Product**
- Resin Product**
- Copper Alloy Product**
- Injection Molded Product**
- Black Oxide coated Product**




Information   
P1 ~ 32

Spur Gears   
P33 ~ 346


Helical Gears   
P347 ~ 364


Internal Gears   
P365 ~ 370


Racks   
P371 ~ 398


CP Racks & Pinions   
P399 ~ 418


Miter Gears   
P419 ~ 448


Bevel Gears   
P449 ~ 492


Screw Gears   
P493 ~ 506

Worm Gear Pair   
P507 ~ 562

Gearboxes   
P563 ~ 578

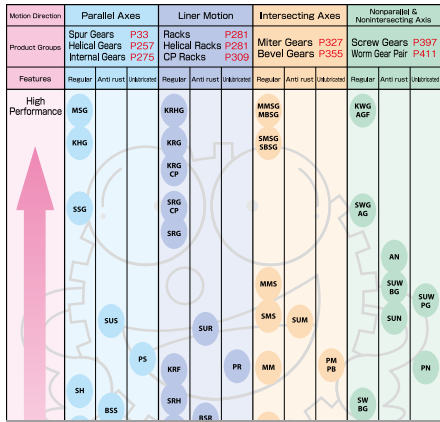
Other Products   
P579 ~ 592

Gear Technology References   
P593 ~ 768

KHK Information   
P769 ~ 784

4. Selection by novices

5. Select by Catalog number



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Series	Gear Type	Page	Features
A AG	Worm Wheels	426-429, 436-443	
AGDL	Double Worm Wheels	420-425	
AGF	Worm Wheels	430-435	
AN	Aluminum-Bronze Screw Gears	406-407	
ARL	Rack Guide Rails	300	
BB	Sintered Metal Bushings	248, 353, 386	
B BG	Worm Wheels	444-459	
BSR	Brass Racks	299	
BSS	Brass Spur Gears	256-255	
C CBX	Bevel Gearboxes	478-479	
CG	Worm Wheels	446-459	
D DB	Injection Molded Bevel Gears	386-387	
DD	Worm Wheels	460-461	
DM	Injection Molded Miter Gears	352	
DR	Molded Flexible Racks	300-301	
DS	Injection Molded Spur Gears	246-249	
DSL	Acetal Plastic Hub Spur Gears	229-231	
F FRCP	Metal Flexible Racks	326	
G GC	Gear Couplings (Inner Hubs)	486-487	
GC-I	Gear Couplings (Outer Rings)	486	
K KBX	Bevel Gearboxes	474-475	
KHG	Ground Helical Gears	262-271	
KRCPP	Thermal Refined Racks	320	
KRF	Racks with Machined Ends	291	
KRG	Ground Racks	288-289	
KRGCP	Ground Racks	318-319	
KRGCPD	Ground Racks	318-319	
KRSG	Ground Racks	318-319	
KRGD	Ground Racks	288-289	
KRGF	Ground Racks	288-289	
KRHE	Ground Helical Racks	304-305	
KRHGF	Ground Helical Racks	304-305	
KSP	Ground Spiral Bevel Gears	390-395	
KTSCP	Tapered Pinions	314-315	

See Page 780

Selection Hints and Applied Usage are also Available.

Characteristics



To meet your requirements, KHK stock gears are made in a variety of types, materials, configurations, modules and numbers of teeth. We also offer products that allow secondary operations to be performed on the bores, shafts, outside diameters, keyways and set screws. The following table lists the main features.

Catalog No.	Module	Material	Heat Treatment	Tooth Surface Finish	Precision JS9 17/2-1.999	Secondary Operations	Features
MSGA · MSGB	1 ~ 4	SCM415	Carburized	Ground	N5	×	High strength, abrasion-resistant and compact.
SSGS	1.5 ~ 3	S45C	Thermal refined · Gear teeth induction hardened	Ground	N7	△	Ground shaft pinions that allow modification of shafts to fit your bearings.
SSG	0.5 ~ 6	S45C	Gear teeth induction hardened NOTE 1	Ground	N7	△	Although heat treatment is applied to tooth area, secondary operation can be added. Finished products for J series are also available.
SSS	0.5 ~ 3	S45C	Thermal refined NOTE 2	Cut	N8 NOTE 3	○	For the SS series, Shaft-Pinions with a small number of teeth (10 to 13 teeth) are available.
SS	0.5 ~ 10	S45C	—	Cut	N8 NOTE 3	○	A low priced, general usage gear with a large selection of modules and number of teeth, finished products for J series are also available.
SSA	1 ~ 5	S45C	—	Cut	N8	○	Hubless gears for lighter and more compact applications.
SSY	0.8, 1	S45C	—	Cut	N8 NOTE 3	○	Narrower face gears for light-duty applications.
SSAY	1	S45C	—	Cut	N8	○	Hubless and narrow faces for even lighter and more compact gears.
SSAY/K	0.8, 1	S45C	—	Cut	N8 NOTE 3	△	Compact sized gears can be clamped to the shafts without a hub.
LS	0.5, 0.8	SMF5040 (Equiv. to S45C)	—	Sintered	N8 NOTE 3	○	Low cost due to elimination of machining and reduction in wasted material.
SUS · SUSA	1 ~ 4	SUS303	—	Cut	N8	○	Stainless steel gears for more rust-resistant gears.
SUSL	0.5 ~ 1	SUS303	—	Cut	N8 NOTE 3	△	Smaller module gears which clamp to the shafts without any keys or set screws.
DSL	0.5 ~ 1	Acetal (SUS303)	—	Cut	N10 NOTE 3	△	These rust-resistant gears can be clamped to the shafts without any keys or set screws.
NSU	1 ~ 3	MC602ST (S45C)	—	Cut	N9	○	Nylon teeth with steel hubs that can have keyways and set screws added.
PU	1 ~ 2	MC901 (SUS303)	—	Cut	N9	○	Nylon teeth with stainless steel hubs for rust-resistance.

- KHK Co. reserves the right to make changes to specifications and dimensions without notice.
- All rights reserved herein and no portion of this catalog may be reproduced without the prior consent in writing from the company.
- We publish content changes and corrections to the catalog on our Web site.



9300 configurations of 145 items are standardized and available for your convenience.



## KHK Stock Gears Introduction

### ● KHK Original Standardized Products

The KHK Stock Gears series is our original line of standardized products, consisting of 9300 configurations of 145 items. You can quickly search and find gears matching your requirements.

### ● Trustworthy and Quality Technology

Based on 75 years of experience, KHK Stock Gears have been contributing to the development of quality gear technologies for more than a half century.

### ● Reasonable Prices

Our cutting-edge and labor saving technology in our production lines enables quality production at a low price.

### ● Prompt Delivery

4500 configurations are regularly in stock for quick delivery. You can also order single units.

■ Features of KHK Products

KHK Products	Product Configuration	Delivery	Price	Design Fees	Selection
		Lead time before delivery	Price For ordering 1 or 2 units	Required cost for design	Required conditions to select
Standard Products	Finished	○ Prompt	○ Inexpensive	○ Not Offered	△ Few
	J Series (Semi-Standard)	○ Short	○ Inexpensive	○ Not Offered	○ Numerous
	Haguruma Kobo (Secondary Operation added)	○ Short	○ Inexpensive	○ Inexpensive	○ Numerous
Custom Products	Custom-made	× Long	× Expensive	× Expensive	○ Unlimited



## Various Types of Gears Available

<b>Spur Gears</b>  P33 ~	<b>Helical Gears</b>  P347 ~	<b>Internal Gears</b>  P365 ~	<b>Racks</b>  P371 ~	<b>Gearboxes</b>  P563 ~
<b>Miter Gears</b>  P419 ~	<b>Bevel Gears</b>  P449 ~	<b>Screw Gears</b>  P493 ~	<b>Worm Gears pair</b>  P507 ~	<b>Others</b>  P579 ~

- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

## Wide Selection of Sizes and Gear Teeth

**Modules 0.5 to 10 are available.**

Modules for Rack Tooth Profiles (Full Scale)

m0.5, m0.8, m1, m1.5, m2, m2.5, m3, m4, m5, m6, m8, m10

## Wide Selections of Materials

You can select materials when you state your usage. Stainless steel and plastic products are widely standardized for antirust and oil-free requirements. Steel products that encourage tooth strength are also available.

SCM415	S45C	SUS303	MC602ST	MC901	Polyacetals	Free Cutting Brass

## Wide Selection of High-precision Gears

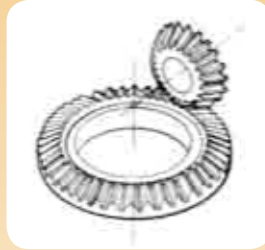
We provide a large selection of ground gears for high-speed, high-torque and quiet transmission applications.

JIS B 1702-1 grade N5 (Old JIS : grade 1)	KHK R001 grade 1	JIS B 1704 grade 2	KHK W001 grade 1

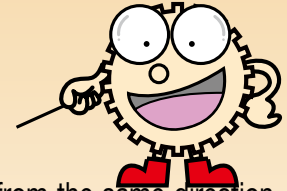


## SMZG Ground Zerol Miter Gears and SBZG Ground Zerol Bevel Gears

**New Series**



Zerol Gears (Miter Gears) are spiral bevel gears, that have a helix angle less than 10 degrees, and featuring characteristics of both straight bevel gears and spiral bevel gears.



**SMZG**  
Ground Zerol Miter Gears

**6 configurations**

**New**

m2 ~ 3 Page 434

**SBZG**  
Ground Zerol Bevel Gears

Gear Ratio 1.5, 2

**12 configurations**

**New**

m2 ~ 3 Page 470

### 《 Features 》

- Zerol Miter / Bevel Gears receive force from the same direction as straight bevel gears and allow you to design with a compact bearing system.
- Compared to quench treated SM Miter Gears, or SB Straight Bevel Gears, these gears have excellent wear resistance and operate quietly. Replacements are also easily obtained, as they have the same dimensions as the mounting distance.

## SUKB Stainless Steel Hubs for PSA

**New Series**



Stainless Steel Hubs for PSA Spur Gears (Hubless Spur Gears) are now available. They are very convenient! You can fasten the gears to the shaft easily. We apply secondary operations from Haguruma Kobo, <sup>NOTE 1</sup> our quality modification system, and we deliver finished products.

NOTE 1 : Haguruma Kobo is a Japanese phrase to describe KHK's system for the quality modification of KHK Stock Gears. For details please see Page 10.

\* PSA Spar Gears attached to the hub are not included and should be purchased separately. For the price of PSA Spur Gears and the secondary operation fee, please ask for a quote.

**SUKB**  
Stainless Steel Hubs

**9 configurations**

**New**

φ 30 ~ 100 Page 334

### 《 Features 》

- Suitable for food processing machinery. An attached stainless steel hub with excellent rust resistance, perfectly matches with PSA Plastic Spur Gears.
- Efficient use of high-value MC Nylon and stainless steel together with superior cost performance.

For details, please see Page 334.

## GCU Gear Assembly Kit (Gears used in learning about gears)

**GCU**  
Gear Assembly Kit

**6 configurations**

**New**

Page 32

**Knockdown style**

**New Series**



Sticker included

Six gear kits are available: Spur Gears, Racks & Pinions, Helical Gears, Miter Gears, Screw Gears and Worm Gear Pair

For details, please see Page 32

*Due to increased popularity, more items have been added to the product lineup!*



## J Series (Semi-Standard Products)

### ● KHK Original Standardized Modified Products

J Series are KHK original standard products, including 4800 configurations of 14 items. This series is based on modification of KHK Stock Gears, bores, keyways, and holes sizes, from the original standardized series.

### ● For Efficient and Quality Production

By providing advanced machining with our JIT\* production line, we enable efficient productivity and reliable quality in our secondary operations.

### ● Shorten Delivery Lead Time

Make from our Stock Gears, J Series Products are quickly processed on the JIT Production Line. Orders range from 1 to 20 units\*\* and the lead-time for shipping is within 3 working-days, after placement of your order by Catalog No.

\* : JIT stands for Just-in-Time production: inventory is manufactured only as the need for it arises. For details, please refer to the Page 10.

\*\* : Order quantity limited to 20 pieces. Larger quantities to be quoted on a custom basis.

**SSG**  
Ground Spur Gears

*J Series*

**Approx. 1000 configurations**

m1 ~ 3 Page 54



**SS**  
Steel Spur Gears

*J Series*

**Approx. 1500 configurations**

m1.5 ~ 3 Page 124



**SUS · SUSA**  
Stainless Steel Spur Gears

*J Series*

**Approx. 1000 configurations**

**Newly added**

m1 ~ 4 Page 218



**PS · PSA**  
Plastic Spur Gears

*J Series*

**Approx. 1100 configurations**

**Newly added**

m1 ~ 3 Page 282



**SRGFD · SRGFK**  
Ground Racks

*J Series*

**18 configurations**

**Newly added**

m0.5 ~ 6 Page 380



**SRFD · SRFK**  
Steel Racks with Bolts Holes

*J Series*

**15 configurations**

m0.5 ~ 6 Page 384



**SRGCPFD**  
CP Ground Racks

*J Series*

**8 configurations**

**Newly added**

CP5 ~ 20 Page 410



**SWG**  
Ground Worms

*J Series*

**19 configurations**

**Newly added**

m1.5 ~ 3 Page 532



**SW**  
Steel Worms

*J Series*

**32 configurations**

**Newly added**

m1.5 ~ 3 Page 544



**SUW**  
Stainless Steel Worms

*J Series*

**18 configurations**

**Newly added**

m1.5 ~ 3 Page 558



**3 days!**

**NEW Lineups!**

**SSG, SS, SRFD (K) and more new items are available now!**

*This popular series has been expanded!*

**SI**  
Steel Internal Gears

**6 configurations**

**Newly added**

m0.5, 0.8 Page 368



**SURO**  
Stainless Steel Round Racks

**3 configurations**

**Newly added**

m2 ~ 3 Page 393



**MMS**  
Spiral Miter Gears

**10 configurations**

**Newly added**

m2 ~ 5 Page 430



**MM**  
Carburized & Hardened Miter Gears

**5 configurations**

**Newly added**

m2 ~ 5 Page 438



**SUN**  
Stainless Steel Screw Gears

**8 configurations**

**Newly added**

m1.5 ~ 3 Page 500



**NEW Lineups!**

# All products are **ROHS** Compliant !

## RoHS Compliance

**Restriction of Hazardous Substances**

RoHS is a compliance ordinance established by the European Parliament / European Commission.

The following six substances are regulated by usage for environmental considerations.

Allowable maximum density of these six substances for RoHS compliance

- Cadmium** : 0.01wt% (100ppm)

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- Lead** : 0.1 wt% (1000ppm)  
 ※ Exception depending on usage  
 Steel 0.35 wt% , Aluminum 0.4 wt% , Copper alloy 4 wt%

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- Mercury** : 0.1 wt% (1000ppm)

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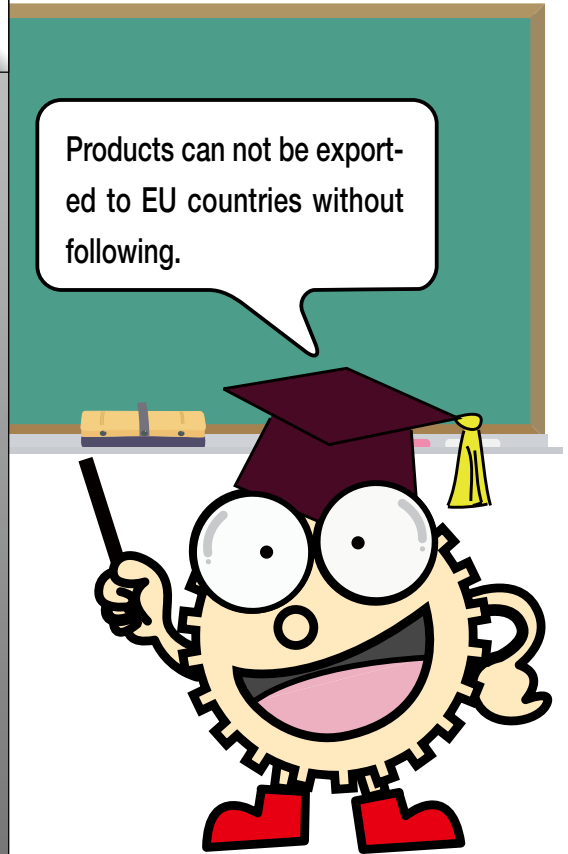
- Hexavalent chromium** : 0.1 wt% (1000ppm)

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- PBB (Polybrominated biphenyl)** : 0.1 wt% (1000ppm)

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- PBDE (Polybrominated diphenyl ether)**  
 : 0.1 wt% (1000ppm)



## KHK Environmental Practices

### An appeal from KHK for the disposal of KHK Stock Gears and packing materials

<b>■ Steel Products</b>	<b>■ Nylon Gears</b>	<b>■ Cardboards</b>	<b>■ Paperboards</b>	<b>■ Other packing materials</b>
				
Please sort by materials and recycle.	Nylon gears are a plastic waste. Please dispose as a reusable industrial waste.	Please recycle cardboards used as packing.	Please recycle paperboards used as packing.	Packing materials like plastic bags, mirrors and boxes are plastic waste. Please dispose as a reusable industrial waste.



### MSDS Activities

In regards to environmental issues, rust preventive oil and packing materials, which are used in the production of our products, are managed by safety data sheets similar to the disposal management of chemicals.

### Green Purchasing

70 percent of office supplies we purchase are made of environmentally friendly materials.

For details, please refer to the Page 773 and KHK Environmental Policy.



## KHK Global Distribution Network

KHK develops a global network all over the world to respond to the internationalization of your business activities.



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 URL:<http://www.amx.com.tw/>  
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### QUALITY TRANSMISSION COMPONENTS

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 PHONE:516-437-6700 FAX:516-328-3343  
 E-mail:qtsupport@qtcgears.com  
 URL:<http://www.qtcgears.com/>

※ Countries are listed in alphabetical order.

To find information on distributors in each country, please visit our web site.

<http://www.khkgears.co.jp/en/>



## Haguruma Kobo is a reliable source for quality modifications.

**Order by drawing !**  
Create a drawing with the modification drawing system. Then, please place an order.

e.g. of Order : SS3-30 10 Units

**Bores, Keyways, and Taps are operated in 3 days after ordering!**

### Advantages of Haguruma Kobo

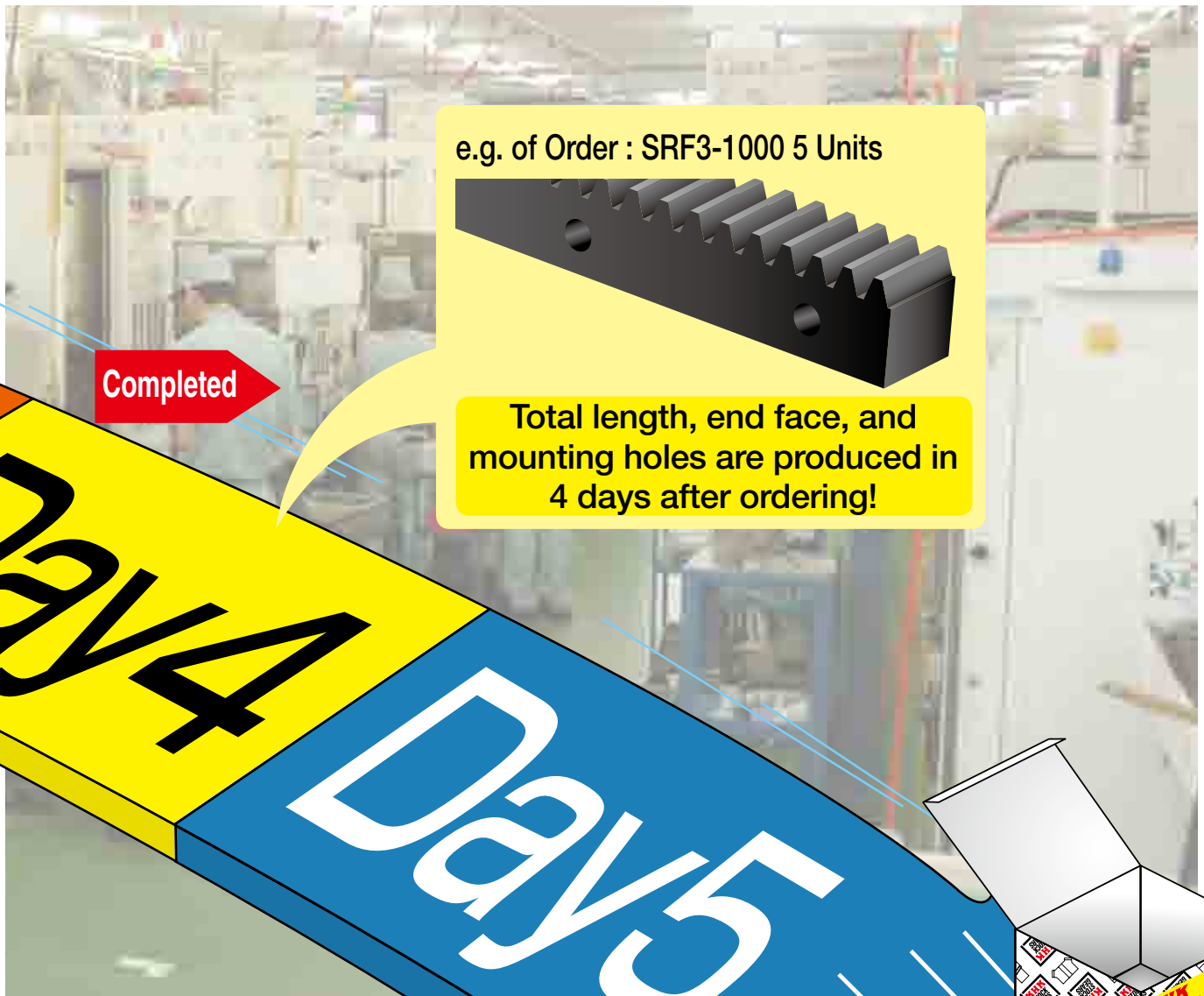
- A consistent modification system for KHK Stock Gears.
- Reliable quality secondary operation is included with the KHK brand.
- Rapid operations by our special JIT Production Line.
- We deliver parts as finished gears.
- We deliver ready-to-use gears.
- We deliver quality and precise gears, reassurance you can count on.



**Ordering**

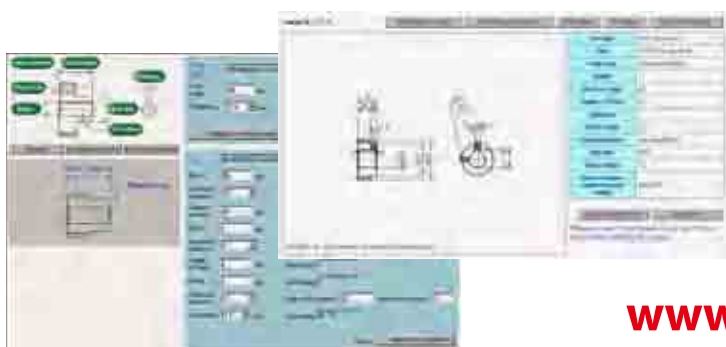
- Please contact your nearest distributor for price, availability or special order requests.
- For the orders shown above, which include secondary operations for bore, keyway and tapped hole, shipping is within a week after receiving an order. However, extra lead time is required for orders that involve surface treatments such as plating or gear teeth induction hardening, complicated machining, and manufacturing for large quantities.
- The gear portion subjected to the secondary operations will not have a black oxide finish.

We have created a unique order entry system to produce KHK Stock Gears with additional secondary operations. This system allows you to reduce design costs and shorten delivery lead time.



### Modification Drawing System

Using the KHK Web Catalog, you can make drawings for secondary modification of KHK Stock Gears, which can be outputted to DXF or printed.





## Please utilize our **HAGURUMA KOBO** for your secondary operations needs.

### Quick Modifications Using the Exclusive JIT Production Line

In the Haguruma Kobo modification system, we perform the following steps: turning, keyway broaching and boring.

#### Lathe Operation



#### Lathe turning limits

Hub (External diameter) :  $\Phi$  16 ~  $\Phi$  650 mm

Bore (Internal diameter) :  $\Phi$  6 ~  $\Phi$  150 mm

#### Keyway Operation



#### Keyway Operation Ranges

Keyway Width : 2 ~ 50 mm

(Broaches : 3 ~ 20 mm)

#### Bore Operation



#### Boring Ranges

Drilled Hole :  $\Phi$  3 ~  $\Phi$  25 mm

Taps : M 3 ~ M 16 mm

Reamer :  $\Phi$  4 ~  $\Phi$  16 mm

### Main Types of Secondary Operations



■ Special Bores



■ Counterbores



■ Counterbores



■ Machined Ends



■ Side Mounting Holes



■ Bores, Keyways and Tapped Holes



■ Bores, Hubs and Keyways



■ Bores, Tapped Faces



■ Tapped Bottom Holes











■ Induction Hardening Holes

# We handle various types of Surface Treatments in the Haguruma Kobo System.



Surface Treatments are done to make surface condition improvements on materials. The following are typical surface treatments, providing rust prevention and inhibiting abrasion by friction, for overall quality control.

Surface Treatments	Features
	<p>■ <b>Electro-galvanizing</b> A typical plating method applied to prevent the rusting of steel. By applying the chromating process, the quality of the appearance improves. Thickness of plating film is generally between 2 to 25 <math>\mu\text{m}</math>.</p> <hr/> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p>■ <b>Uni-chromate</b> The color is silver white with slight bluish tints. Although rust prevention ability is less than of galvanizing, the price is lower.</p> </div> <div style="text-align: center;">  <p>■ <b>Black-chromate</b> The color is basically black, but it looks slightly red depending on product shapes. It has the most corrosion resistance of all 3 types of electro galvanizing.</p> </div> <div style="text-align: center;">  <p>■ <b>Chromate</b> It has a versicolor appearance consisting of red, yellow and green. It has more corrosion resistance than Uni-chromate.</p> </div> </div>
	<p>■ <b>Electroless Nickel Plating</b> A plating method produced without the use of electricity. It encourages corrosion/wear resistance. This plating is suitable for products that have; uniform thickness of plating film (3 -10 <math>\mu\text{m}</math>), complicated shapes, or high-precision is required for measurement.</p>
	<p>■ <b>Black Oxide Treatment</b> A treatment from alkaline black oxidizing. Applying a 140°C heated, strong alkaline processing liquid, material is blacken by the chemical reaction of the steel. It is effective for rust proofing. On the surface it makes a ferrosoferric oxide film, a thickness that is less than 3 <math>\mu\text{m}</math>.</p>
	<p>■ <b>Raydent Treatment</b> Raydent is a registered brand of Raydent Industrial Co., Ltd. You can expect excellent rust prevention performance from this treatment. The color is black and the processing is similar to plating, as it makes a Raydent film (1 to 2 <math>\mu\text{m}</math>) on the surface, which is extremely strong and will not separate.</p> <p><small>[Note 1] For RoHS compliant products, specify required removal processes for residual hexavalent chrome. [Note 2] There may be a case that Raydent film is not created properly in areas, such as the tooth bottom or inside of bore, depending on the product shape or size.</small></p>
	<p>■ <b>Phosphate Treatment</b> A treatment from an Iron phosphate type coating. An Iron phosphate type film is a thin amorphous film used as a base coating for painted interior products. ◇ <b>PALFOS M</b> A treatment with manganese phosphate that produces a plating thickness approximately 3 to 15 <math>\mu\text{m}</math>. Used as a rust prevention film and also applied to slide components as it is wear-resistant.</p>
	<p>■ <b>Solid Lubrication Treatment</b> A dry-coating spray, very useful as a solid lubrication treatment where direct application of lubrication is not possible. Achieved by spraying on tooth areas, it allows the lubricant agent to adhere and dry. It also allows compounded molybdenum to form a disulfide metal texture, to discourage corrosion.</p>

For over 75 years, KHK has had a long history of providing reliable products.



Our production technology and quality management will meet your requirements.



Master gears for gear mesh testing machines



We provide high-precision master gears for gear mesh testing instruments.

For products not in our Stock Gears catalog, we produce custom-made gears per your request, available starting from 1-unit (single) orders.



Please contact us when you have the following requirements to be met:

- When you require specific number of teeth, different configurations or sizes from KHK Stock Gears.
- When you require secondary operations performed on KHK Stock Gears.
- When you require custom-made gears not available as KHK Stock Gears.

## How to Order Custom Gears

When you are ordering, please include detailed specifications and manufacturing drawings. The table on the right indicates required data for manufacturing. Please make sure to provide necessary specifications accordingly. We will contact you with a price and delivery quote.

### Note

- There are circumstances in which, even though the specifications are within the permitted ranges of parameters, it is not possible to produce the items due to other factors, including precision, form, material or heat treatment.
- Even if it is theoretically possible to produce the items, it may not be suitable for our manufacturing methods.
- We do not offer design services for custom gears. Please supply your own part drawings.

Please contact your nearest distributor for order requests. (Refer to Page 9)

When you are considering new gears, please select from the KHK Standard Stock Gears which come in a wide variety of types, precisions, materials, configurations, and ease of uses.

### Parameters to be supplied on your specification sheets

Types	Spur Gears	Bevel Gears	Worms Worm Wheels	Helical Screw Gears	Racks
Pitch (m. DP)	●	●	●	●	●
Outside Dia.	●	●	●	●	●
No. of Teeth	●	●	●	●	●
Pressure Angle	●	●	●	●	●
Face Width	●	●	●	●	●
Hub Dia. (Length)	●	●	●	●	●
Keyway, Set Screw	●	●	●	●	●
Gear Configuration	●	●	●	●	●
Material	●	●	●	●	●
Heat Treatment	●	●	●	●	●
Helix Angle. Spiral Hand		●	●	●	●
Number of Starts			●		
Mating Gears, Center Distance		●	●		
Precision and Tolerance	●	●	●	●	●



To make the best use of the KHK Web Site, we have provided you with reliable, practical information on all aspects of gears.



[www.khkgears.co.jp/en/](http://www.khkgears.co.jp/en/)

Learn more about gears at the KHK Gear World.

The KHK Web Site is available in English, Chinese (Simplified and Traditional), Korean and German languages.



### The Usage of Gears as Machine Elements

There are various types of gears, and by using varying combinations of gears and shafts, you can estimate parameters such as movements, increasing torque, adjusting speed, and changing the direction of motion. Introduced here, using video captures and graphics are gear trains and examples of how gears are used.



### Virtual Factory Tour

If you are not familiar with how gears are made, please visit our Virtual Factory Tour. You can observe and learn through video captures how gears are made by KHK.



### Technical Information on Gears

Introduced here, Introduction to Gears, created as a learning aid for the novice designer. Also, Practical Information on Gears, created for the advanced designer.



### Q & A Concerning Gears

A selection of questions and answers related to gear technologies. Please refer to this information when you need technical advice and help.

## GCSW for Web, the Gear Calculation Software



Our gear calculation software, GCSW for Web, allows you these automatic gear calculations in accordance with your specifications: Dimension calculations, Gear force calculation, Tooth profile calculation, Backlash calculation, and calculation for a Constrained gear system, and others. Please make sure to make the best use of our software for efficient gear drawing.

**FREE! Register now for membership!**

GCSW

Search



# Enabling secondary operations on KHK Stock Gears and DXF downloads!

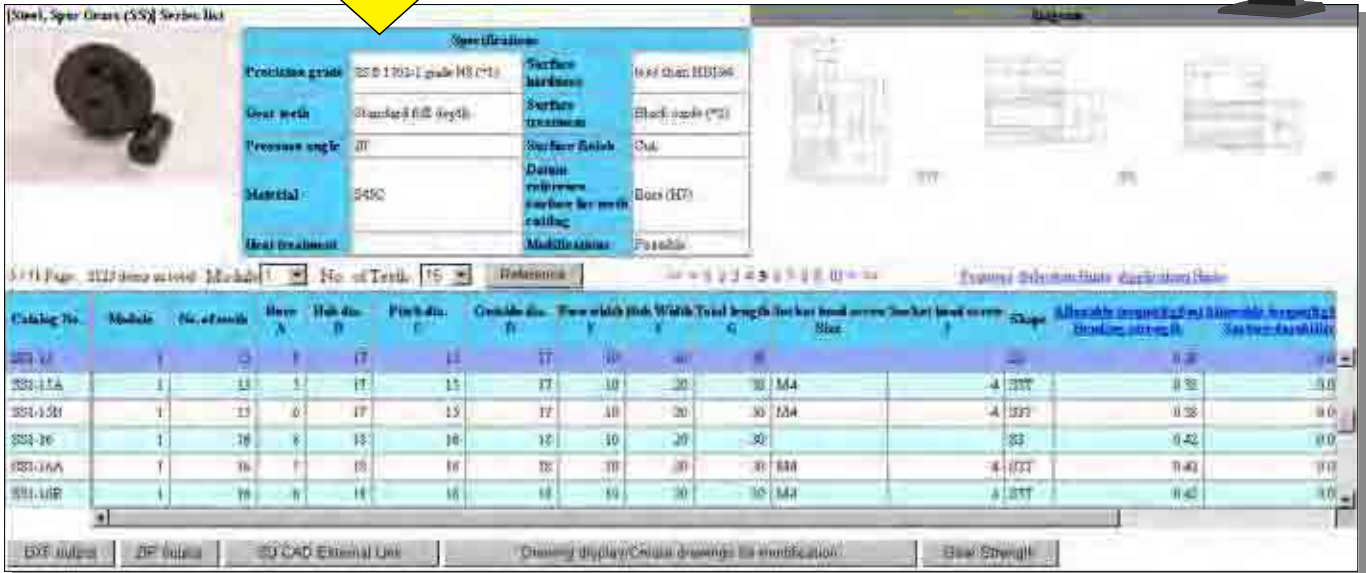


By using these 4 search functions You can select KHK products

## Download Version

You can download the KHK Web Catalog. Make the best use of our catalog.

Download from the web

Catalog No.	Module	No. of Teeth	Pressure Angle	Profile Shift	Outside Dia.	Face Width	Hub Width	Total Length	Keyway	Material	Weight	Price	Availability
SS3-11A	1	11	17	15	17	10	30	30	M4		0.38	0.38	0.0
SS3-12B	1	12	0	17	15	10	20	30	M4		0.38	0.38	0.0
SS3-16	1	16	8	15	16	10	20	30			0.42	0.42	0.0
SS3-17A	1	16	17	18	16	10	30	30	M4		0.43	0.43	0.0
SS3-18B	1	18	0	18	16	10	30	30	M4		0.43	0.43	0.0

## Introduction to Web Catalog Capabilities

### DXF File Download Output 2D CAD

You can download 3D CAD data (DXF format) from 4000 items of KHK Standard Gears.

### Zip File Download Output 2D CAD

You can download 3D CAD data (ZIP format) from 4000 items of KHK Standard Gears.

### 3D CAD Download from External Links Output 3D CAD

After selecting a KHK product, then pressing the button above, you are linked to the PART community. The PART community is a web site operated by CADENAS WEB2CAD Inc., offering CAD data download services.

### Display / Creating or Modification Drawings Output 2D CAD

You can apply modifications to KHK gear products, to modify bores, keyways, and mounting holes, etc. The modification drawings can be printed, or outputted as DXF files.

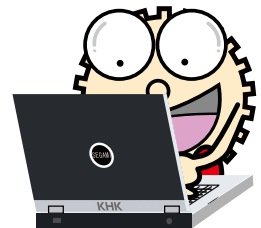
### Strength Calculations

Since the gear data (such as dimensions, material, etc.) are required for strength calculations, which are already available, you only need to input the application data (such as RPM, lubrication conditions) to obtain results.

## Quick-and-Easy Custom Gear Drawing Function Output 2D CAD

You can easily create drawings in accordance with your specifications. The results of size calculations and DXF data can then be outputted.

\*Drawing of each gear can be created only for basic forms.





Parallel  
Axes Gears

## 1. Search from Image

# PICTORIAL INDEX OF SPUR, HELICAL AND INTERNAL GEARS



**SPUR GEARS**

**MSGA · MSGB**  
Ground Spur Gears



m1 ~ 4 Page 38

RoHS     

**SSGS**  
Ground Spur Pinion Shafts



m1.5 ~ 3 Page 50

RoHS     

**SSG**  
Ground Spur Gears

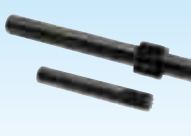


J Series

m0.5 ~ 6 Page 52

RoHS     

**SSS**  
Spur Pinion Shafts



m0.5 ~ 3 Page 106





RoHS    

**SS**  
Steel Spur Gears




J Series



m0.5 ~ 10 Page 108

RoHS    


**SSA**  
Steel Hubless Spur Gears






m1 ~ 5 Page 200

RoHS  

**SSY**  
Steel Thin Face Spur Gears



m0.8, 1 Page 206

RoHS   

**SSAY**  
Steel Hubless Thin Face Spur Gears



m1 Page 210

RoHS  


**SSAY/K**  
Spur Gears with Built-In Clamps





m0.8, 1 Page 212

RoHS  

**LS**  
Sintered Metal Spur Gears



m0.5, 0.8 Page 216

RoHS  

**SUS · SUSA**  
Stainless Steel Spur Gears



Newly added

m1 ~ 4 Page 218

RoHS  


**SUSL**  
Stainless Steel Fairloc Hub Spur Gears





m0.5 ~ 1 Page 266

RoHS  


**DSL**  
Acetal Fairloc Hub Spur Gears





m0.5 ~ 1 Page 270

RoHS  


**NSU**  
Plastic Spur Gears with Steel Core





m1 ~ 3 Page 274

RoHS  

**PU**  
Plastic Spur Gears with Stainless Steel Core



m1 ~ 2 Page 280

RoHS  

**PS · PSA**  
Plastic Spur Gears




Newly added

m1 ~ 3 Page 282



RoHS  

**SUKB**  
Stainless Steel Hubs




NEW




φ30 ~ 100 Page 334

RoHS  


**DS**  
Injection Molded Spur Gears





m0.5 ~ 1 Page 336

RoHS   


**BB**  
Sintered Metal Bushings




φ5 ~ 8 Page 338

RoHS  


**BSS**  
Brass Spur Gears





m0.5 ~ 1 Page 340

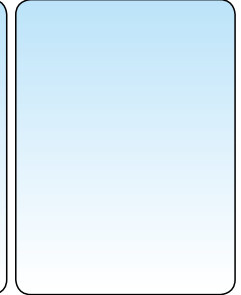
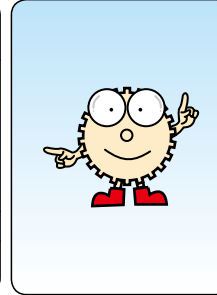
RoHS  

**SSR**  
Steel Ring Gears (Spur Gears)



m2 ~ 3 Page 346

RoHS  




**HELICAL GEARS**

**KHG**  
Ground Helical Gears



m1 ~ 3 Page 352

RoHS    

**SH**  
Steel Helical Gears



m2, 3 Page 362

RoHS  



**INTERNAL GEARS**

**SI**  
Steel Internal Gears



Newly added

m0.5 ~ 3 Page 368

RoHS  

**SIR**  
Steel Ring Gears



m2 ~ 3 Page 369

RoHS  

**Index Information**

Catalog Number










Product Photo

Size

Feature Icons

Page

**Feature Icons**

- RoHS RoHS Compliant Product
-  Re-machinable Product
-  Finished Product
-  Heat Treated Product
-  Ground Gear
-  Stainless Product
-  Resin Product
-  Copper Alloy Product
-  Injection Molded Product
-  Black Oxide coated Product

# PICTORIAL INDEX OF RACKS AND CP RACKS

Spur  
Gears

Helical  
Gears

Internal  
Gears

Racks

CP Racks  
& Pinions

Miter  
Gears

Bevel  
Gears

Screw  
Gears

Worm  
Gear Pair

Bevel  
Gearboxes

Other  
Products

## RACKS

**KRG · KRGF · KRGD**  
Ground Racks

m1 ~ 3 Page 378

RoHS

**KRF**  
Thermal Refined Racks  
with Machined Ends

m1.5 ~ 5 Page 378

RoHS

**SRG · SRGF · SRGFD · SRGFK**  
Ground Racks

*J Series*

Newly added

m0.5 ~ 6 Page 380

RoHS

**SR**  
Steel Racks

m0.5 ~ 10 Page 382

RoHS

**SRF**  
Steel Racks with Machined  
Ends

m0.5 ~ 10 Page 383

RoHS

**SRFD · SRFK**  
Steel Racks with Bolts  
Holes

*J Series*

m0.5 ~ 6 Page 384

RoHS

**SUR · SURF · SURFD**  
Stainless Steel Racks

m1 ~ 4 Page 386

RoHS

**PR · PRF**  
Plastic Racks

m1 ~ 3 Page 388

RoHS

**BSR**  
Brass Racks

m0.5 ~ 1 Page 389

RoHS

**DR**  
Molded Flexible Racks

m0.8 ~ 2 Page 390

RoHS

**SSDR Pinions**  
ARL Rack Guide Rails  
SRS Rack Clamps  
For Molded Flexible Racks

Page 390

RoHS

**SRO · SROS**  
Steel Round Racks

m1 ~ 6 Page 392

RoHS

**SURO**  
Stainless Steel Round  
Racks

Newly added

m1 ~ 3 Page 393

RoHS

**KRHG · KRHGF**  
Ground Helical Racks

m1 ~ 3 Page 394

RoHS

**SRH · SRHF · SRHFD**  
Steel Helical Racks

m2, 3 Page 396

RoHS

## CP RACKS & PINIONS

**KTSCP**  
Tapered Pinions

CP5, 10 Page 404

RoHS

**STRCPF · STRCPFD**  
Tapered Racks

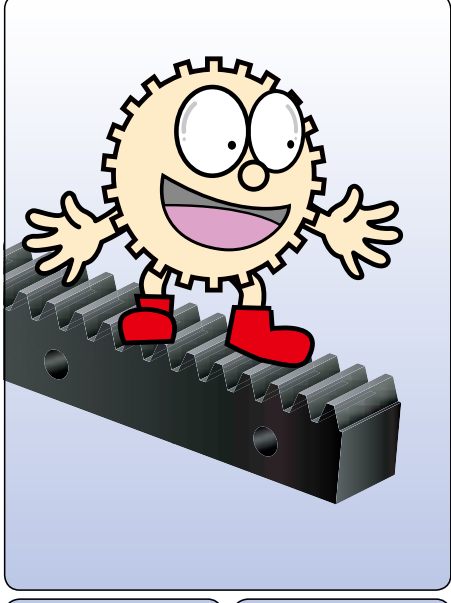
CP5, 10 Page 404

RoHS

**SSCPGS**  
Ground Spur Pinion  
Shafts

CP5, 10 Page 406

RoHS



**SSCPG**  
Ground Spur Gears

CP5 ~ 20 Page 406

RoHS

**KRGCP · KRGPCF · KRGPCD**  
Ground Racks

CP5, 10 Page 408

RoHS

**SRGCP · SRGPCF · SRGPCD**  
Ground Racks

*J Series*

Newly added

CP5 ~ 20 Page 410

RoHS

**SSCP**  
Steel Spur Gears

CP2.5 ~ 20 Page 412

RoHS

**KRCPF**  
Thermal Refined Racks

CP5, 10 Page 412

RoHS

**SRCP · SRCPF · SRCPFD**  
Racks

CP2.5 ~ 20 Page 414

RoHS

**SUSCP**  
Stainless Steel Spur  
Gears

CP5, 10 Page 416

RoHS

**SURCPF · SURCPFD**  
Stainless Steel  
Racks

CP5, 10 Page 416

RoHS

**SROCP**  
Round Racks

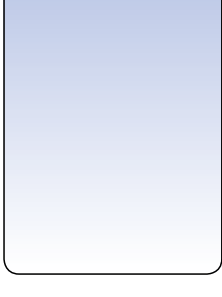
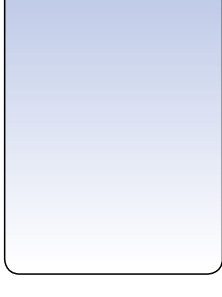
CP2.5 ~ 10 Page 418

RoHS

**FRCP**  
Metal Flexible  
Racks

CP5 Page 418

RoHS





## 1.Search from Image



### PICTORIAL INDEX OF MITER AND BEVEL GEARS

 <p><b>MITER GEARS</b></p>	<p><b>MMSG</b> Ground Spiral Miter Gears</p>  <p>m2 ~ 4 Page 424</p> 	<p><b>SMSG</b> Ground Spiral Miter Gears</p>  <p>m2 ~ 5 Page 426</p> 	<p><b>MMSA · MMSB</b> Finished Bore Spiral Miter Gears</p>  <p>m1 ~ 10 Page 428</p> 	<p><b>MMS</b> Spiral Miter Gears</p>  <p>Newly added m2 ~ 5 Page 430</p> 	<p><b>SMS</b> Spiral Miter Gears</p>  <p>m1 ~ 8 Page 432</p> 	
	<p><b>SMZG</b> Ground Zerol Miter Gears</p>  <p>New m2 ~ 3 Page 434</p> 	<p><b>SMA · SMB · SMC</b> Finished Bore Miter Gears</p>  <p>m1 ~ 8 Page 436</p> 	<p><b>MM</b> Carburized &amp; Hardened Miter Gears</p>  <p>Newly added m2 ~ 5 Page 438</p> 	<p><b>LM</b> Sintered Metal Miter Gears</p>  <p>m0.8 ~ 1.5 Page 438</p> 	<p><b>SM</b> Steel Miter Gears</p>  <p>m1 ~ 8 Page 440</p> 	<p><b>SAM</b> Angular Miter Gears</p>  <p>m1.5 ~ 3 Page 442</p> 
	<p><b>SUM</b> Stainless Steel Miter Gears</p>  <p>m1 ~ 4 Page 444</p> 	<p><b>SUMA</b> Finished Bore Stainless Steel Miter Gears</p>  <p>m1 ~ 4 Page 444</p> 	<p><b>PM</b> Plastic Miter Gears</p>  <p>m1 ~ 4 Page 446</p> 	<p><b>DM</b> Injection Molded Miter Gears</p>  <p>m0.5 ~ 1.5 Page 446</p> 	<p><b>BB</b> Sintered Metal Bushings</p>  <p>φ 5 ~ 8 Page 447</p> 	<p><b>Nissei KSP</b> Ground Spiral Miter Gears</p>  <p>m1.5 ~ 6 Page 486</p> 
	 <p><b>BEVEL GEARS</b></p>	<p><b>MHP</b> High-Ratio Hypoid Gears</p>  <p>Gear Ratio 15 ~ 200</p> <p>m1, 1.5 Page 456</p> 	<p><b>MBSG</b> Ground Spiral Bevel Gears</p>  <p>Gear Ratio 2</p> <p>m2 ~ 4 Page 458</p> 	<p><b>SBSG</b> Ground Spiral Bevel Gears</p>  <p>Gear Ratio 1.5 ~ 3</p> <p>m2 ~ 4 Page 460</p> 	<p><b>MBSA · MBSB</b> Finished Bore Spiral Bevel Gears</p>  <p>Gear Ratio 1.5 ~ 3</p> <p>m2 ~ 6 Page 462</p> 	<p><b>SBS</b> Spiral Bevel Gears</p>  <p>Gear Ratio 1.5 ~ 4</p> <p>m1 ~ 5 Page 466</p> 
		<p><b>SBZG</b> Ground Zerol Bevel Gears</p>  <p>New Gear Ratio 1.5, 2</p> <p>m2 ~ 3 Page 470</p> 	<p><b>SB</b> Steel Bevel Gears</p>  <p>Gear Ratio 1.5 ~ 4</p> <p>m1.5 ~ 6 Page 472</p> 	<p><b>SBY</b> Steel Bevel Gears</p>  <p>Gear Ratio 2 ~ 4</p> <p>m5 ~ 8 Page 472</p> 	<p><b>SB</b> Steel Bevel Gears &amp; Pinion Shafts</p>  <p>Gear Ratio 5</p> <p>m1.5 ~ 3 Page 476</p> 	<p><b>SUB</b> Stainless Steel Bevel Gears</p>  <p>Gear Ratio 1.5 ~ 3</p> <p>m1.5 ~ 3 Page 478</p> 
<p><b>DB</b> Injection Molded Bevel Gears</p>  <p>Gear Ratio 2</p> <p>m0.5 ~ 1 Page 482</p> 		<p><b>BB</b> Sintered Metal Bushings</p>  <p>φ 5 ~ 8 Page 482</p> 	<p><b>Nissei KSP</b> Ground Spiral Bevel Gears</p>  <p>Gear Ratio 1.5 ~ 2</p> <p>m2 ~ 5 Page 488</p> 	<p><b>Index Information</b></p> <ul style="list-style-type: none"> <li>Catalog No. ....</li> <li>Product Photo ....</li> <li>Page ....</li> <li>Size ....</li> <li>Feature Icons ....</li> </ul>		
			<p>● MMSG Ground Spiral Miter Gears</p>  <p>m2 ~ 4 Page 424</p> 			

# PICTORIAL INDEX OF SCREW GEARS, WORMS, WORM WHEELS AND OTHER MISCELLANEOUS PRODUCTS



Nonparallel & Nonintersecting Axes Gears

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

Bevel Gearboxes

Other Products

## SCREW GEARS

**SN**  
Steel Screw Gears

*Newly added*

m1 ~ 4 Page 496

RoHS

**SUN**  
Stainless Steel Screw Gears

*Newly added*

m1 ~ 3 Page 500

RoHS

**AN**  
Aluminum-Bronze Screw Gears

m1 ~ 4 Page 502

RoHS

**PN**  
Plastic Screw Gears

m1.5 ~ 3 Page 504

RoHS

## WORM GEAR PAIR

**KWGD L · KWGDLS**  
Duplex Worms

m1.5 ~ 4 Page 516

RoHS

**AGDL**  
Duplex Worm Wheels

Reduction Ratio 20 ~ 60

m1.5 ~ 4 Page 516

RoHS

**KWG**  
Ground Worm Shafts

m0.5 ~ 6 Page 522

RoHS

**AG**  
Worm Wheels

Reduction Ratio 10 ~ 60

m0.5 ~ 1.5 Page 522

RoHS

**AGF**  
Worm Wheels

Reduction Ratio 10 ~ 60

m2 ~ 6 Page 526

RoHS

**SWG**  
Ground Worms

*J Series*

*Newly added*

m1 ~ 6 Page 532

RoHS

**AG**  
Worm Wheels

Reduction Ratio 10 ~ 60

m1 ~ 6 Page 532

RoHS

**SW**  
Steel Worms

*J Series*

*Newly added*

m0.5 ~ 6 Page 540

RoHS

**BG**  
Bronze Worm Wheels

Reduction Ratio 10 ~ 60

m0.5 ~ 6 Page 540

RoHS

**CG**  
Gray Iron Worm Wheels

Reduction Ratio 10 ~ 120

m1 ~ 6 Page 542

RoHS

**SUW**  
Stainless Steel Worms

*J Series*

*Newly added*

m0.5 ~ 3 Page 556

RoHS

**DG**  
Plastic Worm Wheels

Reduction Ratio 10 ~ 60

m0.5, 0.8 Page 556

RoHS

**PG**  
Plastic Worm Wheels

Reduction Ratio 10 ~ 50

m1 ~ 3 Page 558

RoHS

## GEARBOXES

**PBX**  
Miniature Bevel Gearboxes

Model L / T Page 564

RoHS

**KBX**  
Bevel Gearboxes

Model L / T Page 568

RoHS

**CBX**  
Bevel Gearboxes

Model L / T Page 572

RoHS

### Feature Icons

- RoHS Compliant Product
- Re-machinable Product
- Finished Product
- Heat Treated Product
- Ground Gear
- Stainless Product
- Resin Product
- Copper Alloy Product
- Injection Molding Product
- Black Oxide coated Product

## OTHER PRODUCTS

**SRT · SRTB · SRT-C**  
Pawls & Ratchets

P2.09 ~ 12.56 Page 580

RoHS

**GC · GC-I**  
Gear Couplings

m2, 2.5 Page 584

RoHS

**SV · SVI**  
Involute Spline Shafts, Spline Bushings

m1.667 Page 588

RoHS

**QSGA · QSG**  
Master Gears (Spur Gear)

m0.4 ~ 1 Page 592

RoHS




## 2. Selecting Gears by Application

### High Precision Gears with Excellent **Low** Noise Qualities




#### Recommended Products


**MSG A · MSG B**  
Ground Spur Gears




m1 ~ 4 Page 38



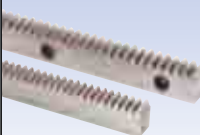
**KHG**  
Ground Helical Gears




m1 ~ 3 Page 352



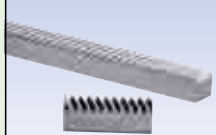
**KRG · KRGF · KRGD**  
Ground Racks




m1 ~ 3 Page 378



**KRHG · KRHGF**  
Ground Helical Racks



m1 ~ 3 Page 394



#### Machine Application Example

##### OKUMA 2SP-25HG

Lathe machine with output of  $\phi$  100 to 200 mm. Can be operated 24-hours a day by attaching a loader that produces 150 to 300 units per day. KHK gears (KRGD and MSGA) are used.

### Quenched, Ground Gears with High **Durability**



#### Recommended Products

**SSG**  
Ground Spur Gears

*J Series*



m0.5 ~ 6 Page 52



**SRG · SRGF · SRGFD · SRGFK**  
Ground Racks

*J Series*



**Newly added**


m0.5 ~ 6 Page 380



**SMSG**  
Ground Spiral Miter Gears




m2 ~ 5 Page 426




**SBSG**  
Ground Spiral Bevel Gears

Gear Ratio  
1.5 ~ 3



m2 ~ 4 Page 460

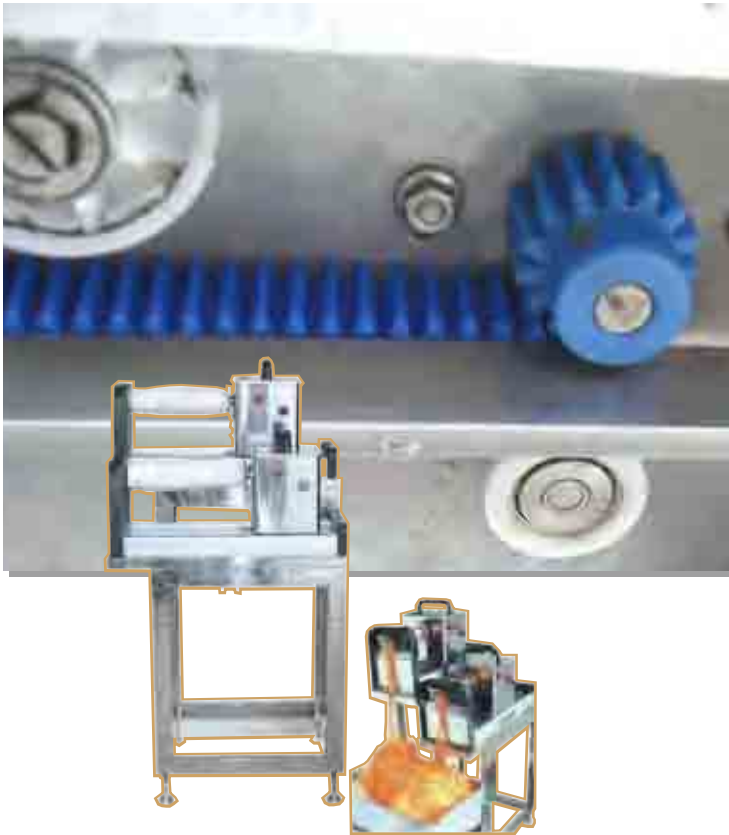


#### Machine Application Example

##### Precision Roll Feeder

A machine for cutting off stainless steel belts at designated lengths. KHK gears (SSG) are used in the feeding device of the servomotor.

## Antirust and Oil-free Components



### Recommended Products

**SUS · SUSA**  
Stainless Steel Spur Gears

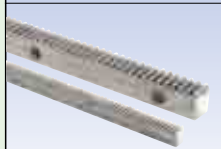


Newly added

m1 ~ 4 Page 218



**SUR · SURF · SURFD**  
Stainless Steel Racks



m1 ~ 4 Page 386



**PS · PSA**  
Plastic Spur Gears

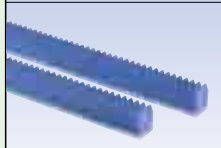


Newly added

m1 ~ 3 Page 282



**PR · PRF**  
Plastic Racks



m1 ~ 3 Page 388



### Machine Application Example

**F-T200 High-speed vegetable cutting machine, by DREMAX Inc.**

A high-precision vegetable cutting machine with a force-feed device used to produce sushi (sashimi) garnishes. To use this machine, just cut off both sides of a Daikon radish, and set to Daikon cutting, the machine performs automatically. In addition, handles two radishes at one time, for doubled efficiency. Our Gear Products (PR and PS) are used in this machine.

## High Reduction, High-load Gears



### Recommended Products

**SW**  
Steel Worms



Newly added

m0.5 ~ 6 Page 540



**BG**  
Bronze Worm Wheels

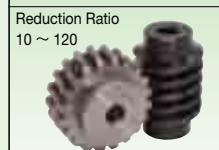


Reduction Ratio 10 ~ 60

m0.5 ~ 6 Page 540



**CG**  
Gray Iron Worm Wheels

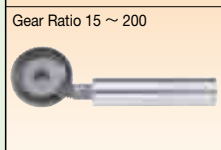


Reduction Ratio 10 ~ 120

m1 ~ 6 Page 542



**MHP**  
High-Ratio Hypoid Gears



Gear Ratio 15 ~ 200

m1, 1.5 Page 456



### Machine Application Example

**Yaesu Steam Kettle**

A food processing machine with water holding capacity of 360L and cooking capacity of 216kg (Machine Model SK-6). KHK gears (SW and CG) are used in this machine.



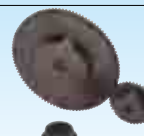
## 2. Selecting Gears Based on Use

### Small and Lightweight Components

"Vanadis", a Compact Robot used in Robot Competitions



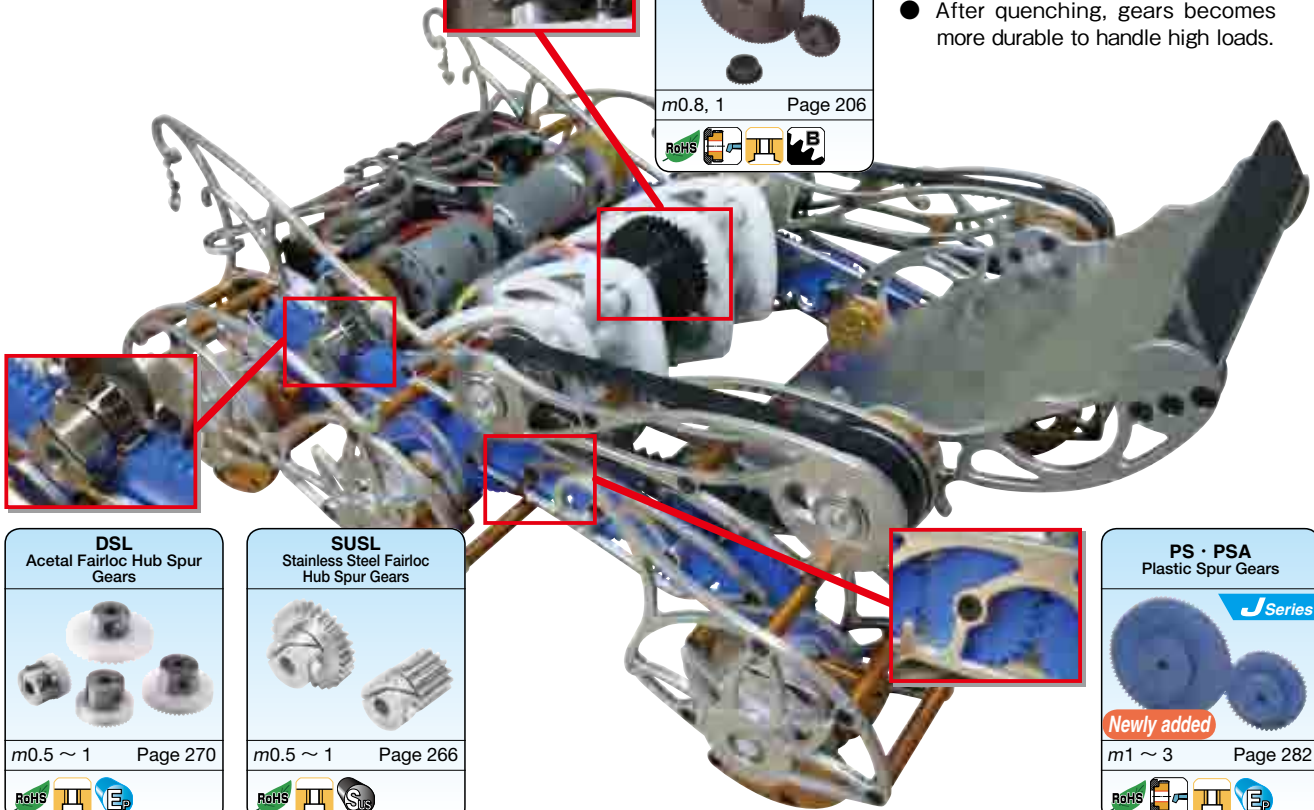
**SSY**  
Steel Thin Face Spur Gears




m0.8, 1 Page 206

RoHS

- Gears are used in power transmission to the arms. (Used when the transmission of high-loads is required.)
- After quenching, gears become more durable to handle high loads.




**DSL**  
Acetal Fairloc Hub Spur Gears



m0.5 ~ 1 Page 270

RoHS

**SUSL**  
Stainless Steel Fairloc Hub Spur Gears



m0.5 ~ 1 Page 266

RoHS

**PS · PSA**  
Plastic Spur Gears

*J Series*



Newly added

m1 ~ 3 Page 282

RoHS

- The gear decreases torque by taking advantage of slippage due to over loading or being over-powered. Also useful when the shaft is too thin to attach components such as keys and pins.
- You can select gears based on your requirements; plastic gears for light weight and SUS gears for strength.
- Used in power transmission to the legs.

KHK gears can be applied to any other type of robots.

**LS**  
Sintered Metal Spur Gears




m0.5, 0.8 Page 216

RoHS

- Used in a motor as a reduction gear mechanism, compact and strong with a metallic body.
- Used in applications with high loading, but does not need the same strength as required for SS Spur Gears.

**DR**  
Molded Flexible Racks




m0.8 ~ 2 Page 390

RoHS

- Used as a linear motion mechanism. Metal Racks with higher strength are also available.

**DM**  
Injection Molded Miter Gears




m0.5 ~ 1.5 Page 446

RoHS

- Used in changing the direction of the power transmission.
- Selection should be based on strength or weight.

**DS**  
Injection Molded Spur Gears



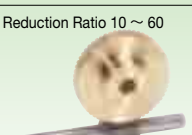
m0.5 ~ 1 Page 336

RoHS

- Used in power transmission to the legs (at the section where load reduction is required)

**AG**  
Ground Worm Shafts & Worm Wheels

Reduction Ratio 10 ~ 60



m0.5 ~ 1.5 Page 522

RoHS

&

**KWG**  
Ground Worm Shafts & Worm Wheels



m0.5 ~ 6 Page 522

RoHS

- Used when large speed reductions are required in a single reduction gearing, with the advantage of being one-way and used for the arms. (Worms can not be rotated directly from the wheels.)



# Components with **Backlash** Considerations



Duplex Worms & Worm Wheels

### Example

**KWGD · KWGDLS**  
Duplex Worms & Worm Wheels

m1.5 ~ 4 Page 516

RoHS CE H G B

**AGDL**  
Duplex Worm Shafts & Worm Wheels

Reduction Ratio  
20 ~ 60

m1.5 ~ 4 Page 516

RoHS CE G

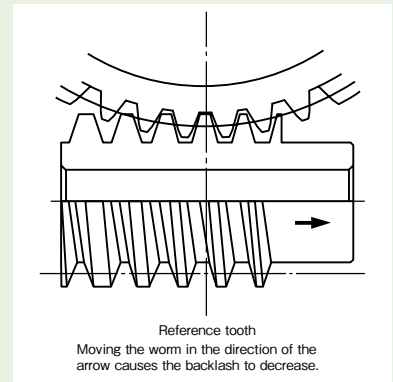
### Features

A Duplex worm gear is a dual-lead worm gear, which has a lead difference between the right tooth surface, the left tooth surface and the lead angles. Backlash adjustment is done by shifting the worm axially.

### Description of Duplex Worm Gear Pair

The usual method of adjusting the backlash of a worm gear assembly is to modify the center distance. Once assembled, such adjustment requires a major rework of the gear housing.

The use of duplex worm gears and worm wheels allows backlash adjustment to be made by axially shifting the worm. This simplifies greatly the assembly and maintenance operations.



Tapered Racks & Pinions

### Example

**KTSCP**  
Tapered Pinions

CP5, 10 Page 404

RoHS CE H B

**STRCPF · STRCPFD**  
Tapered Racks

CP5, 10 Page 404

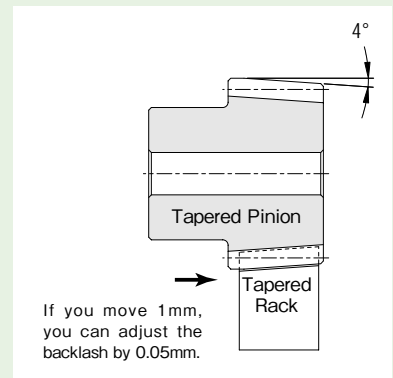
RoHS CE H B

### Features

These are designed so that moving the pinion axially by 1mm changes the backlash by 0.05mm.

### Examples

- A SRCP5-1000 and SSCP5-30 combination produces backlash values of 0.1 to 0.26.
- STRCPF5-1000 and KTSCP5-30 combination can have the backlash value of 0.05 or less. (Target value)



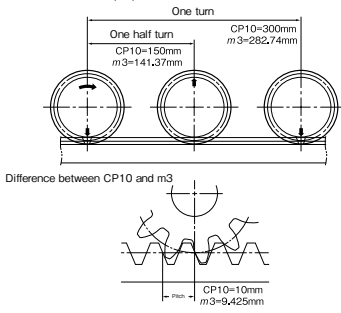


## 2. Selecting Gears Based on Use

### Convenient Positioning in **Linear Motion** Applications



Movement of one cycle of the CP10-30 pinion on a CP rack vs. SS3-30 (m3) on a m3 rack.



#### Example

**SSCPG**  
 CP Ground Spur Gears

CP5 ~ 20 Page 406

RoHS

**SRGCP · SRGCPF · SRGCPD**  
 CP Ground Racks

*J Series*

Newly added

CP5 ~ 20 Page 410

RoHS

**SSCP**  
 CP Spur Gears

CP2.5 ~ 20 Page 412

RoHS

**SRCP · SRCPF · SRCPFD**  
 CP Racks

CP2.5 ~ 20 Page 414

RoHS

#### About CP Racks & Pinions

The reference pitch of a metric module is computed by multiplying the number of module by  $\pi$  (3.14159). For example, the reference pitch of m3 rack is 9.425mm ( $3 \times \pi$ ). When using a rack and a pinion in linear motion applications, the fact that the pitch is not an integral number presents a difficulty in accurate positioning. This problem is solved by using circular pitch racks and pinions where one rotation of a pinion moves it precisely 50, 100, 150, to 600. The difference in movement of one rotation of 30-teeth CP10 vs. SS3 spur gears is illustrated on the left.

### Mount the Gears on the Shaft with a **Single Touch**



#### Example

**SUSL**  
 Stainless Steel Fairloc Hub Spur Gears

m0.5 ~ 1 Page 266

RoHS

**DSL**  
 Acetal Fairloc Hub Spur Gears

m0.5 ~ 1 Page 270

RoHS

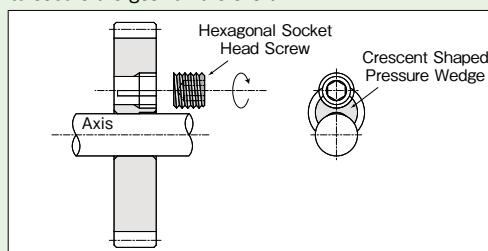
**SSAY/K**  
 Spur Gears with Built-In Clamps

m0.8, 1 Page 212

RoHS

#### How does the K-Clamp work?

The K-Clamp uses a crescent shaped piece, appropriate for the size of the shaft as the pressure wedge to secure the gear on the shaft.



#### Special Features

- Possible to mount repeatedly without marring the shafts.
- The component consists of one screw; this simple construction leads to lower costs.
- Machining of shafts or auxiliary mounting hardware is not necessary.
- Especially suitable when positional adjustment is needed after assembly.

\* The sizes and shapes of the K-clamps are standardized depending on their bore sizes.

### 3. Selecting Gears Based on Gear Strength

## Gear Strength is one of the most important factors in selecting gears.

#### Step 1

Approximate the type of gear, strength and torque load.

##### Definition of Bending Strength

The allowable bending strength of a gear is defined as the allowable tangential force at the pitch circle based on the mutually allowable root stress of two meshing gears under load.



Example of failure due to insufficient bending strength.

##### Definition of Surface Durability

The surface durability of a gear is defined as the allowable tangential force at the pitch circle, which permits the force to be transmitted safely without incurring surface failures.



Example of defacement due to insufficient surface durability.

#### Step 2

Make a tentative selection based on the torque load using the printed version of the KHK catalog, or the Web catalog.

The KHK catalog is used for the tentative selections.

Catalog No.	Module	No. of Teeth	Shaft Dia.	Pitch Dia.	Face Width	Weight	Material	Modulus of Elasticity (N/mm <sup>2</sup> )	Surface Stress (MPa)	Root Stress (MPa)	Weight (kg)	Catalog No.
MSSG1-18	1.8	51	8	15	18	20	SAE 1045	210,000	225	200	0.02	MSSG1-18
MSSG1-20	2.0	51	8	17	20	22	SAE 1045	210,000	242	200	0.03	MSSG1-20
MSSG1-24	2.4	51	10	20	24	26	SAE 1045	210,000	288	198	0.04	MSSG1-24
MSSG1-25	2.5	51	12	20	25	27	SAE 1045	210,000	296	200	0.04	MSSG1-25
MSSG1-30	3.0	51	12	25	30	32	SAE 1045	210,000	351	200	0.07	MSSG1-30
MSSG1-35	3.5	51	15	25	35	37	SAE 1045	210,000	387	200	0.09	MSSG1-35
MSSG1-40	4.0	51	15	25	36	38	SAE 1045	210,000	415	200	0.10	MSSG1-40
MSSG1-45	4.5	51	15	30	45	47	SAE 1045	210,000	463	200	0.15	MSSG1-45
MSSG1-50	5.0	51	15	30	48	50	SAE 1045	210,000	498	200	0.17	MSSG1-50
MSSG1-55	5.5	51	15	35	50	52	SAE 1045	210,000	551	200	0.19	MSSG1-55
MSSG1-60	6.0	51	15	40	60	62	SAE 1045	210,000	611	200	0.25	MSSG1-60
MSSG1-70	7.0	51	20	45	70	72	SAE 1045	210,000	719	200	0.39	MSSG1-70
MSSG1-80	8.0	51	20	45	80	82	SAE 1045	210,000	839	200	0.48	MSSG1-80
MSSG1-100	10.0	51	20	45	100	102	SAE 1045	210,000	1092	200	0.71	MSSG1-100

The Web catalog is used for the tentative selections.



#### Step 3

After calculating the required strength using the actual conditions of usage, examine the selection mode in Step 2.

The formal strength calculation can be performed using the various formulas. (Page 663)

##### (2) Bending Strength Formulas

In order to satisfy the bending strength, the transmitted tangential force at the working pitch circle,  $F_t$ , is not to exceed the allowable tangential force at the working pitch circle,  $F_{tlim}$ , that is calculated taking into account the allowable bending stress at the root.

$$F_t \leq F_{tlim} \quad (1.4)$$

At the same time, the actual bending stress at the root,  $\sigma_r$ , that is calculated on the basis of the transmitted tangential force at the working pitch circle,  $F_t$ , must be less than the allowable bending stress at the root,  $\sigma_{rlim}$ .

$$\sigma_r \leq \sigma_{rlim} \quad (1.5)$$

Equation (1.6) presents the calculation of  $F_{tlim}$  (kgf).

$$F_{tlim} = \sigma_{rlim} \frac{m_b b}{Y_F Y_\beta} \frac{K_L K_{FX}}{K_V K_O} \frac{1}{S_F} \quad (1.6)$$

Equation (1.6) can be converted into stress by Equation (1.7) (kgf/mm<sup>2</sup>).

$$\sigma_r = F_t \frac{Y_F Y_\beta}{m_b b} \frac{K_V K_O}{K_L K_{FX}} S_F \quad (1.7)$$

If the Web catalog is used, the strength can be easily confirmed.



Also, please refer to "Safety Considerations when Selecting Gears". (Page 29)

GCSW for Web, the Gear Calculation Software Available for free. Member registration is required for use.



Our gear calculation software, GCSW for Web, allows you these automatic gear calculations in accordance with your specifications: Dimension calculations, Gear force calculation, Tooth profile calculation, Backlash calculation, and calculation for a Constrained gear system, and others. Please make sure to make the best use of our software for efficient gear drawing.

FREE! Register now for membership!

GCSW

Search



# KHK Stock Gears Selection Methods

## 4. Selection Methods for first-time users

Please select product series from the performance / price indication chart below.

Motion Direction	Parallel Axes			Liner Motion			Intersecting Axes			Nonparallel & Nonintersecting Axes				
Product Groups	Spur Gears P33	Helical Gears P347	Internal Gears P365	Racks P371	Helical Racks P371	CP Racks P399	Miter Gears P419	Bevel Gears P449		Screw Gears P493	Worm Gear Pair P507			
Features	Regular	Anti rust	Unlubricated	Regular	Anti rust	Unlubricated	Regular	Anti rust	Unlubricated	Regular	Anti rust	Unlubricated		
High Performance	MSG			KRHG			MMSG	MBSG		KWG				
	KHG			KRG			SMZG	SBZG						
	SSG			KRG CP			SMSG	SBSG						
				SRG CP						SWG				
				SRG						AG				
												AN		
												SUN		
												SUN	SUN	
													SUN	SUN
														PN
	Low Cost	LS		DS										

\* Please read through the selection / application hints in the pages of each product series, based on your selection. Also, please refer to the product specifications in the dimensional table for selecting gears fitting your requirements in mind.



To select KHK Stock Gears, please be sure to carefully consider the characteristics of the items and contents of the product table in each section of a product series.

## Attention

- As for items not in this catalog or products having specifications (material, modules, tooth number etc.) not shown in the dimension tables, KHK handles custom-made gear product requests. To order custom-made gears, please refer to the information on the page 14.
- Caution in regards to the special characteristics is described in each dimension table in the product information page. Please read carefully to understand the correct specifications and select suitable gears properly.
- When selecting gears with angled teeth, please be careful and understand the helix direction of the mating gear. These gears cannot be installed with an improper orientation. For details, please refer to the information in the first page of each product series.
- There might be cases that the products shown in each product information page are different from the actual shown products, in color or shape. Especially for shapes, please be sure and check the information in the dimension tables.
- For the purpose of modifications, there are cases where specifications or dimensions are changed without notice. The most updated information is published on the KHK Web Catalog, at our official web site. Keep up to date, by visiting the web site. Thank you very much.
  - [www.khkgears.co.jp/en/web\\_catalog/index.html](http://www.khkgears.co.jp/en/web_catalog/index.html)
- We publish any changes and corrections to the catalog on our web site. Keep up to date, by visiting the web site. Thank you very much.
  - [www.khkgears.co.jp/en/catalogs/data\\_corrections\\_catalog.html](http://www.khkgears.co.jp/en/catalogs/data_corrections_catalog.html)



Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

Bevel Gearboxes

Other Products

■ For ordering KHK Stock Gears, please place an order by letting us know the catalog number of each item.

You will find explanations about the catalog number in the first page of each product series.

■ For more information, please visit our web site, or contact us directly.

Web Site

URL : [www.khkgears.co.jp/en/](http://www.khkgears.co.jp/en/)

Sales Department

TEL : +81-48-254-1744 FAX : +81-48-254-1765

E-mail : [export@khkgears.co.jp](mailto:export@khkgears.co.jp)



# Safety Considerations when Using KHK Gears

In order for our customers to use our products safely:

We consider safety to be of utmost importance. Please consider the following issues in order to prevent danger in handling, assembling, and operating KHK products.



## Warning Protection of Body and Property

1. Follow all applicable safety regulations (Labor, Safety, and Sanitation Regulations) in installing and operating our products.
2. Adhere to the following procedures when installing, dismantling or inspecting our products.
  - ① Turn off the power.
  - ② Do not place any part of your body in harm's way.
  - ③ Wear proper attire and protective gear appropriate for the task.



## Attention Prevention of Accidents

1. Please read the "CAUTION" notes before using our products in your applications.
2. Please avoid using the products in an environment where it may cause adverse effects.
3. KHK Products are made in accordance with ISO 9000 Quality Standard. However, if any defective products are found, please contact the dealer.



Please feel free to contact our distributors or KHK with any questions.

## Precautions on Applications

1. KHK products are individually packaged to avoid damage during shipping. In case you find rust, scratches, dents or other problems when you unpack your gears, please contact the dealer where you made your purchase.
2. Depending on how they are handled, it is still possible to deform or break gears. Please be sure to handle gears carefully, especially the long racks or ring gears, as they are easily deformed.

## Precautions on Performing Secondary Operations

1. We can not guarantee the precision of gears once a customer performs a modification (secondary operation) on any gears.
2. When you apply additional secondary operations on KHK Stock Gears, please read through the information "Cautions on Performing Secondary Operations" on the first page of each product series section.

## Precautions on Assembling

1. KHK Gears are designed so to give the proper backlash as long as assembled in accordance with the normal value (theoretical values) of the center distance. For a pair of gears, the center distance tolerance is specified to the plus side of tolerances H7 to H8. However, in case of using multiple gear trains, please aim for near-zero by setting to a plus-tolerance, or minus-tolerance.
2. When you assemble gears, please read through the information "Points of Caution in Assembling" on the first page of each product series section.

## Precautions on Starting Operations

Before operating, check the following:

- ① Are the gears firmly mounted on the shafts?
- ② Have you eliminated uneven tooth contact?
- ③ Does the gear mesh have a proper amount of backlash?  
(Please avoid the condition of no backlash)
- ④ Is there sufficient lubrication?

2. If the gears are exposed, install a safety cover for protection. Never touch gears while they are in motion.
3. The following are the gear lubrication methods for general use.
  - (a) Grease Lubrication
  - (b) Splash Lubrication (Oil Bath Method)
  - (c) Forced Oil Circulation Lubrication

Check lubrication after start up, sometimes, when the unit is initially being operated, lubricating oil deteriorates rapidly. For details, please refer to "Lubrication of Gears" on the page 704.
4. If there is unusual noise or vibration at the start up, please recheck the gears and correctness of the assembly. Some of the methods for achieving noise reduction are:
  - (a) High Precision
  - (b) Fine Tooth Surface Finish
  - (c) Accurate Tooth Contact

For details, please refer to "Gear Noise" on the page 711.

*Must check*





GCU

Gear Assembly Kit (For use in learning about gears)

RoHS Compliant



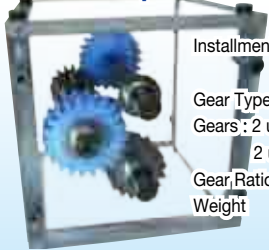
Gear Cube

Gear Assembly Kits are products used in learning about gears. This gear assembly kit clearly shows how gears work and allows users to understand gear types, directions of motion, speed reductions and other factors. GCU Assembly Kits come with different gear types that can be combined in usage for learning more about the characteristics and features of gears.



### New Products

#### GCU-S Spur Gear Kit



Installation : Parallel axes gears (Two-stage)  
Gear Type : Spur Gears  
Gears : 2 units of SS1.5-16  
2 units of PS1.5-22  
Gear Ratio : 1.89  
Weight : Approx. 1kg

The Gear Kit contains two-stage spur gears and allows speed increases / reductions, and includes the most commonly used combinations of gears.

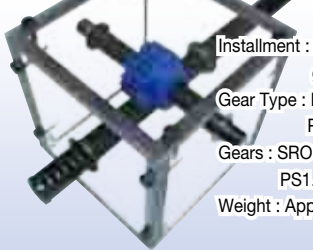
#### GCU-H Helical Gear Kit



Installation : Parallel axes gears  
Gear Type : Helical Gears (Screw Gears)  
Gears : SN2.5-10L  
PN2.5-10R  
Gear Ratio : 1  
Weight : Approx. 1kg

Helical gears have more strength than spur gears of the same dimensions and have the advantage of being less noisy.

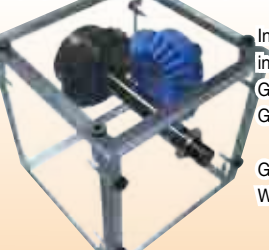
#### GCU-R Rack Kit



Installation : Parallel axes gears  
Gear Type : Racks & Pinions  
Gears : SRO1.5-500  
PS1.5-20  
Weight : Approx. 1kg

Use of racks enables the conversion of rotation motion to linear motion. Applications include devices that provide lift.

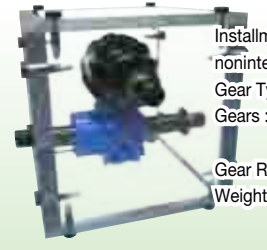
#### GCU-M Miter Gear Kit



Installation : Intersecting axes gears  
Gear Type : Miter Gears  
Gears : SM2-25  
PM2-25  
Gear Ratio : 1  
Weight : Approx. 1kg

Use of bevel gears allows the changing of the shaft angle by 90 degrees. Applications include the changing of the direction of power.

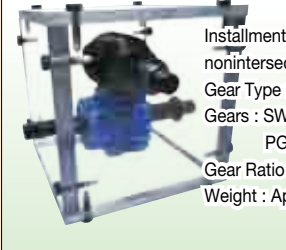
#### GCU-N Screw Gear Kit



Installation : Nonparallel and nonintersecting gears  
Gear Type : Screw Gears  
Gears : SN2.5-10R  
PN2.5-10R  
Gear Ratio : 1  
Weight : Approx. 1kg

Screw Gears are helical gears used in nonparallel and nonintersecting situations. Applications include devices like conveyers with light loads.

#### GCU-W Worm Gear Pair Kit



Installation : Nonparallel and nonintersecting gears  
Gear Type : Worm Gear Pair  
Gears : SW2-R1  
PG2-20R1  
Gear Ratio : 20  
Weight : Approx. 1kg

Worm Gear Pairs can be used to make large reductions in speed in a single phase. The Worm gear cannot be driven by the worm wheel due to inherent self-locking.

\* These kits are not for actual use to transmit power and please use only as representations of gear systems.

### Components Included in a Kit



Photo : GCU-R

### Assembling

Detailed information is available on our web site.

Photo : GCU-R



Remove film coverings from the frames.



Attach bushings.



Install the gear to the shaft.



Place the sticker and the gear kit is now completed!

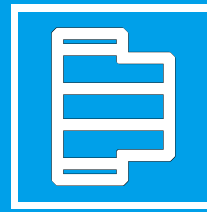


Fasten screws.



Set up the shaft in the frame.



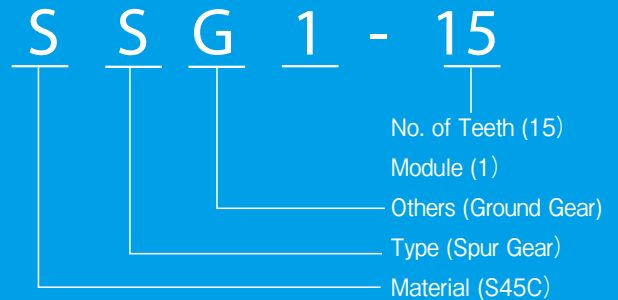


# Spur Gears

## Catalog Number of KHK Stock Gears

The Catalog Number for KHK stock gears is based on the simple formula listed below. Please order KHK gears by specifying the Catalog Numbers.

(Example) Spur Gears



### Material

S	S45C
M	SCM415
SU	SUS303
P	MC901
N	MC602-ST
D	DURACON
BS	Free-Cutting Brass C3604
L	SMF5040

### Type

S	Spur Gears
---	------------

### Other Information

A	Hubless Gears
G	Ground Gears
L	Fairloc Hub Gears
R	Ring Gears
S	Pinion Shafts
U	Plastic Gears with Steel Core
Y	Thin Face Gears

### Feature Icons

	RoHS Compliant Product		Stainless Product
	Re-machinable Product		Resin Product
	Finished Product		Copper Alloy Product
	Heat Treated Product		Injection Molded Product
	Ground Gear		Black Oxide coated Product

<b>MSGA · MSGB</b> Ground Spur Gears  m1 ~ 4 Page 38 RoHS	<b>SSGS</b> Ground Spur Pinion Shafts  m1.5 ~ 3 Page 50 RoHS	<b>SSG</b> Ground Spur Gears  m0.5 ~ 6 Page 52 RoHS
<b>SSS</b> Spur Pinion Shafts  m0.5 ~ 3 Page 106 RoHS	<b>SS</b> Steel Spur Gears  m0.5 ~ 10 Page 108 RoHS	<b>SSA</b> Steel Hubless Spur Gears  m1 ~ 5 Page 200 RoHS
<b>SSY</b> Steel Thin Face Spur Gears  m0.8, 1 Page 206 RoHS	<b>SSAY</b> Steel Hubless Thin Face Spur Gears  m1 Page 210 RoHS	<b>SSAY/K</b> Spur Gears with Built-In Clamps  m0.8, 1 Page 212 RoHS
<b>LS</b> Sintered Metal Spur Gears  m0.5, 0.8 Page 216 RoHS	<b>SUS · SUS A</b> Stainless Steel Spur Gears  m1 ~ 4 Page 218 RoHS	<b>SUSL</b> Stainless Steel Fairloc Hub Spur Gears  m0.5 ~ 1 Page 266 RoHS
<b>DSL</b> Acetal Fairloc Hub Spur Gears  m0.5 ~ 1 Page 270 RoHS	<b>NSU</b> Plastic Spur Gears with Steel Core  m1 ~ 3 Page 274 RoHS	<b>PU</b> Plastic Spur Gears with Stainless Steel Core  m1 ~ 2 Page 280 RoHS
<b>PS · PSA</b> Plastic Spur Gears  m1 ~ 3 Page 282 RoHS	<b>SUKB</b> Stainless Steel Hubs  φ30 ~ 100 Page 334 RoHS	<b>DS</b> Injection Molded Spur Gears  m0.5 ~ 1 Page 336 RoHS
<b>BB</b> Sintered Metal Bushings  φ5 ~ 8 Page 338 RoHS	<b>BSS</b> Brass Spur Gears  m0.5 ~ 1 Page 340 RoHS	<b>SSR</b> Steel Ring Gears (Spur Gears)  m2 ~ 3 Page 346 RoHS

- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products



## Characteristics



To meet your requirements, KHK stock gears are made in a variety of types, materials, configurations, modules and numbers of teeth. We also offer products that allow secondary operations to be performed on the bores, shafts, outside diameters, keyways and set screws. The following table lists the main features.

Catalog No.	Module	Material	Heat Treatment	Tooth Surface Finish	Precision JIS B 1702-1:1998	Secondary Operations	Features
<b>MSGA · MSGB</b>	1 ~ 4	SCM415	Carburized	Ground	N5	×	High strength, abrasion-resistant and compact.
<b>SSGS</b>	1.5 ~ 3	S45C	Thermal refined · Gear teeth induction hardened	Ground	N7	△	Ground shaft pinions that allow modification of shafts to fit your bearings.
<b>SSG</b>	0.5 ~ 6	S45C	Gear teeth induction hardened NOTE 1	Ground	N7	△	Although heat treatment is applied to tooth area, secondary operation can be added. Finished products for J Series are also available.
<b>SSS</b>	0.5 ~ 3	S45C	Thermal refined NOTE 2	Cut	N8 NOTE 3	○	For the SS series, Shaft-Pinions with a small number of teeth (10 to 13 teeth) are available.
<b>SS</b>	0.5 ~ 10	S45C	—	Cut	N8 NOTE 3	○	A low priced, general usage gear with a large selection of modules and number of teeth, finished products for J Series are also available.
<b>SSA</b>	1 ~ 5	S45C	—	Cut	N8	○	Hubless gears for lighter and more compact applications.
<b>SSY</b>	0.8, 1	S45C	—	Cut	N8 NOTE 3	○	Narrower face gears for light-duty applications.
<b>SSAY</b>	1	S45C	—	Cut	N8	○	Hubless and narrow faces for even lighter and more compact gears.
<b>SSAY/K</b>	0.8, 1	S45C	—	Cut	N8 NOTE 3	△	Compact sized gears can be clamped to the shafts without a hub.
<b>LS</b>	0.5, 0.8	SMF5040 (Equiv. to S45C)	—	Sintered	N8 NOTE 3	○	Low cost due to elimination of machining and reduction in wasted material.
<b>SUS · SUSA</b>	1 ~ 4	SUS303	—	Cut	N8	○	Stainless steel gears for more rust-resistant gears. Finished products for J Series are also available.
<b>SUSL</b>	0.5 ~ 1	SUS303	—	Cut	N8 NOTE 3	△	Smaller module gears which clamp to the shafts without any keys or set screws.
<b>DSL</b>	0.5 ~ 1	Acetal (SUS303)	—	Cut	N10 NOTE 3	△	These rust-resistant gears can be clamped to the shafts without any keys or set screws.
<b>NSU</b>	1 ~ 3	MC602ST (S45C)	—	Cut	N9	○	Nylon teeth with steel hubs that can have keyways and set screws added.
<b>PU</b>	1 ~ 2	MC901 (SUS303)	—	Cut	N9	○	Nylon teeth with stainless steel hubs for rust-resistance.
<b>PS · PSA</b>	1 ~ 3	MC901	—	Cut	N9	○	Possible to operate without lubrication. Suitable for food processing machines. Finished products for J Series are also available.
<b>DS</b>	0.5 ~ 1	Duracon (M90-44)	—	Injection Molded	Equiv. to N12	△	Low cost, mass-produced products suitable for light duty office machines.
<b>BSS</b>	0.5 ~ 1	Free-cutting Brass (C3604)	—	Cut	N8 NOTE 3	○	Small module brass spur gears suitable for mating with DS gears.
<b>SSR</b>	2 ~ 3	S45C	—	Cut	N9	○	Allows large gear ratios. Can also be used as segment gears and corner racks.

(NOTE 1) Products with module less than 0.8 are thermal refined, without gear teeth hardened.

(NOTE 2) SA-shaped products with module less than 1 have no material thermal refinement treatment.

(NOTE 3) For products which are smaller than module 0.8, the accuracy grade is equivalent to the value shown.

○ Possible △ Partly possible × Not possible

- By chamfering the corners of the top land, gear noise is reduced, and the chances of damage due to handling and transportation are decreased. All KHK gears larger than m1.5 have their teeth chamfered.
- Black colored products are KHK stock gears that have black oxide coating for rust resistance; this 'blackness' is a product characteristic of KHK stock gears.

## Selection Hints



Please select the most suitable products by carefully considering the characteristics of items and contents of the product tables. It is also important to read all applicable "CAUTION" notes before the final selection. Use of catalog numbers when ordering will simplify and expedite the processing of your order.

### 1. Caution in selecting the mating Gears

- ① Basically, all spur gears, internal gears and racks can be paired as long as the module matches. The product with different materials, tooth widths, or methods of cutting the teeth can be mated.
- ② When using a pinion with an internal gear with a small difference in the numbers of teeth, there are possibilities for involute interference, trochoid interference and trimming interference. See the internal gear interference portion of the technical section to avoid problems in assembling these items. (Page 367)

### 2. Caution in Selecting Gears Based on Gear Strength

The gear strength values shown in the product pages were computed by assuming a certain application environment. Therefore, they should be used as reference only. We recommend that each user computes his own values by applying the actual usage conditions. Also, SUSL Fairloc hub spur gears, DSL Fairloc hub spur gears and SSAY/K spur gears with built-in clamps need additional considerations of the starting torque.

The table below contains the assumptions established for various products in order to compute gear strengths.

### ■ Calculation of Bending Strength of Gears

Item	Catalog No.									
	MSGB	SSGS	SSG	SSS,SS,SSA SSY,SSAY SSAY/K SSR	SUS SUSA SUSL LS	BSS	NSU	PU PS PSA	DSL DS	
Formula <small>NOTE 1</small>	Formula of spur and helical gears on bending strength (JGMA401-01)						The Lewis formula			
No. of teeth of mating gears	Same number of teeth (30 for SSGS, SSS, SSR)						—			
Rotation	600rpm			100rpm			100rpm			
Durability	Over 10 <sup>7</sup> cycles						—			
Impact from motor	Uniform load						Allowable Bending Stress(kgf/mm <sup>2</sup> )			
Impact from load	Uniform load									
Direction of load	Bidirectional									
Allowable bending stresses at root $\sigma_{Flim}$ (kgf/mm <sup>2</sup> ) <small>NOTE 1</small>	47	24.5	19 (24.5) <small>NOTE 3</small>	19 (24.5) <small>NOTE 4</small>	10.5	4	1.38 (40°C with No Lubrication)	1.15 (40°C with No Lubrication)	m 0.5 4.0 m 0.8 4.0 m 1.0 3.5 (40°C with Grease Lubrication)	
Safety factor $S_F$	1.2									

### ■ Calculation of Surface Durability (Except where it is common with Bending Strength)

Formula <small>NOTE 1</small>	Formula of spur and helical gears on surface durability(JGMA402-01)					
Kinematic viscosity of lubricant	100cSt (50°C )					
Gear support	Symmetric support by bearings <small>NOTE 5</small>					
Allowable Hertz stress $\sigma_{Hlim}$ (kgf/mm <sup>2</sup> )	166	99	90 (62.5) <small>NOTE 3</small>	49 (62.5) <small>NOTE 4</small>	41.3	—
Safety factor $S_H$	1.15					

**(NOTE 1)** JGMA (Japanese Manufacturers' Association), "MC Nylon Technical Data" of Nippon Polypenco Limited and "Duracon Gear" of Polyplastic Co. The units for rotational speed (rpm) and the load (kgf/mm<sup>2</sup>) were matched to the units needed in the equation.

**(NOTE 2)** Since the load is bidirectional, the allowable bending stress at root  $\sigma_{Flim}$ , calculated from JGMA 401-01, is set to 2/3 of the value.

**(NOTE 3)** For SSG Ground Spur Gears, with module 0.8 or lesser, thermal refining is applied. Allowable bending stress and allowable hertz stress are referred to as the value shown in the parentheses.

**(NOTE 4)** For SSS Spur Pinion Shafts, with module over 1.5, teeth induction hardening is not applied. Allowable bending stress and allowable hertz stress are referred to the value shown in the parentheses.

**(NOTE 5)** SSS Spur Pinion Shafts with module 1.0 or lesser (SA configuration) are set to cantilever support as it is a single shaft type.

#### ■ Definition of bending strength by JGMA 401-01(1974)

The allowable bending strength of a gear is defined as the allowable tangential force at the pitch circle based on the mutually allowable root stress of two meshing gears under load.



Example of the failure due to insufficient bending strength.

#### ■ Definition of surface durability by JGMA 402-01(1975)

The surface durability of a gear is defined as the allowable tangential force at the pitch circle, which permits the force to be transmitted safely without incurring surface failure.



Example of the defacement due to insufficient surface durability.



## Application Hints

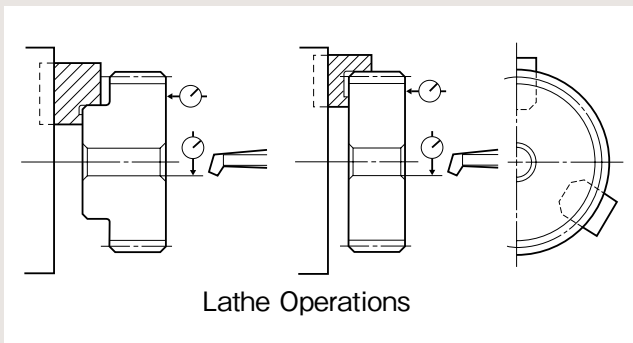


In order to use KHK stock gears safely, carefully read the Application Hints before proceeding. If there are questions or if you require clarifications, please contact our technical department or your nearest distributor.

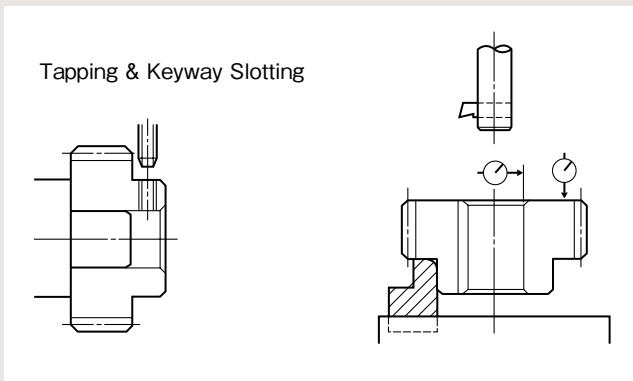
KHK CO., LTD. TECHNICAL DEPARTMENT  
PHONE: 81-48-254-1744 FAX: 81-48-254-1765  
E-mail export@khkgears.co.jp

### 1. Caution on Performing Secondary Operations

- ① If you are reboring, it is important to pay special attention to locating the center in order to avoid runout.
- ② The reference datum for gear cutting is the bore. Therefore, use the bore for locating the center. If it is too difficult to do for small bores, the alternative is to use one spot on the bore and the runout of the side surface.
- ③ If the rework requires using scroll chucks, we recommend the use of new or rebored jaws for improved precision. If chucking by the teeth, please apply the pressure carefully to avoid crushing the teeth which will lead to noisy gears.



- ④ The maximum bore size is dictated by the requirement that the strength of the hub is to be higher than that of the gear teeth. The maximum bore size should be 60% to 70% of the hub diameter (or teeth root diameter), and 50% to 60% for keyway applied modifications.
- ⑤ In order to avoid stress concentration, leave radii on the keyway corners.



- ⑥ To avoid problems of reduced gear precision and other manufacturing difficulties, do not attempt to machine the gears to reduce face widths.
- ⑦ If you apply induction hardening on gear teeth, please be aware of potential thermal stress cracks. Also, note that the precision grade of the product declines by 1 or 2 grades, as deformation on material may occur. If you require tolerance for bore or other parts, machining is necessary after heat treatment.

## Heat Treatment

If you apply induction hardening to the gear teeth of S45C products, you need to designate the hardness and where to apply the heat treatment. Below is an example of common specifications and KHK's specifications for hardening:

- Common Specifications for Heat Treatment  
Area: Tooth surface, or, Tooth surface and Tooth root  
Hardness: Within 10 HRC in the range from 45 to 60 HRC. (e.g. 48 - 58 HRC)
- KHK's Specifications for Heat Treatment  
Area: Tooth surface, or, Tooth surface and Tooth root  
Hardness: From 45 to 55 HRC.

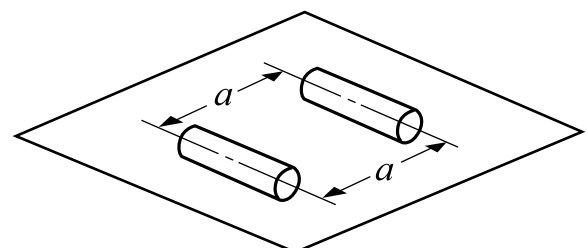
\* Hardness and Depth of Gear-teeth Induction Hardening  
The hardening method and the state of hardened teeth area are varied depending on the size of gears. Since different hardening treatment is applied in accordance with the module and number of teeth, the hardness level you designate is referred to as the hardness of the pitch line. For some of our products, there may be a case that the hardness at tooth tip / root may not be equal to the hardness you designated.

As to the effective case depth for S45C, it is specified by JIS, as "The distance from the surface of the case to the area with hardness HV450". The case depth differs from area to area of a tooth.

### 2. Points of Caution in Assembling

- ① KHK stock spur gears are designed to give the proper backlash when assembled using the center distance given by the formula below (center distance tolerance of H7 - H8).

Backlash may be adjusted by changing the center distance of mating gears. For more information, please consult the technical section on gear backlash (page 648).



$$a = m(Z_1 + Z_2) / 2$$

where

$a$  : Center Distance

$m$  : Module

$Z_1$  : No. of teeth of pinion

$Z_2$  : No. of teeth of gear

- ② The table below indicates the tolerance on the total length of KHK stock spur gears. Please refer to this data when designing gear boxes or other components.

■ Overall Length Tolerance for Spur and Helical Gears

Overall Length(mm)	Tolerance
Under 30	0 - 0.10
Over 30 Under 100	0 - 0.15
Over 100	0 - 0.20

(Note) Following products are excluded from this table: Spur pinion shafts, Injection molded spur gears, Fairloc hub spur gears, and MC nylon products.

- ③ Spur gears produce no thrust forces, however, be sure to fasten them firmly with stepped shafts, or collars, to prevent shifting toward the shaft. Keyways are generally used in fastening gears to a shaft, and they should be secured by applying drilled holes for set screws, or applying flats to the shaft, in case of fastening only with set screws. There are also methods of secure settings using a MACHALOCK, a Posi-Lock, or a Shupan-ring, which are parts for the engaging the hole and the axis.

- ④ Verify that the two shafts are parallel. Incorrect assembly will lead to uneven teeth contact which will cause noise and wear. (After assembly, the gear mesh can be checked by applying a contact pattern compound and rotating the gears.)

■ Test example: Abrasion occurred on SSG3-30 due to poor edge contact (only 30% with proper contact).



Poor tooth contact and pitting

In this example, the gear oil used is equivalent to the JIS gear oil category 2, No. 3

The design conditions were load torque at 278 rpm, 42.5 kg/m (12 kW), 1.5 times the allowable bending strength, and 3 times the allowable surface durability torque. The pitting occurred on the poor tooth contact area after 60 hours of continuous operation.

## Application Examples



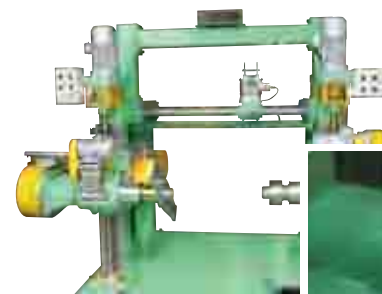
Full-automatic Forming Machine by Jey Machine Co. SSA and SS Spur Gears are used for stirring devices.



Takashima High-Speed Wire Straightening & Cutting Machines by Takashima Sangyo Co., Ltd. SS Spur Gears are used at the feeder.



Automatic Packing Machine by New Max SS Spur Gears, segment shaped by secondary operation, are used at the crimping device.

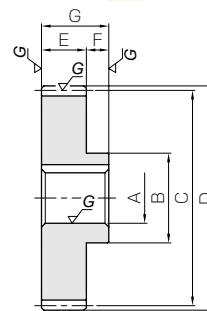


Electric Wire Winder by Sakuma Tekko KK. SS Spur Gears are used at the stopper of handgrip.





Specifications	
Precision grade	JIS grade N5 (JIS B1702-1: 1998) JIS grade 1 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	SCM415
Heat treatment	Overall carburizing
Tooth hardness	55 ~ 60HRC



S1

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.
				A <sub>H7</sub>	B	C	D	E	F	G	H	I
<b>MSGA1-18</b>	m1	18	S1	8	15	18	20	10	5	15	—	—
<b>MSGA1-20</b> <b>MSGB1-20**</b>		20	S1	8 10	17	20	22	10	5	15	—	—
<b>MSGA1-24</b> <b>MSGB1-24</b>		24	S1	10 12	20	24	26	10	5	15	—	—
<b>MSGA1-25</b> <b>MSGB1-25</b>		25	S1	10 12	20	25	27	10	5	15	—	—
<b>MSGA1-30</b> <b>MSGB1-30</b>		30	S1	10 12	25	30	32	10	5	15	—	—
<b>MSGA1-35</b> <b>MSGB1-35</b>		35	S1	10 15	25	35	37	10	5	15	—	—
<b>MSGA1-36</b> <b>MSGB1-36</b>		36	S1	12 15	25	36	38	10	5	15	—	—
<b>MSGA1-40</b> <b>MSGB1-40</b>		40	S1	12 15	30	40	42	10	5	15	—	—
<b>MSGA1-45</b> <b>MSGB1-45</b>		45	S1	12 15	30	45	47	10	5	15	—	—
<b>MSGA1-48</b> <b>MSGB1-48</b>		48	S1	12 15	30	48	50	10	5	15	—	—
<b>MSGA1-50</b> <b>MSGB1-50</b>		50	S1	12 15	35	50	52	10	5	15	—	—
<b>MSGA1-55</b> <b>MSGB1-55</b>		55	S1	15 20	40	55	57	10	10	20	—	—
<b>MSGA1-60</b> <b>MSGB1-60</b>		60	S1	15 20	40	60	62	10	10	20	—	—
<b>MSGA1-70</b> <b>MSGB1-70</b>		70	S1	20 25	45	70	72	10	10	20	—	—
<b>MSGA1-80</b> <b>MSGB1-80</b>		80	S1	20 25	45	80	82	10	10	20	—	—
<b>MSGA1-100</b> <b>MSGB1-100</b>		100	S1	20 25	45	100	102	10	10	20	—	—

[Caution on Product Characteristics]

- ① Although the dimensions of the keyway are made to the JIS (Js9) tolerance, there may be some deviations due to the effects of the heat treatment.
- ② The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ③ The backlash values shown in the table are the theoretical values for the backlash in the normal direction for a pair of identical gears in mesh.
- ④ Products marked with “\*\*” have a small amount of material between the corner of the keyway and the tooth root. This mode of failure must be considered when selecting these gears. For details, please see our web site.

Ground Spur Gears

Keyway WidthxDepth	Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No.
	Bending strength	Surface durability	Bending strength	Surface durability			
3 x 1.4	12.1	6.37	1.24	0.65	0.08~0.16	0.020	<b>MSGA1-18</b>
3 x 1.4 4 x 1.8	14.2	8.04	1.45	0.82	0.08~0.16	0.027 0.023	<b>MSGA1-20</b> <b>MSGB1-20**</b>
4 x 1.8 4 x 1.8	18.5	12.0	1.88	1.22	0.08~0.16	0.038 0.034	<b>MSGA1-24</b> <b>MSGB1-24</b>
4 x 1.8 4 x 1.8	19.6	13.1	2.00	1.33	0.08~0.16	0.041 0.037	<b>MSGA1-25</b> <b>MSGB1-25</b>
4 x 1.8 4 x 1.8	25.1	19.0	2.56	1.94	0.08~0.16	0.065 0.061	<b>MSGA1-30</b> <b>MSGB1-30</b>
4 x 1.8 5 x 2.3	30.7	26.2	3.13	2.67	0.08~0.16	0.085 0.073	<b>MSGA1-35</b> <b>MSGB1-35</b>
4 x 1.8 5 x 2.3	31.9	27.8	3.25	2.84	0.08~0.16	0.085 0.077	<b>MSGA1-36</b> <b>MSGB1-36</b>
4 x 1.8 5 x 2.3	36.5	34.6	3.72	3.53	0.08~0.16	0.11 0.10	<b>MSGA1-40</b> <b>MSGB1-40</b>
4 x 1.8 5 x 2.3	42.3	44.3	4.31	4.51	0.08~0.16	0.14 0.13	<b>MSGA1-45</b> <b>MSGB1-45</b>
4 x 1.8 5 x 2.3	45.8	50.6	4.67	5.16	0.08~0.16	0.16 0.15	<b>MSGA1-48</b> <b>MSGB1-48</b>
4 x 1.8 5 x 2.3	48.1	55.1	4.91	5.62	0.08~0.16	0.18 0.17	<b>MSGA1-50</b> <b>MSGB1-50</b>
5 x 2.3 6 x 2.8	54.0	67.3	5.51	6.86	0.10~0.18	0.26 0.23	<b>MSGA1-55</b> <b>MSGB1-55</b>
5 x 2.3 6 x 2.8	59.9	80.6	6.11	8.22	0.10~0.18	0.29 0.27	<b>MSGA1-60</b> <b>MSGB1-60</b>
6 x 2.8 8 x 3.3	71.9	111	7.33	11.4	0.10~0.18	0.37 0.35	<b>MSGA1-70</b> <b>MSGB1-70</b>
6 x 2.8 8 x 3.3	83.9	147	8.55	15.0	0.10~0.18	0.47 0.44	<b>MSGA1-80</b> <b>MSGB1-80</b>
6 x 2.8 8 x 3.3	103	224	10.5	22.8	0.10~0.18	0.69 0.66	<b>MSGA1-100</b> <b>MSGB1-100</b>

[Caution on Secondary Operations] ① No secondary operations can be performed on these precision finished gears due to the applied carburizing process.

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

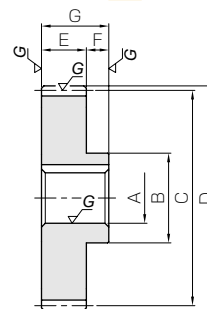
Worm Gear Pair

Bevel Gearboxes

Other Products



Specifications	
Precision grade	JIS grade N5 (JIS B1702-1: 1998) JIS grade 1 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	SCM415
Heat treatment	Overall carburizing
Tooth hardness	55 ~ 60HRC



S1

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.
				A <sub>H7</sub>	B	C	D	E	F	G	H	I
<b>MSGA1.5-15**</b>	<b>m1.5</b>	15	S1	10	18	22.5	22.5	15	10	25	—	—
<b>MSGA1.5-18</b> <b>MSGB1.5-18</b>		18	S1	10 12	22	27	30	15	10	25	—	—
<b>MSGA1.5-20</b> <b>MSGB1.5-20</b>		20	S1	12 15	25	30	33	15	10	25	—	—
<b>MSGA1.5-24</b> <b>MSGB1.5-24</b>		24	S1	12 15	28	36	39	15	10	25	—	—
<b>MSGA1.5-25</b> <b>MSGB1.5-25</b>		25	S1	14 16	30	37.5	40.5	15	10	25	—	—
<b>MSGA1.5-30</b> <b>MSGB1.5-30</b>		30	S1	15 18	30	45	48	15	10	25	—	—
<b>MSGA1.5-35</b> <b>MSGB1.5-35</b>		35	S1	15 18	32	52.5	55.5	15	10	25	—	—
<b>MSGA1.5-36</b> <b>MSGB1.5-36</b>		36	S1	15 18	32	54	57	15	10	25	—	—
<b>MSGA1.5-40</b> <b>MSGB1.5-40</b>		40	S1	16 20	35	60	63	15	10	25	—	—
<b>MSGA1.5-45</b> <b>MSGB1.5-45</b>		45	S1	16 20	40	67.5	70.5	15	10	25	—	—
<b>MSGA1.5-48</b> <b>MSGB1.5-48</b>		48	S1	16 20	40	72	75	15	10	25	—	—
<b>MSGA1.5-50</b> <b>MSGB1.5-50</b>		50	S1	18 22	40	75	78	15	10	25	—	—
<b>MSGA1.5-55</b> <b>MSGB1.5-55</b>		55	S1	20 25	45	82.5	85.5	15	10	25	—	—
<b>MSGA1.5-60</b> <b>MSGB1.5-60</b>		60	S1	20 25	45	90	93	15	10	25	—	—
<b>MSGA1.5-70</b> <b>MSGB1.5-70</b>		70	S1	20 25	45	105	108	15	10	25	—	—
<b>MSGA1.5-80</b> <b>MSGB1.5-80</b>		80	S1	20 25	45	120	123	15	10	25	—	—
<b>MSGA1.5-100</b> <b>MSGB1.5-100</b>	100	S1	25 30	50	150	153	15	10	25	—	—	

[Caution on Product Characteristics]

- ① Although the dimensions of the keyway are made to the JIS (Js9) tolerance, there may be some deviations due to the effects of the heat treatment.
- ② The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ③ The backlash values shown in the table are the theoretical values for the backlash in the normal direction for a pair of identical gears in mesh.
- ④ Products marked with “\*\*” have a small amount of material between the corner of the keyway and the tooth root. This mode of failure must be considered when selecting these gears. For details, please see our web site.

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 Bevel Gears  
 Screw Gears  
 Worm Gear Pair  
 Bevel Gearboxes  
 Other Products



Ground Spur Gears

Keyway WidthxDepth	Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No.
	Bending strength	Surface durability	Bending strength	Surface durability			
4 x 1.8	30.8	14.8	3.15	1.51	0.08~0.16	0.050	<b>MSGA1.5-15**</b>
4 x 1.8 4 x 1.8	41.0	22.1	4.18	2.26	0.08~0.16	0.080 0.074	<b>MSGA1.5-18</b> <b>MSGB1.5-18</b>
4 x 1.8 5 x 2.3	48.0	27.9	4.89	2.84	0.08~0.16	0.098 0.085	<b>MSGA1.5-20</b> <b>MSGB1.5-20</b>
4 x 1.8 5 x 2.3	62.4	41.5	6.36	4.24	0.08~0.16	0.14 0.13	<b>MSGA1.5-24</b> <b>MSGB1.5-24</b>
5 x 2.3 5 x 2.3	66.0	45.4	6.73	4.63	0.08~0.16	0.15 0.14	<b>MSGA1.5-25</b> <b>MSGB1.5-25</b>
5 x 2.3 6 x 2.8	84.7	66.4	8.63	6.77	0.08~0.16	0.21 0.19	<b>MSGA1.5-30</b> <b>MSGB1.5-30</b>
5 x 2.3 6 x 2.8	104	91.5	10.6	9.34	0.10~0.18	0.28 0.26	<b>MSGA1.5-35</b> <b>MSGB1.5-35</b>
5 x 2.3 6 x 2.8	108	97.1	11.0	9.90	0.10~0.18	0.30 0.28	<b>MSGA1.5-36</b> <b>MSGB1.5-36</b>
5 x 2.3 6 x 2.8	123	121	12.6	12.3	0.10~0.18	0.37 0.34	<b>MSGA1.5-40</b> <b>MSGB1.5-40</b>
5 x 2.3 6 x 2.8	143	155	14.5	15.8	0.10~0.18	0.48 0.46	<b>MSGA1.5-45</b> <b>MSGB1.5-45</b>
5 x 2.3 6 x 2.8	155	177	15.8	18.1	0.10~0.18	0.54 0.51	<b>MSGA1.5-48</b> <b>MSGB1.5-48</b>
6 x 2.8 6 x 2.8	162	193	16.6	19.7	0.10~0.18	0.57 0.54	<b>MSGA1.5-50</b> <b>MSGB1.5-50</b>
6 x 2.8 8 x 3.3	182	236	18.6	24.0	0.10~0.18	0.69 0.65	<b>MSGA1.5-55</b> <b>MSGB1.5-55</b>
6 x 2.8 8 x 3.3	202	283	20.6	28.8	0.10~0.18	0.81 0.77	<b>MSGA1.5-60</b> <b>MSGB1.5-60</b>
6 x 2.8 8 x 3.3	231	372	23.6	38.0	0.12~0.20	1.08 1.04	<b>MSGA1.5-70</b> <b>MSGB1.5-70</b>
6 x 2.8 8 x 3.3	270	494	27.5	50.3	0.12~0.20	1.39 1.36	<b>MSGA1.5-80</b> <b>MSGB1.5-80</b>
8 x 3.3 8 x 3.3	347	787	35.4	80.2	0.12~0.20	2.13 2.09	<b>MSGA1.5-100</b> <b>MSGB1.5-100</b>

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Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

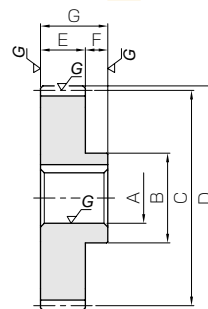
Worm Gear Pair

Bevel Gearboxes

Other Products



Specifications	
Precision grade	JIS grade N5 (JIS B1702-1: 1998) JIS grade 1 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	SCM415
Heat treatment	Overall carburizing
Tooth hardness	55 ~ 60HRC



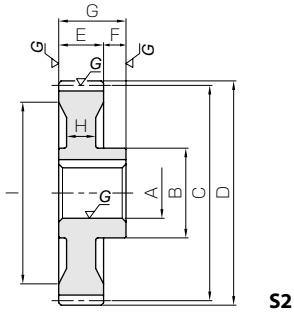
S1

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.
				A <sub>H7</sub>	B	C	D	E	F	G	H	I
<b>MSGA2-15</b> <b>MSGB2-15**</b>	<b>m2</b>	15	S1	12 15	24	30	34	20	10	30	—	—
<b>MSGA2-18</b> <b>MSGB2-18</b>		18	S1	12 15	30	36	40	20	10	30	—	—
<b>MSGA2-20</b> <b>MSGB2-20</b>		20	S1	15 18	32	40	44	20	10	30	—	—
<b>MSGA2-24</b> <b>MSGB2-24</b>		24	S1	15 18	35	48	52	20	10	30	—	—
<b>MSGA2-25</b> <b>MSGB2-25</b>		25	S1	16 20	35	50	54	20	10	30	—	—
<b>MSGA2-30</b> <b>MSGB2-30</b>		30	S1	18 22	40	60	64	20	10	30	—	—
<b>MSGA2-35</b> <b>MSGB2-35</b>		35	S1	18 22	40	70	74	20	10	30	—	—
<b>MSGA2-36</b> <b>MSGB2-36</b>		36	S1	18 22	40	72	76	20	10	30	—	—
<b>MSGA2-40</b> <b>MSGB2-40</b>		40	S1	20 25	45	80	84	20	10	30	—	—
<b>MSGA2-45</b> <b>MSGB2-45</b>		45	S1	20 25	45	90	94	20	10	30	—	—
<b>MSGA2-48</b> <b>MSGB2-48</b>		48	S1	22 28	50	96	100	20	10	30	—	—
<b>MSGA2-50</b> <b>MSGB2-50</b>		50	S1	22 28	50	100	104	20	10	30	—	—
<b>MSGA2-55</b> <b>MSGB2-55</b>		55	S1	25 30	55	110	114	20	10	30	—	—
<b>MSGA2-60</b> <b>MSGB2-60</b>		60	S1	25 30	55	120	124	20	10	30	—	—
<b>MSGA2-70</b> <b>MSGB2-70</b>		70	S1	25 30	55	140	144	20	10	30	—	—
<b>MSGA2-80</b> <b>MSGB2-80</b>		80	S2	30 35	60	160	164	20	10	30	13	144
<b>MSGA2-100</b> <b>MSGB2-100</b>	100	S2	35 40	80	200	204	20	10	30	13	174	

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  - ③ The backlash values shown in the table are the theoretical values for the backlash in the normal direction for a pair of identical gears in mesh.
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Ground Spur Gears



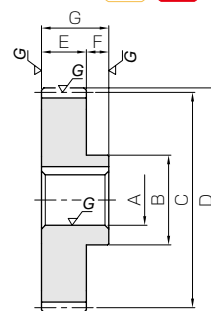
Keyway	Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No.
	Width×Depth	Bending strength	Surface durability	Bending strength			
4 x 1.8 5 x 2.3	73.1	35.7	7.46	3.64	0.10~0.20	0.12 0.10	<b>MSGA2-15</b> <b>MSGB2-15**</b>
4 x 1.8 5 x 2.3	97.2	53.5	9.91	5.46	0.10~0.20	0.19 0.17	<b>MSGA2-18</b> <b>MSGB2-18</b>
5 x 2.3 6 x 2.8	114	67.6	11.6	6.89	0.10~0.20	0.22 0.20	<b>MSGA2-20</b> <b>MSGB2-20</b>
5 x 2.3 6 x 2.8	148	101	15.1	10.3	0.10~0.20	0.32 0.30	<b>MSGA2-24</b> <b>MSGB2-24</b>
5 x 2.3 6 x 2.8	157	110	16.0	11.2	0.10~0.20	0.33 0.31	<b>MSGA2-25</b> <b>MSGB2-25</b>
6 x 2.8 6 x 2.8	201	161	20.5	16.5	0.12~0.22	0.48 0.45	<b>MSGA2-30</b> <b>MSGB2-30</b>
6 x 2.8 6 x 2.8	246	223	25.1	22.7	0.12~0.22	0.64 0.61	<b>MSGA2-35</b> <b>MSGB2-35</b>
6 x 2.8 6 x 2.8	255	236	26.0	24.1	0.12~0.22	0.67 0.64	<b>MSGA2-36</b> <b>MSGB2-36</b>
6 x 2.8 8 x 3.3	292	294	29.7	30.0	0.12~0.22	0.84 0.79	<b>MSGA2-40</b> <b>MSGB2-40</b>
6 x 2.8 8 x 3.3	338	377	34.5	38.4	0.12~0.22	1.05 1.00	<b>MSGA2-45</b> <b>MSGB2-45</b>
6 x 2.8 8 x 3.3	349	411	35.6	41.9	0.12~0.22	1.20 1.14	<b>MSGA2-48</b> <b>MSGB2-48</b>
6 x 2.8 8 x 3.3	367	448	37.4	45.7	0.12~0.22	1.29 1.24	<b>MSGA2-50</b> <b>MSGB2-50</b>
8 x 3.3 8 x 3.3	412	548	42.0	55.8	0.14~0.24	1.56 1.51	<b>MSGA2-55</b> <b>MSGB2-55</b>
8 x 3.3 8 x 3.3	457	658	46.6	67.1	0.14~0.24	1.84 1.79	<b>MSGA2-60</b> <b>MSGB2-60</b>
8 x 3.3 8 x 3.3	547	909	55.8	92.7	0.14~0.24	2.48 2.43	<b>MSGA2-70</b> <b>MSGB2-70</b>
8 x 3.3 10 x 3.3	610	1150	62.2	117	0.14~0.24	2.55 2.49	<b>MSGA2-80</b> <b>MSGB2-80</b>
10 x 3.3 12 x 3.3	785	1820	80.1	186	0.14~0.24	4.16 4.09	<b>MSGA2-100</b> <b>MSGB2-100</b>

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Specifications	
Precision grade	JIS grade N5 (JIS B1702-1: 1998) JIS grade 1 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	SCM415
Heat treatment	Overall carburizing
Tooth hardness	55 ~ 60HRC



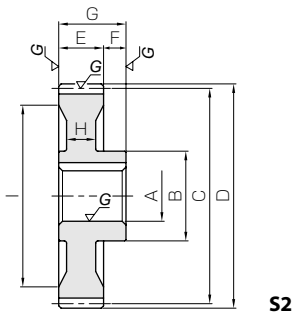
S1

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.
				A <sub>H7</sub>	B	C	D	E	F	G	H	I
<b>MSGA2.5-15</b> <b>MSGB2.5-15**</b>	m2.5	15	S1	15 18	30	37.5	42.5	25	12	37	—	—
<b>MSGA2.5-18</b> <b>MSGB2.5-18</b>		18	S1	18 20	38	45	50	25	12	37	—	—
<b>MSGA2.5-20</b> <b>MSGB2.5-20</b>		20	S1	18 22	40	50	55	25	12	37	—	—
<b>MSGA2.5-24</b> <b>MSGB2.5-24</b>		24	S1	18 22	40	60	65	25	12	37	—	—
<b>MSGA2.5-25</b> <b>MSGB2.5-25</b>		25	S1	20 25	45	62.5	67.5	25	12	37	—	—
<b>MSGA2.5-30</b> <b>MSGB2.5-30</b>		30	S1	22 28	50	75	80	25	12	37	—	—
<b>MSGA2.5-35</b> <b>MSGB2.5-35</b>		35	S1	25 30	55	87.5	92.5	25	12	37	—	—
<b>MSGA2.5-36</b> <b>MSGB2.5-36</b>		36	S1	25 30	55	90	95	25	12	37	—	—
<b>MSGA2.5-40</b> <b>MSGB2.5-40</b>		40	S1	25 32	55	100	105	25	12	37	—	—
<b>MSGA2.5-45</b> <b>MSGB2.5-45</b>		45	S1	30 35	60	112.5	117.5	25	12	37	—	—
<b>MSGA2.5-48</b> <b>MSGB2.5-48</b>		48	S1	30 35	60	120	125	25	12	37	—	—
<b>MSGA2.5-50</b> <b>MSGB2.5-50</b>		50	S1	30 35	60	125	130	25	12	37	—	—
<b>MSGA2.5-55</b> <b>MSGB2.5-55</b>		55	S1	30 40	70	137.5	142.5	25	12	37	—	—
<b>MSGA2.5-60</b> <b>MSGB2.5-60</b>		60	S1	30 40	70	150	155	25	12	37	—	—
<b>MSGA2.5-70</b> <b>MSGB2.5-70</b>		70	S2	40 50	85	175	180	25	12	37	17	150

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Ground Spur Gears



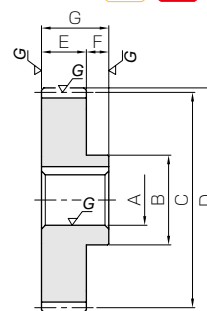
Keyway WidthxDepth	Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No.
	Bending strength	Surface durability	Bending strength	Surface durability			
5 x 2.3 6 x 2.8	143	71.0	14.6	7.24	0.10~0.20	0.23 0.20	<b>MSGA2.5-15</b> <b>MSGB2.5-15**</b>
6 x 2.8 6 x 2.8	190	107	19.4	10.9	0.10~0.20	0.34 0.32	<b>MSGA2.5-18</b> <b>MSGB2.5-18</b>
6 x 2.8 6 x 2.8	222	134	22.7	13.7	0.10~0.20	0.42 0.39	<b>MSGA2.5-20</b> <b>MSGB2.5-20</b>
6 x 2.8 6 x 2.8	289	201	29.4	20.5	0.12~0.22	0.59 0.56	<b>MSGA2.5-24</b> <b>MSGB2.5-24</b>
6 x 2.8 8 x 3.3	306	220	31.2	22.4	0.12~0.22	0.66 0.60	<b>MSGA2.5-25</b> <b>MSGB2.5-25</b>
6 x 2.8 8 x 3.3	392	322	40.0	32.8	0.12~0.22	0.94 0.87	<b>MSGA2.5-30</b> <b>MSGB2.5-30</b>
8 x 3.3 8 x 3.3	480	444	49.0	45.3	0.12~0.22	1.25 1.19	<b>MSGA2.5-35</b> <b>MSGB2.5-35</b>
8 x 3.3 8 x 3.3	498	471	50.8	48.0	0.12~0.22	1.32 1.26	<b>MSGA2.5-36</b> <b>MSGB2.5-36</b>
8 x 3.3 10 x 3.3	543	560	55.3	57.1	0.12~0.22	1.61 1.52	<b>MSGA2.5-40</b> <b>MSGB2.5-40</b>
8 x 3.3 10 x 3.3	629	718	64.1	73.2	0.14~0.24	2.00 1.93	<b>MSGA2.5-45</b> <b>MSGB2.5-45</b>
8 x 3.3 10 x 3.3	681	823	69.5	83.9	0.14~0.24	2.27 2.20	<b>MSGA2.5-48</b> <b>MSGB2.5-48</b>
8 x 3.3 10 x 3.3	716	897	73.0	91.5	0.14~0.24	2.46 2.39	<b>MSGA2.5-50</b> <b>MSGB2.5-50</b>
8 x 3.3 12 x 3.3	804	1090	82.0	112	0.14~0.24	3.06 2.90	<b>MSGA2.5-55</b> <b>MSGB2.5-55</b>
8 x 3.3 12 x 3.3	892	1310	90.9	134	0.14~0.24	3.62 3.45	<b>MSGA2.5-60</b> <b>MSGB2.5-60</b>
12 x 3.3 14 x 3.8	1020	1730	104	176	0.14~0.24	4.24 4.03	<b>MSGA2.5-70</b> <b>MSGB2.5-70</b>

[Caution on Secondary Operations] ① No secondary operations can be performed on these precision finished gears due to the applied carburizing process.

- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products



Specifications	
Precision grade	JIS grade N5 (JIS B1702-1: 1998) JIS grade 1 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	SCM415
Heat treatment	Overall carburizing
Tooth hardness	55 ~ 60HRC



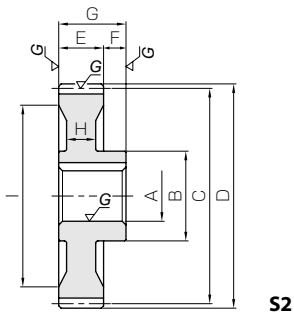
S1

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.
				A <sub>H7</sub>	B	C	D	E	F	G	H	I
<b>MSGA3-15</b> <b>MSGB3-15**</b>	m3	15	S1	18 22	36	45	51	30	15	45	—	—
<b>MSGA3-18</b> <b>MSGB3-18</b>		18	S1	20 25	45	54	60	30	15	45	—	—
<b>MSGA3-20</b> <b>MSGB3-20</b>		20	S1	20 25	45	60	66	30	15	45	—	—
<b>MSGA3-24</b> <b>MSGB3-24</b>		24	S1	20 25	45	72	78	30	15	45	—	—
<b>MSGA3-25</b> <b>MSGB3-25</b>		25	S1	25 30	55	75	81	30	15	45	—	—
<b>MSGA3-30</b> <b>MSGB3-30</b>		30	S1	28 35	60	90	96	30	15	45	—	—
<b>MSGA3-35</b> <b>MSGB3-35</b>		35	S1	30 35	60	105	111	30	15	45	—	—
<b>MSGA3-36</b> <b>MSGB3-36</b>		36	S1	30 35	60	108	114	30	15	45	—	—
<b>MSGA3-40</b> <b>MSGB3-40</b>		40	S1	30 40	70	120	126	30	15	45	—	—
<b>MSGA3-45</b> <b>MSGB3-45</b>		45	S1	30 40	70	135	141	30	15	45	—	—
<b>MSGA3-48</b> <b>MSGB3-48</b>		48	S1	35 40	70	144	150	30	15	45	—	—
<b>MSGA3-50</b> <b>MSGB3-50</b>		50	S2	32 40	70	150	156	30	15	45	20	126
<b>MSGA3-55</b> <b>MSGB3-55</b>		55	S2	35 40	70	165	171	30	15	45	20	140
<b>MSGA3-60</b> <b>MSGB3-60</b>		60	S2	35 45	80	180	186	30	15	45	20	156

[Caution on Product Characteristics]

- ① Although the dimensions of the keyway are made to the JIS (Js9) tolerance, there may be some deviations due to the effects of the heat treatment.
- ② The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ③ The backlash values shown in the table are the theoretical values for the backlash in the normal direction for a pair of identical gears in mesh.
- ④ Products marked with “\*\*” have a small amount of material between the corner of the keyway and the tooth root. This mode of failure must be considered when selecting these gears. For details, please see our web site.

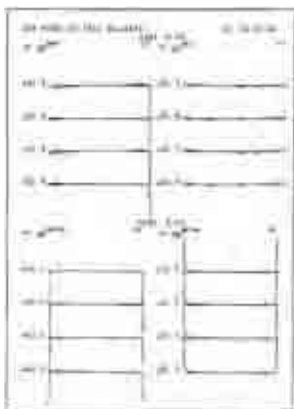
Spur Gears  
 Helical Gears  
 Internal Gears  
 Racks  
 CP Racks & Pinions  
 Miter Gears  
 Bevel Gears  
 Screw Gears  
 Worm Gear Pair  
 Bevel Gearboxes  
 Other Products



S2

Keyway Width×Depth	Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No.
	Bending strength	Surface durability	Bending strength	Surface durability			
6 x 2.8 6 x 2.8	247	124	25.2	12.7	0.10~0.20	0.40 0.35	<b>MSGA3-15</b> <b>MSGB3-15**</b>
6 x 2.8 8 x 3.3	328	187	33.4	19.1	0.12~0.22	0.61 0.54	<b>MSGA3-18</b> <b>MSGB3-18</b>
6 x 2.8 8 x 3.3	384	236	39.1	24.1	0.12~0.22	0.74 0.67	<b>MSGA3-20</b> <b>MSGB3-20</b>
6 x 2.8 8 x 3.3	499	353	50.9	36.0	0.12~0.22	1.03 0.96	<b>MSGA3-24</b> <b>MSGB3-24</b>
8 x 3.3 10 x 3.3	528	386	53.9	39.3	0.12~0.22	1.14 1.06	<b>MSGA3-25</b> <b>MSGB3-25</b>
8 x 3.3 10 x 3.3	677	565	69.1	57.7	0.12~0.22	1.60 1.48	<b>MSGA3-30</b> <b>MSGB3-30</b>
8 x 3.3 10 x 3.3	790	745	80.6	75.9	0.14~0.24	2.11 2.02	<b>MSGA3-35</b> <b>MSGB3-35</b>
8 x 3.3 10 x 3.3	820	790	83.6	80.6	0.14~0.24	2.23 2.14	<b>MSGA3-36</b> <b>MSGB3-36</b>
8 x 3.3 12 x 3.3	938	988	95.6	101	0.14~0.24	2.86 2.66	<b>MSGA3-40</b> <b>MSGB3-40</b>
8 x 3.3 12 x 3.3	1090	1260	111	129	0.14~0.24	3.57 3.37	<b>MSGA3-45</b> <b>MSGB3-45</b>
10 x 3.3 12 x 3.3	1180	1450	120	147	0.14~0.24	3.94 3.83	<b>MSGA3-48</b> <b>MSGB3-48</b>
10 x 3.3 12 x 3.3	1240	1570	126	161	0.14~0.24	3.79 3.62	<b>MSGA3-50</b> <b>MSGB3-50</b>
10 x 3.3 12 x 3.3	1330	1830	135	187	0.14~0.24	4.39 4.29	<b>MSGA3-55</b> <b>MSGB3-55</b>
10 x 3.3 14 x 3.8	1470	2200	150	224	0.14~0.24	5.31 5.08	<b>MSGA3-60</b> <b>MSGB3-60</b>

[Caution on Secondary Operations] ① No secondary operations can be performed on these precision finished gears due to the applied carburizing process.



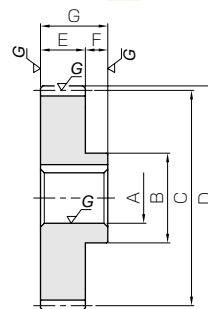
**An example of KHK's inspection report on tooth profile and lead errors.**

The precision grade of a spur gear (JIS B 1702-1:1998 and JIS B 1702-2:1998) is determined by factors such as single pitch error, pitch variation error, accumulated pitch error, tooth profile error, run out error, load error etc. For more details, please refer to the section “Accuracy of Spur and Helical Gears” in the technical reference.

- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products



Specifications	
Precision grade	JIS grade N5 (JIS B1702-1: 1998) JIS grade 1 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	SCM415
Heat treatment	Overall carburizing
Tooth hardness	55 ~ 60HRC



S1

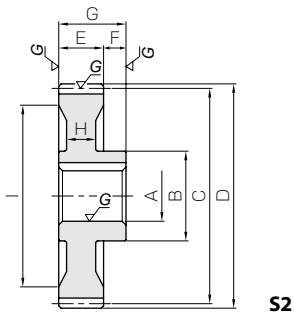
Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.
				A <sub>H7</sub>	B	C	D	E	F	G	H	I
<b>MSGA4-15</b> <b>MSGB4-15**</b>	m4	15	S1	25 30	48	60	68	40	20	60	—	—
<b>MSGA4-18</b> <b>MSGB4-18</b>		18	S1	25 30	50	72	80	40	20	60	—	—
<b>MSGA4-20</b> <b>MSGB4-20</b>		20	S1	28 32	60	80	88	40	20	60	—	—
<b>MSGA4-24</b> <b>MSGB4-24</b>		24	S1	28 32	60	96	104	40	20	60	—	—
<b>MSGA4-25</b> <b>MSGB4-25</b>		25	S1	30 35	60	100	108	40	20	60	—	—
<b>MSGA4-30</b> <b>MSGB4-30</b>		30	S1	35 40	70	120	128	40	20	60	—	—
<b>MSGA4-35</b> <b>MSGB4-35</b>		35	S1	35 40	70	140	148	40	20	60	—	—
<b>MSGA4-36</b> <b>MSGB4-36</b>		36	S1	35 40	70	144	152	40	20	60	—	—
<b>MSGA4-40</b> <b>MSGB4-40</b>		40	S1	40 45	80	160	168	40	20	60	—	—
<b>MSGA4-45</b> <b>MSGB4-45</b>		45	S1	40 45	80	180	188	40	20	60	—	—
<b>MSGA4-48</b> <b>MSGB4-48</b>		48	S2	40 45	80	192	200	40	20	60	26	160
<b>MSGA4-50</b> <b>MSGB4-50</b>		50	S2	40 50	85	200	208	40	20	60	26	168

[Caution on Product Characteristics]

- ① Although the dimensions of the keyway are made to the JIS (Js9) tolerance, there may be some deviations due to the effects of the heat treatment.
- ② The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ③ The backlash values shown in the table are the theoretical values for the backlash in the normal direction for a pair of identical gears in mesh.
- ④ Products marked with “\*\*” have a small amount of material between the corner of the keyway and the tooth root. This mode of failure must be considered when selecting these gears. For details, please see our web site.

Spur Gears  
Helical Gears  
Internal Gears  
Racks  
CP Racks & Pinions  
Miter Gears  
Bevel Gears  
Screw Gears  
Worm Gear Pair  
Bevel Gearboxes  
Other Products





Keyway	Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No.
	Width×Depth	Bending strength	Surface durability	Bending strength			
8 x 3.3 8 x 3.3	585	302	59.7	30.8	0.14~0.24	0.93 0.83	<b>MSGA4-15</b> <b>MSGB4-15**</b>
8 x 3.3 8 x 3.3	777	455	79.3	46.4	0.14~0.24	1.34 1.24	<b>MSGA4-18</b> <b>MSGB4-18</b>
8 x 3.3 10 x 3.3	910	574	92.8	58.6	0.14~0.24	1.72 1.63	<b>MSGA4-20</b> <b>MSGB4-20</b>
8 x 3.3 10 x 3.3	1130	819	115	83.5	0.14~0.24	2.41 2.32	<b>MSGA4-24</b> <b>MSGB4-24</b>
8 x 3.3 10 x 3.3	1190	896	122	91.4	0.14~0.24	2.56 2.44	<b>MSGA4-25</b> <b>MSGB4-25</b>
10 x 3.3 12 x 3.3	1530	1320	156	134	0.16~0.26	3.69 3.54	<b>MSGA4-30</b> <b>MSGB4-30</b>
10 x 3.3 12 x 3.3	1870	1820	191	185	0.16~0.26	4.97 4.83	<b>MSGA4-35</b> <b>MSGB4-35</b>
10 x 3.3 12 x 3.3	1940	1930	198	197	0.16~0.26	5.25 5.11	<b>MSGA4-36</b> <b>MSGB4-36</b>
12 x 3.3 14 x 3.8	2120	2290	216	234	0.16~0.26	6.49 6.33	<b>MSGA4-40</b> <b>MSGB4-40</b>
12 x 3.3 14 x 3.8	2460	2930	251	299	0.16~0.26	8.17 8.01	<b>MSGA4-45</b> <b>MSGB4-45</b>
12 x 3.3 14 x 3.8	2660	3350	272	342	0.16~0.26	7.97 7.81	<b>MSGA4-48</b> <b>MSGB4-48</b>
12 x 3.3 14 x 3.8	2800	3650	285	372	0.16~0.26	8.71 8.37	<b>MSGA4-50</b> <b>MSGB4-50</b>

[Caution on Secondary Operations] ① No secondary operations can be performed on these precision finished gears due to the applied carburizing process.



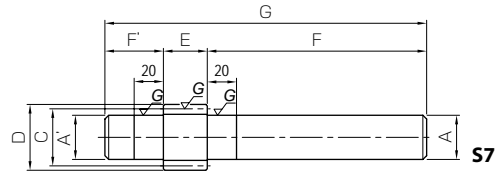
**An example of KHK's inspection report on various pitch errors.**

The precision grade of a spur gear (JIS B 1702-1:1998 and JIS B 1702-2:1998) is determined by factors such as single pitch error, pitch variation error, accumulated pitch error, tooth profile error, run out error, load error etc. For more details, please refer to the section “Accuracy of Spur and Helical Gears” in the technical reference.

- Spur Gears
- Helical Gears
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- Worm Gear Pair
- Bevel Gearboxes
- Other Products



Specifications	
Precision grade	JIS grade N7 (JIS B1702-1: 1998) JIS grade 3 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	Thermal refined, tooth surfaces induction hardened
Tooth hardness	45 ~ 55HRC



Catalog No.	Module	No. of teeth	Profile shift coefficient	Shape	Shaft dia. (L)		Pitch dia.	Outside dia.	Face width	Shaft dia. (R)		Total length
					A'	F'				A	F	
SSGS1.5-10	m1.5	10	+0.5	S7	12.2	25	15	19.35	15	12.2	100	140
SSGS1.5-11		11	+0.5	S7	13.7	25	16.5	20.85	15	13.7	100	140
SSGS1.5-12		12	0	S7	13.7	25	18	21	15	13.7	100	140
SSGS1.5-13		13	0	S7	15.2	25	19.5	22.5	15	15.2	100	140
SSGS2-10	m2	10	+0.5	S7	16.2	30	20	25.8	20	16.2	120	170
SSGS2-11		11	+0.5	S7	18.2	30	22	27.8	20	18.2	120	170
SSGS2-12		12	0	S7	18.2	30	24	28	20	18.2	120	170
SSGS2-13		13	0	S7	20.2	30	26	30	20	20.2	120	170
SSGS2.5-10	m2.5	10	+0.5	S7	20.2	35	25	32.25	25	20.2	135	195
SSGS2.5-11		11	+0.5	S7	22.7	35	27.5	34.75	25	22.7	135	195
SSGS2.5-12		12	0	S7	22.7	35	30	35	25	22.7	135	195
SSGS2.5-13		13	0	S7	25.2	35	32.5	37.5	25	25.2	135	195
SSGS3-10	m3	10	+0.5	S7	24.2	40	30	38.7	30	24.2	150	220
SSGS3-11		11	+0.5	S7	27.2	40	33	41.7	30	27.2	150	220
SSGS3-12		12	0	S7	27.2	40	36	42	30	27.2	150	220
SSGS3-13		13	0	S7	30.2	40	39	45	30	30.2	150	220

[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② 10- and 11-tooth gears with a pitch of module 1.5 or greater are profile shifted gears ( $x = +0.5$ ). Please refer to the below tables for calculating the center distance when assembled.
- ③ The backlash values shown in the table are the theoretical values for the normal direction for a pair of identical SSG Spur Gears with 30 teeth in mesh.

### Center distance of Stock Spur Gears Meshing with Profile Shifted Spur Gears

The table on the right shows the center distance of the spur gears ( $x=0$ ) which can be meshed with profile shifted spur gears ( $x=+0.5$ ) with module 1. Multiply by the actual module to determine your center distance.

Center distance when gear has 12 to 30 teeth (unit : mm)

No. of teeth( $x=0$ )	No. of teeth( $x=+0.5$ )	
	10	11
12	11.4410	11.9428
13	11.9428	12.4446
14	12.4446	12.9462
15	12.9462	13.4477
16	13.4477	13.9492
17	13.9492	14.4505
18	14.4505	14.9518
19	14.9518	15.4530
20	15.4530	15.9542
21	15.9542	16.4553
22	16.4553	16.9564
23	16.9564	17.4574
24	17.4574	17.9583
25	17.9583	18.4592
26	18.4592	18.9601
27	18.9601	19.4610
28	19.4610	19.9618
29	19.9618	20.4625
30	20.4625	20.9633

Center distance when gear has 32 to 62 teeth (unit : mm)

No. of teeth( $x=0$ )	No. of teeth( $x=+0.5$ )	
	10	11
32	21.4640	21.9647
34	22.4653	22.9660
35	22.9660	23.4666
36	23.4666	23.9671
38	24.4677	24.9683
40	25.4688	25.9693
42	26.4698	26.9703
44	27.4707	27.9712
45	27.9712	28.4716
46	28.4716	28.9721
48	29.4725	29.9729
50	30.4733	30.9736
52	31.4740	31.9744
54	32.4747	32.9750
55	32.9750	33.4754
56	33.4754	33.9757
58	34.4760	34.9763
60	35.4766	35.9769
62	36.4772	36.9774

Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No.
Bending strength	Surface durability	Bending strength	Surface durability			
12.7	3.76	1.30	0.38	0.08~0.16	0.14	<b>SSGS1.5-10</b>
14.5	4.61	1.48	0.47	0.08~0.16	0.17	<b>SSGS1.5-11</b>
9.97	4.70	1.02	0.48	0.08~0.16	0.17	<b>SSGS1.5-12</b>
12.1	5.51	1.23	0.56	0.08~0.16	0.21	<b>SSGS1.5-13</b>
30.2	9.07	3.08	0.93	0.11~0.21	0.30	<b>SSGS2-10</b>
34.3	11.0	3.50	1.12	0.11~0.21	0.38	<b>SSGS2-11</b>
23.6	11.3	2.41	1.15	0.11~0.21	0.38	<b>SSGS2-12</b>
28.6	13.3	2.92	1.35	0.11~0.21	0.46	<b>SSGS2-13</b>
58.9	17.9	6.01	1.83	0.11~0.21	0.54	<b>SSGS2.5-10</b>
67.1	22.0	6.84	2.24	0.11~0.21	0.68	<b>SSGS2.5-11</b>
46.2	22.4	4.71	2.28	0.11~0.21	0.68	<b>SSGS2.5-12</b>
46.6	21.9	4.75	2.23	0.11~0.21	0.83	<b>SSGS2.5-13</b>
102	31.3	10.4	3.19	0.11~0.21	0.89	<b>SSGS3-10</b>
96.6	31.9	9.85	3.26	0.11~0.21	1.11	<b>SSGS3-11</b>
66.5	32.6	6.78	3.32	0.11~0.21	1.11	<b>SSGS3-12</b>
80.4	38.3	8.20	3.91	0.11~0.21	1.35	<b>SSGS3-13</b>

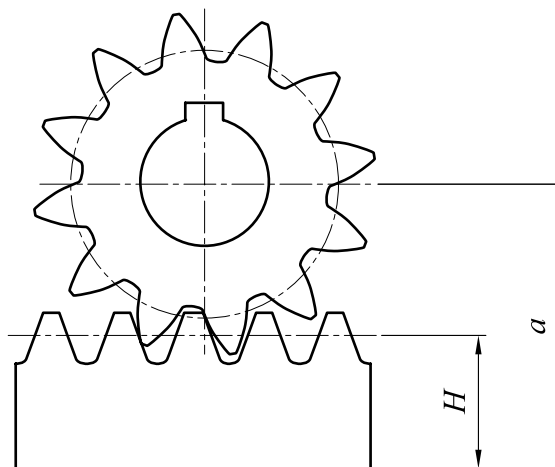
[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Hagu-ruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land ( approx. 1 to 2 mm). Use carbide tools for the modification of the shaft area near the bottom land.

■ Center distance when gear has 64 to 200 teeth (unit : mm)

No. of teeth( $z_1=0$ )	No. of teeth( $z_2=+0.5$ )	
	10	11
64	37.4777	37.9780
65	37.9780	38.4782
66	38.4782	38.9785
68	39.4787	39.9790
70	40.4792	40.9794
72	41.4796	41.9799
75	42.9803	43.4805
76	43.4805	43.9807
80	45.4813	45.9814
84	47.4820	47.9822
85	47.9822	48.4823
88	49.4826	49.9828
90	50.4830	50.9831
95	52.9837	53.4838
100	55.4844	55.9845
120	65.4866	65.9867
150	80.4890	80.9890
200	105.4915	105.9915

■ Assembly distance of a profile shifted gear and the meshing rack



$$a = \frac{z_2 m}{2} + H + x m$$

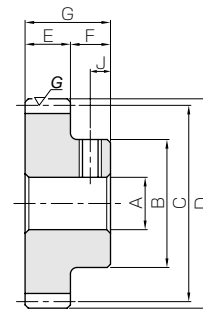
Where

- $a$  : Assembly Distance  
 $H$  : Height of pitch line of rack  
 $m$  : Module  
 $z_2$  : No. of Teeth  
 $x$  : Profile Shift Coefficient



Specifications	
Precision grade	JIS grade N7 (JIS B1702-1: 1998) JIS grade 3 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	Thermal refined *
Tooth hardness	225 ~ 260HB

\* Tooth areas, where size is less than 0.8 module, without quenching treatment.



S1T

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway	
				A <sub>H7</sub>	B	C	D	E	F	G	Width×Depth	
<b>SSG0.5-30A</b> <b>SSG0.5-30B</b>	<b>m0.5</b>	30	S1T S1T	5 6	13	15	16	5	7	12	— —	
<b>SSG0.5-32A</b>		32	S1T	5	14	16	17	5	7	12	—	
<b>SSG0.5-34A</b>		34	S1T	5	15	17	18	5	7	12	—	
<b>SSG0.5-35A</b>		35	S1T	5	15	17.5	18.5	5	7	12	—	
<b>SSG0.5-36A</b>		36	S1T	5	16	18	19	5	7	12	—	
<b>SSG0.5-38A</b>		38	S1T	5	16	19	20	5	7	12	—	
<b>SSG0.5-40A</b> <b>SSG0.5-40B</b>		40	S1T S1T	5 6	18	20	21	5	7	12	— —	
<b>SSG0.5-50A</b> <b>SSG0.5-50B</b>		50	S1T S1T	5 6	22	25	26	5	7	12	— —	
<b>SSG0.5-60A</b> <b>SSG0.5-60B</b>		60	S1T S1T	6 8	28	30	31	5	7	12	— —	
<b>SSG0.5-70A</b> <b>SSG0.5-70B</b>		70	S1T S1T	6 8	28	35	36	5	7	12	— —	
<b>SSG0.5-80A</b> <b>SSG0.5-80B</b>		80	S1T S1T	6 8	28	40	41	5	7	12	— —	
<b>SSG0.8-20A</b> <b>SSG0.8-20B</b>		<b>m0.8</b>	20	S1T S1T	5 6	13	16	17.6	8	8	16	— —
<b>SSG0.8-21A</b>			21	S1T	6	14	16.8	18.4	8	8	16	—
<b>SSG0.8-22A</b>			22	S1T	6	15	17.6	19.2	8	8	16	—
<b>SSG0.8-23A</b>	23		S1T	6	15	18.4	20	8	8	16	—	
<b>SSG0.8-24A</b> <b>SSG0.8-24B</b>	24		S1T S1T	5 6	16	19.2	20.8	8	8	16	— —	
<b>SSG0.8-25A</b> <b>SSG0.8-25B</b>	25		S1T S1T	5 6	16	20	21.6	8	8	16	— —	
<b>SSG0.8-26A</b>	26		S1T	6	18	20.8	22.4	8	8	16	—	
<b>SSG0.8-27A</b>	27		S1T	6	18	21.6	23.2	8	8	16	—	
<b>SSG0.8-28A</b>	28		S1T	6	18	22.4	24	8	8	16	—	
<b>SSG0.8-29A</b>	29		S1T	6	20	23.2	24.8	8	8	16	—	
<b>SSG0.8-30A</b> <b>SSG0.8-30B</b> <b>SSG0.8-30C</b>	30		S1T S1T S1T	5 6 8	20	24	25.6	8	8	16	— — —	
<b>SSG0.8-32A</b>	32		S1T	6	22	25.6	27.2	8	8	16	—	
<b>SSG0.8-34A</b>	34		S1T	6	22	27.2	28.8	8	8	16	—	
<b>SSG0.8-35A</b>	35		S1T	6	25	28	29.6	8	8	16	—	
<b>SSG0.8-36A</b>	36		S1T	6	25	28.8	30.4	8	8	16	—	
<b>SSG0.8-38A</b>	38		S1T	6	25	30.4	32	8	8	16	—	
<b>SSG0.8-40A</b> <b>SSG0.8-40B</b>	40		S1T S1T	6 8	28	32	33.6	8	8	16	— —	
<b>SSG0.8-50A</b> <b>SSG0.8-50B</b>	50		S1T S1T	6 8	28	40	41.6	8	8	16	— —	
<b>SSG0.8-60A</b> <b>SSG0.8-60B</b>	60	S1T S1T	6 8	28	48	49.6	8	8	16	— —		
<b>SSG0.8-70A</b> <b>SSG0.8-70B</b>	70	S1T S1T	6 8	28	56	57.6	8	8	16	— —		
<b>SSG0.8-80A</b> <b>SSG0.8-80B</b>	80	S1T S1T	6 8	28	64	65.6	8	8	16	— —		

[Caution on Product Characteristics]

- ① For products with a tapped hole, a set screw is included.
- ② The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ③ The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No.
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
M4	3.5	1.63	0.29	0.17	0.030	0~0.08	0.012	<b>SSG0.5-30A</b>
M4	3.5							0.011
M4	3.5	1.78	0.34	0.18	0.035	0~0.08	0.014	<b>SSG0.5-32A</b>
M4	3.5	1.93	0.39	0.20	0.039	0~0.08	0.016	<b>SSG0.5-34A</b>
M4	3.5	2.00	0.41	0.20	0.042	0~0.08	0.017	<b>SSG0.5-35A</b>
M4	3.5	2.08	0.44	0.21	0.045	0~0.08	0.019	<b>SSG0.5-36A</b>
M4	3.5	2.23	0.49	0.23	0.050	0~0.08	0.020	<b>SSG0.5-38A</b>
M4	3.5	2.38	0.55	0.24	0.056	0~0.08	0.024	<b>SSG0.5-40A</b>
M4	3.5						0.023	<b>SSG0.5-40B</b>
M4	3.5	3.14	0.89	0.32	0.091	0~0.08	0.038	<b>SSG0.5-50A</b>
M4	3.5						0.037	<b>SSG0.5-50B</b>
M4	3.5	3.91	1.32	0.40	0.13	0~0.08	0.058	<b>SSG0.5-60A</b>
M5	3.5						0.056	<b>SSG0.5-60B</b>
M4	3.5	3.90	1.53	0.40	0.16	0~0.08	0.068	<b>SSG0.5-70A</b>
M5	3.5						0.066	<b>SSG0.5-70B</b>
M4	3.5	4.55	2.04	0.46	0.21	0~0.08	0.080	<b>SSG0.5-80A</b>
M5	3.5						0.077	<b>SSG0.5-80B</b>
M4	4	3.79	0.53	0.39	0.054	0~0.08	0.018	<b>SSG0.8-20A</b>
M4	4						0.017	<b>SSG0.8-20B</b>
M4	4	4.08	0.59	0.42	0.060	0~0.08	0.020	<b>SSG0.8-21A</b>
M4	4	4.36	0.66	0.44	0.067	0~0.08	0.022	<b>SSG0.8-22A</b>
M4	4	4.64	0.73	0.47	0.074	0~0.08	0.024	<b>SSG0.8-23A</b>
M4	4	4.93	0.80	0.50	0.082	0~0.08	0.028	<b>SSG0.8-24A</b>
M4	4						0.027	<b>SSG0.8-24B</b>
M4	4	5.22	0.88	0.53	0.090	0~0.08	0.029	<b>SSG0.8-25A</b>
M4	4						0.028	<b>SSG0.8-25B</b>
M4	4	5.51	0.96	0.56	0.098	0~0.08	0.033	<b>SSG0.8-26A</b>
M4	4	5.81	1.04	0.59	0.11	0~0.08	0.035	<b>SSG0.8-27A</b>
M4	4	6.10	1.12	0.62	0.11	0~0.08	0.037	<b>SSG0.8-28A</b>
M4	4	6.40	1.21	0.65	0.12	0~0.08	0.042	<b>SSG0.8-29A</b>
M4	4	6.70	1.30	0.68	0.13	0~0.08	0.045	<b>SSG0.8-30A</b>
M4	4						0.044	<b>SSG0.8-30B</b>
M5	4						0.041	<b>SSG0.8-30C</b>
M4	4	7.29	1.50	0.74	0.15	0~0.08	0.052	<b>SSG0.8-32A</b>
M4	4	7.90	1.71	0.81	0.17	0~0.08	0.056	<b>SSG0.8-34A</b>
M4	4	8.20	1.82	0.84	0.19	0~0.08	0.065	<b>SSG0.8-35A</b>
M4	4	8.51	1.93	0.87	0.20	0~0.08	0.067	<b>SSG0.8-36A</b>
M4	4	9.12	2.17	0.93	0.22	0~0.08	0.072	<b>SSG0.8-38A</b>
M4	4	8.11	2.02	0.83	0.21	0~0.08	0.085	<b>SSG0.8-40A</b>
M5	4						0.082	<b>SSG0.8-40B</b>
M4	4	10.7	3.26	1.09	0.33	0~0.08	0.11	<b>SSG0.8-50A</b>
M5	4						0.11	<b>SSG0.8-50B</b>
M4	4	13.3	4.83	1.36	0.49	0~0.08	0.15	<b>SSG0.8-60A</b>
M5	4						0.14	<b>SSG0.8-60B</b>
M4	4	16.0	6.73	1.63	0.69	0~0.08	0.19	<b>SSG0.8-70A</b>
M5	4						0.19	<b>SSG0.8-70B</b>
M4	4	18.7	8.97	1.90	0.91	0~0.08	0.24	<b>SSG0.8-80A</b>
M5	4						0.23	<b>SSG0.8-80B</b>

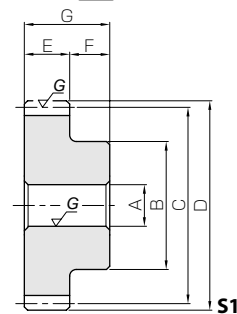
[Caution on Secondary Operations]

① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.



Specifications	
Precision grade	JIS grade N7 (JIS B1702-1: 1998) * JIS grade 3 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	Tooth surface induction hardened
Tooth hardness	45 ~ 55HRC

\* The precision grade of J Series products is equivalent to the value shown in the table.



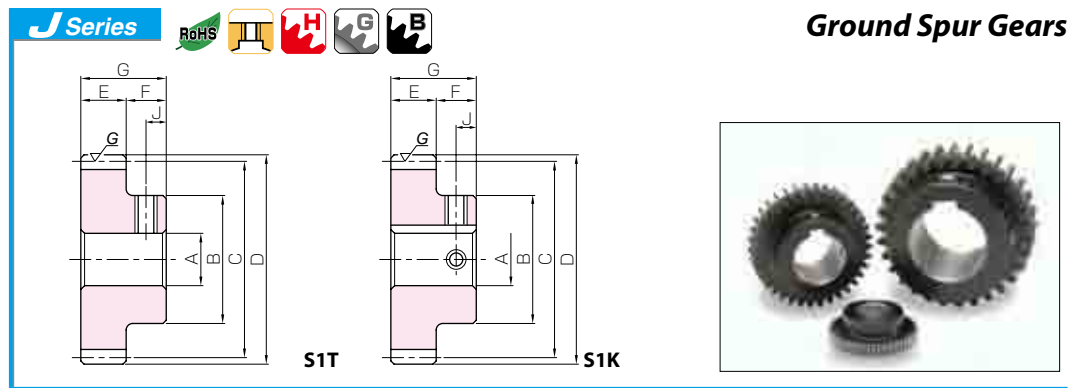
Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	Width×Depth
<b>SSG1-15</b> ● <b>SSG1-15 J6</b>	<b>m1</b>	15	S1	6	12	15	17	8	10	18	—
S1T			6	—							
<b>SSG1-16</b> ● <b>SSG1-16 J6</b>		16	S1	6	13	16	18	8	10	18	—
S1T			6	—							
<b>SSG1-17</b> ● <b>SSG1-17 J6</b> ● <b>SSG1-17 J8</b>		17	S1	6	14	17	19	8	10	18	—
S1T			6	—							
S1T			8	—							
<b>SSG1-18</b> ● <b>SSG1-18 J6</b> ● <b>SSG1-18 J8</b>		18	S1	6	15	18	20	8	10	18	—
S1T			6	—							
S1T			8	—							
<b>SSG1-19</b> ● <b>SSG1-19 J6</b> ● <b>SSG1-19 J8</b>		19	S1	6	16	19	21	8	10	18	—
S1T			6	—							
S1T			8	—							
<b>SSG1-20</b> ● <b>SSG1-20 J6</b> ● <b>SSG1-20 J8</b> ● <b>SSG1-20 J10**</b>		20	S1	6	17	20	22	8	10	18	—
S1T			6	—							
S1T			8	—							
S1K			10	4 x 1.8							
<b>SSG1-21</b> ● <b>SSG1-21 J8</b> ● <b>SSG1-21 J10</b>		21	S1	8	18	21	23	8	10	18	—
S1T			8	—							
S1K			10	4 x 1.8							
<b>SSG1-22</b> ● <b>SSG1-22 J8</b> ● <b>SSG1-22 J10</b>		22	S1	8	18	22	24	8	10	18	—
S1T			8	—							
S1K			10	4 x 1.8							
<b>SSG1-23</b> ● <b>SSG1-23 J8</b> ● <b>SSG1-23 J10</b> ● <b>SSG1-23 J12</b>		23	S1	8	20	23	25	8	10	18	—
S1T			8	—							
S1K			10	4 x 1.8							
S1K			12	4 x 1.8							
<b>SSG1-24</b> ● <b>SSG1-24 J8</b> ● <b>SSG1-24 J10</b> ● <b>SSG1-24 J12</b>		24	S1	8	20	24	26	8	10	18	—
S1T			8	—							
S1K	10		4 x 1.8								
S1K	12		4 x 1.8								
<b>SSG1-25</b> ● <b>SSG1-25 J8</b> ● <b>SSG1-25 J10</b> ● <b>SSG1-25 J12</b>	25	S1	8	20	25	27	8	10	18	—	
S1T		8	—								
S1K		10	4 x 1.8								
S1K		12	4 x 1.8								
<b>SSG1-26</b> ● <b>SSG1-26 J8</b> ● <b>SSG1-26 J10</b> ● <b>SSG1-26 J12</b>	26	S1	8	20	26	28	8	10	18	—	
S1T		8	—								
S1K		10	4 x 1.8								
S1K		12	4 x 1.8								
<b>SSG1-27</b> ● <b>SSG1-27 J8</b> ● <b>SSG1-27 J10</b> ● <b>SSG1-27 J12</b>	27	S1	8	20	27	29	8	10	18	—	
S1T		8	—								
S1K		10	4 x 1.8								
S1K		12	4 x 1.8								
<b>SSG1-28</b> ● <b>SSG1-28 J8</b> ● <b>SSG1-28 J10</b> ● <b>SSG1-28 J12</b>	28	S1	8	20	28	30	8	10	18	—	
S1T		8	—								
S1K		10	4 x 1.8								
S1K		12	4 x 1.8								
<b>SSG1-29</b> ● <b>SSG1-29 J8</b> ● <b>SSG1-29 J10</b> ● <b>SSG1-29 J12</b> ● <b>SSG1-29 J14</b> ● <b>SSG1-29 J15</b>	29	S1	8	25	29	31	8	10	18	—	
S1T		8	—								
S1K		10	4 x 1.8								
S1K		12	4 x 1.8								
S1K		14	5 x 2.3								
S1K		15	5 x 2.3								

[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 1 to 2 mm).



Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—	2.96	1.03	0.30	0.11	0.08~0.16	0.016	<b>SSG1-15</b>
M4	5						0.015	● <b>SSG1-15 J6</b>
—	—	3.28	1.19	0.33	0.12	0.08~0.16	0.019	<b>SSG1-16</b>
M4	5						0.018	● <b>SSG1-16 J6</b>
—	—	3.60	1.36	0.37	0.14	0.08~0.16	0.022	<b>SSG1-17</b>
M4	5						0.022	● <b>SSG1-17 J6</b>
M5	5						0.018	● <b>SSG1-17 J8</b>
—	—	3.93	1.54	0.40	0.16	0.08~0.16	0.026	<b>SSG1-18</b>
M4	5						0.025	● <b>SSG1-18 J6</b>
M5	5						0.022	● <b>SSG1-18 J8</b>
—	—	4.26	1.73	0.43	0.18	0.08~0.16	0.030	<b>SSG1-19</b>
M4	5						0.029	● <b>SSG1-19 J6</b>
M5	5						0.025	● <b>SSG1-19 J8</b>
—	—	4.60	1.94	0.47	0.20	0.08~0.16	0.034	<b>SSG1-20</b>
M4	5						0.033	● <b>SSG1-20 J6</b>
M5	5						0.029	● <b>SSG1-20 J8</b>
M4	5						0.025	● <b>SSG1-20 J10**</b>
—	—	4.94	2.14	0.50	0.22	0.08~0.16	0.035	<b>SSG1-21</b>
M5	5						0.033	● <b>SSG1-21 J8</b>
M4	5						0.029	● <b>SSG1-21 J10</b>
—	—	5.28	2.36	0.54	0.24	0.08~0.16	0.037	<b>SSG1-22</b>
M5	5						0.035	● <b>SSG1-22 J8</b>
M4	5						0.031	● <b>SSG1-22 J10</b>
—	—	5.63	2.59	0.57	0.26	0.08~0.16	0.044	<b>SSG1-23</b>
M5	5						0.042	● <b>SSG1-23 J8</b>
M4	5						0.038	● <b>SSG1-23 J10</b>
M4	5						0.033	● <b>SSG1-23 J12</b>
—	—	5.98	2.83	0.61	0.29	0.08~0.16	0.046	<b>SSG1-24</b>
M5	5						0.044	● <b>SSG1-24 J8</b>
M4	5						0.040	● <b>SSG1-24 J10</b>
M4	5						0.036	● <b>SSG1-24 J12</b>
—	—	6.33	3.07	0.65	0.31	0.08~0.16	0.048	<b>SSG1-25</b>
M5	5						0.047	● <b>SSG1-25 J8</b>
M4	5						0.043	● <b>SSG1-25 J10</b>
M4	5						0.038	● <b>SSG1-25 J12</b>
—	—	6.68	3.33	0.68	0.34	0.08~0.16	0.051	<b>SSG1-26</b>
M5	5						0.049	● <b>SSG1-26 J8</b>
M4	5						0.045	● <b>SSG1-26 J10</b>
M4	5						0.041	● <b>SSG1-26 J12</b>
—	—	7.04	3.60	0.72	0.37	0.08~0.16	0.054	<b>SSG1-27</b>
M5	5						0.052	● <b>SSG1-27 J8</b>
M4	5						0.048	● <b>SSG1-27 J10</b>
M4	5						0.043	● <b>SSG1-27 J12</b>
—	—	7.39	3.89	0.75	0.40	0.08~0.16	0.056	<b>SSG1-28</b>
M5	5						0.055	● <b>SSG1-28 J8</b>
M4	5						0.051	● <b>SSG1-28 J10</b>
M4	5						0.046	● <b>SSG1-28 J12</b>
—	—	7.75	4.18	0.79	0.43	0.08~0.16	0.073	<b>SSG1-29</b>
M5	5						0.071	● <b>SSG1-29 J8</b>
M4	5						0.067	● <b>SSG1-29 J10</b>
M4	5						0.062	● <b>SSG1-29 J12</b>
M4	5						0.056	● <b>SSG1-29 J14</b>
M4	5						0.053	● <b>SSG1-29 J15</b>

**[Caution on J series]**

- ① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).
- ⑤ Areas of products which have been re-worked will not be black oxide coated.
- ⑥ For products having a tapped hole, a set screw is included.
- ⑦ Products marked with "\*\*" in their catalog numbers, have a thin gap between the keyway and the gear root surface. So, thickness must be considered when using. For details, please see our web site.

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks &amp; Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

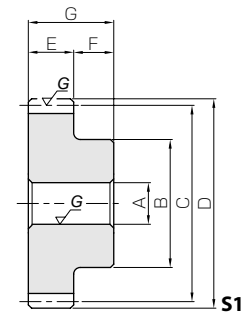
Bevel Gearboxes

Other Products



Specifications	
Precision grade	JIS grade N7 (JIS B1702-1: 1998) * JIS grade 3 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	Tooth surface induction hardened
Tooth hardness	45 ~ 55HRC

\* The precision grade of J Series products is equivalent to the value shown in the table.



- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	Width×Depth
SSG1-30 ●SSG1-30 J10 ●SSG1-30 J12 ●SSG1-30 J14 ●SSG1-30 J15	m1	30	S1	10	25	30	32	8	10	18	—
			S1K	10							4 x 1.8
			S1K	12							4 x 1.8
			S1K	14							5 x 2.3
SSG1-32 ●SSG1-32 J10 ●SSG1-32 J12 ●SSG1-32 J14 ●SSG1-32 J15	32	32	S1	10	25	32	34	8	10	18	—
			S1K	10							4 x 1.8
			S1K	12							4 x 1.8
			S1K	14							5 x 2.3
SSG1-34 ●SSG1-34 J10 ●SSG1-34 J12 ●SSG1-34 J14 ●SSG1-34 J15	34	34	S1	10	25	34	36	8	10	18	—
			S1K	10							4 x 1.8
			S1K	12							4 x 1.8
			S1K	14							5 x 2.3
SSG1-35 ●SSG1-35 J10 ●SSG1-35 J12 ●SSG1-35 J14 ●SSG1-35 J15	35	35	S1	10	25	35	37	8	10	18	—
			S1K	10							4 x 1.8
			S1K	12							4 x 1.8
			S1K	14							5 x 2.3
SSG1-36 ●SSG1-36 J10 ●SSG1-36 J12 ●SSG1-36 J14 ●SSG1-36 J15	36	36	S1	10	25	36	38	8	10	18	—
			S1K	10							4 x 1.8
			S1K	12							4 x 1.8
			S1K	14							5 x 2.3
SSG1-38 ●SSG1-38 J10 ●SSG1-38 J12 ●SSG1-38 J14 ●SSG1-38 J15 ●SSG1-38 J16 ●SSG1-38 J18	38	38	S1	10	30	38	40	8	10	18	—
			S1K	10							4 x 1.8
			S1K	12							4 x 1.8
			S1K	14							5 x 2.3
SSG1-40 ●SSG1-40 J10 ●SSG1-40 J12 ●SSG1-40 J14 ●SSG1-40 J15 ●SSG1-40 J16 ●SSG1-40 J18	40	40	S1	10	30	40	42	8	10	18	—
			S1K	10							4 x 1.8
			S1K	12							4 x 1.8
			S1K	14							5 x 2.3
SSG1-42 ●SSG1-42 J10 ●SSG1-42 J12 ●SSG1-42 J14 ●SSG1-42 J15 ●SSG1-42 J16 ●SSG1-42 J18	42	42	S1	10	30	42	44	8	10	18	—
			S1K	10							4 x 1.8
			S1K	12							4 x 1.8
			S1K	14							5 x 2.3
SSG1-44 ●SSG1-44 J10 ●SSG1-44 J12 ●SSG1-44 J14 ●SSG1-44 J15 ●SSG1-44 J16 ●SSG1-44 J18	44	44	S1	10	30	44	46	8	10	18	—
			S1K	10							4 x 1.8
			S1K	12							4 x 1.8
			S1K	14							5 x 2.3

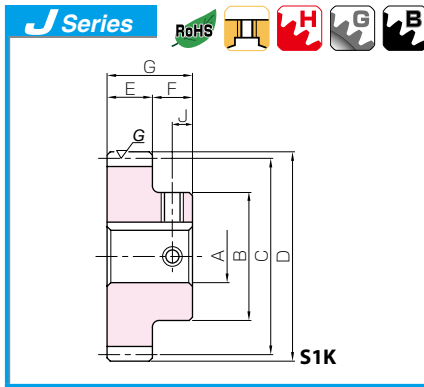
[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 1 to 2 mm).





## Ground Spur Gears



Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)	
Size	J	Bending strength	Surface durability	Bending strength	Surface durability				
—	—	—	—	—	—	—	—	<b>SSG1-30</b>	
M4	5	8.11	4.48	0.83	0.46	0.08~0.16	0.072	● <b>SSG1-30 J10</b>	
M4	5							0.070	● <b>SSG1-30 J12</b>
M4	5							0.065	● <b>SSG1-30 J14</b>
M4	5							0.059	● <b>SSG1-30 J15</b>
—	—	—	—	—	—	—	—	<b>SSG1-32</b>	
M4	5	7.37	4.27	0.75	0.43	0.08~0.16	0.078	● <b>SSG1-32 J10</b>	
M4	5							0.076	● <b>SSG1-32 J12</b>
M4	5							0.071	● <b>SSG1-32 J14</b>
M4	5							0.065	● <b>SSG1-32 J15</b>
—	—	—	—	—	—	—	—	<b>SSG1-34</b>	
M4	5	7.98	4.84	0.81	0.49	0.08~0.16	0.084	● <b>SSG1-34 J10</b>	
M4	5							0.083	● <b>SSG1-34 J12</b>
M4	5							0.078	● <b>SSG1-34 J14</b>
M4	5							0.072	● <b>SSG1-34 J15</b>
—	—	—	—	—	—	—	—	<b>SSG1-35</b>	
M4	5	8.28	5.14	0.84	0.52	0.08~0.16	0.088	● <b>SSG1-35 J10</b>	
M4	5							0.086	● <b>SSG1-35 J12</b>
M4	5							0.081	● <b>SSG1-35 J14</b>
M4	5							0.075	● <b>SSG1-35 J15</b>
—	—	—	—	—	—	—	—	<b>SSG1-36</b>	
M4	5	8.59	5.45	0.88	0.56	0.08~0.16	0.091	● <b>SSG1-36 J10</b>	
M4	5							0.089	● <b>SSG1-36 J12</b>
M4	5							0.085	● <b>SSG1-36 J14</b>
M4	5							0.079	● <b>SSG1-36 J15</b>
—	—	—	—	—	—	—	—	<b>SSG1-38</b>	
M4	5	9.21	6.10	0.94	0.62	0.08~0.16	0.12	● <b>SSG1-38 J10</b>	
M4	5							0.11	● <b>SSG1-38 J12</b>
M4	5							0.11	● <b>SSG1-38 J14</b>
M4	5							0.10	● <b>SSG1-38 J15</b>
M4	5							0.099	● <b>SSG1-38 J16</b>
M5	5							0.096	● <b>SSG1-38 J18</b>
—	—	—	—	—	—	—	—	<b>SSG1-40</b>	
M4	5	9.83	6.79	1.00	0.69	0.08~0.16	0.12	● <b>SSG1-40 J10</b>	
M4	5							0.12	● <b>SSG1-40 J12</b>
M4	5							0.12	● <b>SSG1-40 J14</b>
M4	5							0.11	● <b>SSG1-40 J15</b>
M4	5							0.11	● <b>SSG1-40 J16</b>
M5	5							0.10	● <b>SSG1-40 J18</b>
—	—	—	—	—	—	—	—	<b>SSG1-42</b>	
M4	5	10.5	7.51	1.07	0.77	0.08~0.16	0.13	● <b>SSG1-42 J10</b>	
M4	5							0.13	● <b>SSG1-42 J12</b>
M4	5							0.12	● <b>SSG1-42 J14</b>
M4	5							0.12	● <b>SSG1-42 J15</b>
M4	5							0.12	● <b>SSG1-42 J16</b>
M5	5							0.11	● <b>SSG1-42 J18</b>
—	—	—	—	—	—	—	—	<b>SSG1-44</b>	
M4	5	11.1	8.28	1.13	0.84	0.08~0.16	0.14	● <b>SSG1-44 J10</b>	
M4	5							0.14	● <b>SSG1-44 J12</b>
M4	5							0.13	● <b>SSG1-44 J14</b>
M4	5							0.13	● <b>SSG1-44 J15</b>
M4	5							0.12	● <b>SSG1-44 J16</b>
M5	5							0.12	● <b>SSG1-44 J18</b>

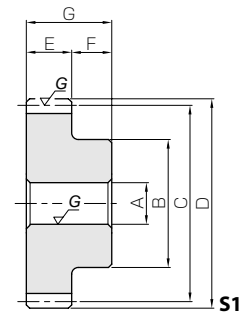
**[Caution on J series]**

- ① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).
- ⑤ Areas of products which have been re-worked will not be black oxide coated.
- ⑥ For products having a tapped hole, a set screw is included.



Specifications	
Precision grade	JIS grade N7 (JIS B1702-1: 1998) * JIS grade 3 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	Tooth surface induction hardened
Tooth hardness	45 ~ 55HRC

\* The precision grade of J Series products is equivalent to the value shown in the table.



- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

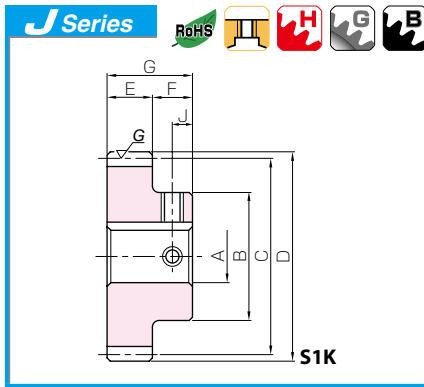
Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	Width×Depth
<b>SSG1-45</b> ● SSG1-45 J10 ● SSG1-45 J12 ● SSG1-45 J14 ● SSG1-45 J15 ● SSG1-45 J16 ● SSG1-45 J18	m1	45	S1	10	30	45	47	8	10	18	—
			S1K	10							4 x 1.8
			S1K	12							4 x 1.8
			S1K	14							5 x 2.3
			S1K	15							5 x 2.3
			S1K	16							5 x 2.3
S1K	18	6 x 2.8									
<b>SSG1-48</b> ● SSG1-48 J10 ● SSG1-48 J12 ● SSG1-48 J14 ● SSG1-48 J15 ● SSG1-48 J16 ● SSG1-48 J18	m1	48	S1	10	30	48	50	8	10	18	—
			S1K	10							4 x 1.8
			S1K	12							4 x 1.8
			S1K	14							5 x 2.3
			S1K	15							5 x 2.3
			S1K	16							5 x 2.3
S1K	18	6 x 2.8									
<b>SSG1-50</b> ● SSG1-50 J12 ● SSG1-50 J14 ● SSG1-50 J15 ● SSG1-50 J16 ● SSG1-50 J18 ● SSG1-50 J19 ● SSG1-50 J20	m1	50	S1	12	35	50	52	8	10	18	—
			S1K	12							4 x 1.8
			S1K	14							5 x 2.3
			S1K	15							5 x 2.3
			S1K	16							5 x 2.3
			S1K	18							6 x 2.8
S1K	19	6 x 2.8									
S1K	20	6 x 2.8									
<b>SSG1-55</b> ● SSG1-55 J12 ● SSG1-55 J14 ● SSG1-55 J15 ● SSG1-55 J16 ● SSG1-55 J18 ● SSG1-55 J19 ● SSG1-55 J20	m1	55	S1	12	35	55	57	8	10	18	—
			S1K	12							4 x 1.8
			S1K	14							5 x 2.3
			S1K	15							5 x 2.3
			S1K	16							5 x 2.3
			S1K	18							6 x 2.8
S1K	19	6 x 2.8									
S1K	20	6 x 2.8									
<b>SSG1-56</b> ● SSG1-56 J12 ● SSG1-56 J14 ● SSG1-56 J15 ● SSG1-56 J16 ● SSG1-56 J18 ● SSG1-56 J19 ● SSG1-56 J20	m1	56	S1	12	35	56	58	8	10	18	—
			S1K	12							4 x 1.8
			S1K	14							5 x 2.3
			S1K	15							5 x 2.3
			S1K	16							5 x 2.3
			S1K	18							6 x 2.8
S1K	19	6 x 2.8									
S1K	20	6 x 2.8									
<b>SSG1-60</b> ● SSG1-60 J12 ● SSG1-60 J14 ● SSG1-60 J15 ● SSG1-60 J16 ● SSG1-60 J18 ● SSG1-60 J19 ● SSG1-60 J20 ● SSG1-60 J22	m1	60	S1	12	40	60	62	8	10	18	—
			S1K	12							4 x 1.8
			S1K	14							5 x 2.3
			S1K	15							5 x 2.3
			S1K	16							5 x 2.3
			S1K	18							6 x 2.8
S1K	19	6 x 2.8									
S1K	20	6 x 2.8									
S1K	22	6 x 2.8									

[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

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- ② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 1 to 2 mm).



## Ground Spur Gears



Set Screw		Allowable torque(N-m)		Allowable torque(kgf-m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—						0.14	<b>SSG1-45</b>
M4	5	11.4	8.67	1.16	0.88	0.08~0.16	0.14	● <b>SSG1-45 J10</b>
M4	5						0.14	● <b>SSG1-45 J12</b>
M4	5						0.13	● <b>SSG1-45 J14</b>
M4	5						0.13	● <b>SSG1-45 J15</b>
M4	5						0.12	● <b>SSG1-45 J16</b>
M5	5						0.12	● <b>SSG1-45 J18</b>
—	—						0.16	<b>SSG1-48</b>
M4	5	12.3	9.92	1.26	1.01	0.08~0.16	0.16	● <b>SSG1-48 J10</b>
M4	5						0.15	● <b>SSG1-48 J12</b>
M4	5						0.14	● <b>SSG1-48 J14</b>
M4	5						0.14	● <b>SSG1-48 J15</b>
M4	5						0.14	● <b>SSG1-48 J16</b>
M5	5						0.13	● <b>SSG1-48 J18</b>
—	—						0.18	<b>SSG1-50</b>
M4	5	13.0	10.8	1.32	1.10	0.08~0.16	0.18	● <b>SSG1-50 J12</b>
M4	5						0.17	● <b>SSG1-50 J14</b>
M4	5						0.17	● <b>SSG1-50 J15</b>
M4	5						0.17	● <b>SSG1-50 J16</b>
M5	5						0.16	● <b>SSG1-50 J18</b>
M5	5						0.15	● <b>SSG1-50 J19</b>
M5	5	0.15	● <b>SSG1-50 J20</b>					
—	—						0.21	<b>SSG1-55</b>
M4	5	14.6	13.2	1.48	1.34	0.10~0.18	0.21	● <b>SSG1-55 J12</b>
M4	5						0.21	● <b>SSG1-55 J14</b>
M4	5						0.20	● <b>SSG1-55 J15</b>
M4	5						0.19	● <b>SSG1-55 J16</b>
M5	5						0.18	● <b>SSG1-55 J18</b>
M5	5						0.18	● <b>SSG1-55 J19</b>
M5	5	0.18	● <b>SSG1-55 J20</b>					
—	—						0.21	<b>SSG1-56</b>
M4	5	14.9	13.7	1.52	1.40	0.10~0.18	0.21	● <b>SSG1-56 J12</b>
M4	5						0.21	● <b>SSG1-56 J14</b>
M4	5						0.20	● <b>SSG1-56 J15</b>
M4	5						0.20	● <b>SSG1-56 J16</b>
M5	5						0.19	● <b>SSG1-56 J18</b>
M5	5						0.19	● <b>SSG1-56 J19</b>
M5	5	0.18	● <b>SSG1-56 J20</b>					
—	—						0.26	<b>SSG1-60</b>
M4	5	16.2	15.8	1.65	1.61	0.10~0.18	0.26	● <b>SSG1-60 J12</b>
M4	5						0.25	● <b>SSG1-60 J14</b>
M4	5						0.25	● <b>SSG1-60 J15</b>
M4	5						0.24	● <b>SSG1-60 J16</b>
M5	5						0.24	● <b>SSG1-60 J18</b>
M5	5						0.23	● <b>SSG1-60 J19</b>
M5	5	0.23	● <b>SSG1-60 J20</b>					
M5	5	0.22	● <b>SSG1-60 J22</b>					

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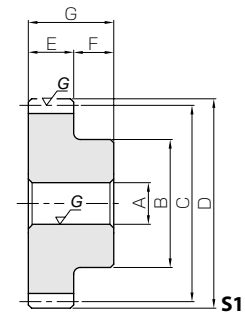
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Specifications	
Precision grade	JIS grade N7 (JIS B1702-1: 1998) * JIS grade 3 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	Tooth surface induction hardened
Tooth hardness	45 ~ 55HRC

\* The precision grade of J Series products is equivalent to the value shown in the table.



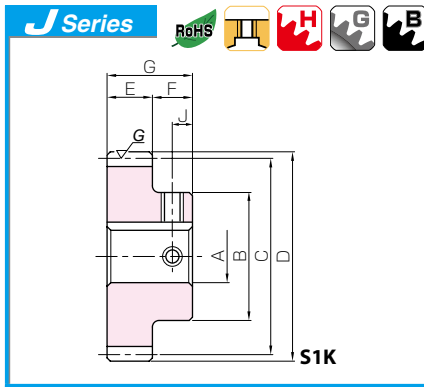
Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	Width×Depth
<b>SSG1-64</b>	<b>m1</b>	64	S1	12	40	64	66	8	10	18	—
●SSG1-64 J12			S1K	12							4 x 1.8
●SSG1-64 J14			S1K	14							5 x 2.3
●SSG1-64 J15			S1K	15							5 x 2.3
●SSG1-64 J16			S1K	16							5 x 2.3
●SSG1-64 J18			S1K	18							6 x 2.8
●SSG1-64 J19			S1K	19							6 x 2.8
●SSG1-64 J20			S1K	20							6 x 2.8
●SSG1-64 J22		S1K	22	6 x 2.8							
<b>SSG1-70</b>		70	S1	12	40	70	72	8	10	18	—
●SSG1-70 J12			S1K	12							4 x 1.8
●SSG1-70 J14			S1K	14							5 x 2.3
●SSG1-70 J15			S1K	15							5 x 2.3
●SSG1-70 J16			S1K	16							5 x 2.3
●SSG1-70 J18			S1K	18							6 x 2.8
●SSG1-70 J19			S1K	19							6 x 2.8
●SSG1-70 J20			S1K	20							6 x 2.8
●SSG1-70 J22		S1K	22	6 x 2.8							
<b>SSG1-75</b>		75	S1	12	40	75	77	8	10	18	—
●SSG1-75 J12			S1K	12							4 x 1.8
●SSG1-75 J14			S1K	14							5 x 2.3
●SSG1-75 J15			S1K	15							5 x 2.3
●SSG1-75 J16			S1K	16							5 x 2.3
●SSG1-75 J18			S1K	18							6 x 2.8
●SSG1-75 J19			S1K	19							6 x 2.8
●SSG1-75 J20			S1K	20							6 x 2.8
●SSG1-75 J22		S1K	22	6 x 2.8							
<b>SSG1-80</b>		80	S1	15	50	80	82	8	10	18	—
●SSG1-80 J15	S1K		15	5 x 2.3							
●SSG1-80 J16	S1K		16	5 x 2.3							
●SSG1-80 J18	S1K		18	6 x 2.8							
●SSG1-80 J19	S1K		19	6 x 2.8							
●SSG1-80 J20	S1K		20	6 x 2.8							
●SSG1-80 J22	S1K		22	6 x 2.8							
●SSG1-80 J25	S1K		25	8 x 3.3							
●SSG1-80 J28	S1K	28	8 x 3.3								
●SSG1-80 J30	S1K	30	8 x 3.3								
<b>SSG1-90</b>	90	S1	15	50	90	92	8	10	18	—	
●SSG1-90 J15		S1K	15							5 x 2.3	
●SSG1-90 J16		S1K	16							5 x 2.3	
●SSG1-90 J18		S1K	18							6 x 2.8	
●SSG1-90 J19		S1K	19							6 x 2.8	
●SSG1-90 J20		S1K	20							6 x 2.8	
●SSG1-90 J22		S1K	22							6 x 2.8	
●SSG1-90 J25		S1K	25							8 x 3.3	
●SSG1-90 J28	S1K	28	8 x 3.3								
●SSG1-90 J30	S1K	30	8 x 3.3								

[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 1 to 2 mm).



## Ground Spur Gears



Set Screw		Allowable torque(N-m)		Allowable torque(kgf-m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—						0.28	<b>SSG1-64</b>
M4	5						0.28	● <b>SSG1-64 J12</b>
M4	5						0.28	● <b>SSG1-64 J14</b>
M4	5						0.27	● <b>SSG1-64 J15</b>
M4	5	17.4	18.1	1.78	1.84	0.10~0.18	0.27	● <b>SSG1-64 J16</b>
M5	5						0.26	● <b>SSG1-64 J18</b>
M5	5						0.26	● <b>SSG1-64 J19</b>
M5	5						0.25	● <b>SSG1-64 J20</b>
M5	5						0.24	● <b>SSG1-64 J22</b>
—	—						0.32	<b>SSG1-70</b>
M4	5						0.32	● <b>SSG1-70 J12</b>
M4	5						0.32	● <b>SSG1-70 J14</b>
M4	5	19.4	21.8	1.97	2.22	0.10~0.18	0.31	● <b>SSG1-70 J15</b>
M4	5						0.31	● <b>SSG1-70 J16</b>
M5	5						0.30	● <b>SSG1-70 J18</b>
M5	5						0.30	● <b>SSG1-70 J19</b>
M5	5						0.29	● <b>SSG1-70 J20</b>
M5	5						0.28	● <b>SSG1-70 J22</b>
—	—						0.36	<b>SSG1-75</b>
M4	5						0.36	● <b>SSG1-75 J12</b>
M4	5						0.35	● <b>SSG1-75 J14</b>
M4	5	21.0	25.2	2.14	2.57	0.10~0.18	0.35	● <b>SSG1-75 J15</b>
M4	5						0.34	● <b>SSG1-75 J16</b>
M5	5						0.34	● <b>SSG1-75 J18</b>
M5	5						0.33	● <b>SSG1-75 J19</b>
M5	5						0.33	● <b>SSG1-75 J20</b>
M5	5						0.32	● <b>SSG1-75 J22</b>
—	—						0.44	<b>SSG1-80</b>
M4*	5						0.44	● <b>SSG1-80 J15</b>
M4*	5						0.43	● <b>SSG1-80 J16</b>
M5	5						0.43	● <b>SSG1-80 J18</b>
M5	5	22.6	28.8	2.30	2.94	0.10~0.18	0.42	● <b>SSG1-80 J19</b>
M5	5						0.42	● <b>SSG1-80 J20</b>
M5	5						0.41	● <b>SSG1-80 J22</b>
M6	5						0.39	● <b>SSG1-80 J25</b>
M6	5						0.38	● <b>SSG1-80 J28</b>
M6	5						0.36	● <b>SSG1-80 J30</b>
—	—						0.53	<b>SSG1-90</b>
M4*	5						0.52	● <b>SSG1-90 J15</b>
M4*	5						0.52	● <b>SSG1-90 J16</b>
M5	5						0.51	● <b>SSG1-90 J18</b>
M5	5	25.8	36.9	2.64	3.77	0.10~0.18	0.51	● <b>SSG1-90 J19</b>
M5	5						0.50	● <b>SSG1-90 J20</b>
M5	5						0.49	● <b>SSG1-90 J22</b>
M6	5						0.48	● <b>SSG1-90 J25</b>
M6	5						0.46	● <b>SSG1-90 J28</b>
M6	5						0.45	● <b>SSG1-90 J30</b>

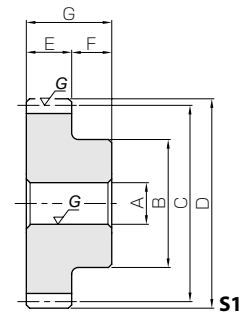
**[Caution on J series]**

- ① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order.  
Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).
- ⑤ Areas of products which have been re-worked will not be black oxide coated.
- ⑥ For products having a tapped hole, a set screw is included.



Specifications	
Precision grade	JIS grade N7 (JIS B1702-1: 1998) * JIS grade 3 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	Tooth surface induction hardened
Tooth hardness	45 ~ 55HRC

\* The precision grade of J Series products is equivalent to the value shown in the table.



Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway								
				A <sub>H7</sub>	B	C	D	E	F	G	Width×Depth								
<b>SSG1-100</b>	<b>m1</b>	100	S1	15	50	100	102	8	10	18	—								
● <b>SSG1-100 J15</b>			S1K	15							5 x 2.3								
● <b>SSG1-100 J16</b>			S1K	16							5 x 2.3								
● <b>SSG1-100 J18</b>			S1K	18							6 x 2.8								
● <b>SSG1-100 J19</b>			S1K	19							6 x 2.8								
● <b>SSG1-100 J20</b>			S1K	20							6 x 2.8								
● <b>SSG1-100 J22</b>			S1K	22							6 x 2.8								
● <b>SSG1-100 J25</b>			S1K	25							8 x 3.3								
● <b>SSG1-100 J28</b>			S1K	28							8 x 3.3								
● <b>SSG1-100 J30</b>			S1K	30							8 x 3.3								
<b>SSG1-120</b>				120							S1	15	50	120	122	8	10	18	—
● <b>SSG1-120 J15</b>											S1K	15							5 x 2.3
● <b>SSG1-120 J16</b>											S1K	16							5 x 2.3
● <b>SSG1-120 J18</b>	S1K	18			6 x 2.8														
● <b>SSG1-120 J19</b>	S1K	19			6 x 2.8														
● <b>SSG1-120 J20</b>	S1K	20			6 x 2.8														
● <b>SSG1-120 J22</b>	S1K	22			6 x 2.8														
● <b>SSG1-120 J25</b>	S1K	25			8 x 3.3														
● <b>SSG1-120 J28</b>	S1K	28			8 x 3.3														
● <b>SSG1-120 J30</b>	S1K	30			8 x 3.3														

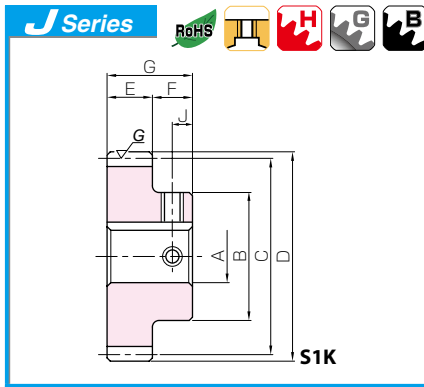
[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 1 to 2 mm).

- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products



## Ground Spur Gears



Set Screw		Allowable torque(N-m)		Allowable torque(kgf-m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)	
Size	J	Bending strength	Surface durability	Bending strength	Surface durability				
—	—	26.9	42.5	2.74	4.34	0.10~0.18	0.62	<b>SSG1-100</b>	
M4*	5							0.62	●SSG1-100 J15
M4*	5							0.61	●SSG1-100 J16
M5	5							0.61	●SSG1-100 J18
M5	5							0.60	●SSG1-100 J19
M5	5							0.60	●SSG1-100 J20
M5	5							0.59	●SSG1-100 J22
M6	5							0.57	●SSG1-100 J25
M6	5							0.55	●SSG1-100 J28
M6	5							0.54	●SSG1-100 J30
—	—	32.9	62.5	3.36	6.37	0.12~0.20	0.84	<b>SSG1-120</b>	
M4*	5							0.83	●SSG1-120 J15
M4*	5							0.83	●SSG1-120 J16
M5	5							0.82	●SSG1-120 J18
M5	5							0.82	●SSG1-120 J19
M5	5							0.81	●SSG1-120 J20
M5	5							0.81	●SSG1-120 J22
M6	5							0.79	●SSG1-120 J25
M6	5							0.77	●SSG1-120 J28
M6	5							0.76	●SSG1-120 J30

**[Caution on J series]**

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Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).
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Spur  
GearsHelical  
GearsInternal  
Gears

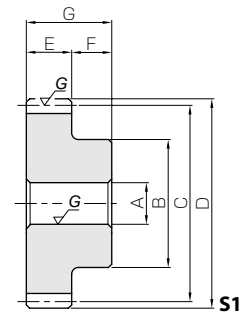
Racks

CP Racks  
& PinionsMiter  
GearsBevel  
GearsScrew  
GearsWorm  
Gear PairBevel  
GearboxesOther  
Products



Specifications	
Precision grade	JIS grade N7 (JIS B1702-1: 1998) * JIS grade 3 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	Tooth surface induction hardened
Tooth hardness	45 ~ 55HRC

\* The precision grade of J Series products is equivalent to the value shown in the table.

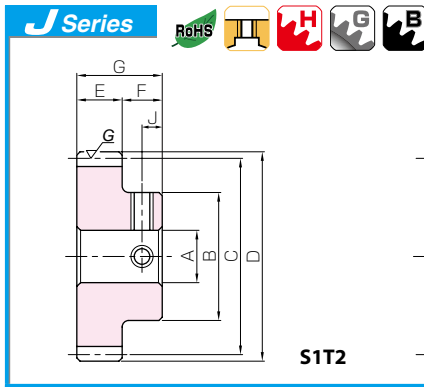


- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	Width×Depth
<b>SSG1.5-14</b> ● <b>SSG1.5-14 J10</b>	m1.5	14	S1	10	17	21	24	15	14	29	—
S1T2			10	—							
<b>SSG1.5-15</b> ● <b>SSG1.5-15 J10**</b>		15	S1	10	18	22.5	25.5	15	14	29	—
S1K			10	4 x 1.8							
<b>SSG1.5-16</b> ● <b>SSG1.5-16 J10</b> ● <b>SSG1.5-16 J12**</b>		16	S1	10	20	24	27	15	14	29	—
S1K			10	4 x 1.8							
S1K			12	4 x 1.8							
<b>SSG1.5-17</b> ● <b>SSG1.5-17 J10</b> ● <b>SSG1.5-17 J12</b>		17	S1	10	21	25.5	28.5	15	14	29	—
S1K			10	4 x 1.8							
S1K			12	4 x 1.8							
<b>SSG1.5-18</b> ● <b>SSG1.5-18 J10</b> ● <b>SSG1.5-18 J12</b>		18	S1	10	22	27	30	15	14	29	—
S1K			10	4 x 1.8							
S1K			12	4 x 1.8							
<b>SSG1.5-19</b> ● <b>SSG1.5-19 J10</b> ● <b>SSG1.5-19 J12</b>		19	S1	10	23	28.5	31.5	15	14	29	—
S1K			10	4 x 1.8							
S1K			12	4 x 1.8							
<b>SSG1.5-20</b> ● <b>SSG1.5-20 J10</b> ● <b>SSG1.5-20 J12</b> ● <b>SSG1.5-20 J14</b>		20	S1	10	24	30	33	15	14	29	—
S1K			10	4 x 1.8							
S1K			12	4 x 1.8							
S1K			14	5 x 2.3							
<b>SSG1.5-21</b> ● <b>SSG1.5-21 J10</b> ● <b>SSG1.5-21 J12</b> ● <b>SSG1.5-21 J14</b> ● <b>SSG1.5-21 J15</b>		21	S1	10	25	31.5	34.5	15	14	29	—
S1K			10	4 x 1.8							
S1K			12	4 x 1.8							
S1K			14	5 x 2.3							
S1K			15	5 x 2.3							
<b>SSG1.5-22</b> ● <b>SSG1.5-22 J12</b> ● <b>SSG1.5-22 J14</b> ● <b>SSG1.5-22 J15</b>		22	S1	12	26	33	36	15	14	29	—
S1K	12		4 x 1.8								
S1K	14		5 x 2.3								
S1K	15		5 x 2.3								
<b>SSG1.5-23</b> ● <b>SSG1.5-23 J12</b> ● <b>SSG1.5-23 J14</b> ● <b>SSG1.5-23 J15</b> ● <b>SSG1.5-23 J16</b>	23	S1	12	27	34.5	37.5	15	14	29	—	
S1K		12	4 x 1.8								
S1K		14	5 x 2.3								
S1K		15	5 x 2.3								
S1K		16	5 x 2.3								
<b>SSG1.5-24</b> ● <b>SSG1.5-24 J12</b> ● <b>SSG1.5-24 J14</b> ● <b>SSG1.5-24 J15</b> ● <b>SSG1.5-24 J16</b>	24	S1	12	28	36	39	15	14	29	—	
S1K		12	4 x 1.8								
S1K		14	5 x 2.3								
S1K		15	5 x 2.3								
S1K		16	5 x 2.3								
<b>SSG1.5-25</b> ● <b>SSG1.5-25 J12</b> ● <b>SSG1.5-25 J14</b> ● <b>SSG1.5-25 J15</b> ● <b>SSG1.5-25 J16</b> ● <b>SSG1.5-25 J18</b>	25	S1	12	30	37.5	40.5	15	14	29	—	
S1K		12	4 x 1.8								
S1K		14	5 x 2.3								
S1K		15	5 x 2.3								
S1K		16	5 x 2.3								
S1K		18	6 x 2.8								
<b>SSG1.5-26</b> ● <b>SSG1.5-26 J12</b> ● <b>SSG1.5-26 J14</b> ● <b>SSG1.5-26 J15</b> ● <b>SSG1.5-26 J16</b> ● <b>SSG1.5-26 J18</b>	26	S1	12	32	39	42	15	14	29	—	
S1K		12	4 x 1.8								
S1K		14	5 x 2.3								
S1K		15	5 x 2.3								
S1K		16	5 x 2.3								
S1K		18	6 x 2.8								

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- The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
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## Ground Spur Gears



Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—	11.1	3.73	1.13	0.38	0.08~0.16	0.048	<b>SSG1.5-14</b>
M4	7						0.046	● <b>SSG1.5-14 J10</b>
—	—	12.5	4.35	1.27	0.44	0.08~0.16	0.057	<b>SSG1.5-15</b>
M4	7						0.055	● <b>SSG1.5-15 J10**</b>
—	—	13.8	5.02	1.41	0.51	0.08~0.16	0.070	<b>SSG1.5-16</b>
M4	7						0.068	● <b>SSG1.5-16 J10</b>
M4	7						0.060	● <b>SSG1.5-16 J12**</b>
—	—	15.2	5.74	1.55	0.58	0.08~0.16	0.080	<b>SSG1.5-17</b>
M4	7						0.078	● <b>SSG1.5-17 J10</b>
M4	7						0.070	● <b>SSG1.5-17 J12</b>
—	—	16.6	6.51	1.69	0.66	0.08~0.16	0.091	<b>SSG1.5-18</b>
M4	7						0.089	● <b>SSG1.5-18 J10</b>
M4	7						0.081	● <b>SSG1.5-18 J12</b>
—	—	18.0	7.33	1.83	0.75	0.08~0.16	0.10	<b>SSG1.5-19</b>
M4	7						0.10	● <b>SSG1.5-19 J10</b>
M4	7						0.093	● <b>SSG1.5-19 J12</b>
—	—	19.4	8.20	1.98	0.84	0.08~0.16	0.12	<b>SSG1.5-20</b>
M4	7						0.11	● <b>SSG1.5-20 J10</b>
M4	7						0.10	● <b>SSG1.5-20 J12</b>
M4	7						0.095	● <b>SSG1.5-20 J14</b>
—	—	20.8	9.12	2.12	0.93	0.08~0.16	0.13	<b>SSG1.5-21</b>
M4	7						0.13	● <b>SSG1.5-21 J10</b>
M4	7						0.12	● <b>SSG1.5-21 J12</b>
M4	7						0.11	● <b>SSG1.5-21 J14</b>
M4	7						0.10	● <b>SSG1.5-21 J15</b>
—	—	18.6	8.41	1.89	0.86	0.08~0.16	0.13	<b>SSG1.5-22</b>
M4	7						0.13	● <b>SSG1.5-22 J12</b>
M4	7						0.12	● <b>SSG1.5-22 J14</b>
M4	7						0.12	● <b>SSG1.5-22 J15</b>
—	—	19.8	9.27	2.02	0.95	0.08~0.16	0.15	<b>SSG1.5-23</b>
M4	7						0.14	● <b>SSG1.5-23 J12</b>
M4	7						0.13	● <b>SSG1.5-23 J14</b>
M4	7						0.13	● <b>SSG1.5-23 J15</b>
M4	7						0.12	● <b>SSG1.5-23 J16</b>
—	—	21.0	10.2	2.14	1.04	0.08~0.16	0.16	<b>SSG1.5-24</b>
M4	7						0.16	● <b>SSG1.5-24 J12</b>
M4	7						0.15	● <b>SSG1.5-24 J14</b>
M4	7						0.14	● <b>SSG1.5-24 J15</b>
M4	7						0.14	● <b>SSG1.5-24 J16</b>
—	—	22.2	11.1	2.27	1.13	0.08~0.16	0.18	<b>SSG1.5-25</b>
M4	7						0.18	● <b>SSG1.5-25 J12</b>
M4	7						0.17	● <b>SSG1.5-25 J14</b>
M4	7						0.16	● <b>SSG1.5-25 J15</b>
M4	7						0.16	● <b>SSG1.5-25 J16</b>
M5	7						0.15	● <b>SSG1.5-25 J18</b>
—	—	23.5	12.1	2.39	1.23	0.08~0.16	0.20	<b>SSG1.5-26</b>
M4	7						0.20	● <b>SSG1.5-26 J12</b>
M4	7						0.19	● <b>SSG1.5-26 J14</b>
M4	7						0.19	● <b>SSG1.5-26 J15</b>
M4	7						0.18	● <b>SSG1.5-26 J16</b>
M5	7						0.17	● <b>SSG1.5-26 J18</b>

[Caution on J series]

① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order.

Please allow additional shipping time to get to your local distributor.

② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.

③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.

④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).

⑤ Areas of products which have been re-worked will not be black oxide coated.

⑥ For products having a tapped hole, a set screw is included.

⑦ Products marked with "\*\*\*" have a small amount of material between the corner of the keyway and the tooth root. This mode of failure must be considered when selecting these gears. For details, please see our web site.

For updated information, please see KHK Web Catalog.

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks &amp; Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

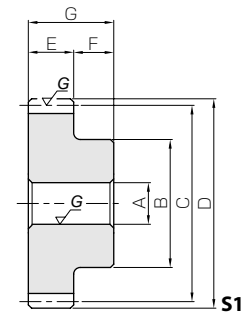
Bevel Gearboxes

Other Products



Specifications	
Precision grade	JIS grade N7 (JIS B1702-1: 1998) * JIS grade 3 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	Tooth surface induction hardened
Tooth hardness	45 ~ 55HRC

\* The precision grade of J Series products is equivalent to the value shown in the table.



- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

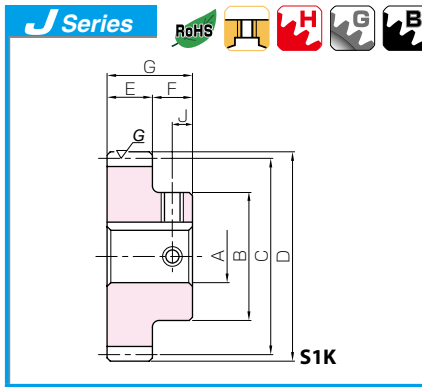
Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	Width×Depth
SSG1.5-27 ●SSG1.5-27 J15 ●SSG1.5-27 J16 ●SSG1.5-27 J18 ●SSG1.5-27 J19 ●SSG1.5-27 J20	m1.5	27	S1	15	34	40.5	43.5	15	14	29	—
			S1K	15							5 x 2.3
			S1K	16							5 x 2.3
			S1K	18							6 x 2.8
			S1K	19							6 x 2.8
			S1K	20							6 x 2.8
SSG1.5-28 ●SSG1.5-28 J15 ●SSG1.5-28 J16 ●SSG1.5-28 J18 ●SSG1.5-28 J19 ●SSG1.5-28 J20	m1.5	28	S1	15	36	42	45	15	14	29	—
			S1K	15							5 x 2.3
			S1K	16							5 x 2.3
			S1K	18							6 x 2.8
			S1K	19							6 x 2.8
			S1K	20							6 x 2.8
SSG1.5-29 ●SSG1.5-29 J15 ●SSG1.5-29 J16 ●SSG1.5-29 J18 ●SSG1.5-29 J19 ●SSG1.5-29 J20 ●SSG1.5-29 J22	m1.5	29	S1	15	37	43.5	46.5	15	14	29	—
			S1K	15							5 x 2.3
			S1K	16							5 x 2.3
			S1K	18							6 x 2.8
			S1K	19							6 x 2.8
			S1K	20							6 x 2.8
SSG1.5-30 ●SSG1.5-30 J15 ●SSG1.5-30 J16 ●SSG1.5-30 J18 ●SSG1.5-30 J19 ●SSG1.5-30 J20 ●SSG1.5-30 J22	m1.5	30	S1	15	38	45	48	15	14	29	—
			S1K	15							5 x 2.3
			S1K	16							5 x 2.3
			S1K	18							6 x 2.8
			S1K	19							6 x 2.8
			S1K	20							6 x 2.8
SSG1.5-32 ●SSG1.5-32 J15 ●SSG1.5-32 J16 ●SSG1.5-32 J18 ●SSG1.5-32 J19 ●SSG1.5-32 J20 ●SSG1.5-32 J22	m1.5	32	S1	15	40	48	51	15	14	29	—
			S1K	15							5 x 2.3
			S1K	16							5 x 2.3
			S1K	18							6 x 2.8
			S1K	19							6 x 2.8
			S1K	20							6 x 2.8
SSG1.5-34 ●SSG1.5-34 J15 ●SSG1.5-34 J16 ●SSG1.5-34 J18 ●SSG1.5-34 J19 ●SSG1.5-34 J20 ●SSG1.5-34 J22 ●SSG1.5-34 J25	m1.5	34	S1	15	42	51	54	15	14	29	—
			S1K	15							5 x 2.3
			S1K	16							5 x 2.3
			S1K	18							6 x 2.8
			S1K	19							6 x 2.8
			S1K	20							6 x 2.8
SSG1.5-35 ●SSG1.5-35 J15 ●SSG1.5-35 J16 ●SSG1.5-35 J18 ●SSG1.5-35 J19 ●SSG1.5-35 J20 ●SSG1.5-35 J22 ●SSG1.5-35 J25	m1.5	35	S1	15	42	52.5	55.5	15	14	29	—
			S1K	15							5 x 2.3
			S1K	16							5 x 2.3
			S1K	18							6 x 2.8
			S1K	19							6 x 2.8
			S1K	20							6 x 2.8
S1K	22	6 x 2.8									
S1K	25	8 x 3.3									

[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 1 to 2 mm).



## Ground Spur Gears



Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—							SSG1.5-27
M4	7	24.7	13.1	2.52	1.33	0.08~0.16	0.21	● SSG1.5-27 J15
M4	7							● SSG1.5-27 J16
M5	7							● SSG1.5-27 J18
M5	7							● SSG1.5-27 J19
M5	7							● SSG1.5-27 J20
—	—							SSG1.5-28
M4	7	26.0	14.1	2.65	1.44	0.08~0.16	0.23	● SSG1.5-28 J15
M4	7							● SSG1.5-28 J16
M5	7							● SSG1.5-28 J18
M5	7							● SSG1.5-28 J19
M5	7							● SSG1.5-28 J20
—	—							SSG1.5-29
M4	7	27.3	15.2	2.78	1.55	0.08~0.16	0.25	● SSG1.5-29 J15
M4	7							● SSG1.5-29 J16
M5	7							● SSG1.5-29 J18
M5	7							● SSG1.5-29 J19
M5	7							● SSG1.5-29 J20
M5	7							● SSG1.5-29 J22
—	—							SSG1.5-30
M4	7	28.5	16.3	2.91	1.66	0.08~0.16	0.27	● SSG1.5-30 J15
M4	7							● SSG1.5-30 J16
M5	7							● SSG1.5-30 J18
M5	7							● SSG1.5-30 J19
M5	7							● SSG1.5-30 J20
M5	7							● SSG1.5-30 J22
—	—							SSG1.5-32
M4	7	31.1	18.6	3.17	1.90	0.08~0.16	0.31	● SSG1.5-32 J15
M4	7							● SSG1.5-32 J16
M5	7							● SSG1.5-32 J18
M5	7							● SSG1.5-32 J19
M5	7							● SSG1.5-32 J20
M5	7							● SSG1.5-32 J22
—	—							SSG1.5-34
M4	7	33.6	21.1	3.43	2.15	0.10~0.18	0.35	● SSG1.5-34 J15
M4	7							● SSG1.5-34 J16
M5	7							● SSG1.5-34 J18
M5	7							● SSG1.5-34 J19
M5	7							● SSG1.5-34 J20
M5	7							● SSG1.5-34 J22
M6	7							● SSG1.5-34 J25
—	—							SSG1.5-35
M4	7	34.9	22.4	3.56	2.29	0.10~0.18	0.37	● SSG1.5-35 J15
M4	7							● SSG1.5-35 J16
M5	7							● SSG1.5-35 J18
M5	7							● SSG1.5-35 J19
M5	7							● SSG1.5-35 J20
M5	7							● SSG1.5-35 J22
M6	7							● SSG1.5-35 J25

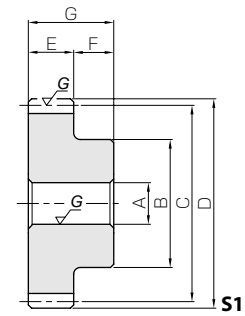
**[Caution on J series]**

- ① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order.  
Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).
- ⑤ Areas of products which have been re-worked will not be black oxide coated.
- ⑥ For products having a tapped hole, a set screw is included.



Specifications	
Precision grade	JIS grade N7 (JIS B1702-1: 1998) * JIS grade 3 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	Tooth surface induction hardened
Tooth hardness	45 ~ 55HRC

\* The precision grade of J Series products is equivalent to the value shown in the table.



- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

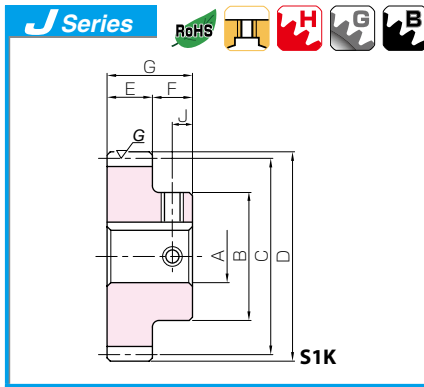
Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	Width×Depth
SSG1.5-36 ●SSG1.5-36 J15 ●SSG1.5-36 J16 ●SSG1.5-36 J18 ●SSG1.5-36 J19 ●SSG1.5-36 J20 ●SSG1.5-36 J22 ●SSG1.5-36 J25	m1.5	36	S1	15	45	54	57	15	14	29	—
			S1K	15							5 x 2.3
			S1K	16							5 x 2.3
			S1K	18							6 x 2.8
			S1K	19							6 x 2.8
			S1K	20							6 x 2.8
			S1K	22							6 x 2.8
S1K	25	8 x 3.3									
SSG1.5-38 ●SSG1.5-38 J15 ●SSG1.5-38 J16 ●SSG1.5-38 J18 ●SSG1.5-38 J19 ●SSG1.5-38 J20 ●SSG1.5-38 J22 ●SSG1.5-38 J25	m1.5	38	S1	15	45	57	60	15	14	29	—
			S1K	15							5 x 2.3
			S1K	16							5 x 2.3
			S1K	18							6 x 2.8
			S1K	19							6 x 2.8
			S1K	20							6 x 2.8
			S1K	22							6 x 2.8
S1K	25	8 x 3.3									
SSG1.5-40 ●SSG1.5-40 J15 ●SSG1.5-40 J16 ●SSG1.5-40 J18 ●SSG1.5-40 J19 ●SSG1.5-40 J20 ●SSG1.5-40 J22 ●SSG1.5-40 J25 ●SSG1.5-40 J28 ●SSG1.5-40 J30	m1.5	40	S1	15	50	60	63	15	14	29	—
			S1K	15							5 x 2.3
			S1K	16							5 x 2.3
			S1K	18							6 x 2.8
			S1K	19							6 x 2.8
			S1K	20							6 x 2.8
			S1K	22							6 x 2.8
S1K	25	8 x 3.3									
S1K	28	8 x 3.3									
S1K	30	8 x 3.3									
SSG1.5-42 ●SSG1.5-42 J15 ●SSG1.5-42 J16 ●SSG1.5-42 J18 ●SSG1.5-42 J19 ●SSG1.5-42 J20 ●SSG1.5-42 J22 ●SSG1.5-42 J25 ●SSG1.5-42 J28 ●SSG1.5-42 J30	m1.5	42	S1	15	50	63	66	15	14	29	—
			S1K	15							5 x 2.3
			S1K	16							5 x 2.3
			S1K	18							6 x 2.8
			S1K	19							6 x 2.8
			S1K	20							6 x 2.8
			S1K	22							6 x 2.8
S1K	25	8 x 3.3									
S1K	28	8 x 3.3									
S1K	30	8 x 3.3									
SSG1.5-44 ●SSG1.5-44 J15 ●SSG1.5-44 J16 ●SSG1.5-44 J18 ●SSG1.5-44 J19 ●SSG1.5-44 J20 ●SSG1.5-44 J22 ●SSG1.5-44 J25 ●SSG1.5-44 J28 ●SSG1.5-44 J30	m1.5	44	S1	15	50	66	69	15	14	29	—
			S1K	15							5 x 2.3
			S1K	16							5 x 2.3
			S1K	18							6 x 2.8
			S1K	19							6 x 2.8
			S1K	20							6 x 2.8
			S1K	22							6 x 2.8
S1K	25	8 x 3.3									
S1K	28	8 x 3.3									
S1K	30	8 x 3.3									
SSG1.5-45 ●SSG1.5-45 J18 ●SSG1.5-45 J19 ●SSG1.5-45 J20 ●SSG1.5-45 J22 ●SSG1.5-45 J25 ●SSG1.5-45 J28 ●SSG1.5-45 J30	m1.5	45	S1	18	50	67.5	70.5	15	14	29	—
			S1K	18							6 x 2.8
			S1K	19							6 x 2.8
			S1K	20							6 x 2.8
			S1K	22							6 x 2.8
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
S1K	30	8 x 3.3									

[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 1 to 2 mm).



## Ground Spur Gears



Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—	36.2	23.8	3.70	2.43	0.10~0.18	0.40	SSG1.5-36
M4*	7							●SSG1.5-36 J15
M4*	7							●SSG1.5-36 J16
M5	7							●SSG1.5-36 J18
M5	7							●SSG1.5-36 J19
M5	7							●SSG1.5-36 J20
M6	7							●SSG1.5-36 J22
—	—	38.8	26.6	3.96	2.71	0.10~0.18	0.44	SSG1.5-38
M4*	7							●SSG1.5-38 J15
M4*	7							●SSG1.5-38 J16
M5	7							●SSG1.5-38 J18
M5	7							●SSG1.5-38 J19
M5	7							●SSG1.5-38 J20
M6	7							●SSG1.5-38 J22
—	—	41.5	29.6	4.23	3.02	0.10~0.18	0.51	SSG1.5-40
M4*	7							●SSG1.5-40 J15
M4*	7							●SSG1.5-40 J16
M5	7							●SSG1.5-40 J18
M5	7							●SSG1.5-40 J19
M5	7							●SSG1.5-40 J20
M6	7							●SSG1.5-40 J22
—	—	44.1	32.8	4.50	3.35	0.10~0.18	0.54	SSG1.5-42
M4*	7							●SSG1.5-42 J15
M4*	7							●SSG1.5-42 J16
M5	7							●SSG1.5-42 J18
M5	7							●SSG1.5-42 J19
M5	7							●SSG1.5-42 J20
M6	7							●SSG1.5-42 J22
—	—	46.7	36.2	4.77	3.69	0.10~0.18	0.58	SSG1.5-44
M4*	7							●SSG1.5-44 J15
M4*	7							●SSG1.5-44 J16
M5	7							●SSG1.5-44 J18
M5	7							●SSG1.5-44 J19
M5	7							●SSG1.5-44 J20
M6	7							●SSG1.5-44 J22
—	—	48.1	37.9	4.90	3.86	0.10~0.18	0.58	SSG1.5-45
M5	7							●SSG1.5-45 J18
M5	7							●SSG1.5-45 J19
M5	7							●SSG1.5-45 J20
M6	7							●SSG1.5-45 J22
M6	7							●SSG1.5-45 J25
M6	7							●SSG1.5-45 J28
M6	7	●SSG1.5-45 J30						

## [Caution on J series]

① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order.

Please allow additional shipping time to get to your local distributor.

② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.

③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.

④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).

⑤ Areas of products which have been re-worked will not be black oxide coated.

⑥ For products having a tapped hole, a set screw is included.

For updated information, please see KHK Web Catalog.

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks &amp; Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

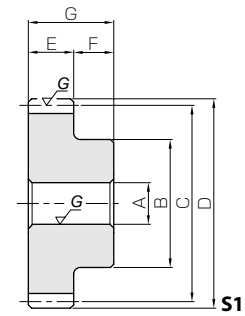
Bevel Gearboxes

Other Products



Specifications	
Precision grade	JIS grade N7 (JIS B1702-1: 1998) * JIS grade 3 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	Tooth surface induction hardened
Tooth hardness	45 ~ 55HRC

\* The precision grade of J Series products is equivalent to the value shown in the table.

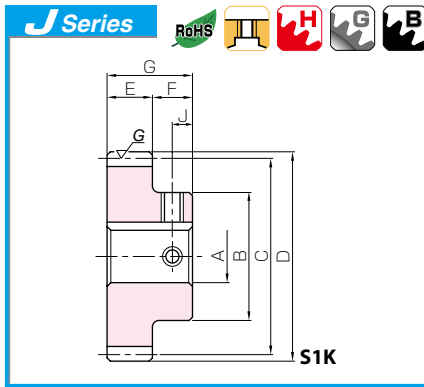


- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	Width×Depth
SSG1.5-48 ●SSG1.5-48 J18 ●SSG1.5-48 J19 ●SSG1.5-48 J20 ●SSG1.5-48 J22 ●SSG1.5-48 J25 ●SSG1.5-48 J28 ●SSG1.5-48 J30	m1.5	48	S1	18	50	72	75	15	14	29	—
			S1K	18							6 x 2.8
			S1K	19							6 x 2.8
			S1K	20							6 x 2.8
			S1K	22							6 x 2.8
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
S1K	30	8 x 3.3									
SSG1.5-50 ●SSG1.5-50 J18 ●SSG1.5-50 J19 ●SSG1.5-50 J20 ●SSG1.5-50 J22 ●SSG1.5-50 J25 ●SSG1.5-50 J28 ●SSG1.5-50 J30 ●SSG1.5-50 J32 ●SSG1.5-50 J35	m1.5	50	S1	18	60	75	78	15	14	29	—
			S1K	18							6 x 2.8
			S1K	19							6 x 2.8
			S1K	20							6 x 2.8
			S1K	22							6 x 2.8
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
			S1K	30							8 x 3.3
			S1K	32							10 x 3.3
			S1K	35							10 x 3.3
SSG1.5-55 ●SSG1.5-55 J18 ●SSG1.5-55 J19 ●SSG1.5-55 J20 ●SSG1.5-55 J22 ●SSG1.5-55 J25 ●SSG1.5-55 J28 ●SSG1.5-55 J30 ●SSG1.5-55 J32 ●SSG1.5-55 J35	m1.5	55	S1	18	60	82.5	85.5	15	14	29	—
			S1K	18							6 x 2.8
			S1K	19							6 x 2.8
			S1K	20							6 x 2.8
			S1K	22							6 x 2.8
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
			S1K	30							8 x 3.3
			S1K	32							10 x 3.3
			S1K	35							10 x 3.3
SSG1.5-56 ●SSG1.5-56 J18 ●SSG1.5-56 J19 ●SSG1.5-56 J20 ●SSG1.5-56 J22 ●SSG1.5-56 J25 ●SSG1.5-56 J28 ●SSG1.5-56 J30 ●SSG1.5-56 J32 ●SSG1.5-56 J35	m1.5	56	S1	18	60	84	87	15	14	29	—
			S1K	18							6 x 2.8
			S1K	19							6 x 2.8
			S1K	20							6 x 2.8
			S1K	22							6 x 2.8
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
			S1K	30							8 x 3.3
			S1K	32							10 x 3.3
			S1K	35							10 x 3.3
SSG1.5-60 ●SSG1.5-60 J20 ●SSG1.5-60 J22 ●SSG1.5-60 J25 ●SSG1.5-60 J28 ●SSG1.5-60 J30 ●SSG1.5-60 J32 ●SSG1.5-60 J35	m1.5	60	S1	20	60	90	93	15	14	29	—
			S1K	20							6 x 2.8
			S1K	22							6 x 2.8
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
			S1K	30							8 x 3.3
			S1K	32							10 x 3.3
S1K	35	10 x 3.3									

[Caution on Product Characteristics] ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.  
② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.  
② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 1 to 2 mm).



## Ground Spur Gears



Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—						0.64	<b>SSG1.5-48</b>
M5	7	52.0	43.4	5.31	4.42	0.10~0.18	0.63	● <b>SSG1.5-48 J18</b>
M5	7						0.62	● <b>SSG1.5-48 J19</b>
M5	7						0.62	● <b>SSG1.5-48 J20</b>
M5	7						0.60	● <b>SSG1.5-48 J22</b>
M6	7						0.57	● <b>SSG1.5-48 J25</b>
M6	7						0.55	● <b>SSG1.5-48 J28</b>
M6	7						0.53	● <b>SSG1.5-48 J30</b>
—	—						0.77	<b>SSG1.5-50</b>
M5*	7	54.7	47.2	5.58	4.82	0.10~0.18	0.76	● <b>SSG1.5-50 J18</b>
M5*	7						0.76	● <b>SSG1.5-50 J19</b>
M5*	7						0.75	● <b>SSG1.5-50 J20</b>
M5*	7						0.73	● <b>SSG1.5-50 J22</b>
M6	7						0.71	● <b>SSG1.5-50 J25</b>
M6	7						0.68	● <b>SSG1.5-50 J28</b>
M6	7						0.66	● <b>SSG1.5-50 J30</b>
M8	7						0.63	● <b>SSG1.5-50 J32</b>
M8	7						0.60	● <b>SSG1.5-50 J35</b>
—	—						0.88	<b>SSG1.5-55</b>
M5*	7	61.4	57.7	6.26	5.88	0.10~0.18	0.87	● <b>SSG1.5-55 J18</b>
M5*	7						0.86	● <b>SSG1.5-55 J19</b>
M5*	7						0.86	● <b>SSG1.5-55 J20</b>
M5*	7						0.84	● <b>SSG1.5-55 J22</b>
M6	7						0.82	● <b>SSG1.5-55 J25</b>
M6	7						0.79	● <b>SSG1.5-55 J28</b>
M6	7						0.77	● <b>SSG1.5-55 J30</b>
M8	7						0.74	● <b>SSG1.5-55 J32</b>
M8	7						0.71	● <b>SSG1.5-55 J35</b>
—	—						0.91	<b>SSG1.5-56</b>
M5*	7	62.8	59.9	6.40	6.11	0.10~0.18	0.89	● <b>SSG1.5-56 J18</b>
M5*	7						0.89	● <b>SSG1.5-56 J19</b>
M5*	7						0.88	● <b>SSG1.5-56 J20</b>
M5*	7						0.87	● <b>SSG1.5-56 J22</b>
M6	7						0.84	● <b>SSG1.5-56 J25</b>
M6	7						0.81	● <b>SSG1.5-56 J28</b>
M6	7						0.79	● <b>SSG1.5-56 J30</b>
M8	7						0.77	● <b>SSG1.5-56 J32</b>
M8	7						0.73	● <b>SSG1.5-56 J35</b>
—	—						0.99	<b>SSG1.5-60</b>
M5*	7	68.1	69.2	6.95	7.06	0.10~0.18	0.98	● <b>SSG1.5-60 J20</b>
M5*	7						0.96	● <b>SSG1.5-60 J22</b>
M6	7						0.94	● <b>SSG1.5-60 J25</b>
M6	7						0.91	● <b>SSG1.5-60 J28</b>
M6	7						0.89	● <b>SSG1.5-60 J30</b>
M6	7						0.89	● <b>SSG1.5-60 J32</b>
M8	7						0.86	● <b>SSG1.5-60 J35</b>
M8	7							

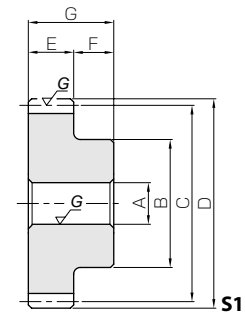
**[Caution on J series]**

- ① As available-on-request products, requires a lead-time for shipping within **3 working-days (excludes the day ordered)**, after placing an order. Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is **1 to 20 units**. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).
- ⑤ Areas of products which have been re-worked will not be black oxide coated.
- ⑥ For products having a tapped hole, a set screw is included.



Specifications	
Precision grade	JIS grade N7 (JIS B1702-1: 1998) * JIS grade 3 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	Tooth surface induction hardened
Tooth hardness	45 ~ 55HRC

\* The precision grade of J Series products is equivalent to the value shown in the table.



- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

Catalog No. ●: J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	Width×Depth
SSG1.5-64 ●SSG1.5-64 J20 ●SSG1.5-64 J22 ●SSG1.5-64 J25 ●SSG1.5-64 J28 ●SSG1.5-64 J30 ●SSG1.5-64 J32 ●SSG1.5-64 J35	m1.5	64	S1	20	60	96	99	15	14	29	—
			S1K	20							6 x 2.8
			S1K	22							6 x 2.8
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
			S1K	30							8 x 3.3
			S1K	32							10 x 3.3
S1K	35	10 x 3.3									
SSG1.5-70 ●SSG1.5-70 J20 ●SSG1.5-70 J22 ●SSG1.5-70 J25 ●SSG1.5-70 J28 ●SSG1.5-70 J30 ●SSG1.5-70 J32 ●SSG1.5-70 J35	m1.5	70	S1	20	60	105	108	15	14	29	—
			S1K	20							6 x 2.8
			S1K	22							6 x 2.8
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
			S1K	30							8 x 3.3
			S1K	32							10 x 3.3
S1K	35	10 x 3.3									
SSG1.5-75 ●SSG1.5-75 J20 ●SSG1.5-75 J22 ●SSG1.5-75 J25 ●SSG1.5-75 J28 ●SSG1.5-75 J30 ●SSG1.5-75 J32 ●SSG1.5-75 J35	m1.5	75	S1	20	60	112.5	115.5	15	14	29	—
			S1K	20							6 x 2.8
			S1K	22							6 x 2.8
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
			S1K	30							8 x 3.3
			S1K	32							10 x 3.3
S1K	35	10 x 3.3									
SSG1.5-80 ●SSG1.5-80 J20 ●SSG1.5-80 J22 ●SSG1.5-80 J25 ●SSG1.5-80 J28 ●SSG1.5-80 J30 ●SSG1.5-80 J32 ●SSG1.5-80 J35 ●SSG1.5-80 J40	m1.5	80	S1	20	70	120	123	15	14	29	—
			S1K	20							6 x 2.8
			S1K	22							6 x 2.8
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
			S1K	30							8 x 3.3
			S1K	32							10 x 3.3
S1K	35	10 x 3.3									
S1K	40	12 x 3.3									
SSG1.5-90 ●SSG1.5-90 J20 ●SSG1.5-90 J22 ●SSG1.5-90 J25 ●SSG1.5-90 J28 ●SSG1.5-90 J30 ●SSG1.5-90 J32 ●SSG1.5-90 J35 ●SSG1.5-90 J40	m1.5	90	S1	20	70	135	138	15	14	29	—
			S1K	20							6 x 2.8
			S1K	22							6 x 2.8
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
			S1K	30							8 x 3.3
			S1K	32							10 x 3.3
S1K	35	10 x 3.3									
S1K	40	12 x 3.3									
SSG1.5-100 ●SSG1.5-100 J20 ●SSG1.5-100 J22 ●SSG1.5-100 J25 ●SSG1.5-100 J28 ●SSG1.5-100 J30 ●SSG1.5-100 J32 ●SSG1.5-100 J35 ●SSG1.5-100 J40	m1.5	100	S1	20	70	150	153	15	14	29	—
			S1K	20							6 x 2.8
			S1K	22							6 x 2.8
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
			S1K	30							8 x 3.3
			S1K	32							10 x 3.3
S1K	35	10 x 3.3									
S1K	40	12 x 3.3									

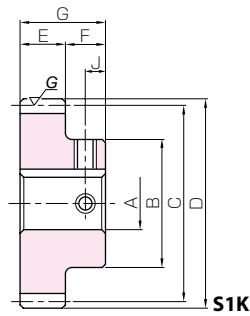
- [Caution on Product Characteristics]
- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
  - ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.
- [Caution on Secondary Operations]
- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
  - ② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 1 to 2 mm).



## J series



## Ground Spur Gears



Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—						1.09	<b>SSG1.5-64</b>
M5*	7						1.08	● <b>SSG1.5-64 J20</b>
M5*	7						1.07	● <b>SSG1.5-64 J22</b>
M6	7	67.9	73.2	6.92	7.46	0.10~0.18	1.04	● <b>SSG1.5-64 J25</b>
M6	7						1.01	● <b>SSG1.5-64 J28</b>
M6	7						0.99	● <b>SSG1.5-64 J30</b>
M8	7						0.97	● <b>SSG1.5-64 J32</b>
M8	7						0.93	● <b>SSG1.5-64 J35</b>
—	—							
M5*	7	75.4	88.4	7.69	9.01	0.12~0.20	1.25	● <b>SSG1.5-70 J20</b>
M5*	7						1.23	● <b>SSG1.5-70 J22</b>
M6	7						1.21	● <b>SSG1.5-70 J25</b>
M6	7						1.18	● <b>SSG1.5-70 J28</b>
M6	7						1.16	● <b>SSG1.5-70 J30</b>
M8	7						1.13	● <b>SSG1.5-70 J32</b>
M8	7						1.10	● <b>SSG1.5-70 J35</b>
—	—							
M5*	7	81.7	102	8.33	10.4	0.12~0.20	1.40	● <b>SSG1.5-75 J20</b>
M5*	7						1.38	● <b>SSG1.5-75 J22</b>
M6	7						1.36	● <b>SSG1.5-75 J25</b>
M6	7						1.33	● <b>SSG1.5-75 J28</b>
M6	7						1.31	● <b>SSG1.5-75 J30</b>
M8	7						1.28	● <b>SSG1.5-75 J32</b>
M8	7						1.25	● <b>SSG1.5-75 J35</b>
—	—							
M5*	7	88.0	117	8.97	12.0	0.12~0.20	1.67	● <b>SSG1.5-80 J20</b>
M5*	7						1.65	● <b>SSG1.5-80 J22</b>
M6*	7						1.63	● <b>SSG1.5-80 J25</b>
M6*	7						1.60	● <b>SSG1.5-80 J28</b>
M6	7						1.58	● <b>SSG1.5-80 J30</b>
M8	7						1.55	● <b>SSG1.5-80 J32</b>
M8	7						1.52	● <b>SSG1.5-80 J35</b>
M8	7						1.45	● <b>SSG1.5-80 J40</b>
—	—							
M5*	7	101	150	10.3	15.3	0.12~0.20	2.02	● <b>SSG1.5-90 J20</b>
M5*	7						2.01	● <b>SSG1.5-90 J22</b>
M6*	7						1.98	● <b>SSG1.5-90 J25</b>
M6*	7						1.95	● <b>SSG1.5-90 J28</b>
M6	7						1.94	● <b>SSG1.5-90 J30</b>
M8	7						1.91	● <b>SSG1.5-90 J32</b>
M8	7						1.87	● <b>SSG1.5-90 J35</b>
M8	7						1.81	● <b>SSG1.5-90 J40</b>
—	—							
M5*	7	113	187	11.6	19.1	0.12~0.20	2.42	● <b>SSG1.5-100 J20</b>
M5*	7						2.40	● <b>SSG1.5-100 J22</b>
M6*	7						2.38	● <b>SSG1.5-100 J25</b>
M6*	7						2.35	● <b>SSG1.5-100 J28</b>
M6	7						2.33	● <b>SSG1.5-100 J30</b>
M8	7						2.30	● <b>SSG1.5-100 J32</b>
M8	7						2.27	● <b>SSG1.5-100 J35</b>
M8	7						2.20	● <b>SSG1.5-100 J40</b>

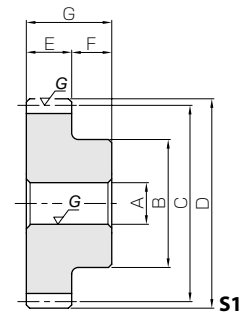
**[Caution on J series]**

- ① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order.  
Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).
- ⑤ Areas of products which have been re-worked will not be black oxide coated.
- ⑥ For products having a tapped hole, a set screw is included.



Specifications	
Precision grade	JIS grade N7 (JIS B1702-1: 1998) * JIS grade 3 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	Tooth surface induction hardened
Tooth hardness	45 ~ 55HRC

\* The precision grade of J Series products is equivalent to the value shown in the table.



- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

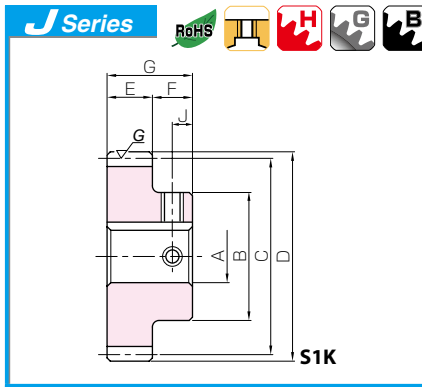
Catalog No. ● J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway
				AH7	B	C	D	E	F	G	Width×Depth
SSG2-14 ●SSG2-14 J12**	m2	14	S1	12	22	28	32	20	16	36	—
			S1K	12							4 x 1.8
SSG2-15 ●SSG2-15 J12 ●SSG2-15 J14**		15	S1	12	24	30	34	20	16	36	—
			S1K	12							4 x 1.8
			S1K	14							5 x 2.3
SSG2-16 ●SSG2-16 J12 ●SSG2-16 J14 ●SSG2-16 J15**		16	S1	12	26	32	36	20	16	36	—
			S1K	12							4 x 1.8
			S1K	14							5 x 2.3
SSG2-17 ●SSG2-17 J12 ●SSG2-17 J14 ●SSG2-17 J15 ●SSG2-17 J16		17	S1	12	28	34	38	20	16	36	—
			S1K	12							4 x 1.8
			S1K	14							5 x 2.3
			S1K	15							5 x 2.3
SSG2-18 ●SSG2-18 J12 ●SSG2-18 J14 ●SSG2-18 J15 ●SSG2-18 J16 ●SSG2-18 J18**		18	S1	12	30	36	40	20	16	36	—
			S1K	12							4 x 1.8
			S1K	14							5 x 2.3
			S1K	15							5 x 2.3
SSG2-19 ●SSG2-19 J12 ●SSG2-19 J14 ●SSG2-19 J15 ●SSG2-19 J16 ●SSG2-19 J18		19	S1	12	31	38	42	20	16	36	—
			S1K	12							4 x 1.8
			S1K	14							5 x 2.3
			S1K	15							5 x 2.3
SSG2-20 ●SSG2-20 J15 ●SSG2-20 J16 ●SSG2-20 J18		20	S1	15	32	40	44	20	16	36	—
			S1K	15							5 x 2.3
			S1K	16							5 x 2.3
			S1K	18							6 x 2.8
SSG2-21 ●SSG2-21 J15 ●SSG2-21 J16 ●SSG2-21 J18 ●SSG2-21 J19 ●SSG2-21 J20	21	S1	15	34	42	46	20	16	36	—	
		S1K	15							5 x 2.3	
		S1K	16							5 x 2.3	
		S1K	18							6 x 2.8	
		S1K	19							6 x 2.8	
		S1K	20							6 x 2.8	
SSG2-22 ●SSG2-22 J15 ●SSG2-22 J16 ●SSG2-22 J18 ●SSG2-22 J19 ●SSG2-22 J20	22	S1	15	36	44	48	20	16	36	—	
		S1K	15							5 x 2.3	
		S1K	16							5 x 2.3	
		S1K	18							6 x 2.8	
		S1K	19							6 x 2.8	
		S1K	20							6 x 2.8	
SSG2-23 ●SSG2-23 J15 ●SSG2-23 J16 ●SSG2-23 J18 ●SSG2-23 J19 ●SSG2-23 J20 ●SSG2-23 J22	23	S1	15	37	46	50	20	16	36	—	
		S1K	15							5 x 2.3	
		S1K	16							5 x 2.3	
		S1K	18							6 x 2.8	
		S1K	19							6 x 2.8	
		S1K	20							6 x 2.8	

[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 1 to 2 mm).



## Ground Spur Gears



Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—	26.3	9.01	2.69	0.92	0.10~0.20	0.11	<b>SSG2-14</b>
M4	8							● <b>SSG2-14 J12**</b>
—	—	29.6	10.5	3.01	1.07	0.10~0.20	0.14	<b>SSG2-15</b>
M4	8							● <b>SSG2-15 J12</b>
M4	8							● <b>SSG2-15 J14**</b>
—	—	27.3	10.1	2.78	1.03	0.10~0.20	0.16	<b>SSG2-16</b>
M4	8							● <b>SSG2-16 J12</b>
M4	8							● <b>SSG2-16 J14</b>
M4	8							● <b>SSG2-16 J15**</b>
—	—	30.0	11.6	3.06	1.18	0.10~0.20	0.19	<b>SSG2-17</b>
M4	8							● <b>SSG2-17 J12</b>
M4	8							● <b>SSG2-17 J14</b>
M4	8							● <b>SSG2-17 J15</b>
M4	8							● <b>SSG2-17 J16</b>
—	—	32.7	13.1	3.34	1.34	0.10~0.20	0.22	<b>SSG2-18</b>
M4	8							● <b>SSG2-18 J12</b>
M4	8							● <b>SSG2-18 J14</b>
M4	8							● <b>SSG2-18 J15</b>
M4	8							● <b>SSG2-18 J16</b>
M5	8							● <b>SSG2-18 J18**</b>
—	—	35.5	14.8	3.62	1.51	0.10~0.20	0.24	<b>SSG2-19</b>
M4	8							● <b>SSG2-19 J12</b>
M4	8							● <b>SSG2-19 J14</b>
M4	8							● <b>SSG2-19 J15</b>
M4	8							● <b>SSG2-19 J16</b>
M5	8							● <b>SSG2-19 J18</b>
—	—	38.3	16.6	3.91	1.69	0.10~0.20	0.25	<b>SSG2-20</b>
M4	8							● <b>SSG2-20 J15</b>
M4	8							● <b>SSG2-20 J16</b>
M5	8							● <b>SSG2-20 J18</b>
—	—	41.1	18.4	4.20	1.88	0.10~0.20	0.28	<b>SSG2-21</b>
M4	8							● <b>SSG2-21 J15</b>
M4	8							● <b>SSG2-21 J16</b>
M5	8							● <b>SSG2-21 J18</b>
M5	8							● <b>SSG2-21 J19</b>
M5	8							● <b>SSG2-21 J20</b>
—	—	44.0	20.4	4.49	2.08	0.10~0.20	0.32	<b>SSG2-22</b>
M4	8							● <b>SSG2-22 J15</b>
M4	8							● <b>SSG2-22 J16</b>
M5	8							● <b>SSG2-22 J18</b>
M5	8							● <b>SSG2-22 J19</b>
M5	8							● <b>SSG2-22 J20</b>
—	—	46.9	22.5	4.78	2.30	0.10~0.20	0.35	<b>SSG2-23</b>
M4	8							● <b>SSG2-23 J15</b>
M4	8							● <b>SSG2-23 J16</b>
M5	8							● <b>SSG2-23 J18</b>
M5	8							● <b>SSG2-23 J19</b>
M5	8							● <b>SSG2-23 J20</b>
M5	8							● <b>SSG2-23 J22</b>

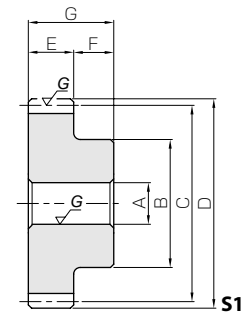
**[Caution on J series]**

- ① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).
- ⑤ Areas of products which have been re-worked will not be black oxide coated.
- ⑥ For products having a tapped hole, a set screw is included.
- ⑦ Products marked with "\*\*\*" have a small amount of material between the corner of the keyway and the tooth root. This mode of failure must be considered when selecting these gears. For details, please see our web site.



Specifications	
Precision grade	JIS grade N7 (JIS B1702-1: 1998) * JIS grade 3 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	Tooth surface induction hardened
Tooth hardness	45 ~ 55HRC

\* The precision grade of J Series products is equivalent to the value shown in the table.

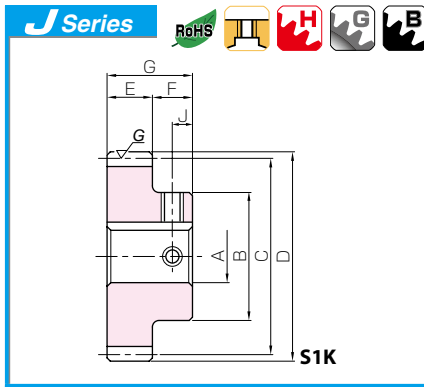


- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

Catalog No. ●: J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	Width×Depth
SSG2-24 ●SSG2-24 J15 ●SSG2-24 J16 ●SSG2-24 J18 ●SSG2-24 J19 ●SSG2-24 J20 ●SSG2-24 J22	m2	24	S1	15	38	48	52	20	16	36	—
			S1K	15							5 x 2.3
			S1K	16							5 x 2.3
			S1K	18							6 x 2.8
			S1K	19							6 x 2.8
			S1K	20							6 x 2.8
S1K	22	6 x 2.8									
SSG2-25 ●SSG2-25 J15 ●SSG2-25 J16 ●SSG2-25 J18 ●SSG2-25 J19 ●SSG2-25 J20 ●SSG2-25 J22	m2	25	S1	15	40	50	54	20	16	36	—
			S1K	15							5 x 2.3
			S1K	16							5 x 2.3
			S1K	18							6 x 2.8
			S1K	19							6 x 2.8
			S1K	20							6 x 2.8
S1K	22	6 x 2.8									
SSG2-26 ●SSG2-26 J15 ●SSG2-26 J16 ●SSG2-26 J18 ●SSG2-26 J19 ●SSG2-26 J20 ●SSG2-26 J22 ●SSG2-26 J25	m2	26	S1	15	42	52	56	20	16	36	—
			S1K	15							5 x 2.3
			S1K	16							5 x 2.3
			S1K	18							6 x 2.8
			S1K	19							6 x 2.8
			S1K	20							6 x 2.8
S1K	22	6 x 2.8									
S1K	25	8 x 3.3									
SSG2-27 ●SSG2-27 J15 ●SSG2-27 J16 ●SSG2-27 J18 ●SSG2-27 J19 ●SSG2-27 J20 ●SSG2-27 J22 ●SSG2-27 J25	m2	27	S1	15	44	54	58	20	16	36	—
			S1K	15							5 x 2.3
			S1K	16							5 x 2.3
			S1K	18							6 x 2.8
			S1K	19							6 x 2.8
			S1K	20							6 x 2.8
S1K	22	6 x 2.8									
S1K	25	8 x 3.3									
SSG2-28 ●SSG2-28 J15 ●SSG2-28 J16 ●SSG2-28 J18 ●SSG2-28 J19 ●SSG2-28 J20 ●SSG2-28 J22 ●SSG2-28 J25	m2	28	S1	15	45	56	60	20	16	36	—
			S1K	15							5 x 2.3
			S1K	16							5 x 2.3
			S1K	18							6 x 2.8
			S1K	19							6 x 2.8
			S1K	20							6 x 2.8
S1K	22	6 x 2.8									
S1K	25	8 x 3.3									
SSG2-29 ●SSG2-29 J15 ●SSG2-29 J16 ●SSG2-29 J18 ●SSG2-29 J19 ●SSG2-29 J20 ●SSG2-29 J22 ●SSG2-29 J25 ●SSG2-29 J28	m2	29	S1	15	48	58	62	20	16	36	—
			S1K	15							5 x 2.3
			S1K	16							5 x 2.3
			S1K	18							6 x 2.8
			S1K	19							6 x 2.8
			S1K	20							6 x 2.8
S1K	22	6 x 2.8									
S1K	25	8 x 3.3									
S1K	28	8 x 3.3									
SSG2-30 ●SSG2-30 J18 ●SSG2-30 J19 ●SSG2-30 J20 ●SSG2-30 J22 ●SSG2-30 J25 ●SSG2-30 J28 ●SSG2-30 J30	m2	30	S1	18	50	60	64	20	16	36	—
			S1K	18							6 x 2.8
			S1K	19							6 x 2.8
			S1K	20							6 x 2.8
			S1K	22							6 x 2.8
			S1K	25							8 x 3.3
S1K	28	8 x 3.3									
S1K	30	8 x 3.3									

[Caution on Product Characteristics] ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.  
② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.  
② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 1 to 2 mm).



## Ground Spur Gears



Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—						0.38	<b>SSG2-24</b>
M4	8						0.37	● <b>SSG2-24 J15</b>
M4	8						0.37	● <b>SSG2-24 J16</b>
M5	8	49.8	24.7	5.08	2.52	0.10~0.20	0.35	● <b>SSG2-24 J18</b>
M5	8						0.34	● <b>SSG2-24 J19</b>
M5	8						0.33	● <b>SSG2-24 J20</b>
M5	8						0.31	● <b>SSG2-24 J22</b>
—	—						0.42	<b>SSG2-25</b>
M4	8						0.41	● <b>SSG2-25 J15</b>
M4	8						0.40	● <b>SSG2-25 J16</b>
M5	8	52.7	27.0	5.38	2.75	0.10~0.20	0.39	● <b>SSG2-25 J18</b>
M5	8						0.38	● <b>SSG2-25 J19</b>
M5	8						0.37	● <b>SSG2-25 J20</b>
M5	8						0.35	● <b>SSG2-25 J22</b>
—	—						0.46	<b>SSG2-26</b>
M4	8						0.45	● <b>SSG2-26 J15</b>
M4	8						0.45	● <b>SSG2-26 J16</b>
M5	8	55.7	29.3	5.68	2.99	0.12~0.22	0.43	● <b>SSG2-26 J18</b>
M5	8						0.42	● <b>SSG2-26 J19</b>
M5	8						0.41	● <b>SSG2-26 J20</b>
M5	8						0.39	● <b>SSG2-26 J22</b>
M6	8						0.36	● <b>SSG2-26 J25</b>
—	—						0.50	<b>SSG2-27</b>
M4*	8						0.49	● <b>SSG2-27 J15</b>
M4	8						0.49	● <b>SSG2-27 J16</b>
M5	8	58.6	31.7	5.98	3.23	0.12~0.22	0.47	● <b>SSG2-27 J18</b>
M5	8						0.46	● <b>SSG2-27 J19</b>
M5	8						0.45	● <b>SSG2-27 J20</b>
M5	8						0.44	● <b>SSG2-27 J22</b>
M6	8						0.40	● <b>SSG2-27 J25</b>
—	—						0.54	<b>SSG2-28</b>
M4*	8						0.53	● <b>SSG2-28 J15</b>
M4*	8						0.52	● <b>SSG2-28 J16</b>
M5	8	61.6	34.2	6.28	3.49	0.12~0.22	0.51	● <b>SSG2-28 J18</b>
M5	8						0.50	● <b>SSG2-28 J19</b>
M5	8						0.49	● <b>SSG2-28 J20</b>
M5	8						0.47	● <b>SSG2-28 J22</b>
M6	8						0.44	● <b>SSG2-28 J25</b>
—	—						0.59	<b>SSG2-29</b>
M4*	8						0.58	● <b>SSG2-29 J15</b>
M4*	8						0.58	● <b>SSG2-29 J16</b>
M5	8	64.6	36.8	6.59	3.75	0.12~0.22	0.56	● <b>SSG2-29 J18</b>
M5	8						0.55	● <b>SSG2-29 J19</b>
M5	8						0.55	● <b>SSG2-29 J20</b>
M5	8						0.53	● <b>SSG2-29 J22</b>
M6	8						0.49	● <b>SSG2-29 J25</b>
M6	8						0.46	● <b>SSG2-29 J28</b>
—	—						0.62	<b>SSG2-30</b>
M5	8						0.61	● <b>SSG2-30 J18</b>
M5	8						0.60	● <b>SSG2-30 J19</b>
M5	8	67.6	39.5	6.89	4.03	0.12~0.22	0.59	● <b>SSG2-30 J20</b>
M5	8						0.58	● <b>SSG2-30 J22</b>
M6	8						0.54	● <b>SSG2-30 J25</b>
M6	8						0.51	● <b>SSG2-30 J28</b>
M6	8						0.48	● <b>SSG2-30 J30</b>

**[Caution on J series]**

① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order.

Please allow additional shipping time to get to your local distributor.

② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.

③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.

④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with \* \* \* are tap size).

⑤ Areas of products which have been re-worked will not be black oxide coated.

⑥ For products having a tapped hole, a set screw is included.

For updated information, please see KHK Web Catalog.

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks &amp; Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

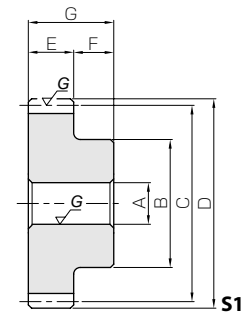
Bevel Gearboxes

Other Products



Specifications	
Precision grade	JIS grade N7 (JIS B1702-1: 1998) * JIS grade 3 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	Tooth surface induction hardened
Tooth hardness	45 ~ 55HRC

\* The precision grade of J Series products is equivalent to the value shown in the table.



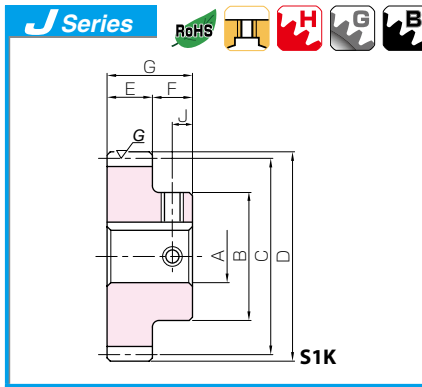
Catalog No. ●: J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	Width×Depth
SSG2-32 ●SSG2-32 J18 ●SSG2-32 J19 ●SSG2-32 J20 ●SSG2-32 J22 ●SSG2-32 J25 ●SSG2-32 J28 ●SSG2-32 J30	m2	32	S1	18	50	64	68	20	16	36	—
			S1K	18							6 x 2.8
			S1K	19							6 x 2.8
			S1K	20							6 x 2.8
			S1K	22							6 x 2.8
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
S1K	30	8 x 3.3									
SSG2-34 ●SSG2-34 J18 ●SSG2-34 J19 ●SSG2-34 J20 ●SSG2-34 J22 ●SSG2-34 J25 ●SSG2-34 J28 ●SSG2-34 J30	m2	34	S1	18	50	68	72	20	16	36	—
			S1K	18							6 x 2.8
			S1K	19							6 x 2.8
			S1K	20							6 x 2.8
			S1K	22							6 x 2.8
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
S1K	30	8 x 3.3									
SSG2-35 ●SSG2-35 J18 ●SSG2-35 J19 ●SSG2-35 J20 ●SSG2-35 J22 ●SSG2-35 J25 ●SSG2-35 J28 ●SSG2-35 J30	m2	35	S1	18	50	70	74	20	16	36	—
			S1K	18							6 x 2.8
			S1K	19							6 x 2.8
			S1K	20							6 x 2.8
			S1K	22							6 x 2.8
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
S1K	30	8 x 3.3									
SSG2-36 ●SSG2-36 J18 ●SSG2-36 J19 ●SSG2-36 J20 ●SSG2-36 J22 ●SSG2-36 J25 ●SSG2-36 J28 ●SSG2-36 J30	m2	36	S1	18	50	72	76	20	16	36	—
			S1K	18							6 x 2.8
			S1K	19							6 x 2.8
			S1K	20							6 x 2.8
			S1K	22							6 x 2.8
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
S1K	30	8 x 3.3									
SSG2-38 ●SSG2-38 J18 ●SSG2-38 J19 ●SSG2-38 J20 ●SSG2-38 J22 ●SSG2-38 J25 ●SSG2-38 J28 ●SSG2-38 J30	m2	38	S1	18	50	76	80	20	16	36	—
			S1K	18							6 x 2.8
			S1K	19							6 x 2.8
			S1K	20							6 x 2.8
			S1K	22							6 x 2.8
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
S1K	30	8 x 3.3									
SSG2-40 ●SSG2-40 J20 ●SSG2-40 J22 ●SSG2-40 J25 ●SSG2-40 J28 ●SSG2-40 J30 ●SSG2-40 J32 ●SSG2-40 J35	m2	40	S1	20	60	80	84	20	16	36	—
			S1K	20							6 x 2.8
			S1K	22							6 x 2.8
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
			S1K	30							8 x 3.3
			S1K	32							10 x 3.3
S1K	35	10 x 3.3									

[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 1 to 2 mm).



## Ground Spur Gears



Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—						0.68	<b>SSG2-32</b>
M5	8	73.7	45.2	7.51	4.61	0.12~0.22	0.67	● <b>SSG2-32 J18</b>
M5	8						● <b>SSG2-32 J19</b>	
M5	8						● <b>SSG2-32 J20</b>	
M5	8						● <b>SSG2-32 J22</b>	
M6	8						● <b>SSG2-32 J25</b>	
M6	8						● <b>SSG2-32 J28</b>	
M6	8						● <b>SSG2-32 J30</b>	
M6	8						0.66	● <b>SSG2-32 J18</b>
—	—						0.74	<b>SSG2-34</b>
M5	8	79.8	51.3	8.13	5.23	0.12~0.22	0.74	● <b>SSG2-34 J18</b>
M5	8						● <b>SSG2-34 J19</b>	
M5	8						● <b>SSG2-34 J20</b>	
M5	8						● <b>SSG2-34 J22</b>	
M6	8						● <b>SSG2-34 J25</b>	
M6	8						● <b>SSG2-34 J28</b>	
M6	8						● <b>SSG2-34 J30</b>	
M6	8						0.73	● <b>SSG2-34 J18</b>
—	—						0.78	<b>SSG2-35</b>
M5	8	82.8	54.5	8.45	5.56	0.12~0.22	0.77	● <b>SSG2-35 J18</b>
M5	8						● <b>SSG2-35 J19</b>	
M5	8						● <b>SSG2-35 J20</b>	
M5	8						● <b>SSG2-35 J22</b>	
M6	8						● <b>SSG2-35 J25</b>	
M6	8						● <b>SSG2-35 J28</b>	
M6	8						● <b>SSG2-35 J30</b>	
M6	8						0.76	● <b>SSG2-35 J18</b>
—	—						0.81	<b>SSG2-36</b>
M5	8	85.9	57.8	8.76	5.90	0.12~0.22	0.81	● <b>SSG2-36 J18</b>
M5	8						● <b>SSG2-36 J19</b>	
M5	8						● <b>SSG2-36 J20</b>	
M5	8						● <b>SSG2-36 J22</b>	
M6	8						● <b>SSG2-36 J25</b>	
M6	8						● <b>SSG2-36 J28</b>	
M6	8						● <b>SSG2-36 J30</b>	
M6	8						0.80	● <b>SSG2-36 J18</b>
—	—						0.89	<b>SSG2-38</b>
M5	8	92.1	64.8	9.39	6.60	0.12~0.22	0.89	● <b>SSG2-38 J18</b>
M5	8						● <b>SSG2-38 J19</b>	
M5	8						● <b>SSG2-38 J20</b>	
M5	8						● <b>SSG2-38 J22</b>	
M6	8						● <b>SSG2-38 J25</b>	
M6	8						● <b>SSG2-38 J28</b>	
M6	8						● <b>SSG2-38 J30</b>	
M6	8						0.87	● <b>SSG2-38 J18</b>
—	—						1.06	<b>SSG2-40</b>
M5*	8	98.3	72.1	10.0	7.35	0.12~0.22	1.06	● <b>SSG2-40 J20</b>
M5*	8						● <b>SSG2-40 J22</b>	
M6	8						● <b>SSG2-40 J25</b>	
M6	8						● <b>SSG2-40 J28</b>	
M6	8						● <b>SSG2-40 J30</b>	
M8	8						● <b>SSG2-40 J32</b>	
M8	8						● <b>SSG2-40 J35</b>	
M8	8						0.99	● <b>SSG2-40 J20</b>

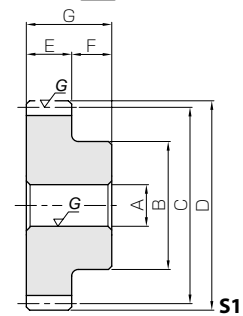
**[Caution on J series]**

- ① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order.  
Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ Certain products which would otherwise have a very long tapped hole are conerbored to reduce the length of the tap. (Products marked with "\*" are tap size).
- ⑤ Areas of products which have been re-worked will not be black oxide coated.
- ⑥ For products having a tapped hole, a set screw is included.



Specifications	
Precision grade	JIS grade N7 (JIS B1702-1: 1998) * JIS grade 3 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	Tooth surface induction hardened
Tooth hardness	45 ~ 55HRC

\* The precision grade of J Series products is equivalent to the value shown in the table.



Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	Width×Depth
SSG2-42 ●SSG2-42 J20 ●SSG2-42 J22 ●SSG2-42 J25 ●SSG2-42 J28 ●SSG2-42 J30 ●SSG2-42 J32 ●SSG2-42 J35	m2	42	S1	20	60	84	88	20	16	36	—
			S1K	20							6 x 2.8
			S1K	22							6 x 2.8
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
			S1K	30							8 x 3.3
			S1K	32							10 x 3.3
S1K	35	10 x 3.3									
SSG2-44 ●SSG2-44 J20 ●SSG2-44 J22 ●SSG2-44 J25 ●SSG2-44 J28 ●SSG2-44 J30 ●SSG2-44 J32 ●SSG2-44 J35	44	S1	20	60	88	92	20	16	36	—	
		S1K	20							6 x 2.8	
		S1K	22							6 x 2.8	
		S1K	25							8 x 3.3	
		S1K	28							8 x 3.3	
		S1K	30							8 x 3.3	
		S1K	32							10 x 3.3	
S1K	35	10 x 3.3									
SSG2-45 ●SSG2-45 J20 ●SSG2-45 J22 ●SSG2-45 J25 ●SSG2-45 J28 ●SSG2-45 J30 ●SSG2-45 J32 ●SSG2-45 J35	45	S1	20	60	90	94	20	16	36	—	
		S1K	20							6 x 2.8	
		S1K	22							6 x 2.8	
		S1K	25							8 x 3.3	
		S1K	28							8 x 3.3	
		S1K	30							8 x 3.3	
		S1K	32							10 x 3.3	
S1K	35	10 x 3.3									
SSG2-48 ●SSG2-48 J20 ●SSG2-48 J22 ●SSG2-48 J25 ●SSG2-48 J28 ●SSG2-48 J30 ●SSG2-48 J32 ●SSG2-48 J35	48	S1	20	60	96	100	20	16	36	—	
		S1K	20							6 x 2.8	
		S1K	22							6 x 2.8	
		S1K	25							8 x 3.3	
		S1K	28							8 x 3.3	
		S1K	30							8 x 3.3	
		S1K	32							10 x 3.3	
S1K	35	10 x 3.3									
SSG2-50 ●SSG2-50 J25 ●SSG2-50 J28 ●SSG2-50 J30 ●SSG2-50 J32 ●SSG2-50 J35	50	S1	25	60	100	104	20	16	36	—	
		S1K	25							8 x 3.3	
		S1K	28							8 x 3.3	
		S1K	30							8 x 3.3	
		S1K	32							10 x 3.3	
		S1K	35							10 x 3.3	
		SSG2-55 ●SSG2-55 J25 ●SSG2-55 J28 ●SSG2-55 J30 ●SSG2-55 J32 ●SSG2-55 J35	55							S1	25
S1K	25			8 x 3.3							
S1K	28			8 x 3.3							
S1K	30			8 x 3.3							
S1K	32			10 x 3.3							
S1K	35			10 x 3.3							
SSG2-56 ●SSG2-56 J25 ●SSG2-56 J28 ●SSG2-56 J30 ●SSG2-56 J32 ●SSG2-56 J35	56			S1	25	60	112	116	20	16	36
		S1K	25	8 x 3.3							
		S1K	28	8 x 3.3							
		S1K	30	8 x 3.3							
		S1K	32	10 x 3.3							
		S1K	35	10 x 3.3							

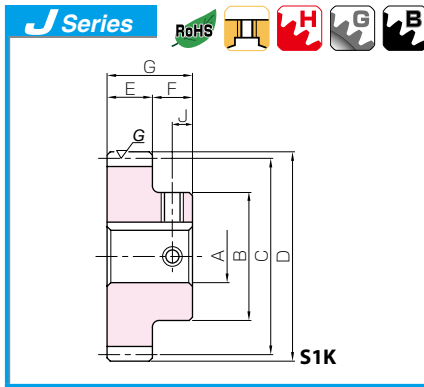
[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 1 to 2 mm).





## Ground Spur Gears



Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—	105	79.9	10.7	8.15	0.12~0.22	1.14	<b>SSG2-42</b>
M5*	8							● <b>SSG2-42 J20</b>
M5*	8							● <b>SSG2-42 J22</b>
M6	8							● <b>SSG2-42 J25</b>
M6	8							● <b>SSG2-42 J28</b>
M6	8							● <b>SSG2-42 J30</b>
M8	8							● <b>SSG2-42 J32</b>
M8	8							● <b>SSG2-42 J35</b>
—	—	111	88.1	11.3	8.98	0.12~0.22	1.22	<b>SSG2-44</b>
M5*	8							● <b>SSG2-44 J20</b>
M5*	8							● <b>SSG2-44 J22</b>
M6	8							● <b>SSG2-44 J25</b>
M6	8							● <b>SSG2-44 J28</b>
M6	8							● <b>SSG2-44 J30</b>
M8	8							● <b>SSG2-44 J32</b>
M8	8							● <b>SSG2-44 J35</b>
—	—	114	92.3	11.6	9.41	0.12~0.22	1.27	<b>SSG2-45</b>
M5*	8							● <b>SSG2-45 J20</b>
M5*	8							● <b>SSG2-45 J22</b>
M6	8							● <b>SSG2-45 J25</b>
M6	8							● <b>SSG2-45 J28</b>
M6	8							● <b>SSG2-45 J30</b>
M8	8							● <b>SSG2-45 J32</b>
M8	8							● <b>SSG2-45 J35</b>
—	—	114	97.6	11.6	9.95	0.12~0.22	1.40	<b>SSG2-48</b>
M5*	8							● <b>SSG2-48 J20</b>
M5*	8							● <b>SSG2-48 J22</b>
M6	8							● <b>SSG2-48 J25</b>
M6	8							● <b>SSG2-48 J28</b>
M6	8							● <b>SSG2-48 J30</b>
M8	8							● <b>SSG2-48 J32</b>
M8	8							● <b>SSG2-48 J35</b>
—	—	120	106	12.2	10.8	0.12~0.22	1.45	<b>SSG2-50</b>
M6	8							● <b>SSG2-50 J25</b>
M6	8							● <b>SSG2-50 J28</b>
M6	8							● <b>SSG2-50 J30</b>
M8	8							● <b>SSG2-50 J32</b>
M8	8							● <b>SSG2-50 J35</b>
—	—	134	130	13.7	13.3	0.14~0.24	1.71	<b>SSG2-55</b>
M6	8							● <b>SSG2-55 J25</b>
M6	8							● <b>SSG2-55 J28</b>
M6	8							● <b>SSG2-55 J30</b>
M8	8							● <b>SSG2-55 J32</b>
M8	8							● <b>SSG2-55 J35</b>
—	—	137	135	14.0	13.8	0.14~0.24	1.76	<b>SSG2-56</b>
M6	8							● <b>SSG2-56 J25</b>
M6	8							● <b>SSG2-56 J28</b>
M6	8							● <b>SSG2-56 J30</b>
M8	8							● <b>SSG2-56 J32</b>
M8	8							● <b>SSG2-56 J35</b>

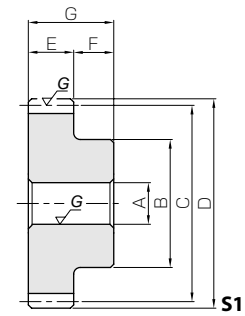
**[Caution on J series]**

- ① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order.  
Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).
- ⑤ Areas of products which have been re-worked will not be black oxide coated.
- ⑥ For products having a tapped hole, a set screw is included.



Specifications	
Precision grade	JIS grade N7 (JIS B1702-1: 1998) * JIS grade 3 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	Tooth surface induction hardened
Tooth hardness	45 ~ 55HRC

\* The precision grade of J Series products is equivalent to the value shown in the table.



- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

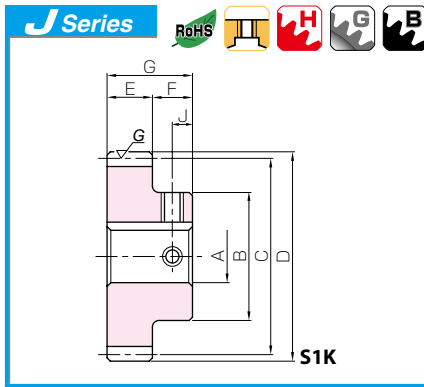
Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	Width×Depth
SSG2-60 ● SSG2-60 J25 ● SSG2-60 J28 ● SSG2-60 J30 ● SSG2-60 J32 ● SSG2-60 J35	m2	60	S1	25	65	120	124	20	16	36	—
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
			S1K	30							8 x 3.3
			S1K	32							10 x 3.3
			S1K	35							10 x 3.3
SSG2-64 ● SSG2-64 J25 ● SSG2-64 J28 ● SSG2-64 J30 ● SSG2-64 J32 ● SSG2-64 J35	64	64	S1	25	65	128	132	20	16	36	—
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
			S1K	30							8 x 3.3
			S1K	32							10 x 3.3
			S1K	35							10 x 3.3
SSG2-70 ● SSG2-70 J25 ● SSG2-70 J28 ● SSG2-70 J30 ● SSG2-70 J32 ● SSG2-70 J35 ● SSG2-70 J40	70	70	S1	25	70	140	144	20	16	36	—
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
			S1K	30							8 x 3.3
			S1K	32							10 x 3.3
			S1K	35							10 x 3.3
SSG2-75 ● SSG2-75 J25 ● SSG2-75 J28 ● SSG2-75 J30 ● SSG2-75 J32 ● SSG2-75 J35 ● SSG2-75 J40	75	75	S1	25	70	150	154	20	16	36	—
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
			S1K	30							8 x 3.3
			S1K	32							10 x 3.3
			S1K	35							10 x 3.3
SSG2-80 ● SSG2-80 J25 ● SSG2-80 J28 ● SSG2-80 J30 ● SSG2-80 J32 ● SSG2-80 J35 ● SSG2-80 J40 ● SSG2-80 J45	80	80	S1	25	80	160	164	20	16	36	—
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
			S1K	30							8 x 3.3
			S1K	32							10 x 3.3
			S1K	35							10 x 3.3
SSG2-90 ● SSG2-90 J25 ● SSG2-90 J28 ● SSG2-90 J30 ● SSG2-90 J32 ● SSG2-90 J35 ● SSG2-90 J40 ● SSG2-90 J45	90	90	S1	25	80	180	184	20	16	36	—
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
			S1K	30							8 x 3.3
			S1K	32							10 x 3.3
			S1K	35							10 x 3.3
SSG2-100 ● SSG2-100 J25 ● SSG2-100 J28 ● SSG2-100 J30 ● SSG2-100 J32 ● SSG2-100 J35 ● SSG2-100 J40 ● SSG2-100 J45	100	100	S1	25	80	200	204	20	16	36	—
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
			S1K	30							8 x 3.3
			S1K	32							10 x 3.3
			S1K	35							10 x 3.3
SSG2-100 J40 ● SSG2-100 J45	100	100	S1K	40	80	200	204	20	16	36	12 x 3.3
			S1K	45							14 x 3.8

[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations]

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- ② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 1 to 2 mm).



## Ground Spur Gears



Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—						2.05	<b>SSG2-60</b>
M6	8	149	156	15.2	15.9	0.14~0.24	2.04	● <b>SSG2-60 J25</b>
M6	8						2.01	● <b>SSG2-60 J28</b>
M6	8						1.98	● <b>SSG2-60 J30</b>
M8	8						1.95	● <b>SSG2-60 J32</b>
M8	8						1.90	● <b>SSG2-60 J35</b>
—	—						2.30	<b>SSG2-64</b>
M6	8	161	179	16.4	18.3	0.14~0.24	2.29	● <b>SSG2-64 J25</b>
M6	8						2.25	● <b>SSG2-64 J28</b>
M6	8						2.22	● <b>SSG2-64 J30</b>
M8	8						2.19	● <b>SSG2-64 J32</b>
M8	8						2.15	● <b>SSG2-64 J35</b>
—	—						2.76	<b>SSG2-70</b>
M6*	8	179	216	18.2	22.0	0.14~0.24	2.74	● <b>SSG2-70 J25</b>
M6*	8						2.71	● <b>SSG2-70 J28</b>
M6	8						2.69	● <b>SSG2-70 J30</b>
M8	8						2.65	● <b>SSG2-70 J32</b>
M8	8						2.61	● <b>SSG2-70 J35</b>
M8	8						2.53	● <b>SSG2-70 J40</b>
—	—						3.12	<b>SSG2-75</b>
M6*	8	194	249	19.7	25.4	0.14~0.24	3.10	● <b>SSG2-75 J25</b>
M6*	8						3.07	● <b>SSG2-75 J28</b>
M6	8						3.04	● <b>SSG2-75 J30</b>
M8	8						3.01	● <b>SSG2-75 J32</b>
M8	8						2.97	● <b>SSG2-75 J35</b>
M8	8						2.88	● <b>SSG2-75 J40</b>
—	—						3.65	<b>SSG2-80</b>
M6*	8	194	265	19.8	27.0	0.14~0.24	3.63	● <b>SSG2-80 J25</b>
M6*	8						3.59	● <b>SSG2-80 J28</b>
M6*	8						3.57	● <b>SSG2-80 J30</b>
M8	8						3.54	● <b>SSG2-80 J32</b>
M8	8						3.49	● <b>SSG2-80 J35</b>
M8	8						3.41	● <b>SSG2-80 J40</b>
M10	8						3.31	● <b>SSG2-80 J45</b>
—	—						4.49	<b>SSG2-90</b>
M6*	8	222	338	22.6	34.5	0.14~0.24	4.47	● <b>SSG2-90 J25</b>
M6*	8						4.43	● <b>SSG2-90 J28</b>
M6*	8						4.41	● <b>SSG2-90 J30</b>
M8	8						4.38	● <b>SSG2-90 J32</b>
M8	8						4.33	● <b>SSG2-90 J35</b>
M8	8						4.25	● <b>SSG2-90 J40</b>
M8	8						4.15	● <b>SSG2-90 J45</b>
M10	8							
—	—						5.42	<b>SSG2-100</b>
M6*	8	250	421	25.4	43.0	0.14~0.24	5.40	● <b>SSG2-100 J25</b>
M6*	8						5.37	● <b>SSG2-100 J28</b>
M6*	8						5.34	● <b>SSG2-100 J30</b>
M8	8						5.31	● <b>SSG2-100 J32</b>
M8	8						5.27	● <b>SSG2-100 J35</b>
M8	8						5.19	● <b>SSG2-100 J40</b>
M10	8						5.09	● <b>SSG2-100 J45</b>

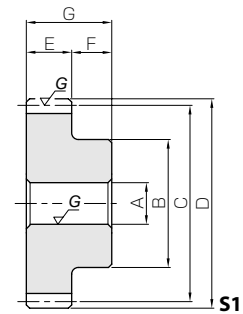
**[Caution on J series]**

- ① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order.  
Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).
- ⑤ Areas of products which have been re-worked will not be black oxide coated.
- ⑥ For products having a tapped hole, a set screw is included.



Specifications	
Precision grade	JIS grade N7 (JIS B1702-1: 1998) * JIS grade 3 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	Tooth surface induction hardened
Tooth hardness	45 ~ 55HRC

\* The precision grade of J Series products is equivalent to the value shown in the table.



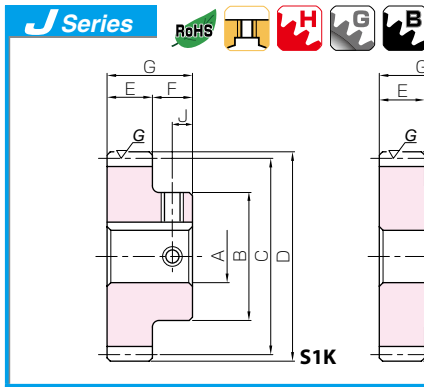
Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway
				AH7	B	C	D	E	F	G	Width×Depth
<b>SSG2.5-14</b>	m2.5	14	S1	15	28	35	40	25	18	43	—
● <b>SSG2.5-14 J15**</b>			S1K	15							5 x 2.3
● <b>SSG2.5-14 J16**</b>			S1K	16							5 x 2.3
<b>SSG2.5-15</b>		15	S1	15	30	37.5	42.5	25	18	43	—
● <b>SSG2.5-15 J15</b>			S1K	15							5 x 2.3
● <b>SSG2.5-15 J16</b>			S1K	16							5 x 2.3
● <b>SSG2.5-15 J18</b>		S1T2	18	—							
<b>SSG2.5-16</b>		16	S1	15	32	40	45	25	18	43	—
● <b>SSG2.5-16 J15</b>			S1K	15							5 x 2.3
● <b>SSG2.5-16 J16</b>			S1K	16							5 x 2.3
● <b>SSG2.5-16 J18</b>		S1K	18	6 x 2.8							
<b>SSG2.5-17</b>		17	S1	15	35	42.5	47.5	25	18	43	—
● <b>SSG2.5-17 J15</b>			S1K	15							5 x 2.3
● <b>SSG2.5-17 J16</b>			S1K	16							5 x 2.3
● <b>SSG2.5-17 J18</b>			S1K	18							6 x 2.8
● <b>SSG2.5-17 J19</b>			S1K	19							6 x 2.8
● <b>SSG2.5-17 J20</b>		S1K	20	6 x 2.8							
<b>SSG2.5-18</b>		18	S1	15	38	45	50	25	18	43	—
● <b>SSG2.5-18 J15</b>			S1K	15							5 x 2.3
● <b>SSG2.5-18 J16</b>			S1K	16							5 x 2.3
● <b>SSG2.5-18 J18</b>			S1K	18							6 x 2.8
● <b>SSG2.5-18 J19</b>			S1K	19							6 x 2.8
● <b>SSG2.5-18 J20</b>	S1K		20	6 x 2.8							
● <b>SSG2.5-18 J22</b>	S1K	22	6 x 2.8								
<b>SSG2.5-19</b>	19	S1	15	39	47.5	52.5	25	18	43	—	
● <b>SSG2.5-19 J15</b>		S1K	15							5 x 2.3	
● <b>SSG2.5-19 J16</b>		S1K	16							5 x 2.3	
● <b>SSG2.5-19 J18</b>		S1K	18							6 x 2.8	
● <b>SSG2.5-19 J19</b>		S1K	19							6 x 2.8	
● <b>SSG2.5-19 J20</b>		S1K	20							6 x 2.8	
● <b>SSG2.5-19 J22</b>	S1K	22	6 x 2.8								
<b>SSG2.5-20</b>	20	S1	18	40	50	55	25	18	43	—	
● <b>SSG2.5-20 J18</b>		S1K	18							6 x 2.8	
● <b>SSG2.5-20 J19</b>		S1K	19							6 x 2.8	
● <b>SSG2.5-20 J20</b>		S1K	20							6 x 2.8	
● <b>SSG2.5-20 J22</b>	S1K	22	6 x 2.8								
<b>SSG2.5-21</b>	21	S1	18	42	52.5	57.5	25	18	43	—	
● <b>SSG2.5-21 J18</b>		S1K	18							6 x 2.8	
● <b>SSG2.5-21 J19</b>		S1K	19							6 x 2.8	
● <b>SSG2.5-21 J20</b>		S1K	20							6 x 2.8	
● <b>SSG2.5-21 J22</b>		S1K	22							6 x 2.8	
● <b>SSG2.5-21 J25</b>	S1K	25	8 x 3.3								
<b>SSG2.5-22</b>	22	S1	18	44	55	60	25	18	43	—	
● <b>SSG2.5-22 J18</b>		S1K	18							6 x 2.8	
● <b>SSG2.5-22 J19</b>		S1K	19							6 x 2.8	
● <b>SSG2.5-22 J20</b>		S1K	20							6 x 2.8	
● <b>SSG2.5-22 J22</b>		S1K	22							6 x 2.8	
● <b>SSG2.5-22 J25</b>	S1K	25	8 x 3.3								

[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 1 to 2 mm).



## Ground Spur Gears



Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—							<b>SSG2.5-14</b>
M4	9	42.9	14.9	4.37	1.52	0.10~0.20	0.22	● <b>SSG2.5-14 J15**</b>
M4	9							● <b>SSG2.5-14 J16**</b>
—	—							<b>SSG2.5-15</b>
M4	9	48.1	17.4	4.91	1.77	0.10~0.20	0.26	● <b>SSG2.5-15 J15</b>
M4	9							● <b>SSG2.5-15 J16</b>
M5	9							● <b>SSG2.5-15 J18</b>
—	—							<b>SSG2.5-16</b>
M4	9	53.3	20.1	5.44	2.05	0.10~0.20	0.30	● <b>SSG2.5-16 J15</b>
M4	9							● <b>SSG2.5-16 J16</b>
M5	9							● <b>SSG2.5-16 J18</b>
—	—							<b>SSG2.5-17</b>
M4	9	58.6	23.0	5.97	2.34	0.10~0.20	0.35	● <b>SSG2.5-17 J15</b>
M4	9							● <b>SSG2.5-17 J16</b>
M5	9							● <b>SSG2.5-17 J18</b>
M5	9							● <b>SSG2.5-17 J19</b>
M5	9							● <b>SSG2.5-17 J20</b>
—	—							<b>SSG2.5-18</b>
M4	9	63.9	26.1	6.52	2.66	0.10~0.20	0.41	● <b>SSG2.5-18 J15</b>
M4	9							● <b>SSG2.5-18 J16</b>
M5	9							● <b>SSG2.5-18 J18</b>
M5	9							● <b>SSG2.5-18 J19</b>
M5	9							● <b>SSG2.5-18 J20</b>
M5	9							● <b>SSG2.5-18 J22</b>
—	—							<b>SSG2.5-19</b>
M4	9	69.4	29.4	7.07	3.00	0.10~0.20	0.46	● <b>SSG2.5-19 J15</b>
M4	9							● <b>SSG2.5-19 J16</b>
M5	9							● <b>SSG2.5-19 J18</b>
M5	9							● <b>SSG2.5-19 J19</b>
M5	9							● <b>SSG2.5-19 J20</b>
M5	9							● <b>SSG2.5-19 J22</b>
—	—							
M5	9	74.8	32.9	7.63	3.36	0.10~0.20	0.48	● <b>SSG2.5-20 J18</b>
M5	9							● <b>SSG2.5-20 J19</b>
M5	9							● <b>SSG2.5-20 J20</b>
M5	9							● <b>SSG2.5-20 J22</b>
—	—							<b>SSG2.5-21</b>
M5	9	80.4	36.7	8.20	3.74	0.12~0.22	0.53	● <b>SSG2.5-21 J18</b>
M5	9							● <b>SSG2.5-21 J19</b>
M5	9							● <b>SSG2.5-21 J20</b>
M5	9							● <b>SSG2.5-21 J22</b>
M6	9							● <b>SSG2.5-21 J25</b>
—	—							<b>SSG2.5-22</b>
M5	9	86.0	40.6	8.77	4.14	0.12~0.22	0.60	● <b>SSG2.5-22 J18</b>
M5	9							● <b>SSG2.5-22 J19</b>
M5	9							● <b>SSG2.5-22 J20</b>
M5	9							● <b>SSG2.5-22 J22</b>
M6	9							● <b>SSG2.5-22 J25</b>

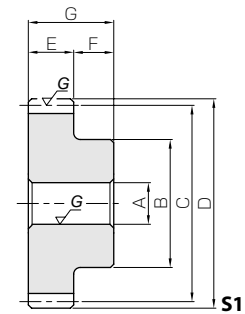
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- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).
- ⑤ Areas of products which have been re-worked will not be black oxide coated.
- ⑥ For products having a tapped hole, a set screw is included.
- ⑦ Products marked with "\*\*\*" have a small amount of material between the corner of the keyway and the tooth root. This mode of failure must be considered when selecting these gears. For details, please see our web site.



Specifications	
Precision grade	JIS grade N7 (JIS B1702-1: 1998) * JIS grade 3 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	Tooth surface induction hardened
Tooth hardness	45 ~ 55HRC

\* The precision grade of J Series products is equivalent to the value shown in the table.

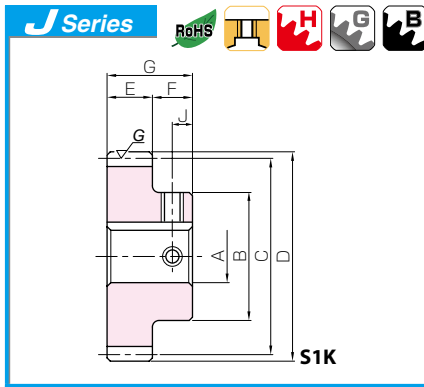


- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	Width×Depth
SSG2.5-23 ● SSG2.5-23 J18 ● SSG2.5-23 J19 ● SSG2.5-23 J20 ● SSG2.5-23 J22 ● SSG2.5-23 J25	m2.5	23	S1	18	46	57.5	62.5	25	18	43	—
			S1K	18							6 x 2.8
			S1K	19							6 x 2.8
			S1K	20							6 x 2.8
			S1K	22							6 x 2.8
			S1K	25							8 x 3.3
SSG2.5-24 ● SSG2.5-24 J18 ● SSG2.5-24 J19 ● SSG2.5-24 J20 ● SSG2.5-24 J22 ● SSG2.5-24 J25 ● SSG2.5-24 J28	m2.5	24	S1	18	48	60	65	25	18	43	—
			S1K	18							6 x 2.8
			S1K	19							6 x 2.8
			S1K	20							6 x 2.8
			S1K	22							6 x 2.8
			S1K	25							8 x 3.3
SSG2.5-25 ● SSG2.5-25 J20 ● SSG2.5-25 J22 ● SSG2.5-25 J25 ● SSG2.5-25 J28 ● SSG2.5-25 J30	m2.5	25	S1	20	50	62.5	67.5	25	18	43	—
			S1K	20							6 x 2.8
			S1K	22							6 x 2.8
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
			S1K	30							8 x 3.3
SSG2.5-26 ● SSG2.5-26 J20 ● SSG2.5-26 J22 ● SSG2.5-26 J25 ● SSG2.5-26 J28 ● SSG2.5-26 J30 ● SSG2.5-26 J32	m2.5	26	S1	20	54	65	70	25	18	43	—
			S1K	20							6 x 2.8
			S1K	22							6 x 2.8
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
			S1K	30							8 x 3.3
SSG2.5-27 ● SSG2.5-27 J20 ● SSG2.5-27 J22 ● SSG2.5-27 J25 ● SSG2.5-27 J28 ● SSG2.5-27 J30 ● SSG2.5-27 J32	m2.5	27	S1	20	56	67.5	72.5	25	18	43	—
			S1K	20							6 x 2.8
			S1K	22							6 x 2.8
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
			S1K	30							8 x 3.3
SSG2.5-28 ● SSG2.5-28 J20 ● SSG2.5-28 J22 ● SSG2.5-28 J25 ● SSG2.5-28 J28 ● SSG2.5-28 J30 ● SSG2.5-28 J32 ● SSG2.5-28 J35	m2.5	28	S1	20	60	70	75	25	18	43	—
			S1K	20							6 x 2.8
			S1K	22							6 x 2.8
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
			S1K	30							8 x 3.3
SSG2.5-29 ● SSG2.5-29 J20 ● SSG2.5-29 J22 ● SSG2.5-29 J25 ● SSG2.5-29 J28 ● SSG2.5-29 J30 ● SSG2.5-29 J32 ● SSG2.5-29 J35	m2.5	29	S1	20	60	72.5	77.5	25	18	43	—
			S1K	20							6 x 2.8
			S1K	22							6 x 2.8
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
			S1K	30							8 x 3.3
	m2.5	29	S1K	32	60	72.5	77.5	25	18	43	10 x 3.3
			S1K	35							10 x 3.3
			S1K	35							10 x 3.3

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 ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.  
 ② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 1 to 2 mm).



## Ground Spur Gears



Set Screw		Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)					
Size	J	Bending strength	Surface durability	Bending strength	Surface durability								
—	—						0.66	<b>SSG2.5-23</b>					
M5	9	91.6	44.8	9.34	4.57	0.12~0.22	0.65	● <b>SSG2.5-23 J18</b>					
M5	9						0.64	● <b>SSG2.5-23 J19</b>					
M5	9						0.63	● <b>SSG2.5-23 J20</b>					
M5	9						0.61	● <b>SSG2.5-23 J22</b>					
M6	9						0.57	● <b>SSG2.5-23 J25</b>					
—	—						0.72	<b>SSG2.5-24</b>					
M5	9	97.3	49.2	9.92	5.02	0.12~0.22	0.72	● <b>SSG2.5-24 J18</b>					
M5	9						0.71	● <b>SSG2.5-24 J19</b>					
M5	9						0.70	● <b>SSG2.5-24 J20</b>					
M5	9						0.67	● <b>SSG2.5-24 J22</b>					
M6	9						0.63	● <b>SSG2.5-24 J25</b>					
M6	9						0.59	● <b>SSG2.5-24 J28</b>					
—	—						0.77	<b>SSG2.5-25</b>					
M5	9	103	53.8	10.5	5.48	0.12~0.22	0.76	● <b>SSG2.5-25 J20</b>					
M5	9						0.74	● <b>SSG2.5-25 J22</b>					
M6	9						0.70	● <b>SSG2.5-25 J25</b>					
M6	9						0.66	● <b>SSG2.5-25 J28</b>					
M6	9						0.63	● <b>SSG2.5-25 J30</b>					
M6	9												
—	—						0.87	<b>SSG2.5-26</b>					
M5	9	109	58.4	11.1	5.95	0.12~0.22	0.86	● <b>SSG2.5-26 J20</b>					
M5	9						0.84	● <b>SSG2.5-26 J22</b>					
M6	9						0.80	● <b>SSG2.5-26 J25</b>					
M6	9						0.75	● <b>SSG2.5-26 J28</b>					
M6	9						0.72	● <b>SSG2.5-26 J30</b>					
M6	9						0.69	● <b>SSG2.5-26 J32</b>					
M8	9												
—	—						0.94	<b>SSG2.5-27</b>					
M5*	9	115	63.2	11.7	6.44	0.12~0.22	0.93	● <b>SSG2.5-27 J20</b>					
M5	9						0.91	● <b>SSG2.5-27 J22</b>					
M6	9						0.87	● <b>SSG2.5-27 J25</b>					
M6	9						0.83	● <b>SSG2.5-27 J28</b>					
M6	9						0.80	● <b>SSG2.5-27 J30</b>					
M6	9						0.76	● <b>SSG2.5-27 J32</b>					
M8	9												
—	—						1.05	<b>SSG2.5-28</b>					
M5*	9	120	68.2	12.3	6.95	0.12~0.22	1.04	● <b>SSG2.5-28 J20</b>					
M5*	9						1.01	● <b>SSG2.5-28 J22</b>					
M6	9						0.98	● <b>SSG2.5-28 J25</b>					
M6	9						0.93	● <b>SSG2.5-28 J28</b>					
M6	9						0.90	● <b>SSG2.5-28 J30</b>					
M8	9						0.87	● <b>SSG2.5-28 J32</b>					
M8	9						0.81	● <b>SSG2.5-28 J35</b>					
—	—											1.10	<b>SSG2.5-29</b>
M5*	9						126	73.3	12.9	7.48	0.12~0.22	1.09	● <b>SSG2.5-29 J20</b>
M5*	9	1.07	● <b>SSG2.5-29 J22</b>										
M6	9	1.03	● <b>SSG2.5-29 J25</b>										
M6	9	0.99	● <b>SSG2.5-29 J28</b>										
M6	9	0.96	● <b>SSG2.5-29 J30</b>										
M8	9	0.92	● <b>SSG2.5-29 J32</b>										
M8	9	0.87	● <b>SSG2.5-29 J35</b>										
M8	9												

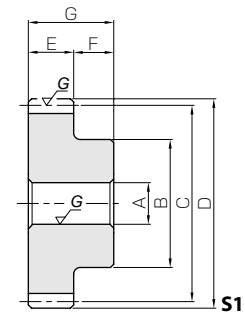
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Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).
- ⑤ Areas of products which have been re-worked will not be black oxide coated.
- ⑥ For products having a tapped hole, a set screw is included.



Specifications	
Precision grade	JIS grade N7 (JIS B1702-1: 1998) * JIS grade 3 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	Tooth surface induction hardened
Tooth hardness	45 ~ 55HRC

\* The precision grade of J Series products is equivalent to the value shown in the table.



Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks &amp; Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

Bevel Gearboxes

Other Products

Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	Width×Depth
SSG2.5-30 ●SSG2.5-30 J20 ●SSG2.5-30 J22 ●SSG2.5-30 J25 ●SSG2.5-30 J28 ●SSG2.5-30 J30 ●SSG2.5-30 J32 ●SSG2.5-30 J35	m2.5	30	S1	20	65	75	80	25	18	43	—
			S1K	20							6 x 2.8
			S1K	22							6 x 2.8
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
			S1K	30							8 x 3.3
			S1K	32							10 x 3.3
S1K	35	10 x 3.3									
SSG2.5-32 ●SSG2.5-32 J20 ●SSG2.5-32 J22 ●SSG2.5-32 J25 ●SSG2.5-32 J28 ●SSG2.5-32 J30 ●SSG2.5-32 J32 ●SSG2.5-32 J35 ●SSG2.5-32 J40	m2.5	32	S1	20	70	80	85	25	18	43	—
			S1K	20							6 x 2.8
			S1K	22							6 x 2.8
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
			S1K	30							8 x 3.3
			S1K	32							10 x 3.3
S1K	35	10 x 3.3									
S1K	40	12 x 3.3									
SSG2.5-34 ●SSG2.5-34 J20 ●SSG2.5-34 J22 ●SSG2.5-34 J25 ●SSG2.5-34 J28 ●SSG2.5-34 J30 ●SSG2.5-34 J32 ●SSG2.5-34 J35 ●SSG2.5-34 J40	m2.5	34	S1	20	70	85	90	25	18	43	—
			S1K	20							6 x 2.8
			S1K	22							6 x 2.8
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
			S1K	30							8 x 3.3
			S1K	32							10 x 3.3
S1K	35	10 x 3.3									
S1K	40	12 x 3.3									
SSG2.5-35 ●SSG2.5-35 J20 ●SSG2.5-35 J22 ●SSG2.5-35 J25 ●SSG2.5-35 J28 ●SSG2.5-35 J30 ●SSG2.5-35 J32 ●SSG2.5-35 J35 ●SSG2.5-35 J40	m2.5	35	S1	20	70	87.5	92.5	25	18	43	—
			S1K	20							6 x 2.8
			S1K	22							6 x 2.8
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
			S1K	30							8 x 3.3
			S1K	32							10 x 3.3
S1K	35	10 x 3.3									
S1K	40	12 x 3.3									
SSG2.5-36 ●SSG2.5-36 J20 ●SSG2.5-36 J22 ●SSG2.5-36 J25 ●SSG2.5-36 J28 ●SSG2.5-36 J30 ●SSG2.5-36 J32 ●SSG2.5-36 J35 ●SSG2.5-36 J40	m2.5	36	S1	20	70	90	95	25	18	43	—
			S1K	20							6 x 2.8
			S1K	22							6 x 2.8
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
			S1K	30							8 x 3.3
			S1K	32							10 x 3.3
S1K	35	10 x 3.3									
S1K	40	12 x 3.3									
SSG2.5-38 ●SSG2.5-38 J20 ●SSG2.5-38 J22 ●SSG2.5-38 J25 ●SSG2.5-38 J28 ●SSG2.5-38 J30 ●SSG2.5-38 J32 ●SSG2.5-38 J35 ●SSG2.5-38 J40	m2.5	38	S1	20	70	95	100	25	18	43	—
			S1K	20							6 x 2.8
			S1K	22							6 x 2.8
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
			S1K	30							8 x 3.3
			S1K	32							10 x 3.3
S1K	35	10 x 3.3									
S1K	40	12 x 3.3									

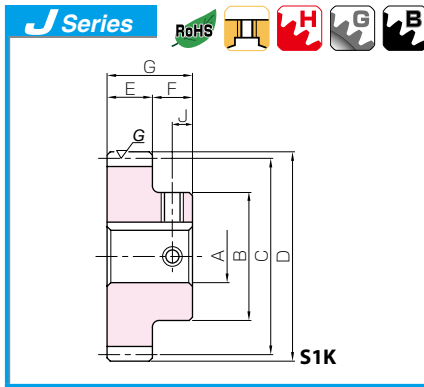
[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 1 to 2 mm).





## Ground Spur Gears



Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—	132	78.7	13.5	8.03	0.12~0.22	1.23 ● SSG2.5-30 J20 ● SSG2.5-30 J22 ● SSG2.5-30 J25 ● SSG2.5-30 J28 ● SSG2.5-30 J30 ● SSG2.5-30 J32 ● SSG2.5-30 J35	
M5*	9							
M5*	9							
M6	9							
M6	9							
M6	9							
M8	9							
M8	9							
—	—	144	90.1	14.7	9.19	0.12~0.22	1.42 ● SSG2.5-32 J20 ● SSG2.5-32 J22 ● SSG2.5-32 J25 ● SSG2.5-32 J28 ● SSG2.5-32 J30 ● SSG2.5-32 J32 ● SSG2.5-32 J35 ● SSG2.5-32 J40	
M5*	9							
M5*	9							
M6*	9							
M6*	9							
M6	9							
M8	9							
M8	9							
—	—	156	102	15.9	10.4	0.12~0.22	1.55 ● SSG2.5-34 J20 ● SSG2.5-34 J22 ● SSG2.5-34 J25 ● SSG2.5-34 J28 ● SSG2.5-34 J30 ● SSG2.5-34 J32 ● SSG2.5-34 J35 ● SSG2.5-34 J40	
M5*	9							
M5*	9							
M6*	9							
M6*	9							
M6	9							
M8	9							
M8	9							
—	—	162	109	16.5	11.1	0.12~0.22	1.62 ● SSG2.5-35 J20 ● SSG2.5-35 J22 ● SSG2.5-35 J25 ● SSG2.5-35 J28 ● SSG2.5-35 J30 ● SSG2.5-35 J32 ● SSG2.5-35 J35 ● SSG2.5-35 J40	
M5*	9							
M5*	9							
M6*	9							
M6*	9							
M6	9							
M8	9							
M8	9							
—	—	168	115	17.1	11.8	0.12~0.22	1.69 ● SSG2.5-36 J20 ● SSG2.5-36 J22 ● SSG2.5-36 J25 ● SSG2.5-36 J28 ● SSG2.5-36 J30 ● SSG2.5-36 J32 ● SSG2.5-36 J35 ● SSG2.5-36 J40	
M5*	9							
M5*	9							
M6*	9							
M6*	9							
M6	9							
M8	9							
M8	9							
—	—	180	129	18.3	13.2	0.12~0.22	1.83 ● SSG2.5-38 J20 ● SSG2.5-38 J22 ● SSG2.5-38 J25 ● SSG2.5-38 J28 ● SSG2.5-38 J30 ● SSG2.5-38 J32 ● SSG2.5-38 J35 ● SSG2.5-38 J40	
M5*	9							
M5*	9							
M6*	9							
M6*	9							
M6	9							
M8	9							
M8	9							

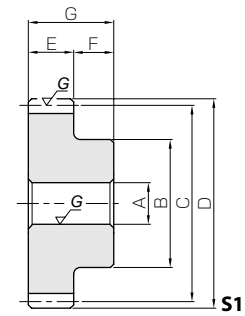
**[Caution on J series]**

- ① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order.  
Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).
- ⑤ Areas of products which have been re-worked will not be black oxide coated.
- ⑥ For products having a tapped hole, a set screw is included.



Specifications	
Precision grade	JIS grade N7 (JIS B1702-1: 1998) * JIS grade 3 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	Tooth surface induction hardened
Tooth hardness	45 ~ 55HRC

\* The precision grade of J Series products is equivalent to the value shown in the table.



- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

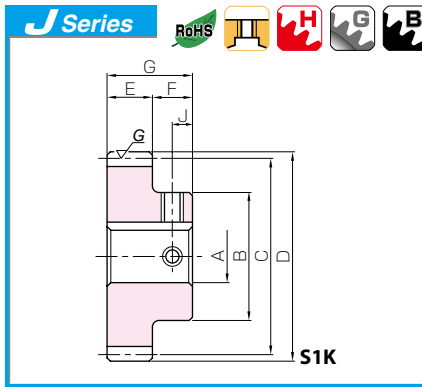
Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway
				AH7	B	C	D	E	F	G	Width×Depth
SSG2.5-40 ●SSG2.5-40 J25 ●SSG2.5-40 J28 ●SSG2.5-40 J30 ●SSG2.5-40 J32 ●SSG2.5-40 J35 ●SSG2.5-40 J40	m2.5	40	S1	25	70	100	105	25	18	43	—
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
			S1K	30							8 x 3.3
			S1K	32							10 x 3.3
			S1K	35							10 x 3.3
			S1K	40							12 x 3.3
SSG2.5-42 ●SSG2.5-42 J25 ●SSG2.5-42 J28 ●SSG2.5-42 J30 ●SSG2.5-42 J32 ●SSG2.5-42 J35 ●SSG2.5-42 J40 ●SSG2.5-42 J45	42	S1	25	75	105	110	25	18	43	—	
		S1K	25							8 x 3.3	
		S1K	28							8 x 3.3	
		S1K	30							8 x 3.3	
		S1K	32							10 x 3.3	
		S1K	35							10 x 3.3	
		S1K	40							12 x 3.3	
SSG2.5-44 ●SSG2.5-44 J25 ●SSG2.5-44 J28 ●SSG2.5-44 J30 ●SSG2.5-44 J32 ●SSG2.5-44 J35 ●SSG2.5-44 J40 ●SSG2.5-44 J45	44	S1	25	75	110	115	25	18	43	—	
		S1K	25							8 x 3.3	
		S1K	28							8 x 3.3	
		S1K	30							8 x 3.3	
		S1K	32							10 x 3.3	
		S1K	35							10 x 3.3	
		S1K	40							12 x 3.3	
SSG2.5-45 ●SSG2.5-45 J25 ●SSG2.5-45 J28 ●SSG2.5-45 J30 ●SSG2.5-45 J32 ●SSG2.5-45 J35 ●SSG2.5-45 J40 ●SSG2.5-45 J45	45	S1	25	75	112.5	117.5	25	18	43	—	
		S1K	25							8 x 3.3	
		S1K	28							8 x 3.3	
		S1K	30							8 x 3.3	
		S1K	32							10 x 3.3	
		S1K	35							10 x 3.3	
		S1K	40							12 x 3.3	
SSG2.5-48 ●SSG2.5-48 J25 ●SSG2.5-48 J28 ●SSG2.5-48 J30 ●SSG2.5-48 J32 ●SSG2.5-48 J35 ●SSG2.5-48 J40 ●SSG2.5-48 J45	48	S1	25	75	120	125	25	18	43	—	
		S1K	25							8 x 3.3	
		S1K	28							8 x 3.3	
		S1K	30							8 x 3.3	
		S1K	32							10 x 3.3	
		S1K	35							10 x 3.3	
		S1K	40							12 x 3.3	
SSG2.5-50 ●SSG2.5-50 J25 ●SSG2.5-50 J28 ●SSG2.5-50 J30 ●SSG2.5-50 J32 ●SSG2.5-50 J35 ●SSG2.5-50 J40 ●SSG2.5-50 J45	50	S1	25	80	125	130	25	18	43	—	
		S1K	25							8 x 3.3	
		S1K	28							8 x 3.3	
		S1K	30							8 x 3.3	
		S1K	32							10 x 3.3	
		S1K	35							10 x 3.3	
		S1K	40							12 x 3.3	
S1K	45	14 x 3.8									

[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 1 to 2 mm).



## Ground Spur Gears



Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—						1.92	<b>SSG2.5-40</b>
M6*	9						1.90	● <b>SSG2.5-40 J25</b>
M6*	9						1.86	● <b>SSG2.5-40 J28</b>
M6	9	177	133	18.1	13.6	0.12~0.22	1.83	● <b>SSG2.5-40 J30</b>
M8	9						1.79	● <b>SSG2.5-40 J32</b>
M8	9						1.74	● <b>SSG2.5-40 J35</b>
M8	9						1.64	● <b>SSG2.5-40 J40</b>
—	—						2.16	<b>SSG2.5-42</b>
M6*	9						2.14	● <b>SSG2.5-42 J25</b>
M6*	9						2.10	● <b>SSG2.5-42 J28</b>
M6*	9	188	147	19.2	15.0	0.14~0.24	2.07	● <b>SSG2.5-42 J30</b>
M8	9						2.03	● <b>SSG2.5-42 J32</b>
M8	9						1.98	● <b>SSG2.5-42 J35</b>
M8	9						1.88	● <b>SSG2.5-42 J40</b>
M10	9						1.76	● <b>SSG2.5-42 J45</b>
—	—						2.32	<b>SSG2.5-44</b>
M6*	9						2.30	● <b>SSG2.5-44 J25</b>
M6*	9						2.26	● <b>SSG2.5-44 J28</b>
M6*	9	200	163	20.4	16.6	0.14~0.24	2.23	● <b>SSG2.5-44 J30</b>
M8	9						2.20	● <b>SSG2.5-44 J32</b>
M8	9						2.14	● <b>SSG2.5-44 J35</b>
M8	9						2.04	● <b>SSG2.5-44 J40</b>
M10	9						1.92	● <b>SSG2.5-44 J45</b>
—	—						2.41	<b>SSG2.5-45</b>
M6*	9						2.39	● <b>SSG2.5-45 J25</b>
M6*	9						2.35	● <b>SSG2.5-45 J28</b>
M6*	9	205	170	20.9	17.4	0.14~0.24	2.32	● <b>SSG2.5-45 J30</b>
M8	9						2.28	● <b>SSG2.5-45 J32</b>
M8	9						2.23	● <b>SSG2.5-45 J35</b>
M8	9						2.13	● <b>SSG2.5-45 J40</b>
M10	9						2.01	● <b>SSG2.5-45 J45</b>
—	—						2.68	<b>SSG2.5-48</b>
M6*	9						2.66	● <b>SSG2.5-48 J25</b>
M6*	9						2.62	● <b>SSG2.5-48 J28</b>
M6*	9	222	195	22.7	19.9	0.14~0.24	2.59	● <b>SSG2.5-48 J30</b>
M8	9						2.55	● <b>SSG2.5-48 J32</b>
M8	9						2.50	● <b>SSG2.5-48 J35</b>
M8	9						2.40	● <b>SSG2.5-48 J40</b>
M10	9						2.28	● <b>SSG2.5-48 J45</b>
—	—						2.95	<b>SSG2.5-50</b>
M6*	9						2.93	● <b>SSG2.5-50 J25</b>
M6*	9						2.89	● <b>SSG2.5-50 J28</b>
M6*	9	234	213	23.8	21.7	0.14~0.24	2.86	● <b>SSG2.5-50 J30</b>
M8	9						2.82	● <b>SSG2.5-50 J32</b>
M8	9						2.77	● <b>SSG2.5-50 J35</b>
M8	9						2.67	● <b>SSG2.5-50 J40</b>
M10	9						2.55	● <b>SSG2.5-50 J45</b>

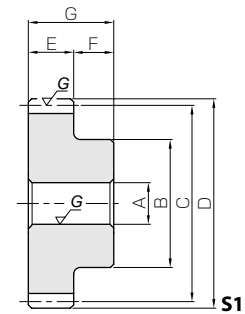
**[Caution on J series]**

- ① As available-on-request products, requires a lead-time for shipping within **3 working-days (excludes the day ordered)**, after placing an order. Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is **1 to 20 units**. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).
- ⑤ Areas of products which have been re-worked will not be black oxide coated.
- ⑥ For products having a tapped hole, a set screw is included.



Specifications	
Precision grade	JIS grade N7 (JIS B1702-1: 1998) * JIS grade 3 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	Tooth surface induction hardened
Tooth hardness	45 ~ 55HRC

\* The precision grade of J Series products is equivalent to the value shown in the table.



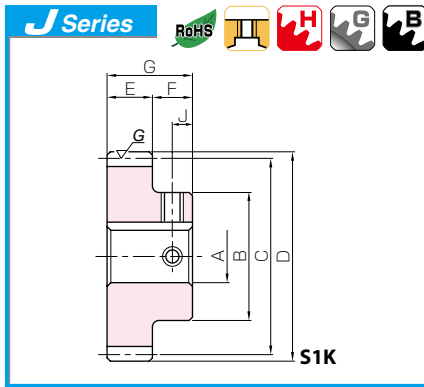
Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	Width×Depth
SSG2.5-55 ● SSG2.5-55 J25 ● SSG2.5-55 J28 ● SSG2.5-55 J30 ● SSG2.5-55 J32 ● SSG2.5-55 J35 ● SSG2.5-55 J40 ● SSG2.5-55 J45	m2.5	55	S1	25	80	137.5	142.5	25	18	43	—
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
			S1K	30							8 x 3.3
			S1K	32							10 x 3.3
			S1K	35							10 x 3.3
			S1K	40							12 x 3.3
S1K	45	14 x 3.8									
SSG2.5-56 ● SSG2.5-56 J25 ● SSG2.5-56 J28 ● SSG2.5-56 J30 ● SSG2.5-56 J32 ● SSG2.5-56 J35 ● SSG2.5-56 J40 ● SSG2.5-56 J45	56	56	S1	25	80	140	145	25	18	43	—
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
			S1K	30							8 x 3.3
			S1K	32							10 x 3.3
			S1K	35							10 x 3.3
			S1K	40							12 x 3.3
S1K	45	14 x 3.8									
SSG2.5-60 ● SSG2.5-60 J25 ● SSG2.5-60 J28 ● SSG2.5-60 J30 ● SSG2.5-60 J32 ● SSG2.5-60 J35 ● SSG2.5-60 J40 ● SSG2.5-60 J45	60	60	S1	25	80	150	155	25	18	43	—
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
			S1K	30							8 x 3.3
			S1K	32							10 x 3.3
			S1K	35							10 x 3.3
			S1K	40							12 x 3.3
S1K	45	14 x 3.8									
SSG2.5-70 ● SSG2.5-70 J25 ● SSG2.5-70 J28 ● SSG2.5-70 J30 ● SSG2.5-70 J32 ● SSG2.5-70 J35 ● SSG2.5-70 J40 ● SSG2.5-70 J45	70	70	S1	25	80	175	180	25	18	43	—
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
			S1K	30							8 x 3.3
			S1K	32							10 x 3.3
			S1K	35							10 x 3.3
			S1K	40							12 x 3.3
S1K	45	14 x 3.8									
SSG2.5-75 ● SSG2.5-75 J25 ● SSG2.5-75 J28 ● SSG2.5-75 J30 ● SSG2.5-75 J32 ● SSG2.5-75 J35 ● SSG2.5-75 J40 ● SSG2.5-75 J45 ● SSG2.5-75 J50	75	75	S1	25	90	187.5	192.5	25	18	43	—
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
			S1K	30							8 x 3.3
			S1K	32							10 x 3.3
			S1K	35							10 x 3.3
			S1K	40							12 x 3.3
S1K	45	14 x 3.8									
S1K	50	14 x 3.8									
SSG2.5-80 ● SSG2.5-80 J25 ● SSG2.5-80 J28 ● SSG2.5-80 J30 ● SSG2.5-80 J32 ● SSG2.5-80 J35 ● SSG2.5-80 J40 ● SSG2.5-80 J45 ● SSG2.5-80 J50	80	80	S1	25	90	200	205	25	18	43	—
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
			S1K	30							8 x 3.3
			S1K	32							10 x 3.3
			S1K	35							10 x 3.3
			S1K	40							12 x 3.3
S1K	45	14 x 3.8									
S1K	50	14 x 3.8									

[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 1 to 2 mm).



## Ground Spur Gears



Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—	262	260	26.8	26.5	0.14~0.24	3.46 3.44 3.40 3.37 3.33 3.28 3.18 3.06	SSG2.5-55 ● SSG2.5-55 J25 ● SSG2.5-55 J28 ● SSG2.5-55 J30 ● SSG2.5-55 J32 ● SSG2.5-55 J35 ● SSG2.5-55 J40 ● SSG2.5-55 J45
M6*	9							
M6*	9							
M6*	9							
M8	9							
M8	9							
M10	9							
—	—	268	270	27.3	27.5	0.14~0.24	3.57 3.54 3.50 3.47 3.44 3.38 3.28 3.16	SSG2.5-56 ● SSG2.5-56 J25 ● SSG2.5-56 J28 ● SSG2.5-56 J30 ● SSG2.5-56 J32 ● SSG2.5-56 J35 ● SSG2.5-56 J40 ● SSG2.5-56 J45
M6*	9							
M6*	9							
M6*	9							
M8	9							
M8	9							
M10	9							
—	—	291	311	29.7	31.8	0.14~0.24	4.01 3.99 3.95 3.92 3.88 3.83 3.73 3.61	SSG2.5-60 ● SSG2.5-60 J25 ● SSG2.5-60 J28 ● SSG2.5-60 J30 ● SSG2.5-60 J32 ● SSG2.5-60 J35 ● SSG2.5-60 J40 ● SSG2.5-60 J45
M6*	9							
M6*	9							
M6*	9							
M8	9							
M8	9							
M10	9							
—	—	324	399	33.1	40.7	0.14~0.24	5.26 5.24 5.20 5.17 5.13 5.08 4.98 4.86	SSG2.5-70 ● SSG2.5-70 J25 ● SSG2.5-70 J28 ● SSG2.5-70 J30 ● SSG2.5-70 J32 ● SSG2.5-70 J35 ● SSG2.5-70 J40 ● SSG2.5-70 J45
M6*	9							
M6*	9							
M6*	9							
M8	9							
M8	9							
M10	9							
—	—	351	461	35.8	47.0	0.14~0.24	6.15 6.13 6.08 6.05 6.01 5.96 5.87 5.74 5.62	SSG2.5-75 ● SSG2.5-75 J25 ● SSG2.5-75 J28 ● SSG2.5-75 J30 ● SSG2.5-75 J32 ● SSG2.5-75 J35 ● SSG2.5-75 J40 ● SSG2.5-75 J45 ● SSG2.5-75 J50
M6*	9							
M6*	9							
M6*	9							
M8*	9							
M8*	9							
M10	9							
M10	9							
—	—	378	527	38.6	53.7	0.14~0.24	6.90 6.87 6.83 6.80 6.76 6.71 6.61 6.49 6.37	SSG2.5-80 ● SSG2.5-80 J25 ● SSG2.5-80 J28 ● SSG2.5-80 J30 ● SSG2.5-80 J32 ● SSG2.5-80 J35 ● SSG2.5-80 J40 ● SSG2.5-80 J45 ● SSG2.5-80 J50
M6*	9							
M6*	9							
M6*	9							
M8*	9							
M8*	9							
M10	9							
M10	9							

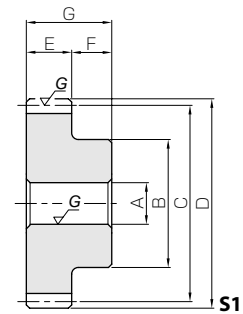
## [Caution on J series]

- As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order.  
Please allow additional shipping time to get to your local distributor.
- Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).
- Areas of products which have been re-worked will not be black oxide coated.
- For products having a tapped hole, a set screw is included.



Specifications	
Precision grade	JIS grade N7 (JIS B1702-1: 1998) * JIS grade 3 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	Tooth surface induction hardened
Tooth hardness	45 ~ 55HRC

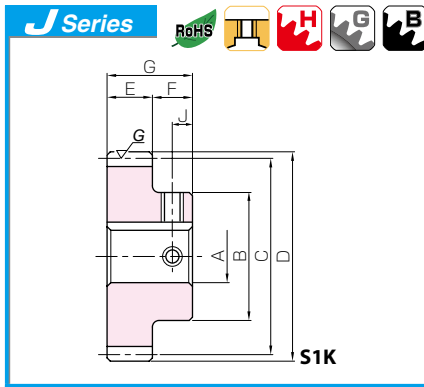
\* The precision grade of J Series products is equivalent to the value shown in the table.



Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	Width×Depth
<b>SSG3-14</b> ● <b>SSG3-14 J16</b> ● <b>SSG3-14 J18**</b> ● <b>SSG3-14 J19</b> ● <b>SSG3-14 J20</b>	<b>m3</b>	14	S1	16	34	42	48	30	20	50	—
			S1K	16							5 x 2.3
			S1K	18							6 x 2.8
			S1T2	19							—
			S1T2	20							—
<b>SSG3-15</b> ● <b>SSG3-15 J16</b> ● <b>SSG3-15 J18</b> ● <b>SSG3-15 J19</b> ● <b>SSG3-15 J20**</b>	<b>m3</b>	15	S1	16	36	45	51	30	20	50	—
			S1K	16							5 x 2.3
			S1K	18							6 x 2.8
			S1K	19							6 x 2.8
			S1K	20							6 x 2.8
<b>SSG3-16</b> ● <b>SSG3-16 J16</b> ● <b>SSG3-16 J18</b> ● <b>SSG3-16 J19</b> ● <b>SSG3-16 J20</b> ● <b>SSG3-16 J22</b>	<b>m3</b>	16	S1	16	38	48	54	30	20	50	—
			S1K	16							5 x 2.3
			S1K	18							6 x 2.8
			S1K	19							6 x 2.8
			S1K	20							6 x 2.8
			S1K	22							6 x 2.8
<b>SSG3-17</b> ● <b>SSG3-17 J16</b> ● <b>SSG3-17 J18</b> ● <b>SSG3-17 J19</b> ● <b>SSG3-17 J20</b> ● <b>SSG3-17 J22</b>	<b>m3</b>	17	S1	16	37	51	57	30	20	50	—
			S1K	16							5 x 2.3
			S1K	18							6 x 2.8
			S1K	19							6 x 2.8
			S1K	20							6 x 2.8
			S1K	22							6 x 2.8
<b>SSG3-18</b> ● <b>SSG3-18 J16</b> ● <b>SSG3-18 J18</b> ● <b>SSG3-18 J19</b> ● <b>SSG3-18 J20</b> ● <b>SSG3-18 J22</b>	<b>m3</b>	18	S1	16	40	54	60	30	20	50	—
			S1K	16							5 x 2.3
			S1K	18							6 x 2.8
			S1K	19							6 x 2.8
			S1K	20							6 x 2.8
			S1K	22							6 x 2.8
<b>SSG3-19</b> ● <b>SSG3-19 J16</b> ● <b>SSG3-19 J18</b> ● <b>SSG3-19 J19</b> ● <b>SSG3-19 J20</b> ● <b>SSG3-19 J22</b> ● <b>SSG3-19 J25</b>	<b>m3</b>	19	S1	16	45	57	63	30	20	50	—
			S1K	16							5 x 2.3
			S1K	18							6 x 2.8
			S1K	19							6 x 2.8
			S1K	20							6 x 2.8
			S1K	22							6 x 2.8
<b>SSG3-20</b> ● <b>SSG3-20 J20</b> ● <b>SSG3-20 J22</b> ● <b>SSG3-20 J25</b> ● <b>SSG3-20 J28</b> ● <b>SSG3-20 J30</b>	<b>m3</b>	20	S1	20	50	60	66	30	20	50	—
			S1K	20							6 x 2.8
			S1K	22							6 x 2.8
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
			S1K	30							8 x 3.3
<b>SSG3-21</b> ● <b>SSG3-21 J20</b> ● <b>SSG3-21 J22</b> ● <b>SSG3-21 J25</b> ● <b>SSG3-21 J28</b> ● <b>SSG3-21 J30</b>	<b>m3</b>	21	S1	20	52	63	69	30	20	50	—
			S1K	20							6 x 2.8
			S1K	22							6 x 2.8
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
			S1K	30							8 x 3.3

[Caution on Product Characteristics] ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.  
② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.  
② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 1 to 2 mm).



## Ground Spur Gears



Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—							<b>SSG3-14</b>
M4	10						0.39	● <b>SSG3-14 J16</b>
M5	10	74.1	26.1	7.55	2.66	0.10~0.20	0.38	● <b>SSG3-14 J18**</b>
M5	10						0.36	● <b>SSG3-14 J19</b>
M5	10						0.35	● <b>SSG3-14 J20</b>
M5	10						0.34	
—	—							<b>SSG3-15</b>
M4	10						0.46	● <b>SSG3-15 J16</b>
M5	10	83.1	30.5	8.48	3.11	0.10~0.20	0.45	● <b>SSG3-15 J18</b>
M5	10						0.43	● <b>SSG3-15 J19</b>
M5	10						0.42	● <b>SSG3-15 J20**</b>
M5	10						0.40	
—	—							<b>SSG3-16</b>
M4	10						0.53	● <b>SSG3-16 J16</b>
M5	10	92.1	35.2	9.39	3.59	0.10~0.20	0.52	● <b>SSG3-16 J18</b>
M5	10						0.50	● <b>SSG3-16 J19</b>
M5	10						0.48	● <b>SSG3-16 J20</b>
M5	10						0.47	● <b>SSG3-16 J22</b>
M5	10						0.45	
—	—							<b>SSG3-17</b>
M4	10						0.57	● <b>SSG3-17 J16</b>
M5	10	101	40.3	10.3	4.11	0.12~0.22	0.57	● <b>SSG3-17 J18</b>
M5	10						0.54	● <b>SSG3-17 J19</b>
M5	10						0.53	● <b>SSG3-17 J20</b>
M5	10						0.52	● <b>SSG3-17 J22</b>
M5	10						0.49	
—	—							<b>SSG3-18</b>
M4	10						0.66	● <b>SSG3-18 J16</b>
M5	10	110	45.8	11.3	4.67	0.12~0.22	0.65	● <b>SSG3-18 J18</b>
M5	10						0.63	● <b>SSG3-18 J19</b>
M5	10						0.62	● <b>SSG3-18 J20</b>
M5	10						0.61	● <b>SSG3-18 J22</b>
M5	10						0.58	
—	—							<b>SSG3-19</b>
M4*	10						0.77	● <b>SSG3-19 J16</b>
M5	10	120	51.6	12.2	5.26	0.12~0.22	0.76	● <b>SSG3-19 J18</b>
M5	10						0.74	● <b>SSG3-19 J19</b>
M5	10						0.73	● <b>SSG3-19 J20</b>
M5	10						0.72	● <b>SSG3-19 J22</b>
M5	10						0.69	● <b>SSG3-19 J25</b>
M6	10						0.65	
—	—							<b>SSG3-20</b>
M5	10						0.85	● <b>SSG3-20 J20</b>
M5	10	129	57.8	13.2	5.90	0.12~0.22	0.84	● <b>SSG3-20 J22</b>
M6	10						0.82	● <b>SSG3-20 J25</b>
M6	10						0.77	● <b>SSG3-20 J28</b>
M6	10						0.72	● <b>SSG3-20 J30</b>
M6	10						0.68	
—	—							<b>SSG3-21</b>
M5	10						0.94	● <b>SSG3-21 J20</b>
M5	10	139	64.4	14.2	6.57	0.12~0.22	0.93	● <b>SSG3-21 J22</b>
M6	10						0.91	● <b>SSG3-21 J25</b>
M6	10						0.86	● <b>SSG3-21 J28</b>
M6	10						0.81	● <b>SSG3-21 J30</b>
M6	10						0.78	

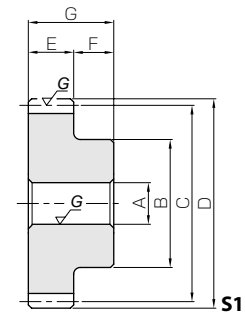
**[Caution on J series]**

- ① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).
- ⑤ Areas of products which have been re-worked will not be black oxide coated.
- ⑥ For products having a tapped hole, a set screw is included.
- ⑦ Products marked with "\*\*\*" have a small amount of material between the corner of the keyway and the tooth root. This mode of failure must be considered when selecting these gears. For details, please see our web site.



Specifications	
Precision grade	JIS grade N7 (JIS B1702-1: 1998) * JIS grade 3 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	Tooth surface induction hardened
Tooth hardness	45 ~ 55HRC

\* The precision grade of J Series products is equivalent to the value shown in the table.



- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

Catalog No. ●: J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	Width×Depth
SSG3-22 ●SSG3-22 J20 ●SSG3-22 J22 ●SSG3-22 J25 ●SSG3-22 J28 ●SSG3-22 J30 ●SSG3-22 J32	m3	22	S1	20	54	66	72	30	20	50	—
			S1K	20							6 x 2.8
			S1K	22							6 x 2.8
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
			S1K	30							8 x 3.3
S1K	32	10 x 3.3									
SSG3-23 ●SSG3-23 J20 ●SSG3-23 J22 ●SSG3-23 J25 ●SSG3-23 J28 ●SSG3-23 J30 ●SSG3-23 J32	m3	23	S1	20	56	69	75	30	20	50	—
			S1K	20							6 x 2.8
			S1K	22							6 x 2.8
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
			S1K	30							8 x 3.3
S1K	32	10 x 3.3									
SSG3-24 ●SSG3-24 J20 ●SSG3-24 J22 ●SSG3-24 J25 ●SSG3-24 J28 ●SSG3-24 J30 ●SSG3-24 J32	m3	24	S1	20	58	72	78	30	20	50	—
			S1K	20							6 x 2.8
			S1K	22							6 x 2.8
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
			S1K	30							8 x 3.3
S1K	32	10 x 3.3									
SSG3-25 ●SSG3-25 J20 ●SSG3-25 J22 ●SSG3-25 J25 ●SSG3-25 J28 ●SSG3-25 J30 ●SSG3-25 J32 ●SSG3-25 J35	m3	25	S1	20	60	75	81	30	20	50	—
			S1K	20							6 x 2.8
			S1K	22							6 x 2.8
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
			S1K	30							8 x 3.3
S1K	32	10 x 3.3									
S1K	35	10 x 3.3									
SSG3-26 ●SSG3-26 J20 ●SSG3-26 J22 ●SSG3-26 J25 ●SSG3-26 J28 ●SSG3-26 J30 ●SSG3-26 J32 ●SSG3-26 J35	m3	26	S1	20	62	78	84	30	20	50	—
			S1K	20							6 x 2.8
			S1K	22							6 x 2.8
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
			S1K	30							8 x 3.3
S1K	32	10 x 3.3									
S1K	35	10 x 3.3									
SSG3-27 ●SSG3-27 J20 ●SSG3-27 J22 ●SSG3-27 J25 ●SSG3-27 J28 ●SSG3-27 J30 ●SSG3-27 J32 ●SSG3-27 J35	m3	27	S1	20	65	81	87	30	20	50	—
			S1K	20							6 x 2.8
			S1K	22							6 x 2.8
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
			S1K	30							8 x 3.3
S1K	32	10 x 3.3									
S1K	35	10 x 3.3									
SSG3-28 ●SSG3-28 J20 ●SSG3-28 J22 ●SSG3-28 J25 ●SSG3-28 J28 ●SSG3-28 J30 ●SSG3-28 J32 ●SSG3-28 J35 ●SSG3-28 J40	m3	28	S1	20	70	84	90	30	20	50	—
			S1K	20							6 x 2.8
			S1K	22							6 x 2.8
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
			S1K	30							8 x 3.3
S1K	32	10 x 3.3									
S1K	35	10 x 3.3									
S1K	40	12 x 3.3									

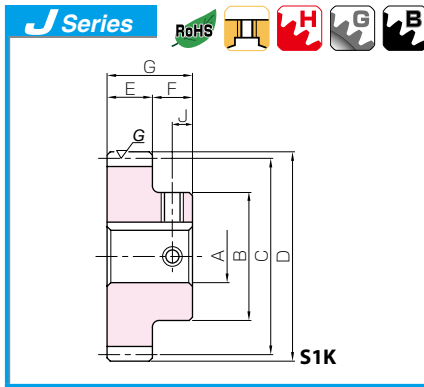
[Caution on Product Characteristics]

- The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations]

- Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 1 to 2 mm).





## Ground Spur Gears



Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—						1.04	<b>SSG3-22</b>
M5	10						1.03	● <b>SSG3-22 J20</b>
M5	10						1.01	● <b>SSG3-22 J22</b>
M6	10	149	71.3	15.1	7.28	0.12~0.22	0.96	● <b>SSG3-22 J25</b>
M6	10						0.91	● <b>SSG3-22 J28</b>
M6	10						0.87	● <b>SSG3-22 J30</b>
M8	10						0.83	● <b>SSG3-22 J32</b>
—	—						1.14	<b>SSG3-23</b>
M5*	10						1.13	● <b>SSG3-23 J20</b>
M5	10						1.11	● <b>SSG3-23 J22</b>
M6	10	158	78.7	16.1	8.02	0.12~0.22	1.06	● <b>SSG3-23 J25</b>
M6	10						1.01	● <b>SSG3-23 J28</b>
M6	10						0.98	● <b>SSG3-23 J30</b>
M8	10						0.93	● <b>SSG3-23 J32</b>
—	—						1.25	<b>SSG3-24</b>
M5*	10						1.21	● <b>SSG3-24 J20</b>
M5	10						1.19	● <b>SSG3-24 J22</b>
M6	10	168	86.4	17.1	8.81	0.12~0.22	1.14	● <b>SSG3-24 J25</b>
M6	10						1.09	● <b>SSG3-24 J28</b>
M6	10						1.05	● <b>SSG3-24 J30</b>
M8	10						1.01	● <b>SSG3-24 J32</b>
—	—						1.36	<b>SSG3-25</b>
M5*	10						1.35	● <b>SSG3-25 J20</b>
M5*	10						1.32	● <b>SSG3-25 J22</b>
M6	10	178	94.5	18.1	9.64	0.12~0.22	1.28	● <b>SSG3-25 J25</b>
M6	10						1.23	● <b>SSG3-25 J28</b>
M6	10						1.19	● <b>SSG3-25 J30</b>
M8	10						1.15	● <b>SSG3-25 J32</b>
M8	10						1.09	● <b>SSG3-25 J35</b>
—	—						1.48	<b>SSG3-26</b>
M5*	10						1.46	● <b>SSG3-26 J20</b>
M5*	10						1.44	● <b>SSG3-26 J22</b>
M6	10	188	103	19.2	10.5	0.12~0.22	1.39	● <b>SSG3-26 J25</b>
M6	10						1.34	● <b>SSG3-26 J28</b>
M6	10						1.31	● <b>SSG3-26 J30</b>
M8	10						1.26	● <b>SSG3-26 J32</b>
M8	10						1.20	● <b>SSG3-26 J35</b>
—	—						1.61	<b>SSG3-27</b>
M5*	10						1.60	● <b>SSG3-27 J20</b>
M5*	10						1.57	● <b>SSG3-27 J22</b>
M6	10	198	111	20.2	11.3	0.12~0.22	1.53	● <b>SSG3-27 J25</b>
M6	10						1.48	● <b>SSG3-27 J28</b>
M6	10						1.44	● <b>SSG3-27 J30</b>
M8	10						1.40	● <b>SSG3-27 J32</b>
M8	10						1.34	● <b>SSG3-27 J35</b>
—	—						1.79	<b>SSG3-28</b>
M5*	10						1.77	● <b>SSG3-28 J20</b>
M5*	10						1.74	● <b>SSG3-28 J22</b>
M6*	10	208	120	21.2	12.2	0.12~0.22	1.70	● <b>SSG3-28 J25</b>
M6*	10						1.65	● <b>SSG3-28 J28</b>
M6	10						1.62	● <b>SSG3-28 J30</b>
M8	10						1.57	● <b>SSG3-28 J32</b>
M8	10						1.51	● <b>SSG3-28 J35</b>
M8	10						1.39	● <b>SSG3-28 J40</b>

**[Caution on J series]**

① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order.

Please allow additional shipping time to get to your local distributor.

② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.

③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.

④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).

⑤ Areas of products which have been re-worked will not be black oxide coated.

⑥ For products having a tapped hole, a set screw is included.

For updated information, please see KHK Web Catalog.

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks &amp; Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

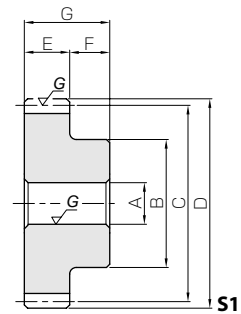
Bevel Gearboxes

Other Products



Specifications	
Precision grade	JIS grade N7 (JIS B1702-1: 1998) * JIS grade 3 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	Tooth surface induction hardened
Tooth hardness	45 ~ 55HRC

\* The precision grade of J Series products is equivalent to the value shown in the table.



- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

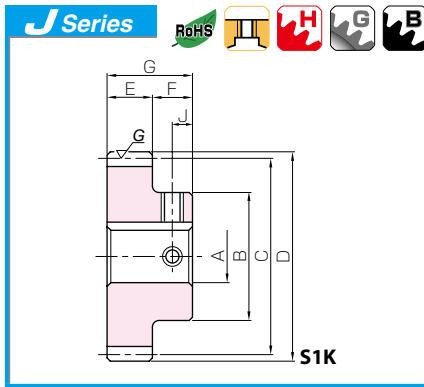
Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	Width×Depth
SSG3-29 ● SSG3-29 J20 ● SSG3-29 J22 ● SSG3-29 J25 ● SSG3-29 J28 ● SSG3-29 J30 ● SSG3-29 J32 ● SSG3-29 J35 ● SSG3-29 J40	m3	29	S1	20	70	87	93	30	20	50	—
			S1K	20							6 x 2.8
			S1K	22							6 x 2.8
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
			S1K	30							8 x 3.3
			S1K	32							10 x 3.3
			S1K	35							10 x 3.3
S1K	40	12 x 3.3									
SSG3-30 ● SSG3-30 J25 ● SSG3-30 J28 ● SSG3-30 J30 ● SSG3-30 J32 ● SSG3-30 J35 ● SSG3-30 J40 ● SSG3-30 J45	m3	30	S1	25	75	90	96	30	20	50	—
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
			S1K	30							8 x 3.3
			S1K	32							10 x 3.3
			S1K	35							10 x 3.3
			S1K	40							12 x 3.3
			S1K	45							14 x 3.8
SSG3-32 ● SSG3-32 J25 ● SSG3-32 J28 ● SSG3-32 J30 ● SSG3-32 J32 ● SSG3-32 J35 ● SSG3-32 J40 ● SSG3-32 J45	m3	32	S1	25	75	96	102	30	20	50	—
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
			S1K	30							8 x 3.3
			S1K	32							10 x 3.3
			S1K	35							10 x 3.3
			S1K	40							12 x 3.3
			S1K	45							14 x 3.8
SSG3-34 ● SSG3-34 J25 ● SSG3-34 J28 ● SSG3-34 J30 ● SSG3-34 J32 ● SSG3-34 J35 ● SSG3-34 J40 ● SSG3-34 J45	m3	34	S1	25	75	102	108	30	20	50	—
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
			S1K	30							8 x 3.3
			S1K	32							10 x 3.3
			S1K	35							10 x 3.3
			S1K	40							12 x 3.3
			S1K	45							14 x 3.8
SSG3-35 ● SSG3-35 J25 ● SSG3-35 J28 ● SSG3-35 J30 ● SSG3-35 J32 ● SSG3-35 J35 ● SSG3-35 J40 ● SSG3-35 J45	m3	35	S1	25	80	105	111	30	20	50	—
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
			S1K	30							8 x 3.3
			S1K	32							10 x 3.3
			S1K	35							10 x 3.3
			S1K	40							12 x 3.3
			S1K	45							14 x 3.8
SSG3-36 ● SSG3-36 J25 ● SSG3-36 J28 ● SSG3-36 J30 ● SSG3-36 J32 ● SSG3-36 J35 ● SSG3-36 J40 ● SSG3-36 J45	m3	36	S1	25	80	108	114	30	20	50	—
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3v
			S1K	30							8 x 3.3
			S1K	32							10 x 3.3
			S1K	35							10 x 3.3
			S1K	40							12 x 3.3
			S1K	45							14 x 3.8

[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 1 to 2 mm).



## Ground Spur Gears



Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—						1.88	<b>SSG3-29</b>
M5*	10						1.86	● <b>SSG3-29 J20</b>
M5*	10						1.84	● <b>SSG3-29 J22</b>
M6*	10						1.79	● <b>SSG3-29 J25</b>
M6*	10	218	129	22.2	13.2	0.12~0.22	1.74	● <b>SSG3-29 J28</b>
M6	10						1.71	● <b>SSG3-29 J30</b>
M8	10						1.67	● <b>SSG3-29 J32</b>
M8	10						1.60	● <b>SSG3-29 J35</b>
M8	10						1.49	● <b>SSG3-29 J40</b>
—	—						2.00	<b>SSG3-30</b>
M6*	10						1.98	● <b>SSG3-30 J25</b>
M6*	10						1.93	● <b>SSG3-30 J28</b>
M6*	10	228	138	23.3	14.1	0.12~0.22	1.90	● <b>SSG3-30 J30</b>
M8	10						1.85	● <b>SSG3-30 J32</b>
M8	10						1.79	● <b>SSG3-30 J35</b>
M8	10						1.68	● <b>SSG3-30 J40</b>
M10	10						1.54	● <b>SSG3-30 J45</b>
—	—						2.21	<b>SSG3-32</b>
M6*	10						2.18	● <b>SSG3-32 J25</b>
M6*	10						2.14	● <b>SSG3-32 J28</b>
M6*	10	229	146	23.4	14.9	0.12~0.22	2.10	● <b>SSG3-32 J30</b>
M8	10						2.06	● <b>SSG3-32 J32</b>
M8	10						2.00	● <b>SSG3-32 J35</b>
M8	10						1.88	● <b>SSG3-32 J40</b>
M10	10						1.74	● <b>SSG3-32 J45</b>
—	—						2.43	<b>SSG3-34</b>
M6*	10						2.40	● <b>SSG3-34 J25</b>
M6*	10						2.36	● <b>SSG3-34 J28</b>
M6*	10	248	166	25.3	17.0	0.14~0.24	2.32	● <b>SSG3-34 J30</b>
M8	10						2.28	● <b>SSG3-34 J32</b>
M8	10						2.22	● <b>SSG3-34 J35</b>
M8	10						2.10	● <b>SSG3-34 J40</b>
M10	10						1.96	● <b>SSG3-34 J45</b>
—	—						2.64	<b>SSG3-35</b>
M6*	10						2.61	● <b>SSG3-35 J25</b>
M6*	10						2.56	● <b>SSG3-35 J28</b>
M6*	10	258	177	26.3	18.0	0.14~0.24	2.53	● <b>SSG3-35 J30</b>
M8	10						2.49	● <b>SSG3-35 J32</b>
M8	10						2.43	● <b>SSG3-35 J35</b>
M8	10						2.31	● <b>SSG3-35 J40</b>
M10	10						2.17	● <b>SSG3-35 J45</b>
—	—						2.75	<b>SSG3-36</b>
M6*	10						2.73	● <b>SSG3-36 J25</b>
M6*	10						2.68	● <b>SSG3-36 J28</b>
M6*	10	268	188	27.3	19.1	0.14~0.24	2.65	● <b>SSG3-36 J30</b>
M8	10						2.61	● <b>SSG3-36 J32</b>
M8	10						2.54	● <b>SSG3-36 J35</b>
M8	10						2.43	● <b>SSG3-36 J40</b>
M10	10						2.29	● <b>SSG3-36 J45</b>

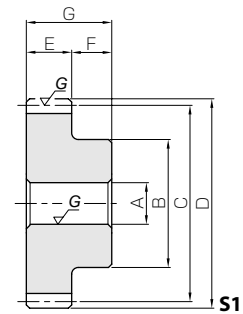
**[Caution on J series]**

- ① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order.  
Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).
- ⑤ Areas of products which have been re-worked will not be black oxide coated.
- ⑥ For products having a tapped hole, a set screw is included.



Specifications	
Precision grade	JIS grade N7 (JIS B1702-1: 1998) * JIS grade 3 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	Tooth surface induction hardened
Tooth hardness	45 ~ 55HRC

\* The precision grade of J Series products is equivalent to the value shown in the table.



- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

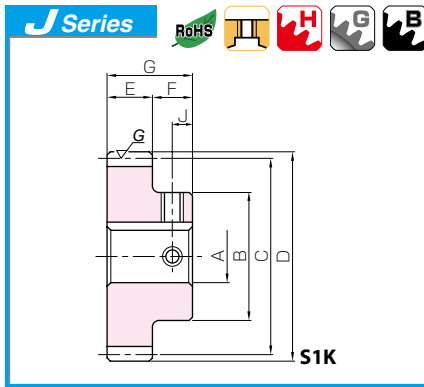
Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	Width×Depth
SSG3-38 ● SSG3-38 J25 ● SSG3-38 J28 ● SSG3-38 J30 ● SSG3-38 J32 ● SSG3-38 J35 ● SSG3-38 J40 ● SSG3-38 J45	m3	38	S1	25	80	114	120	30	20	50	—
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
			S1K	30							8 x 3.3
			S1K	32							10 x 3.3
			S1K	35							10 x 3.3
			S1K	40							12 x 3.3
S1K	45	14 x 3.8									
SSG3-40 ● SSG3-40 J25 ● SSG3-40 J28 ● SSG3-40 J30 ● SSG3-40 J32 ● SSG3-40 J35 ● SSG3-40 J40 ● SSG3-40 J45	m3	40	S1	25	80	120	126	30	20	50	—
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
			S1K	30							8 x 3.3
			S1K	32							10 x 3.3
			S1K	35							10 x 3.3
			S1K	40							12 x 3.3
S1K	45	14 x 3.8									
SSG3-42 ● SSG3-42 J25 ● SSG3-42 J28 ● SSG3-42 J30 ● SSG3-42 J32 ● SSG3-42 J35 ● SSG3-42 J40 ● SSG3-42 J45	m3	42	S1	25	80	126	132	30	20	50	—
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
			S1K	30							8 x 3.3
			S1K	32							10 x 3.3
			S1K	35							10 x 3.3
			S1K	40							12 x 3.3
S1K	45	14 x 3.8									
SSG3-44 ● SSG3-44 J25 ● SSG3-44 J28 ● SSG3-44 J30 ● SSG3-44 J32 ● SSG3-44 J35 ● SSG3-44 J40 ● SSG3-44 J45	m3	44	S1	25	80	132	138	30	20	50	—
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
			S1K	30							8 x 3.3
			S1K	32							10 x 3.3
			S1K	35							10 x 3.3
			S1K	40							12 x 3.3
S1K	45	14 x 3.8									
SSG3-45 ● SSG3-45 J25 ● SSG3-45 J28 ● SSG3-45 J30 ● SSG3-45 J32 ● SSG3-45 J35 ● SSG3-45 J40 ● SSG3-45 J45	m3	45	S1	25	80	135	141	30	20	50	—
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
			S1K	30							8 x 3.3
			S1K	32							10 x 3.3
			S1K	35							10 x 3.3
			S1K	40							12 x 3.3
S1K	45	14 x 3.8									
SSG3-48 ● SSG3-48 J25 ● SSG3-48 J28 ● SSG3-48 J30 ● SSG3-48 J32 ● SSG3-48 J35 ● SSG3-48 J40 ● SSG3-48 J45 ● SSG3-48 J50	m3	48	S1	25	85	144	150	30	20	50	—
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
			S1K	30							8 x 3.3
			S1K	32							10 x 3.3
			S1K	35							10 x 3.3
			S1K	40							12 x 3.3
S1K	45	14 x 3.8									
S1K	50	14 x 3.8									

[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 1 to 2 mm).



## Ground Spur Gears



Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—	287	210	29.2	21.4	0.14~0.24	3.00	<b>SSG3-38</b>
M6*	10						2.98	● <b>SSG3-38 J25</b>
M6*	10						2.93	● <b>SSG3-38 J28</b>
M6*	10						2.89	● <b>SSG3-38 J30</b>
M8	10						2.85	● <b>SSG3-38 J32</b>
M8	10						2.79	● <b>SSG3-38 J35</b>
M8	10						2.67	● <b>SSG3-38 J40</b>
M10	10	2.54	● <b>SSG3-38 J45</b>					
—	—	306	234	31.2	23.9	0.14~0.24	3.26	<b>SSG3-40</b>
M6*	10						3.24	● <b>SSG3-40 J25</b>
M6*	10						3.19	● <b>SSG3-40 J28</b>
M6*	10						3.15	● <b>SSG3-40 J30</b>
M8	10						3.11	● <b>SSG3-40 J32</b>
M8	10						3.05	● <b>SSG3-40 J35</b>
M8	10						2.93	● <b>SSG3-40 J40</b>
M10	10	2.80	● <b>SSG3-40 J45</b>					
—	—	326	260	33.2	26.5	0.14~0.24	3.53	<b>SSG3-42</b>
M6*	10						3.51	● <b>SSG3-42 J25</b>
M6*	10						3.46	● <b>SSG3-42 J28</b>
M6*	10						3.43	● <b>SSG3-42 J30</b>
M8	10						3.38	● <b>SSG3-42 J32</b>
M8	10						3.32	● <b>SSG3-42 J35</b>
M8	10						3.21	● <b>SSG3-42 J40</b>
M10	10	3.07	● <b>SSG3-42 J45</b>					
—	—	345	286	35.2	29.2	0.14~0.24	3.82	<b>SSG3-44</b>
M6*	10						3.80	● <b>SSG3-44 J25</b>
M6*	10						3.75	● <b>SSG3-44 J28</b>
M6*	10						3.71	● <b>SSG3-44 J30</b>
M8	10						3.67	● <b>SSG3-44 J32</b>
M8	10						3.61	● <b>SSG3-44 J35</b>
M8	10						3.49	● <b>SSG3-44 J40</b>
M10	10	3.35	● <b>SSG3-44 J45</b>					
—	—	355	300	36.2	30.6	0.14~0.24	3.97	<b>SSG3-45</b>
M6*	10						3.94	● <b>SSG3-45 J25</b>
M6*	10						3.90	● <b>SSG3-45 J28</b>
M6*	10						3.86	● <b>SSG3-45 J30</b>
M8	10						3.82	● <b>SSG3-45 J32</b>
M8	10						3.76	● <b>SSG3-45 J35</b>
M8	10						3.64	● <b>SSG3-45 J40</b>
M10	10	3.50	● <b>SSG3-45 J45</b>					
—	—	384	343	39.2	35.0	0.14~0.24	4.53	<b>SSG3-48</b>
M6*	10						4.51	● <b>SSG3-48 J25</b>
M6*	10						4.46	● <b>SSG3-48 J28</b>
M6*	10						4.42	● <b>SSG3-48 J30</b>
M8*	10						4.38	● <b>SSG3-48 J32</b>
M8	10						4.32	● <b>SSG3-48 J35</b>
M8	10						4.21	● <b>SSG3-48 J40</b>
M10	10	4.07	● <b>SSG3-48 J45</b>					
M10	10	3.92	● <b>SSG3-48 J50</b>					

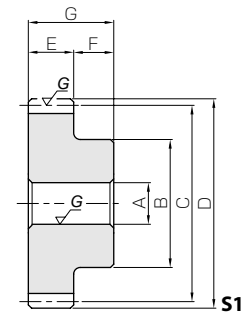
**[Caution on J series]**

- ① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order.  
Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).
- ⑤ Areas of products which have been re-worked will not be black oxide coated.
- ⑥ For products having a tapped hole, a set screw is included.



Specifications	
Precision grade	JIS grade N7 (JIS B1702-1: 1998) * JIS grade 3 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	Tooth surface induction hardened
Tooth hardness	45 ~ 55HRC

\* The precision grade of J Series products is equivalent to the value shown in the table.



- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

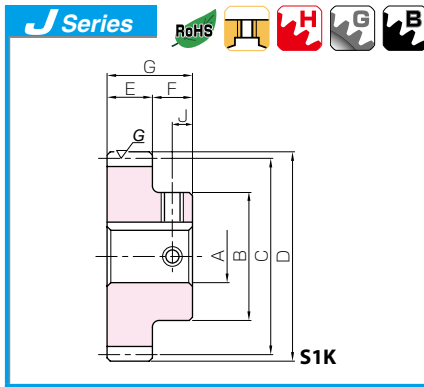
Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	Width×Depth
SSG3-50 ● SSG3-50 J30 ● SSG3-50 J32 ● SSG3-50 J35 ● SSG3-50 J40 ● SSG3-50 J45 ● SSG3-50 J50	m3	50	S1	30	85	150	156	30	20	50	—
			S1K	30							8 x 3.3
			S1K	32							10 x 3.3
			S1K	35							10 x 3.3
			S1K	40							12 x 3.3
			S1K	45							14 x 3.8
S1K	50	14 x 3.8									
SSG3-55 ● SSG3-55 J30 ● SSG3-55 J32 ● SSG3-55 J35 ● SSG3-55 J40 ● SSG3-55 J45 ● SSG3-55 J50	m3	55	S1	30	90	165	171	30	20	50	—
			S1K	30							8 x 3.3
			S1K	32							10 x 3.3
			S1K	35							10 x 3.3
			S1K	40							12 x 3.3
			S1K	45							14 x 3.8
S1K	50	14 x 3.8									
SSG3-56 ● SSG3-56 J30 ● SSG3-56 J32 ● SSG3-56 J35 ● SSG3-56 J40 ● SSG3-56 J45 ● SSG3-56 J50	m3	56	S1	30	90	168	174	30	20	50	—
			S1K	30							8 x 3.3
			S1K	32							10 x 3.3
			S1K	35							10 x 3.3
			S1K	40							12 x 3.3
			S1K	45							14 x 3.8
S1K	50	14 x 3.8									
SSG3-60 ● SSG3-60 J30 ● SSG3-60 J32 ● SSG3-60 J35 ● SSG3-60 J40 ● SSG3-60 J45 ● SSG3-60 J50	m3	60	S1	30	100	180	186	30	20	50	—
			S1K	30							8 x 3.3
			S1K	32							10 x 3.3
			S1K	35							10 x 3.3
			S1K	40							12 x 3.3
			S1K	45							14 x 3.8
S1K	50	14 x 3.8									
SSG3-70 ● SSG3-70 J30 ● SSG3-70 J32 ● SSG3-70 J35 ● SSG3-70 J40 ● SSG3-70 J45 ● SSG3-70 J50	m3	70	S1	30	100	210	216	30	20	50	—
			S1K	30							8 x 3.3
			S1K	32							10 x 3.3
			S1K	35							10 x 3.3
			S1K	40							12 x 3.3
			S1K	45							14 x 3.8
S1K	50	14 x 3.8									
SSG3-75 ● SSG3-75 J30 ● SSG3-75 J32 ● SSG3-75 J35 ● SSG3-75 J40 ● SSG3-75 J45 ● SSG3-75 J50	m3	75	S1	30	100	225	231	30	20	50	—
			S1K	30							8 x 3.3
			S1K	32							10 x 3.3
			S1K	35							10 x 3.3
			S1K	40							12 x 3.3
			S1K	45							14 x 3.8
S1K	50	14 x 3.8									
SSG3-80 ● SSG3-80 J30 ● SSG3-80 J32 ● SSG3-80 J35 ● SSG3-80 J40 ● SSG3-80 J45 ● SSG3-80 J50	m3	80	S1	30	100	240	246	30	20	50	—
			S1K	30							8 x 3.3
			S1K	32							10 x 3.3
			S1K	35							10 x 3.3
			S1K	40							12 x 3.3
			S1K	45							14 x 3.8
S1K	50	14 x 3.8									

[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 1 to 2 mm).



## Ground Spur Gears



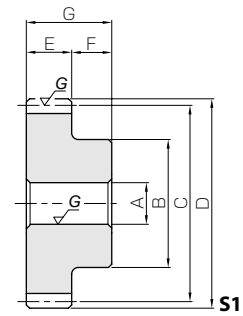
Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—						4.78	<b>SSG3-50</b>
M6*	10						4.75	● <b>SSG3-50 J30</b>
M8*	10						4.71	● <b>SSG3-50 J32</b>
M8	10	404	374	41.2	38.1	0.14~0.24	4.65	● <b>SSG3-50 J35</b>
M8	10						4.53	● <b>SSG3-50 J40</b>
M10	10						4.39	● <b>SSG3-50 J45</b>
M10	10						4.25	● <b>SSG3-50 J50</b>
—	—						5.76	<b>SSG3-55</b>
M6*	10						5.73	● <b>SSG3-55 J30</b>
M8*	10						5.68	● <b>SSG3-55 J32</b>
M8*	10	421	423	42.9	43.2	0.14~0.24	5.62	● <b>SSG3-55 J35</b>
M8	10						5.51	● <b>SSG3-55 J40</b>
M10	10						5.37	● <b>SSG3-55 J45</b>
M10	10						5.23	● <b>SSG3-55 J50</b>
—	—						5.94	<b>SSG3-56</b>
M6*	10						5.92	● <b>SSG3-56 J30</b>
M8*	10						5.87	● <b>SSG3-56 J32</b>
M8*	10	430	439	43.9	44.8	0.14~0.24	5.81	● <b>SSG3-56 J35</b>
M8	10						5.70	● <b>SSG3-56 J40</b>
M10	10						5.56	● <b>SSG3-56 J45</b>
M10	10						5.41	● <b>SSG3-56 J50</b>
—	—						6.95	<b>SSG3-60</b>
M6*	10						6.92	● <b>SSG3-60 J30</b>
M8*	10						6.87	● <b>SSG3-60 J32</b>
M8*	10	467	508	47.6	51.8	0.14~0.24	6.81	● <b>SSG3-60 J35</b>
M8*	10						6.69	● <b>SSG3-60 J40</b>
M10	10						6.56	● <b>SSG3-60 J45</b>
M10	10						6.41	● <b>SSG3-60 J50</b>
—	—						9.11	<b>SSG3-70</b>
M6*	10						9.08	● <b>SSG3-70 J30</b>
M8*	10						9.03	● <b>SSG3-70 J32</b>
M8*	10	560	699	57.1	71.3	0.14~0.24	8.97	● <b>SSG3-70 J35</b>
M8*	10						8.86	● <b>SSG3-70 J40</b>
M10	10						8.72	● <b>SSG3-70 J45</b>
M10	10						8.58	● <b>SSG3-70 J50</b>
—	—						10.3	<b>SSG3-75</b>
M6*	10						10.3	● <b>SSG3-75 J30</b>
M8*	10						10.2	● <b>SSG3-75 J32</b>
M8*	10	607	806	61.9	82.2	0.14~0.24	10.2	● <b>SSG3-75 J35</b>
M8*	10						10.1	● <b>SSG3-75 J40</b>
M10	10						9.93	● <b>SSG3-75 J45</b>
M10	10						9.78	● <b>SSG3-75 J50</b>
—	—						11.6	<b>SSG3-80</b>
M6*	10						11.6	● <b>SSG3-80 J30</b>
M8*	10						11.5	● <b>SSG3-80 J32</b>
M8*	10	654	921	66.7	93.9	0.14~0.24	11.5	● <b>SSG3-80 J35</b>
M8*	10						11.4	● <b>SSG3-80 J40</b>
M10	10						11.2	● <b>SSG3-80 J45</b>
M10	10						11.1	● <b>SSG3-80 J50</b>

**[Caution on J series]**

- ① As available-on-request products, requires a lead-time for shipping within **3 working-days (excludes the day ordered), after placing an order.**  
Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is **1 to 20 units.** For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).
- ⑤ Areas of products which have been re-worked will not be black oxide coated.
- ⑥ For products having a tapped hole, a set screw is included.



Specifications	
Precision grade	JIS grade N7 (JIS B1702-1: 1998) JIS grade 3 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	Tooth surface induction hardened
Tooth hardness	45 ~ 55HRC



Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length
				A <sub>H7</sub>	B	C	D	E	F	G
<b>SSG4-14</b>	<b>m4</b>	14	S1	20	40	56	64	40	25	65
<b>SSG4-15</b>		15	S1	20	45	60	68	40	25	65
<b>SSG4-16</b>		16	S1	20	50	64	72	40	25	65
<b>SSG4-18</b>		18	S1	20	60	72	80	40	25	65
<b>SSG4-20</b>		20	S1	20	65	80	88	40	25	65
<b>SSG4-22</b>		22	S1	20	70	88	96	40	25	65
<b>SSG4-24</b>		24	S1	20	75	96	104	40	25	65
<b>SSG4-25</b>		25	S1	20	80	100	108	40	25	65
<b>SSG4-28</b>		28	S1	20	85	112	120	40	25	65
<b>SSG4-30</b>		30	S1	20	90	120	128	40	25	65
<b>SSG4-32</b>		32	S1	25	90	128	136	40	25	65
<b>SSG4-35</b>		35	S1	25	90	140	148	40	25	65
<b>SSG4-36</b>		36	S1	25	90	144	152	40	25	65
<b>SSG4-40</b>		40	S1	25	90	160	168	40	25	65
<b>SSG4-42</b>		42	S1	25	90	168	176	40	25	65
<b>SSG4-44</b>		44	S1	30	90	176	184	40	25	65
<b>SSG4-45</b>		45	S1	30	90	180	188	40	25	65
<b>SSG4-48</b>		48	S1	30	100	192	200	40	25	65
<b>SSG4-50</b>		50	S1	30	100	200	208	40	25	65
<b>SSG4-55</b>		55	S1	30	100	220	228	40	25	65
<b>SSG4-56</b>	56	S1	30	110	224	232	40	25	65	
<b>SSG4-60</b>	60	S1	30	110	240	248	40	25	65	
<b>SSG5-20</b>	<b>m5</b>	20	S1	25	82	100	110	50	25	75
<b>SSG5-25</b>		25	S1	25	105	125	135	50	25	75
<b>SSG5-30</b>		30	S1	25	120	150	160	50	25	75
<b>SSG6-20</b>	<b>m6</b>	20	S1	25	100	120	132	60	28	88
<b>SSG6-25</b>		25	S1	30	125	150	162	60	28	88
<b>SSG6-30</b>		30	S1	30	150	180	192	60	28	88

[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.



Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No.
Bending strength	Surface durability	Bending strength	Surface durability			
176	63.4	17.9	6.47	0.14~0.24	0.86	<b>SSG4-14</b>
197	74.1	20.1	7.55	0.14~0.24	1.04	<b>SSG4-15</b>
218	85.6	22.3	8.73	0.14~0.24	1.24	<b>SSG4-16</b>
262	111	26.7	11.4	0.14~0.24	1.67	<b>SSG4-18</b>
307	141	31.3	14.3	0.14~0.24	2.07	<b>SSG4-20</b>
352	174	35.9	17.7	0.14~0.24	2.50	<b>SSG4-22</b>
368	194	37.5	19.8	0.14~0.24	2.98	<b>SSG4-24</b>
389	213	39.7	21.7	0.14~0.24	3.29	<b>SSG4-25</b>
455	270	46.4	27.5	0.16~0.26	4.05	<b>SSG4-28</b>
499	313	50.9	31.9	0.16~0.26	4.64	<b>SSG4-30</b>
544	358	55.5	36.5	0.16~0.26	5.04	<b>SSG4-32</b>
612	432	62.4	44.0	0.16~0.26	5.83	<b>SSG4-35</b>
634	458	64.7	46.7	0.16~0.26	6.11	<b>SSG4-36</b>
674	529	68.7	54.0	0.16~0.26	7.31	<b>SSG4-40</b>
717	586	73.1	59.7	0.16~0.26	7.96	<b>SSG4-42</b>
760	646	77.5	65.8	0.16~0.26	8.53	<b>SSG4-44</b>
781	677	79.6	69.0	0.16~0.26	8.88	<b>SSG4-45</b>
846	774	86.3	79.0	0.16~0.26	10.3	<b>SSG4-48</b>
889	842	90.7	85.9	0.16~0.26	11.0	<b>SSG4-50</b>
998	1030	102	105	0.16~0.26	13.1	<b>SSG4-55</b>
1020	1060	104	109	0.16~0.26	13.9	<b>SSG4-56</b>
1110	1230	113	125	0.16~0.26	15.7	<b>SSG4-60</b>
553	259	56.4	26.5	0.14~0.26	3.83	<b>SSG5-20</b>
760	426	77.5	43.4	0.18~0.30	6.23	<b>SSG5-25</b>
975	623	99.4	63.5	0.18~0.30	8.87	<b>SSG5-30</b>
955	457	97.4	46.6	0.18~0.30	6.71	<b>SSG6-20</b>
1310	747	134	76.2	0.18~0.30	10.5	<b>SSG6-25</b>
1560	1020	160	104	0.18~0.30	15.4	<b>SSG6-30</b>

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 1 to 2 mm).



■ **Poor tooth contact occurred on SSG3-30  
(Approx. 30% of the proper gear contact)**

Gear Oil (Equivalent to JIS gear oil category 2 and No. 3)

The design conditions are load torque at 278 rpm, of 42.5 kg/m (12 kW), 1.5 times the allowable bending strength, and 3 times the allowable surface durability torque. The pitting occurs on the poor tooth contact area after only 60 hours of continuous operation.

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks &amp; Pinions

Miter Gears

Bevel Gears

Screw Gears

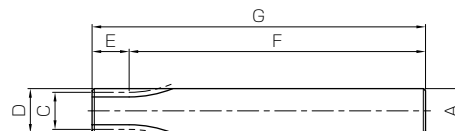
Worm Gear Pair

Bevel Gearboxes

Other Products



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	Thermal refined *
Tooth hardness	225 ~ 260HB *



\* The precision grade of products with a module less than 0.8 is equivalent to the value shown in the table.  
\* Items with the shape SA are not thermally refined and have a hardness of less than 194HB.

SA

Catalog No.	Module	No. of teeth	Profile shift coefficient	Shape	Shaft dia. (L)		Pitch dia. C	Outside dia. D	Face width E	Shaft dia. (R)		Total length G
					A'	F'				A	F	
SSS0.5-10	m0.5	10	0	SA	—	—	5	6	7	6	38	45
SSS0.5-11		11	0	SA	—	—	5.5	6.5	7	6.5	38	45
SSS0.5-12		12	0	SA	—	—	6	7	7	7	38	45
SSS0.5-13		13	0	SA	—	—	6.5	7.5	7	7.5	38	45
SSS0.8-10	m0.8	10	0	SA	—	—	8	9.6	10	9.6	60	70
SSS0.8-11		11	0	SA	—	—	8.8	10.4	10	10.4	60	70
SSS0.8-12		12	0	SA	—	—	9.6	11.2	10	11.2	60	70
SSS0.8-13		13	0	SA	—	—	10.4	12	10	12	60	70
SSS1-10	m1	10	0	SA	—	—	10	12	12	12	78	90
SSS1-11		11	0	SA	—	—	11	13	12	13	78	90
SSS1-12		12	0	SA	—	—	12	14	12	14	78	90
SSS1-13		13	0	SA	—	—	13	15	12	15	78	90
SSS1.5-10	m1.5	10	+0.5	SB	12.2	25	15	19.35	15	12.2	100	140
SSS1.5-11		11	+0.5	SB	13.7	25	16.5	20.85	15	13.7	100	140
SSS1.5-12		12	0	SB	13.7	25	18	21	15	13.7	100	140
SSS1.5-13		13	0	SB	15.2	25	19.5	22.5	15	15.2	100	140
SSS2-10	m2	10	+0.5	SB	16.2	30	20	25.8	20	16.2	120	170
SSS2-11		11	+0.5	SB	18.2	30	22	27.8	20	18.2	120	170
SSS2-12		12	0	SB	18.2	30	24	28	20	18.2	120	170
SSS2-13		13	0	SB	20.2	30	26	30	20	20.2	120	170
SSS2.5-10	m2.5	10	+0.5	SB	20.2	35	25	32.25	25	20.2	135	195
SSS2.5-11		11	+0.5	SB	22.7	35	27.5	34.75	25	22.7	135	195
SSS2.5-12		12	0	SB	22.7	35	30	35	25	22.7	135	195
SSS2.5-13		13	0	SB	25.2	35	32.5	37.5	25	25.2	135	195
SSS3-10	m3	10	+0.5	SB	24.2	40	30	38.7	30	24.2	150	220
SSS3-11		11	+0.5	SB	27.2	40	33	41.7	30	27.2	150	220
SSS3-12		12	0	SB	27.2	40	36	42	30	27.2	150	220
SSS3-13		13	0	SB	30.2	40	39	45	30	30.2	150	220

[Caution on Product Characteristics]

- The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- 10- and 11-tooth gears with a pitch of module 1.5 or greater are profile shifted gears ( $x = +0.5$ ). Please refer to the tables below for calculating the center distance when assembled.
- The backlash values shown in the table are the theoretical values for the normal direction for a pair of identical SS Spur Gears with 30 teeth in mesh.

### Center distance of Stock Spur Gears Meshing with Profile Shifted Spur Gears

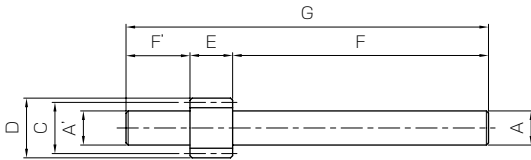
The table on the right shows the center distance of the spur gears ( $x=0$ ) which can be meshed with profile shifted spur gears ( $x=+0.5$ ) with module 1. Multiply by the actual module to determine your center distance.

Center distance when gear has 12 to 30 teeth (unit : mm)

No. of teeth( $x=0$ )	10	11
12	11.4410	11.9428
13	11.9428	12.4446
14	12.4446	12.9462
15	12.9462	13.4477
16	13.4477	13.9492
17	13.9492	14.4505
18	14.4505	14.9518
19	14.9518	15.4530
20	15.4530	15.9542
21	15.9542	16.4553
22	16.4553	16.9564
23	16.9564	17.4574
24	17.4574	17.9583
25	17.9583	18.4592
26	18.4592	18.9601
27	18.9601	19.4610
28	19.4610	19.9618
29	19.9618	20.4625
30	20.4625	20.9633

Center distance when gear has 32 to 62 teeth (unit : mm)

No. of teeth( $x=0$ )	10	11
32	21.4640	21.9647
34	22.4653	22.9660
35	22.9660	23.4666
36	23.4666	23.9671
38	24.4677	24.9683
40	25.4688	25.9693
42	26.4698	26.9703
44	27.4707	27.9712
45	27.9712	28.4716
46	28.4716	28.9721
48	29.4725	29.9729
50	30.4733	30.9736
52	31.4740	31.9744
54	32.4747	32.9750
55	32.9750	33.4754
56	33.4754	33.9757
58	34.4760	34.9763
60	35.4766	35.9769
62	36.4772	36.9774



SB

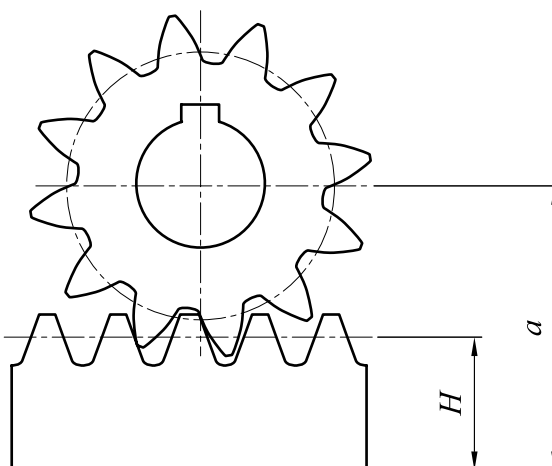
Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No.
Bending strength	Surface durability	Bending strength	Surface durability			
0.20	0.0077	0.021	0.0008	0 ~0.10	0.0095	SSS0.5-10 SSS0.5-11 SSS0.5-12 SSS0.5-13
0.26	0.0094	0.026	0.0010	0 ~0.10	0.011	
0.32	0.011	0.032	0.0011	0 ~0.10	0.013	
0.38	0.013	0.039	0.0014	0 ~0.10	0.015	
0.83	0.032	0.084	0.0032	0 ~0.10	0.038	SSS0.8-10 SSS0.8-11 SSS0.8-12 SSS0.8-13
1.05	0.039	0.11	0.0040	0 ~0.10	0.045	
1.29	0.047	0.13	0.0048	0 ~0.10	0.052	
1.56	0.055	0.16	0.0056	0 ~0.10	0.060	
1.62	0.063	0.16	0.0064	0.09~0.20	0.077	SSS1-10 SSS1-11 SSS1-12 SSS1-13
2.04	0.077	0.21	0.0078	0.09~0.20	0.090	
2.52	0.092	0.26	0.0094	0.09~0.20	0.10	
3.05	0.11	0.31	0.011	0.09~0.20	0.12	
12.7	0.71	1.30	0.073	0.10~0.23	0.14	SSS1.5-10 SSS1.5-11 SSS1.5-12 SSS1.5-13
14.5	0.88	1.48	0.089	0.11~0.24	0.17	
9.97	0.89	1.02	0.091	0.11~0.24	0.17	
12.1	1.05	1.23	0.11	0.11~0.24	0.21	
30.2	1.75	3.08	0.18	0.12~0.26	0.30	SSS2-10 SSS2-11 SSS2-12 SSS2-13
34.3	2.14	3.50	0.22	0.13~0.28	0.38	
23.6	2.18	2.41	0.22	0.13~0.28	0.38	
28.6	2.57	2.92	0.26	0.13~0.28	0.46	
58.9	3.50	6.01	0.36	0.14~0.29	0.54	SSS2.5-10 SSS2.5-11 SSS2.5-12 SSS2.5-13
67.1	4.29	6.84	0.44	0.15~0.31	0.68	
46.2	4.37	4.71	0.45	0.15~0.31	0.68	
55.9	5.13	5.70	0.52	0.15~0.31	0.83	
102	6.15	10.4	0.63	0.15~0.32	0.89	SSS3-10 SSS3-11 SSS3-12 SSS3-13
116	7.54	11.8	0.77	0.16~0.35	1.11	
79.8	7.68	8.14	0.78	0.16~0.35	1.11	
96.5	9.02	9.84	0.92	0.16~0.35	1.35	

- [Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.

Center distance when gear has 64 to 200 teeth (unit : mm)

No. of teeth(z=0)	No. of teeth(z=+0.5) 10	No. of teeth(z=+0.5) 11
64	37.4777	37.9780
65	37.9780	38.4782
66	38.4782	38.9785
68	39.4787	39.9790
70	40.4792	40.9794
72	41.4796	41.9799
75	42.9803	43.4805
76	43.4805	43.9807
80	45.4813	45.9814
84	47.4820	47.9822
85	47.9822	48.4823
88	49.4826	49.9828
90	50.4830	50.9831
95	52.9837	53.4838
100	55.4844	55.9845
120	65.4866	65.9867
150	80.4890	80.9890
200	105.4915	105.9915

Assembly distance of profile shifted gear and the meshing rack

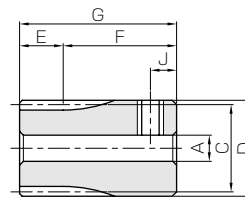


$$a = \frac{zm}{2} + H + xm$$

- Where
- a : Assembly Distance
  - H : Height of pitch line of rack
  - m : Module
  - z : No. of Teeth
  - x : Profile Shift Coefficient



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1:1998) * JIS grade 4 (JIS B1702:1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB



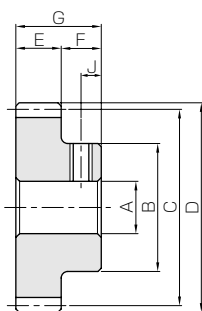
\* The precision grade of products with a module of less than 0.8 is equivalent to the value shown in the table.

S3T

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway
				AH7	B	C	D	E	F	G	Width×Depth
SS0.5-15A	m0.5	15	S3T	3	8.5	7.5	8.5	5	11	16	—
SS0.5-16A		16	S3T	3	9	8	9	5	11	16	—
SS0.5-17A		17	S3T	3	9.5	8.5	9.5	5	11	16	—
SS0.5-18A		18	S3T	4	10	9	10	5	11	16	—
SS0.5-19A		19	S3T	4	10.5	9.5	10.5	5	11	16	—
SS0.5-20A		20	S3T	3	11	10	11	5	11	16	—
SS0.5-20B				4							
SS0.5-21A		21	S3T	4	11.5	10.5	11.5	5	11	16	—
SS0.5-22A		22	S3T	4	12	11	12	5	11	16	—
SS0.5-23A		23	S3T	4	12.5	11.5	12.5	5	11	16	—
SS0.5-24A		24	S3T	4	13	12	13	5	11	16	—
SS0.5-24B				5							
SS0.5-25A		25	S3T	4	13.5	12.5	13.5	5	11	16	—
SS0.5-25B				5							
SS0.5-26A		26	S3T	4	14	13	14	5	11	16	—
SS0.5-27A		27	S3T	4	14.5	13.5	14.5	5	11	16	—
SS0.5-28A		28	S1T	4	12	14	15	5	7	12	—
SS0.5-29A		29	S1T	4	12	14.5	15.5	5	7	12	—
SS0.5-30A		30	S1T	4	13	15	16	5	7	12	—
SS0.5-30B				5							
SS0.5-30C				6							
SS0.5-32A		32	S1T	5	14	16	17	5	7	12	—
SS0.5-34A		34	S1T	5	15	17	18	5	7	12	—
SS0.5-35A		35	S1T	5	15	17.5	18.5	5	7	12	—
SS0.5-36A		36	S1T	5	16	18	19	5	7	12	—
SS0.5-38A		38	S1T	5	16	19	20	5	7	12	—
SS0.5-40A		40	S1T	5	18	20	21	5	7	12	—
SS0.5-40B				6							
SS0.5-42A		42	S1T	5	18	21	22	5	7	12	—
SS0.5-44A		44	S1T	5	20	22	23	5	7	12	—
SS0.5-45A		45	S1T	5	20	22.5	23.5	5	7	12	—
SS0.5-46A		46	S1T	5	20	23	24	5	7	12	—
SS0.5-48A		48	S1T	5	22	24	25	5	7	12	—
SS0.5-50A		50	S1T	5	22	25	26	5	7	12	—
SS0.5-50B				6							
SS0.5-52A		52	S1T	5	22	26	27	5	7	12	—
SS0.5-54A		54	S1T	5	25	27	28	5	7	12	—
SS0.5-55A		55	S1T	5	25	27.5	28.5	5	7	12	—
SS0.5-56A		56	S1T	5	25	28	29	5	7	12	—
SS0.5-58A		58	S1T	5	25	29	30	5	7	12	—
SS0.5-60A		60	S1T	6	28	30	31	5	7	12	—
SS0.5-60B				8							
SS0.5-62A		62	S1T	6	28	31	32	5	7	12	—
SS0.5-64A		64	S1T	6	28	32	33	5	7	12	—
SS0.5-65A		65	S1T	6	28	32.5	33.5	5	7	12	—
SS0.5-66A		66	S1T	6	28	33	34	5	7	12	—
SS0.5-68A		68	S1T	6	28	34	35	5	7	12	—
SS0.5-70A		70	S1T	6	28	35	36	5	7	12	—
SS0.5-70B				8							
SS0.5-72A		72	S1T	6	28	36	37	5	7	12	—

[Caution on Product Characteristics]

- ① For products with a tapped hole, a set screw is included.
- ② The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ③ The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.
- ④ If the bore size is less than  $\phi 4$ , the tolerance is H8. If the bore size is  $\phi 5$  or  $\phi 6$ , and the hole length exceeds 3 times of the bore size, the tolerance is also H8.



S1T

Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No.
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
M3	2.5	0.46	0.022	0.047	0.0022	0~0.10	0.0056	SS0.5-15A
M3	2.5	0.51	0.025	0.052	0.0025	0~0.10	0.0064	SS0.5-16A
M3	2.5	0.56	0.028	0.057	0.0029	0~0.10	0.0073	SS0.5-17A
M3	2.5	0.61	0.032	0.063	0.0033	0~0.10	0.0076	SS0.5-18A
M3	2.5	0.67	0.036	0.068	0.0036	0~0.10	0.0085	SS0.5-19A
M3	2.5	0.72	0.040	0.073	0.0041	0~0.10	0.010	SS0.5-20A
M3	2.5	0.77	0.044	0.079	0.0045	0~0.10	0.011	SS0.5-21A
M3	2.5	0.83	0.049	0.084	0.0050	0~0.10	0.012	SS0.5-22A
M3	2.5	0.88	0.054	0.090	0.0055	0~0.10	0.013	SS0.5-23A
M3	2.5	0.93	0.059	0.095	0.0060	0~0.10	0.014	SS0.5-24A
M4	3	0.93	0.059	0.095	0.0060	0~0.10	0.013	SS0.5-24B
M3	2.5	0.99	0.064	0.10	0.0065	0~0.10	0.015	SS0.5-25A
M4	3	0.99	0.064	0.10	0.0065	0~0.10	0.014	SS0.5-25B
M3	2.5	1.04	0.069	0.11	0.0071	0~0.10	0.017	SS0.5-26A
M3	2.5	1.10	0.075	0.11	0.0076	0~0.10	0.018	SS0.5-27A
M3	3.5	1.16	0.081	0.12	0.0082	0~0.10	0.011	SS0.5-28A
M3	3.5	1.21	0.087	0.12	0.0088	0~0.10	0.011	SS0.5-29A
M3	3.5	1.27	0.093	0.13	0.0095	0~0.10	0.013	SS0.5-30A
M4	3.5	1.27	0.093	0.13	0.0095	0~0.10	0.012	SS0.5-30B
M4	3.5	1.27	0.093	0.13	0.0095	0~0.10	0.011	SS0.5-30C
M4	3.5	1.38	0.11	0.14	0.011	0~0.10	0.014	SS0.5-32A
M4	3.5	1.50	0.12	0.15	0.012	0~0.10	0.016	SS0.5-34A
M4	3.5	1.55	0.13	0.16	0.013	0~0.10	0.017	SS0.5-35A
M4	3.5	1.61	0.14	0.16	0.014	0~0.10	0.019	SS0.5-36A
M4	3.5	1.73	0.15	0.18	0.015	0~0.10	0.020	SS0.5-38A
M4	3.5	1.84	0.17	0.19	0.017	0~0.10	0.024	SS0.5-40A
M4	3.5	1.84	0.17	0.19	0.017	0~0.10	0.023	SS0.5-40B
M4	3.5	1.96	0.19	0.20	0.019	0~0.10	0.025	SS0.5-42A
M4	3.5	2.08	0.20	0.21	0.021	0~0.10	0.030	SS0.5-44A
M4	3.5	2.14	0.21	0.22	0.022	0~0.10	0.030	SS0.5-45A
M4	3.5	2.19	0.22	0.22	0.023	0~0.10	0.031	SS0.5-46A
M4	3.5	2.31	0.25	0.24	0.025	0~0.10	0.036	SS0.5-48A
M4	3.5	2.43	0.27	0.25	0.027	0~0.10	0.038	SS0.5-50A
M4	3.5	2.43	0.27	0.25	0.027	0~0.10	0.037	SS0.5-50B
M4	3.5	2.55	0.29	0.26	0.030	0~0.10	0.039	SS0.5-52A
M4	3.5	2.67	0.32	0.27	0.032	0~0.10	0.047	SS0.5-54A
M4	3.5	2.73	0.33	0.28	0.033	0~0.10	0.048	SS0.5-55A
M4	3.5	2.79	0.34	0.28	0.035	0~0.10	0.048	SS0.5-56A
M4	3.5	2.91	0.37	0.30	0.037	0~0.10	0.050	SS0.5-58A
M4	3.5	3.03	0.39	0.31	0.040	0~0.10	0.058	SS0.5-60A
M5	3.5	3.03	0.39	0.31	0.040	0~0.10	0.055	SS0.5-60B
M4	3.5	3.15	0.42	0.32	0.043	0~0.10	0.060	SS0.5-62A
M4	3.5	3.27	0.45	0.33	0.046	0~0.10	0.062	SS0.5-64A
M4	3.5	3.33	0.47	0.34	0.048	0~0.10	0.063	SS0.5-65A
M4	3.5	3.39	0.48	0.35	0.049	0~0.10	0.064	SS0.5-66A
M4	3.5	3.51	0.51	0.36	0.052	0~0.10	0.066	SS0.5-68A
M4	3.5	3.63	0.55	0.37	0.056	0~0.10	0.068	SS0.5-70A
M5	3.5	3.63	0.55	0.37	0.056	0~0.10	0.065	SS0.5-70B
M4	3.5	3.75	0.58	0.38	0.059	0~0.10	0.070	SS0.5-72A

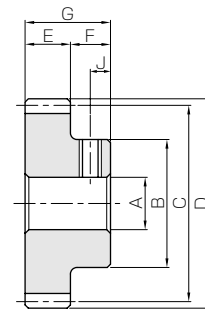
[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1:1998) * JIS grade 4 (JIS B1702:1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB

\* The precision grade of products with a module of less than 0.8 is equivalent to the value shown in the table.



S1T

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	Width×Depth
<b>SS0.5-75A</b>	<b>m0.5</b>	75	S1T	6	28	37.5	38.5	5	7	12	—
<b>SS0.5-76A</b>		76	S1T	6	28	38	39	5	7	12	—
<b>SS0.5-80A</b>		80	S1T	6	28	40	41	5	7	12	—
<b>SS0.5-80B</b>			S1T	8	28	40	41	5	7	12	—
<b>SS0.5-84A</b>		84	S1T	8	28	42	43	5	7	12	—
<b>SS0.5-85A</b>		85	S1T	8	28	42.5	43.5	5	7	12	—
<b>SS0.5-88A</b>		88	S1T	8	28	44	45	5	7	12	—
<b>SS0.5-90A</b>		90	S1T	8	28	45	46	5	7	12	—
<b>SS0.5-95A</b>		95	S1T	8	28	47.5	48.5	5	7	12	—
<b>SS0.5-96A</b>		96	S1T	8	28	48	49	5	7	12	—
<b>SS0.5-100A</b>		100	S1T	8	28	50	51	5	7	12	—
<b>SS0.5-105A</b>		105	S1T	8	28	52.5	53.5	5	7	12	—
<b>SS0.5-110A</b>		110	S1T	8	28	55	56	5	7	12	—
<b>SS0.5-115A</b>		115	S1T	8	28	57.5	58.5	5	7	12	—
<b>SS0.5-120A</b>		120	S1T	8	28	60	61	5	7	12	—

[Caution on Product Characteristics]

- ① For products with a tapped hole, a set screw is included.
- ② The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ③ The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.
- ④ If the bore size is less than  $\phi 4$ , the tolerance is H8. If the bore size is  $\phi 5$  or  $\phi 6$ , and the hole length exceeds 3 times of the bore size, the tolerance is also H8.

Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No.
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
M4	3.5	3.93	0.63	0.40	0.064	0~0.10	0.074	<b>SS0.5-75A</b>
M4	3.5	3.99	0.65	0.41	0.066	0~0.10	0.075	<b>SS0.5-76A</b>
M4	3.5	4.24	0.72	0.43	0.074	0~0.10	0.079	<b>SS0.5-80A</b>
M5	3.5						0.077	<b>SS0.5-80B</b>
M5	3.5	4.48	0.80	0.46	0.082	0~0.10	0.082	<b>SS0.5-84A</b>
M5	3.5	4.54	0.82	0.46	0.084	0~0.10	0.083	<b>SS0.5-85A</b>
M5	3.5	4.72	0.89	0.48	0.090	0~0.10	0.087	<b>SS0.5-88A</b>
M5	3.5	4.85	0.93	0.49	0.095	0~0.10	0.090	<b>SS0.5-90A</b>
M5	3.5	5.15	1.04	0.53	0.11	0~0.10	0.097	<b>SS0.5-95A</b>
M5	3.5	5.21	1.06	0.53	0.11	0~0.10	0.099	<b>SS0.5-96A</b>
M5	3.5	5.46	1.16	0.56	0.12	0~0.10	0.10	<b>SS0.5-100A</b>
M5	3.5	5.76	1.28	0.59	0.13	0~0.10	0.11	<b>SS0.5-105A</b>
M5	3.5	6.07	1.42	0.62	0.14	0~0.10	0.12	<b>SS0.5-110A</b>
M5	3.5	6.38	1.56	0.65	0.16	0~0.10	0.13	<b>SS0.5-115A</b>
M5	3.5	6.68	1.70	0.68	0.17	0~0.10	0.14	<b>SS0.5-120A</b>

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.

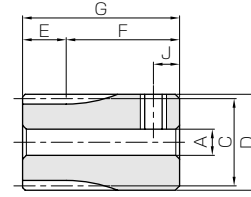
Spur  
GearsHelical  
GearsInternal  
Gears

Racks

CP Racks  
& PinionsMiter  
GearsBevel  
GearsScrew  
GearsWorm  
Gear PairBevel  
GearboxesOther  
Products



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1:1998) * JIS grade 4 (JIS B1702:1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB



\* The precision grade of products with a module of less than 0.8 is equivalent to the value shown in the table.

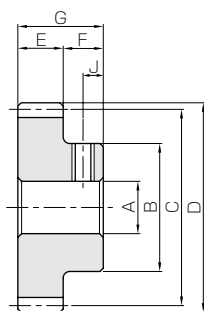
S3T

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway
				AH7	B	C	D	E	F	G	Width×Depth
SS0.8-15A	m0.8	15	S3T	5	13.6	12	13.6	8	14	22	—
SS0.8-16A		16	S3T	5	14.4	12.8	14.4	8	14	22	—
SS0.8-17A		17	S3T	5	15.2	13.6	15.2	8	14	22	—
SS0.8-18A		18	S3T	5	16	14.4	16	8	14	22	—
SS0.8-19A		19	S1T	5	12	15.2	16.8	8	8	16	—
SS0.8-20A		20	S1T	5	13	16	17.6	8	8	16	—
SS0.8-20B				6							
SS0.8-21A		21	S1T	6	14	16.8	18.4	8	8	16	—
SS0.8-22A		22	S1T	6	15	17.6	19.2	8	8	16	—
SS0.8-23A		23	S1T	6	15	18.4	20	8	8	16	—
SS0.8-24A		24	S1T	5	16	19.2	20.8	8	8	16	—
SS0.8-24B				6							
SS0.8-25A		25	S1T	5	16	20	21.6	8	8	16	—
SS0.8-25B				6							
SS0.8-26A		26	S1T	6	18	20.8	22.4	8	8	16	—
SS0.8-27A		27	S1T	6	18	21.6	23.2	8	8	16	—
SS0.8-28A		28	S1T	6	18	22.4	24	8	8	16	—
SS0.8-29A		29	S1T	6	20	23.2	24.8	8	8	16	—
SS0.8-30A		30	S1T	5	20	24	25.6	8	8	16	—
SS0.8-30B				6							
SS0.8-30C				8							
SS0.8-32A		32	S1T	6	22	25.6	27.2	8	8	16	—
SS0.8-34A		34	S1T	6	22	27.2	28.8	8	8	16	—
SS0.8-35A		35	S1T	6	25	28	29.6	8	8	16	—
SS0.8-36A		36	S1T	6	25	28.8	30.4	8	8	16	—
SS0.8-38A		38	S1T	6	25	30.4	32	8	8	16	—
SS0.8-40A		40	S1T	6	28	32	33.6	8	8	16	—
SS0.8-40B				8							
SS0.8-42A		42	S1T	6	28	33.6	35.2	8	8	16	—
SS0.8-44A		44	S1T	6	28	35.2	36.8	8	8	16	—
SS0.8-45A		45	S1T	6	28	36	37.6	8	8	16	—
SS0.8-46A		46	S1T	6	28	36.8	38.4	8	8	16	—
SS0.8-48A		48	S1T	6	28	38.4	40	8	8	16	—
SS0.8-50A		50	S1T	6	28	40	41.6	8	8	16	—
SS0.8-50B				8							
SS0.8-52A		52	S1T	6	28	41.6	43.2	8	8	16	—
SS0.8-54A		54	S1T	6	28	43.2	44.8	8	8	16	—
SS0.8-55A		55	S1T	6	28	44	45.6	8	8	16	—
SS0.8-56A		56	S1T	6	28	44.8	46.4	8	8	16	—
SS0.8-58A		58	S1T	6	28	46.4	48	8	8	16	—
SS0.8-60A		60	S1T	6	28	48	49.6	8	8	16	—
SS0.8-60B				8							
SS0.8-62A		62	S1T	6	28	49.6	51.2	8	8	16	—
SS0.8-64A		64	S1T	6	28	51.2	52.8	8	8	16	—
SS0.8-65A		65	S1T	6	28	52	53.6	8	8	16	—
SS0.8-66A		66	S1T	6	28	52.8	54.4	8	8	16	—
SS0.8-68A		68	S1T	6	28	54.4	56	8	8	16	—
SS0.8-70A		70	S1T	6	28	56	57.6	8	8	16	—
SS0.8-70B				8							
SS0.8-72A		72	S1T	6	28	57.6	59.2	8	8	16	—

[Caution on Product Characteristics]

- ① For products with a tapped hole, a set screw is included.
- ② The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ③ The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.
- ④ If the bore size is less than  $\phi 4$ , the tolerance is H8. If the bore size is  $\phi 5$  or  $\phi 6$ , and the hole length exceeds 3 times of the bore size, the tolerance is also H8.





S1T

Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No.
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
M4	3.5	1.89	0.088	0.19	0.0090	0~0.10	0.019	SS0.8-15A
M4	3.5	2.10	0.10	0.21	0.010	0~0.10	0.022	SS0.8-16A
M4	3.5	2.30	0.12	0.23	0.012	0~0.10	0.025	SS0.8-17A
M4	3.5	2.51	0.13	0.26	0.013	0~0.10	0.028	SS0.8-18A
M4	4	2.73	0.15	0.28	0.015	0~0.10	0.016	SS0.8-19A
M4	4	2.94	0.17	0.30	0.017	0~0.10	0.018	SS0.8-20A
M4	4	3.16	0.18	0.32	0.019	0~0.10	0.020	SS0.8-21A
M4	4	3.38	0.20	0.34	0.021	0~0.10	0.022	SS0.8-22A
M4	4	3.60	0.22	0.37	0.023	0~0.10	0.024	SS0.8-23A
M4	4	3.82	0.25	0.39	0.025	0~0.10	0.028	SS0.8-24A
M4	4	4.05	0.27	0.41	0.027	0~0.10	0.029	SS0.8-25A
M4	4	4.28	0.29	0.44	0.030	0~0.10	0.033	SS0.8-26A
M4	4	4.50	0.31	0.46	0.032	0~0.10	0.035	SS0.8-27A
M4	4	4.73	0.34	0.48	0.035	0~0.10	0.037	SS0.8-28A
M4	4	4.96	0.37	0.51	0.037	0~0.10	0.042	SS0.8-29A
M4	4	5.19	0.39	0.53	0.040	0~0.10	0.045	SS0.8-30A
M4	4	5.19	0.39	0.53	0.040	0~0.10	0.044	SS0.8-30B
M5	4	5.19	0.39	0.53	0.040	0~0.10	0.041	SS0.8-30C
M4	4	5.66	0.45	0.58	0.046	0~0.10	0.052	SS0.8-32A
M4	4	6.13	0.51	0.62	0.052	0~0.10	0.056	SS0.8-34A
M4	4	6.36	0.55	0.65	0.056	0~0.10	0.065	SS0.8-35A
M4	4	6.60	0.58	0.67	0.059	0~0.10	0.067	SS0.8-36A
M4	4	7.07	0.65	0.72	0.066	0~0.10	0.072	SS0.8-38A
M4	4	7.55	0.72	0.77	0.074	0~0.10	0.085	SS0.8-40A
M5	4	7.55	0.72	0.77	0.074	0~0.10	0.081	SS0.8-40B
M4	4	8.03	0.80	0.82	0.082	0~0.10	0.090	SS0.8-42A
M4	4	8.51	0.88	0.87	0.090	0~0.10	0.095	SS0.8-44A
M4	4	8.75	0.93	0.89	0.095	0~0.10	0.098	SS0.8-45A
M4	4	8.99	0.97	0.92	0.099	0~0.10	0.10	SS0.8-46A
M4	4	9.47	1.06	0.97	0.11	0~0.10	0.11	SS0.8-48A
M4	4	9.96	1.16	1.02	0.12	0~0.10	0.11	SS0.8-50A
M5	4	9.96	1.16	1.02	0.12	0~0.10	0.11	SS0.8-50B
M4	4	10.4	1.26	1.07	0.13	0~0.10	0.12	SS0.8-52A
M4	4	10.9	1.36	1.12	0.14	0~0.10	0.13	SS0.8-54A
M4	4	11.2	1.42	1.14	0.14	0~0.10	0.13	SS0.8-55A
M4	4	11.4	1.47	1.16	0.15	0~0.10	0.13	SS0.8-56A
M4	4	11.9	1.59	1.21	0.16	0~0.10	0.14	SS0.8-58A
M4	4	12.4	1.70	1.26	0.17	0~0.10	0.15	SS0.8-60A
M5	4	12.4	1.70	1.26	0.17	0~0.10	0.14	SS0.8-60B
M4	4	12.9	1.82	1.32	0.19	0~0.10	0.16	SS0.8-62A
M4	4	13.4	1.95	1.37	0.20	0~0.10	0.16	SS0.8-64A
M4	4	13.6	2.01	1.39	0.21	0~0.10	0.17	SS0.8-65A
M4	4	13.9	2.08	1.42	0.21	0~0.10	0.17	SS0.8-66A
M4	4	14.4	2.22	1.47	0.23	0~0.10	0.18	SS0.8-68A
M4	4	14.9	2.35	1.52	0.24	0~0.10	0.19	SS0.8-70A
M5	4	14.9	2.35	1.52	0.24	0~0.10	0.19	SS0.8-70B
M4	4	15.4	2.50	1.57	0.25	0~0.10	0.20	SS0.8-72A

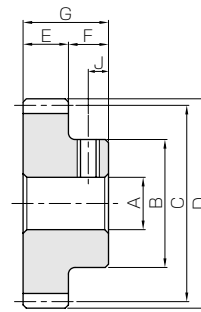
[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.

② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1:1998) * JIS grade 4 (JIS B1702:1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB

\* The precision grade of products with a module of less than 0.8 is equivalent to the value shown in the table.



S1T

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	Width×Depth
<b>SS0.8-75A</b>	<b>m0.8</b>	75	S1T	6	28	60	61.6	8	8	16	—
<b>SS0.8-76A</b>		76	S1T	6	28	60.8	62.4	8	8	16	—
<b>SS0.8-80A</b>		80	S1T	6	28	64	65.6	8	8	16	—
<b>SS0.8-80B</b>			S1T	8	28	64	65.6	8	8	16	—
<b>SS0.8-84A</b>		84	S1T	8	28	67.2	68.8	8	8	16	—
<b>SS0.8-85A</b>		85	S1T	8	28	68	69.6	8	8	16	—
<b>SS0.8-88A</b>		88	S1T	8	28	70.4	72	8	8	16	—
<b>SS0.8-90A</b>		90	S1T	8	28	72	73.6	8	8	16	—
<b>SS0.8-95A</b>		95	S1T	8	28	76	77.6	8	8	16	—
<b>SS0.8-96A</b>		96	S1T	8	28	76.8	78.4	8	8	16	—
<b>SS0.8-100A</b>		100	S1T	8	28	80	81.6	8	8	16	—
<b>SS0.8-105A</b>		105	S1T	8	28	84	85.6	8	8	16	—
<b>SS0.8-110A</b>		110	S1T	8	28	88	89.6	8	8	16	—
<b>SS0.8-115A</b>		115	S1T	8	28	92	93.6	8	8	16	—
<b>SS0.8-120A</b>		120	S1T	8	28	96	97.6	8	8	16	—

[Caution on Product Characteristics]

- ① For products with a tapped hole, a set screw is included.
- ② The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ③ The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.
- ④ If the bore size is less than  $\phi 4$ , the tolerance is H8. If the bore size is  $\phi 5$  or  $\phi 6$ , and the hole length exceeds 3 times of the bore size, the tolerance is also H8.

Spur Gears  
 Helical Gears  
 Internal Gears  
 Racks  
 CP Racks & Pinions  
 Miter Gears  
 Bevel Gears  
 Screw Gears  
 Worm Gear Pair  
 Bevel Gearboxes  
 Other Products

Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No.
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
M4	4	16.1	2.72	1.64	0.28	0~0.10	0.21	<b>SS0.8-75A</b>
M4	4	16.4	2.80	1.67	0.29	0~0.10	0.22	<b>SS0.8-76A</b>
M4	4	17.4	3.11	1.77	0.32	0~0.10	0.24	<b>SS0.8-80A</b>
M5	4						0.23	<b>SS0.8-80B</b>
M5	4	18.4	3.45	1.87	0.35	0~0.10	0.25	<b>SS0.8-84A</b>
M5	4	18.6	3.54	1.90	0.36	0~0.10	0.26	<b>SS0.8-85A</b>
M5	4	19.4	3.80	1.97	0.39	0~0.10	0.28	<b>SS0.8-88A</b>
M5	4	19.9	3.99	2.02	0.41	0~0.10	0.29	<b>SS0.8-90A</b>
M5	4	21.1	4.47	2.15	0.46	0~0.10	0.32	<b>SS0.8-95A</b>
M5	4	21.4	4.57	2.18	0.47	0~0.10	0.32	<b>SS0.8-96A</b>
M5	4	22.4	4.98	2.28	0.51	0~0.10	0.35	<b>SS0.8-100A</b>
M5	4	23.6	5.52	2.41	0.56	0~0.10	0.38	<b>SS0.8-105A</b>
M5	4	24.9	6.09	2.54	0.62	0~0.10	0.41	<b>SS0.8-110A</b>
M5	4	26.1	6.69	2.66	0.68	0~0.10	0.45	<b>SS0.8-115A</b>
M5	4	27.4	7.32	2.79	0.75	0~0.10	0.49	<b>SS0.8-120A</b>

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks &amp; Pinions

Miter Gears

Bevel Gears

Screw Gears

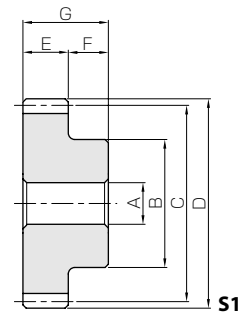
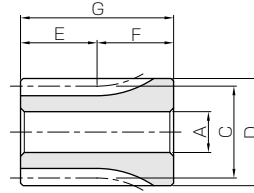
Worm Gear Pair

Bevel Gearboxes

Other Products



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB



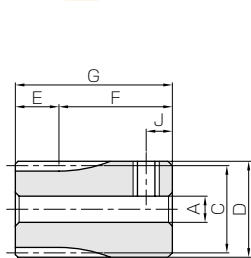
S3

S1

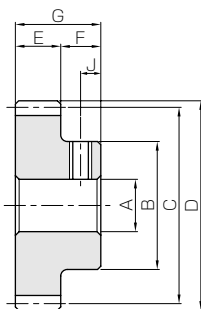
Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	Width×Depth
SS1-15 SS1-15A SS1-15B	m1	15	S3	8	17	15	17	10	20	30	—
S3T			5	—							
S3T			6	—							
SS1-16 SS1-16A SS1-16B		16	S3	8	18	16	18	10	20	30	—
S3T			5	—							
S3T			6	—							
SS1-17 SS1-17A		17	S3	8	19	17	19	10	20	30	—
S3T			8	—							
SS1-18 SS1-18A SS1-18B		18	S3	8	20	18	20	10	20	30	—
S3T			6	—							
S3T			8	—							
SS1-19 SS1-19A		19	S3	8	21	19	21	10	20	30	—
S3T			8	—							
SS1-20 SS1-20A SS1-20B SS1-20C		20	S1	8	16	20	22	10	10	20	—
S1T			5	—							
S1T			6	—							
S1T			8	—							
SS1-21 SS1-21A		21	S1	8	17	21	23	10	10	20	—
S1T			8	—							
SS1-22 SS1-22A		22	S1	8	18	22	24	10	10	20	—
S1T			8	—							
SS1-23 SS1-23A		23	S1	8	18	23	25	10	10	20	—
S1T			8	—							
SS1-24 SS1-24A SS1-24B SS1-24C		24	S1	8	20	24	26	10	10	20	—
S1T			6	—							
S1T			8	—							
S1K			10	4 x 1.8							
SS1-25 SS1-25A SS1-25B SS1-25C		25	S1	8	20	25	27	10	10	20	—
S1T			6	—							
S1T			8	—							
S1K			10	4 x 1.8							
SS1-26 SS1-26A SS1-26B		26	S1	8	22	26	28	10	10	20	—
S1T	8		—								
S1K	10		4 x 1.8								
SS1-27 SS1-27A	27	S1	8	22	27	29	10	10	20	—	
S1T		8	—								
SS1-28 SS1-28A SS1-28B	28	S1	8	22	28	30	10	10	20	—	
S1T		8	—								
S1K		10	4 x 1.8								
SS1-29 SS1-29A	29	S1	8	24	29	31	10	10	20	—	
S1T		8	—								
SS1-30 SS1-30A SS1-30B SS1-30C SS1-30D	30	S1	10	25	30	32	10	10	20	—	
S1T		6	—								
S1T		8	—								
S1K		10	4 x 1.8								
S1K		12	4 x 1.8								
SS1-32 SS1-32A SS1-32B SS1-32C	32	S1	10	26	32	34	10	10	20	—	
S1T		8	—								
S1K		10	4 x 1.8								
S1K		12	4 x 1.8								

[Caution on Product Characteristics]

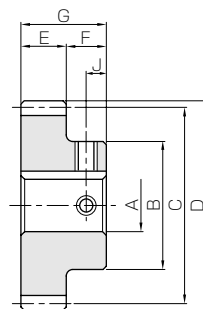
- ① For products with a tapped hole, a set screw is included.
- ② The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ③ The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.
- ④ If the bore size is less than  $\phi 4$ , the tolerance is H8. If the bore size is  $\phi 5$  or  $\phi 6$ , and the hole length exceeds 3 times of the bore size, the tolerance is also H8.



S3T



S1T



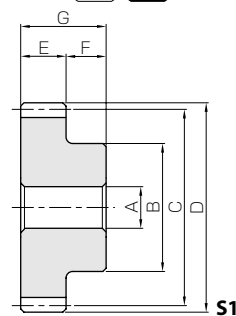
S1K

Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No.
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—	—	—	—	—	—	0.038	<b>SS1-15</b>
M4	4	3.69	0.17	0.38	0.018	0.08~0.18	0.044	<b>SS1-15A</b>
M4	4	—	—	—	—	—	0.042	<b>SS1-15B</b>
—	—	—	—	—	—	—	0.044	<b>SS1-16</b>
M4	4	4.09	0.2	0.42	0.021	0.08~0.18	0.051	<b>SS1-16A</b>
M4	4	—	—	—	—	—	0.049	<b>SS1-16B</b>
—	—	—	—	—	—	—	0.050	<b>SS1-17</b>
M5	4	4.5	0.23	0.46	0.023	0.08~0.18	0.050	<b>SS1-17A</b>
—	—	—	—	—	—	—	0.057	<b>SS1-18</b>
M4	4	4.91	0.26	0.5	0.027	0.08~0.18	0.062	<b>SS1-18A</b>
M5	4	—	—	—	—	—	0.057	<b>SS1-18B</b>
—	—	—	—	—	—	—	0.065	<b>SS1-19</b>
M5	4	5.33	0.29	0.54	0.030	0.08~0.18	0.064	<b>SS1-19A</b>
—	—	—	—	—	—	—	0.033	<b>SS1-20</b>
M4	5	5.75	0.33	0.59	0.033	0.08~0.18	0.037	<b>SS1-20A</b>
M4	5	—	—	—	—	—	0.036	<b>SS1-20B</b>
M5	5	—	—	—	—	—	0.032	<b>SS1-20C</b>
—	—	—	—	—	—	—	0.037	<b>SS1-21</b>
M5	5	6.17	0.36	0.63	0.037	0.08~0.18	0.036	<b>SS1-21A</b>
—	—	—	—	—	—	—	0.042	<b>SS1-22</b>
M5	5	6.6	0.4	0.67	0.041	0.08~0.18	0.041	<b>SS1-22A</b>
—	—	—	—	—	—	—	0.045	<b>SS1-23</b>
M5	5	7.03	0.45	0.72	0.045	0.08~0.18	0.044	<b>SS1-23A</b>
—	—	—	—	—	—	—	0.052	<b>SS1-24</b>
M4	5	7.47	0.49	0.76	0.050	0.08~0.18	0.055	<b>SS1-24A</b>
M5	5	—	—	—	—	—	0.051	<b>SS1-24B</b>
M4	5	—	—	—	—	—	0.046	<b>SS1-24C</b>
—	—	—	—	—	—	—	0.055	<b>SS1-25</b>
M4	5	7.91	0.54	0.81	0.055	0.08~0.18	0.058	<b>SS1-25A</b>
M5	5	—	—	—	—	—	0.054	<b>SS1-25B</b>
M4	5	—	—	—	—	—	0.049	<b>SS1-25C</b>
—	—	—	—	—	—	—	0.064	<b>SS1-26</b>
M5	5	8.35	0.58	0.85	0.059	0.08~0.18	0.063	<b>SS1-26A</b>
M4	5	—	—	—	—	—	0.057	<b>SS1-26B</b>
—	—	—	—	—	—	—	0.067	<b>SS1-27</b>
M5	5	8.79	0.63	0.9	0.064	0.08~0.18	0.066	<b>SS1-27A</b>
—	—	—	—	—	—	—	0.070	<b>SS1-28</b>
M5	5	9.24	0.68	0.94	0.070	0.08~0.18	0.069	<b>SS1-28A</b>
M4	5	—	—	—	—	—	0.064	<b>SS1-28B</b>
—	—	—	—	—	—	—	0.079	<b>SS1-29</b>
M5	5	9.69	0.73	0.99	0.075	0.08~0.18	0.078	<b>SS1-29A</b>
—	—	—	—	—	—	—	0.082	<b>SS1-30</b>
M4	5	10.1	0.79	1.03	0.081	0.08~0.18	0.089	<b>SS1-30A</b>
M5	5	—	—	—	—	—	0.085	<b>SS1-30B</b>
M4	5	—	—	—	—	—	0.080	<b>SS1-30C</b>
M4	5	—	—	—	—	—	0.075	<b>SS1-30D</b>
—	—	—	—	—	—	—	0.092	<b>SS1-32</b>
M5	5	11.1	0.90	1.13	0.092	0.08~0.18	0.096	<b>SS1-32A</b>
M4	5	—	—	—	—	—	0.091	<b>SS1-32B</b>
M4	5	—	—	—	—	—	0.085	<b>SS1-32C</b>

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.  
 ② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB

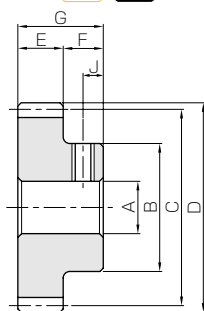


- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

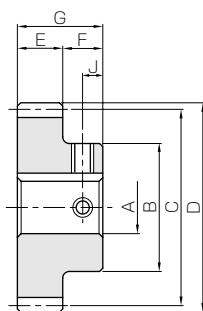
Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	Width×Depth
<b>SS1-34</b> <b>SS1-34A</b>	m1	34	S1	10	26	34	36	10	10	20	—
S1K			10	4 x 1.8							
<b>SS1-35</b> <b>SS1-35A</b> <b>SS1-35B</b>		35	S1	10	26	35	37	10	10	20	—
S1K			10	4 x 1.8							
S1K			12	4 x 1.8							
<b>SS1-36</b> <b>SS1-36A</b> <b>SS1-36B</b>		36	S1	10	28	36	38	10	10	20	—
S1K			10	4 x 1.8							
S1K			12	4 x 1.8							
<b>SS1-38</b> <b>SS1-38A</b>		38	S1	10	32	38	40	10	10	20	—
S1K			10	4 x 1.8							
<b>SS1-40</b> <b>SS1-40A</b> <b>SS1-40B</b> <b>SS1-40C</b>		40	S1	10	35	40	42	10	10	20	—
S1T			8	—							
S1K			10	4 x 1.8							
S1K			12	4 x 1.8							
<b>SS1-42</b> <b>SS1-42A</b>		42	S1	10	35	42	44	10	10	20	—
S1K			10	4 x 1.8							
<b>SS1-44</b> <b>SS1-44A</b>		44	S1	10	35	44	46	10	10	20	—
S1K			10	4 x 1.8							
<b>SS1-45</b> <b>SS1-45A</b> <b>SS1-45B</b> <b>SS1-45C</b>		45	S1	10	35	45	47	10	10	20	—
S1T			8	—							
S1K	10		4 x 1.8								
S1K	12		4 x 1.8								
<b>SS1-46</b> <b>SS1-46A</b>	46	S1	10	35	46	48	10	10	20	—	
S1K		10	4 x 1.8								
<b>SS1-48</b> <b>SS1-48A</b> <b>SS1-48B</b>	48	S1	10	35	48	50	10	10	20	—	
S1K		10	4 x 1.8								
S1K		12	4 x 1.8								
<b>SS1-50</b> <b>SS1-50A</b> <b>SS1-50B</b> <b>SS1-50C</b>	50	S1	10	35	50	52	10	10	20	—	
S1T		8	—								
S1K		10	4 x 1.8								
S1K		12	4 x 1.8								
<b>SS1-52</b> <b>SS1-52A</b>	52	S1	10	35	52	54	10	10	20	—	
S1K		10	4 x 1.8								
<b>SS1-54</b> <b>SS1-54A</b>	54	S1	10	35	54	56	10	10	20	—	
S1K		10	4 x 1.8								
<b>SS1-55</b> <b>SS1-55A</b>	55	S1	10	35	55	57	10	10	20	—	
S1K		10	4 x 1.8								
<b>SS1-56</b> <b>SS1-56A</b> <b>SS1-56B</b>	56	S1	10	35	56	58	10	10	20	—	
S1K		10	4 x 1.8								
S1K		12	4 x 1.8								
<b>SS1-58</b> <b>SS1-58A</b>	58	S1	10	35	58	60	10	10	20	—	
S1K		10	4 x 1.8								
<b>SS1-60</b> <b>SS1-60A</b> <b>SS1-60B</b> <b>SS1-60C</b>	60	S1	10	35	60	62	10	10	20	—	
S1K		10	4 x 1.8								
S1K		12	4 x 1.8								
S1K		15	5 x 2.3								
<b>SS1-62</b> <b>SS1-62A</b>	62	S1	10	40	62	64	10	10	20	—	
S1K		12	4 x 1.8								
<b>SS1-64</b> <b>SS1-64A</b>	64	S1	10	40	64	66	10	10	20	—	
S1K		12	4 x 1.8								

[Caution on Product Characteristics]

- ① For products with a tapped hole, a set screw is included.
- ② The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ③ The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.



S1T



S1K

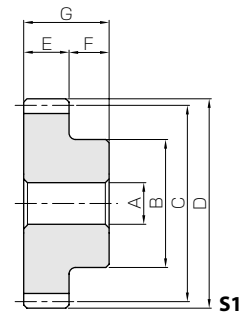
Set Screw		Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No.
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—	12.0	1.03	1.22	0.10	0.08~0.18	0.10	<b>SS1-34</b> <b>SS1-34A</b>
M4	5						0.099	
—	—	12.4	1.09	1.27	0.11	0.08~0.18	0.10	<b>SS1-35</b> <b>SS1-35A</b> <b>SS1-35B</b>
M4	5						0.10	
M4	5						0.098	
—	—	12.9	1.16	1.31	0.12	0.08~0.18	0.12	<b>SS1-36</b> <b>SS1-36A</b> <b>SS1-36B</b>
M4	5						0.11	
M4	5						0.11	
—	—	13.8	1.30	1.41	0.13	0.08~0.18	0.14	<b>SS1-38</b> <b>SS1-38A</b>
M4	5						0.14	
—	—	14.7	1.45	1.50	0.15	0.08~0.18	0.16	<b>SS1-40</b> <b>SS1-40A</b> <b>SS1-40B</b> <b>SS1-40C</b>
M5	5						0.16	
M4	5						0.16	
M4	5						0.15	
—	—	15.7	1.61	1.60	0.16	0.08~0.18	0.17	<b>SS1-42</b> <b>SS1-42A</b>
M4	5						0.17	
—	—	16.6	1.77	1.69	0.18	0.08~0.18	0.18	<b>SS1-44</b> <b>SS1-44A</b>
M4	5						0.18	
—	—	17.1	1.86	1.74	0.19	0.08~0.18	0.19	<b>SS1-45</b> <b>SS1-45A</b> <b>SS1-45B</b> <b>SS1-45C</b>
M5	5						0.19	
M4	5						0.19	
M4	5						0.18	
—	—	17.6	1.95	1.79	0.20	0.08~0.18	0.19	<b>SS1-46</b> <b>SS1-46A</b>
M4	5						0.19	
—	—	18.5	2.13	1.89	0.22	0.08~0.18	0.21	<b>SS1-48</b> <b>SS1-48A</b> <b>SS1-48B</b>
M4	5						0.20	
M4	5						0.20	
—	—	19.5	2.32	1.98	0.24	0.08~0.18	0.22	<b>SS1-50</b> <b>SS1-50A</b> <b>SS1-50B</b> <b>SS1-50C</b>
M5	5						0.22	
M4	5						0.21	
M4	5						0.21	
—	—	20.4	2.52	2.08	0.26	0.08~0.18	0.23	<b>SS1-52</b> <b>SS1-52A</b>
M4	5						0.23	
—	—	21.4	2.73	2.18	0.28	0.08~0.18	0.24	<b>SS1-54</b> <b>SS1-54A</b>
M4	5						0.24	
—	—	21.8	2.83	2.23	0.29	0.08~0.18	0.25	<b>SS1-55</b> <b>SS1-55A</b>
M4	5						0.25	
—	—	22.3	2.94	2.28	0.30	0.08~0.18	0.26	<b>SS1-56</b> <b>SS1-56A</b> <b>SS1-56B</b>
M4	5						0.25	
M4	5						0.25	
—	—	23.3	3.17	2.37	0.32	0.08~0.18	0.27	<b>SS1-58</b> <b>SS1-58A</b>
M4	5						0.27	
—	—	24.2	3.40	2.47	0.35	0.08~0.18	0.29	<b>SS1-60</b> <b>SS1-60A</b> <b>SS1-60B</b> <b>SS1-60C</b>
M4	5						0.28	
M4	5						0.28	
M4	5						0.27	
—	—	25.2	3.64	2.57	0.37	0.08~0.18	0.32	<b>SS1-62</b> <b>SS1-62A</b>
M4	5						0.32	
—	—	26.2	3.89	2.67	0.40	0.08~0.18	0.34	<b>SS1-64</b> <b>SS1-64A</b>
M4	5						0.33	

[Caution on Secondary Operations]

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- ② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB



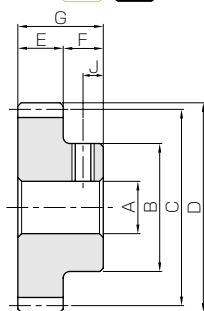
- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	Width×Depth
<b>SS1-65</b> <b>SS1-65A</b>	<b>m1</b>	65	S1	10	40	65	67	10	10	20	—
S1K			12	4 x 1.8							
<b>SS1-66</b> <b>SS1-66A</b>		66	S1	10	40	66	68	10	10	20	—
S1K			12	4 x 1.8							
<b>SS1-68</b> <b>SS1-68A</b>		68	S1	10	40	68	70	10	10	20	—
S1K			12	4 x 1.8							
<b>SS1-70</b> <b>SS1-70A</b> <b>SS1-70B</b> <b>SS1-70C</b>		70	S1	10	40	70	72	10	10	20	—
S1K			12	4 x 1.8							
S1K			15	5 x 2.3							
S1K			18	6 x 2.8							
<b>SS1-72</b> <b>SS1-72A</b> <b>SS1-72B</b> <b>SS1-72C</b>		72	S1	10	40	72	74	10	10	20	—
S1K			12	4 x 1.8							
S1K			15	5 x 2.3							
S1K			18	6 x 2.8							
<b>SS1-75</b> <b>SS1-75A</b>		75	S1	10	40	75	77	10	10	20	—
S1K			12	4 x 1.8							
<b>SS1-76</b> <b>SS1-76A</b>		76	S1	10	40	76	78	10	10	20	—
S1K			12	4 x 1.8							
<b>SS1-80</b> <b>SS1-80A</b> <b>SS1-80B</b> <b>SS1-80C</b>		80	S1	10	40	80	82	10	10	20	—
S1K			12	4 x 1.8							
S1K	15		5 x 2.3								
S1K	18		6 x 2.8								
<b>SS1-84</b> <b>SS1-84A</b>	84	S1	10	40	84	86	10	10	20	—	
S1K		12	4 x 1.8								
<b>SS1-85</b> <b>SS1-85A</b>	85	S1	10	40	85	87	10	10	20	—	
S1K		12	4 x 1.8								
<b>SS1-88</b> <b>SS1-88A</b>	88	S1	10	40	88	90	10	10	20	—	
S1K		12	4 x 1.8								
<b>SS1-90</b> <b>SS1-90A</b> <b>SS1-90B</b> <b>SS1-90C</b>	90	S1	10	40	90	92	10	10	20	—	
S1K		12	4 x 1.8								
S1K		15	5 x 2.3								
S1K		18	6 x 2.8								
<b>SS1-95</b> <b>SS1-95A</b>	95	S1	10	40	95	97	10	10	20	—	
S1K		12	4 x 1.8								
<b>SS1-96</b> <b>SS1-96A</b>	96	S1	10	40	96	98	10	10	20	—	
S1K		12	4 x 1.8								
<b>SS1-100</b> <b>SS1-100A</b> <b>SS1-100B</b> <b>SS1-100C</b>	100	S1	10	40	100	102	10	10	20	—	
S1K		12	4 x 1.8								
S1K		15	5 x 2.3								
S1K		18	6 x 2.8								
<b>SS1-110</b> <b>SS1-110A</b>	110	S1	15	50	110	112	10	10	20	—	
S1K		15	40	5 x 2.3							
<b>SS1-120</b> <b>SS1-120A</b> <b>SS1-120B</b>	120	S1	15	50	120	122	10	10	20	—	
S1K		15	40	5 x 2.3							
S1K		18	6 x 2.8								
<b>SS1-150</b>	150	S1	20	120	150	152	10	10	20	—	
<b>SS1-200</b>	200	S1	20	160	200	202	10	10	20	—	

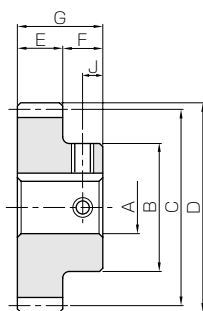
[Caution on Product Characteristics]

- ① For products with a tapped hole, a set screw is included.
- ② The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ③ The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.





S1T



S1K

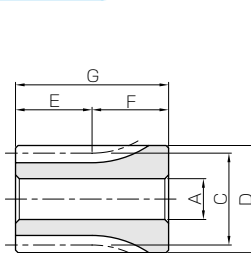
Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No.
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—	26.6	4.02	2.72	0.41	0.08~0.18	0.35 0.34	SS1-65 SS1-65A
M4	5							
—	—	27.1	4.15	2.77	0.42	0.08~0.18	0.35 0.35	SS1-66 SS1-66A
M4	5							
—	—	28.1	4.42	2.86	0.45	0.08~0.18	0.37 0.36	SS1-68 SS1-68A
M4	5							
—	—	29.1	4.70	2.96	0.48	0.08~0.18	0.39 0.38 0.37 0.36	SS1-70 SS1-70A SS1-70B SS1-70C
M4	5							
M4	5							
M5	5							
—	—	30.0	4.98	3.06	0.51	0.08~0.18	0.41 0.40 0.39 0.37	SS1-72 SS1-72A SS1-72B SS1-72C
M4	5							
M4	5							
M5	5							
—	—	31.5	5.43	3.21	0.55	0.08~0.18	0.43 0.42	SS1-75 SS1-75A
M4	5							
—	—	32.0	5.59	3.26	0.57	0.08~0.18	0.44 0.43	SS1-76 SS1-76A
M4	5							
—	—	33.9	6.23	3.46	0.63	0.08~0.18	0.48 0.47 0.46 0.45	SS1-80 SS1-80A SS1-80B SS1-80C
M4	5							
M4	5							
M5	5							
—	—	35.8	6.90	3.66	0.7	0.08~0.18	0.52 0.51	SS1-84 SS1-84A
M4	5							
—	—	36.3	7.08	3.71	0.72	0.08~0.18	0.53 0.52	SS1-85 SS1-85A
M4	5							
—	—	37.8	7.62	3.85	0.78	0.08~0.18	0.56 0.56	SS1-88 SS1-88A
M4	5							
—	—	38.8	7.98	3.95	0.81	0.08~0.18	0.59 0.58 0.57 0.55	SS1-90 SS1-90A SS1-90B SS1-90C
M4	5							
M4	5							
M5	5							
—	—	41.2	8.95	4.20	0.91	0.08~0.18	0.64 0.63	SS1-95 SS1-95A
M4	5							
—	—	41.7	9.15	4.25	0.93	0.08~0.18	0.65 0.65	SS1-96 SS1-96A
M4	5							
—	—	43.7	9.97	4.45	1.02	0.08~0.18	0.70 0.69 0.68 0.67	SS1-100 SS1-100A SS1-100B SS1-100C
M4	5							
M4	5							
M5	5							
—	—	48.6	12.2	4.95	1.24	0.08~0.18	0.87 0.81	SS1-110 SS1-110A
M4	5							
—	—	53.5	14.7	5.45	1.50	0.08~0.18	1.01 0.95 0.94	SS1-120 SS1-120A SS1-120B
M4	5							
M5	5							
—	—	68.2	23.6	6.96	2.41	0.08~0.18	2.23	SS1-150
—	—	71.5	33.6	7.29	3.42	0.08~0.18	4.00	SS1-200

[Caution on Secondary Operations]

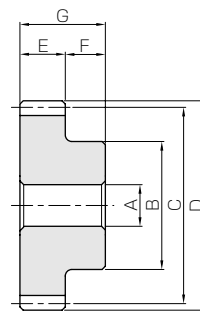
- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB



S3

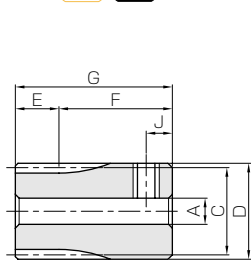


S1

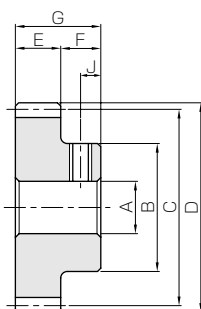
Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	H	I	Width×Depth
<b>SS1.5-12</b> <b>SS1.5-12A</b>	m1.5	12	S3 S3T	8 6	21	18	21	15	15	30	—	—	—
<b>SS1.5-13</b> <b>SS1.5-13A</b>		13	S3 S3T	8 6	22.5	19.5	22.5	15	15	30	—	—	—
<b>SS1.5-14</b> <b>SS1.5-14A</b> <b>SS1.5-14B</b>		14	S1 S1T S1T	8 6 8	16	21	24	15	10	25	—	—	—
<b>SS1.5-15</b> <b>SS1.5-15A</b> <b>SS1.5-15B</b>		15	S1 S1T S1T	8 6 8	18	22.5	25.5	15	10	25	—	—	—
<b>SS1.5-16</b> <b>SS1.5-16A</b> <b>SS1.5-16B</b>		16	S1 S1T S1T	8 6 8	20	24	27	15	10	25	—	—	—
<b>SS1.5-17</b> <b>SS1.5-17A</b>		17	S1 S1T	8 8	21	25.5	28.5	15	10	25	—	—	—
<b>SS1.5-18</b> <b>SS1.5-18A</b> <b>SS1.5-18B</b>		18	S1 S1T S1K	8 8 10	22	27	30	15	10	25	—	—	4 x 1.8
<b>SS1.5-19</b> <b>SS1.5-19A</b>		19	S1 S1T	8 8	23	28.5	31.5	15	10	25	—	—	—
<b>SS1.5-20</b> <b>SS1.5-20A</b> <b>SS1.5-20B</b> <b>SS1.5-20C</b>		20	S1 S1T S1T S1K	8 6 8 10	24	30	33	15	10	25	—	—	4 x 1.8
<b>SS1.5-21</b> <b>SS1.5-21A</b> <b>SS1.5-21B</b>		21	S1 S1T S1K	8 8 10	25	31.5	34.5	15	10	25	—	—	4 x 1.8
<b>SS1.5-22</b> <b>SS1.5-22A</b>		22	S1 S1K	8 10	26	33	36	15	10	25	—	—	4 x 1.8
<b>SS1.5-23</b> <b>SS1.5-23A</b>		23	S1 S1K	8 10	27	34.5	37.5	15	10	25	—	—	4 x 1.8
<b>SS1.5-24</b> <b>SS1.5-24A</b> <b>SS1.5-24B</b> <b>SS1.5-24C</b>		24	S1 S1T S1K S1K	8 8 10 12	28	36	39	15	10	25	—	—	4 x 1.8 4 x 1.8
<b>SS1.5-25</b> <b>SS1.5-25A</b> <b>SS1.5-25B</b> <b>SS1.5-25C</b>		25	S1 S1T S1K S1K	8 8 10 12	30	37.5	40.5	15	10	25	—	—	4 x 1.8 4 x 1.8
<b>SS1.5-26</b> <b>SS1.5-26A</b>		26	S1 S1K	10 12	32	39	42	15	10	25	—	—	4 x 1.8
<b>SS1.5-27</b> <b>SS1.5-27A</b>		27	S1 S1K	10 12	34	40.5	43.5	15	10	25	—	—	4 x 1.8
<b>SS1.5-28</b> <b>SS1.5-28A</b>		28	S1 S1K	10 12	36	42	45	15	10	25	—	—	4 x 1.8
<b>SS1.5-29</b> <b>SS1.5-29A</b>		29	S1 S1K	10 12	37	43.5	46.5	15	10	25	—	—	4 x 1.8
<b>SS1.5-30</b> <b>SS1.5-30A</b> <b>SS1.5-30B</b> <b>SS1.5-30C</b> <b>SS1.5-30D</b>		30	S1 S1K S1K S1K S1K	10 10 12 15 16	38	45	48	15	10	25	—	—	4 x 1.8 4 x 1.8 5 x 2.3 5 x 2.3

[Caution on Product Characteristics]

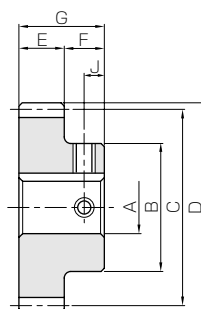
- ① For products with a tapped hole, a set screw is included.
- ② The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ③ The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.



S3T



S1T



S1K

Set Screw		Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No.
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—	6.86	0.36	0.70	0.037	0.10~0.22	0.059 0.063	<b>SS1.5-12</b> <b>SS1.5-12A</b>
M4	4	8.84	0.44	0.90	0.045	0.10~0.22	0.070 0.075	<b>SS1.5-13</b> <b>SS1.5-13A</b>
—	—	11.1	0.52	1.13	0.053	0.10~0.22	0.047 0.051 0.046	<b>SS1.5-14</b> <b>SS1.5-14A</b> <b>SS1.5-14B</b>
M4	5	12.5	0.60	1.27	0.062	0.10~0.22	0.057 0.061 0.056	<b>SS1.5-15</b> <b>SS1.5-15A</b> <b>SS1.5-15B</b>
—	—	13.8	0.70	1.41	0.071	0.10~0.22	0.068 0.072 0.067	<b>SS1.5-16</b> <b>SS1.5-16A</b> <b>SS1.5-16B</b>
M4	5	15.2	0.80	1.55	0.082	0.10~0.22	0.077 0.077	<b>SS1.5-17</b> <b>SS1.5-17A</b>
—	—	16.6	0.91	1.69	0.093	0.10~0.22	0.087 0.086 0.080	<b>SS1.5-18</b> <b>SS1.5-18A</b> <b>SS1.5-18B</b>
M5	5	18.0	1.03	1.83	0.11	0.10~0.22	0.098 0.097	<b>SS1.5-19</b> <b>SS1.5-19A</b>
—	—	19.4	1.15	1.98	0.12	0.10~0.22	0.11 0.11 0.11 0.10	<b>SS1.5-20</b> <b>SS1.5-20A</b> <b>SS1.5-20B</b> <b>SS1.5-20C</b>
M4	5	20.8	1.29	2.12	0.13	0.12~0.26	0.12 0.12 0.11	<b>SS1.5-21</b> <b>SS1.5-21A</b> <b>SS1.5-21B</b>
—	—	22.3	1.43	2.27	0.15	0.12~0.26	0.13 0.12	<b>SS1.5-22</b> <b>SS1.5-22A</b>
M5	5	23.7	1.58	2.42	0.16	0.12~0.26	0.15 0.14	<b>SS1.5-23</b> <b>SS1.5-23A</b>
—	—	25.2	1.73	2.57	0.18	0.12~0.26	0.16 0.16 0.15 0.14	<b>SS1.5-24</b> <b>SS1.5-24A</b> <b>SS1.5-24B</b> <b>SS1.5-24C</b>
M4	5	26.7	1.90	2.72	0.19	0.12~0.26	0.18 0.17 0.17 0.16	<b>SS1.5-25</b> <b>SS1.5-25A</b> <b>SS1.5-25B</b> <b>SS1.5-25C</b>
—	—	28.2	2.06	2.87	0.21	0.12~0.26	0.19 0.18	<b>SS1.5-26</b> <b>SS1.5-26A</b>
M4	5	29.7	2.23	3.03	0.23	0.12~0.26	0.21 0.20	<b>SS1.5-27</b> <b>SS1.5-27A</b>
—	—	31.2	2.41	3.18	0.25	0.12~0.26	0.23 0.22	<b>SS1.5-28</b> <b>SS1.5-28A</b>
M4	5	32.7	2.60	3.34	0.26	0.12~0.26	0.24 0.23	<b>SS1.5-29</b> <b>SS1.5-29A</b>
—	—	34.2	2.79	3.49	0.28	0.12~0.26	0.26 0.26 0.25 0.24 0.23	<b>SS1.5-30</b> <b>SS1.5-30A</b> <b>SS1.5-30B</b> <b>SS1.5-30C</b> <b>SS1.5-30D</b>

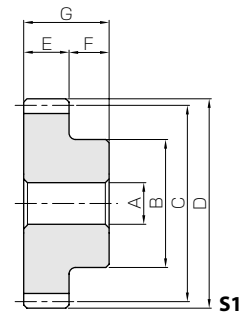
[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB

\* The precision grade of J Series products is equivalent to the value shown in the table.



Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	H	I	Width×Depth
<b>SS1.5-32</b>	<b>m1.5</b>	32	S1	10	40	48	51	15	10	25	—	—	—
<b>SS1.5-32A</b>			S1K	10	38								4 x 1.8
<b>SS1.5-32B</b>			S1K	12	38								4 x 1.8
<b>SS1.5-32C</b>			S1K	15	38								5 x 2.3
<b>SS1.5-32D</b>			S1K	16	38								5 x 2.3
<b>SS1.5-34</b>		34	S1	10	40	51	54	15	10	25	—	—	—
<b>SS1.5-34A</b>			S1K	12	38								4 x 1.8
<b>SS1.5-35</b>		35	S1	10	42	52.5	55.5	15	10	25	—	—	—
<b>SS1.5-35A</b>			S1K	12	40								4 x 1.8
<b>SS1.5-36</b>		36	S1	10	45	54	57	15	10	25	—	—	—
<b>SS1.5-36A</b>			S1K	12	40								4 x 1.8
<b>SS1.5-38</b>		38	S1	12	45	57	60	15	10	25	—	—	—
<b>SS1.5-38A</b>			S1K	15	40								5 x 2.3
<b>SS1.5-40</b>		40	S1	12	45	60	63	15	10	25	—	—	—
<b>SS1.5-40A</b>			S1K	12	40								4 x 1.8
<b>SS1.5-40B</b>			S1K	15	40								5 x 2.3
<b>SS1.5-40C</b>			S1K	16	40								5 x 2.3
<b>SS1.5-42</b>		42	S1	12	45	63	66	15	10	25	—	—	—
● <b>SS1.5-42 J12</b>			S1K	12									4 x 1.8
● <b>SS1.5-42 J14</b>			S1K	14									5 x 2.3
● <b>SS1.5-42 J15</b>			S1K	15									5 x 2.3
● <b>SS1.5-42 J16</b>			S1K	16									5 x 2.3
● <b>SS1.5-42 J18</b>			S1K	18									6 x 2.8
● <b>SS1.5-42 J19</b>			S1K	19									6 x 2.8
● <b>SS1.5-42 J20</b>			S1K	20									6 x 2.8
● <b>SS1.5-42 J22</b>			S1K	22									6 x 2.8
● <b>SS1.5-42 J25</b>			S1K	25									8 x 3.3
<b>SS1.5-44</b>		44	S1	12	45	66	69	15	10	25	—	—	—
● <b>SS1.5-44 J12</b>	S1K		12	4 x 1.8									
● <b>SS1.5-44 J14</b>	S1K		14	5 x 2.3									
● <b>SS1.5-44 J15</b>	S1K		15	5 x 2.3									
● <b>SS1.5-44 J16</b>	S1K		16	5 x 2.3									
● <b>SS1.5-44 J18</b>	S1K		18	6 x 2.8									
● <b>SS1.5-44 J19</b>	S1K		19	6 x 2.8									
● <b>SS1.5-44 J20</b>	S1K		20	6 x 2.8									
● <b>SS1.5-44 J22</b>	S1K		22	6 x 2.8									
● <b>SS1.5-44 J25</b>	S1K		25	8 x 3.3									
<b>SS1.5-45</b>	45	S1	12	45	67.5	70.5	15	10	25	—	—	—	
● <b>SS1.5-45 J12</b>		S1K	12									4 x 1.8	
● <b>SS1.5-45 J14</b>		S1K	14									5 x 2.3	
● <b>SS1.5-45 J15</b>		S1K	15									5 x 2.3	
● <b>SS1.5-45 J16</b>		S1K	16									5 x 2.3	
● <b>SS1.5-45 J18</b>		S1K	18									6 x 2.8	
● <b>SS1.5-45 J19</b>		S1K	19									6 x 2.8	
● <b>SS1.5-45 J20</b>		S1K	20									6 x 2.8	
● <b>SS1.5-45 J22</b>		S1K	22									6 x 2.8	
● <b>SS1.5-45 J25</b>		S1K	25									8 x 3.3	

[Caution on Product Characteristics]

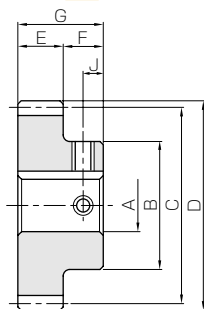
- ① For products with a tapped hole, a set screw is included.
- ② The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ③ The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations]

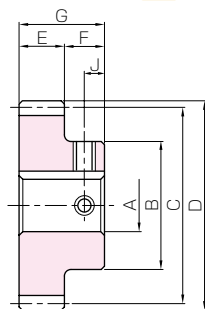
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- ② Avoid performing secondary operations that narrow the tooth width, as it affects precision and strength.



# Steel Spur Gears



S1K



S1K



Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)					
Size	J	Bending strength	Surface durability	Bending strength	Surface durability								
—	—	—	—	—	—	—	0.30	<b>SS1.5-32</b>					
M4	5	37.3	3.19	3.80	0.33	0.12~0.26	0.28	<b>SS1.5-32A</b>					
M4	5						0.28	<b>SS1.5-32B</b>					
M4	5						0.26	<b>SS1.5-32C</b>					
M4	5						0.26	<b>SS1.5-32D</b>					
—	—	—	—	—	—	—	0.32	<b>SS1.5-34</b>					
M4	5	40.4	3.63	4.12	0.37	0.12~0.26	0.30	<b>SS1.5-34A</b>					
—	—	—	—	—	—	—	0.35	<b>SS1.5-35</b>					
M4	5	41.9	3.85	4.28	0.39	0.12~0.26	0.33	<b>SS1.5-35A</b>					
—	—	—	—	—	—	—	0.38	<b>SS1.5-36</b>					
M4	5	43.5	4.09	4.43	0.42	0.12~0.26	0.34	<b>SS1.5-36A</b>					
—	—	—	—	—	—	—	0.40	<b>SS1.5-38</b>					
M4	5	46.6	4.58	4.75	0.47	0.12~0.26	0.36	<b>SS1.5-38A</b>					
—	—	—	—	—	—	—	0.44	<b>SS1.5-40</b>					
M4	5	49.8	5.10	5.07	0.52	0.12~0.26	0.41	<b>SS1.5-40A</b>					
M4	5						0.39	<b>SS1.5-40B</b>					
M4	5						0.39	<b>SS1.5-40C</b>					
M4	5						0.39	<b>SS1.5-40C</b>					
—	—	—	—	—	—	—	0.47	<b>SS1.5-42</b>					
M4*	5	52.9	5.65	5.40	0.58	0.14~0.32	0.46	● <b>SS1.5-42 J12</b>					
M4*	5						0.46	● <b>SS1.5-42 J14</b>					
M4*	5						0.45	● <b>SS1.5-42 J15</b>					
M4*	5						0.45	● <b>SS1.5-42 J16</b>					
M5	5						0.44	● <b>SS1.5-42 J18</b>					
M5	5						0.43	● <b>SS1.5-42 J19</b>					
M5	5						0.42	● <b>SS1.5-42 J20</b>					
M5	5						0.41	● <b>SS1.5-42 J22</b>					
M6	5						0.39	● <b>SS1.5-42 J25</b>					
—	—						—	—	—	—	—	0.51	<b>SS1.5-44</b>
M4*	5						56.1	6.23	5.72	0.64	0.14~0.32	0.50	● <b>SS1.5-44 J12</b>
M4*	5											0.49	● <b>SS1.5-44 J14</b>
M4*	5	0.49	● <b>SS1.5-44 J15</b>										
M4*	5	0.48	● <b>SS1.5-44 J16</b>										
M5	5	0.47	● <b>SS1.5-44 J18</b>										
M5	5	0.47	● <b>SS1.5-44 J19</b>										
M5	5	0.46	● <b>SS1.5-44 J20</b>										
M5	5	0.45	● <b>SS1.5-44 J22</b>										
M6	5	0.42	● <b>SS1.5-44 J25</b>										
—	—	—	—	—	—	—						0.52	<b>SS1.5-45</b>
M4*	5	57.7	6.53	5.88	0.67	0.14~0.32						0.52	● <b>SS1.5-45 J12</b>
M4*	5											0.51	● <b>SS1.5-45 J14</b>
M4*	5						0.51	● <b>SS1.5-45 J15</b>					
M4*	5						0.50	● <b>SS1.5-45 J16</b>					
M5	5						0.49	● <b>SS1.5-45 J18</b>					
M5	5						0.48	● <b>SS1.5-45 J19</b>					
M5	5						0.48	● <b>SS1.5-45 J20</b>					
M5	5						0.47	● <b>SS1.5-45 J22</b>					
M6	5						0.44	● <b>SS1.5-45 J25</b>					

**[Caution on J series]**

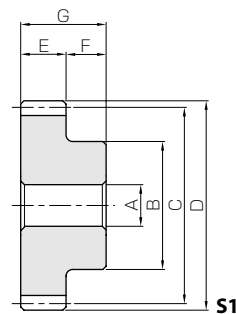
- ① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).
- ⑤ Areas of products which have been re-worked will not be black oxide coated.
- ⑥ For products having a tapped hole, a set screw is included.

- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB

\* The precision grade of J Series products is equivalent to the value shown in the table.



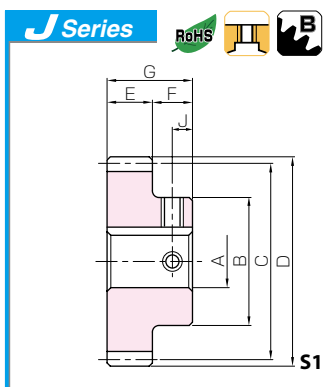
Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	H	I	Width×Depth
SS1.5-46 ● SS1.5-46 J12 ● SS1.5-46 J14 ● SS1.5-46 J15 ● SS1.5-46 J16 ● SS1.5-46 J18 ● SS1.5-46 J19 ● SS1.5-46 J20 ● SS1.5-46 J22 ● SS1.5-46 J25	m1.5	46	S1	12	45	69	72	15	10	25	—	—	—
			S1K	12									4 x 1.8
			S1K	14									5 x 2.3
			S1K	15									5 x 2.3
			S1K	16									5 x 2.3
			S1K	18									6 x 2.8
			S1K	19									6 x 2.8
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
S1K	25	8 x 3.3											
SS1.5-48 ● SS1.5-48 J12 ● SS1.5-48 J14 ● SS1.5-48 J15 ● SS1.5-48 J16 ● SS1.5-48 J18 ● SS1.5-48 J19 ● SS1.5-48 J20 ● SS1.5-48 J22 ● SS1.5-48 J25	m1.5	48	S1	12	45	72	75	15	10	25	—	—	—
			S1K	12									4 x 1.8
			S1K	14									5 x 2.3
			S1K	15									5 x 2.3
			S1K	16									5 x 2.3
			S1K	18									6 x 2.8
			S1K	19									6 x 2.8
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
S1K	25	8 x 3.3											
SS1.5-50 ● SS1.5-50 J12 ● SS1.5-50 J14 ● SS1.5-50 J15 ● SS1.5-50 J16 ● SS1.5-50 J18 ● SS1.5-50 J19 ● SS1.5-50 J20 ● SS1.5-50 J22 ● SS1.5-50 J25	m1.5	50	S1	12	45	75	78	15	10	25	—	—	—
			S1K	12									4 x 1.8
			S1K	14									5 x 2.3
			S1K	15									5 x 2.3
			S1K	16									5 x 2.3
			S1K	18									6 x 2.8
			S1K	19									6 x 2.8
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
S1K	25	8 x 3.3											
SS1.5-52 ● SS1.5-52 J15 ● SS1.5-52 J16 ● SS1.5-52 J18 ● SS1.5-52 J19 ● SS1.5-52 J20 ● SS1.5-52 J22 ● SS1.5-52 J25 ● SS1.5-52 J28 ● SS1.5-52 J30	m1.5	52	S1	15	50	78	81	15	10	25	—	—	—
			S1K	15									5 x 2.3
			S1K	16									5 x 2.3
			S1K	18									6 x 2.8
			S1K	19									6 x 2.8
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
S1K	30	8 x 3.3											
SS1.5-54 ● SS1.5-54 J15 ● SS1.5-54 J16 ● SS1.5-54 J18 ● SS1.5-54 J19 ● SS1.5-54 J20 ● SS1.5-54 J22 ● SS1.5-54 J25 ● SS1.5-54 J28 ● SS1.5-54 J30	m1.5	54	S1	15	50	81	84	15	10	25	—	—	—
			S1K	15									5 x 2.3
			S1K	16									5 x 2.3
			S1K	18									6 x 2.8
			S1K	19									6 x 2.8
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
S1K	30	8 x 3.3											

[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Avoid performing secondary operations that narrow the tooth width, as it affects precision and strength.



### Steel Spur Gears



Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—						0.54	<b>SS1.5-46</b>
M4*	5						0.54	● <b>SS1.5-46 J12</b>
M4*	5						0.53	● <b>SS1.5-46 J14</b>
M4*	5						0.52	● <b>SS1.5-46 J15</b>
M4*	5						0.52	● <b>SS1.5-46 J16</b>
M5	5	59.3	6.83	6.04	0.70	0.14~0.32	0.51	● <b>SS1.5-46 J18</b>
M5	5						0.50	● <b>SS1.5-46 J19</b>
M5	5						0.50	● <b>SS1.5-46 J20</b>
M5	5						0.48	● <b>SS1.5-46 J22</b>
M6	5						0.46	● <b>SS1.5-46 J25</b>
—	—						0.58	<b>SS1.5-48</b>
M4*	5						0.58	● <b>SS1.5-48 J12</b>
M4*	5						0.57	● <b>SS1.5-48 J14</b>
M4*	5						0.56	● <b>SS1.5-48 J15</b>
M4*	5						0.56	● <b>SS1.5-48 J16</b>
M5	5	62.4	7.47	6.37	0.76	0.14~0.32	0.55	● <b>SS1.5-48 J18</b>
M5	5						0.54	● <b>SS1.5-48 J19</b>
M5	5						0.54	● <b>SS1.5-48 J20</b>
M5	5						0.52	● <b>SS1.5-48 J22</b>
M6	5						0.50	● <b>SS1.5-48 J25</b>
—	—						0.62	<b>SS1.5-50</b>
M4*	5						0.62	● <b>SS1.5-50 J12</b>
M4*	5						0.61	● <b>SS1.5-50 J14</b>
M4*	5						0.60	● <b>SS1.5-50 J15</b>
M4*	5						0.60	● <b>SS1.5-50 J16</b>
M5	5	65.7	8.15	6.69	0.83	0.14~0.32	0.60	● <b>SS1.5-50 J18</b>
M5	5						0.59	● <b>SS1.5-50 J19</b>
M5	5						0.58	● <b>SS1.5-50 J20</b>
M5	5						0.56	● <b>SS1.5-50 J22</b>
M6	5						0.54	● <b>SS1.5-50 J25</b>
—	—						0.68	<b>SS1.5-52</b>
M4*	5						0.67	● <b>SS1.5-52 J15</b>
M4*	5						0.67	● <b>SS1.5-52 J16</b>
M5	5						0.66	● <b>SS1.5-52 J18</b>
M5	5						0.65	● <b>SS1.5-52 J19</b>
M5	5	68.9	8.85	7.02	0.90	0.14~0.32	0.65	● <b>SS1.5-52 J20</b>
M5	5						0.64	● <b>SS1.5-52 J22</b>
M6	5						0.61	● <b>SS1.5-52 J25</b>
M6	5						0.59	● <b>SS1.5-52 J28</b>
M6	5						0.57	● <b>SS1.5-52 J30</b>
—	—						0.73	<b>SS1.5-54</b>
M4*	5						0.72	● <b>SS1.5-54 J15</b>
M4*	5						0.71	● <b>SS1.5-54 J16</b>
M5	5						0.70	● <b>SS1.5-54 J18</b>
M5	5						0.70	● <b>SS1.5-54 J19</b>
M5	5	72.1	9.59	7.35	0.98	0.14~0.32	0.69	● <b>SS1.5-54 J20</b>
M5	5						0.68	● <b>SS1.5-54 J22</b>
M6	5						0.66	● <b>SS1.5-54 J25</b>
M6	5						0.63	● <b>SS1.5-54 J28</b>
M6	5						0.61	● <b>SS1.5-54 J30</b>

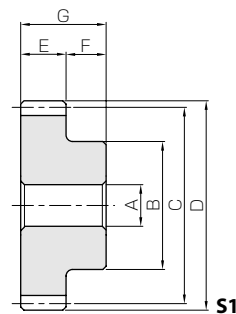
**[Caution on J series]**

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- ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).
- ⑤ Areas of products which have been re-worked will not be black oxide coated.
- ⑥ For products having a tapped hole, a set screw is included.



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB

\* The precision grade of J Series products is equivalent to the value shown in the table.



Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks &amp; Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

Bevel Gearboxes

Other Products

Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	H	I	Width×Depth
SS1.5-55 ● SS1.5-55 J15 ● SS1.5-55 J16 ● SS1.5-55 J18 ● SS1.5-55 J19 ● SS1.5-55 J20 ● SS1.5-55 J22 ● SS1.5-55 J25 ● SS1.5-55 J28 ● SS1.5-55 J30	m1.5	55	S1	15	50	82.5	85.5	15	10	25	—	—	—
			S1K	15									5 x 2.3
			S1K	16									5 x 2.3
			S1K	18									6 x 2.8
			S1K	19									6 x 2.8
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
			S1K	30									8 x 3.3
SS1.5-56 ● SS1.5-56 J15 ● SS1.5-56 J16 ● SS1.5-56 J18 ● SS1.5-56 J19 ● SS1.5-56 J20 ● SS1.5-56 J22 ● SS1.5-56 J25 ● SS1.5-56 J28 ● SS1.5-56 J30	m1.5	56	S1	15	50	84	87	15	10	25	—	—	—
			S1K	15									5 x 2.3
			S1K	16									5 x 2.3
			S1K	18									6 x 2.8
			S1K	19									6 x 2.8
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
			S1K	30									8 x 3.3
SS1.5-58 ● SS1.5-58 J15 ● SS1.5-58 J16 ● SS1.5-58 J18 ● SS1.5-58 J19 ● SS1.5-58 J20 ● SS1.5-58 J22 ● SS1.5-58 J25 ● SS1.5-58 J28 ● SS1.5-58 J30	m1.5	58	S1	15	50	87	90	15	10	25	—	—	—
			S1K	15									5 x 2.3
			S1K	16									5 x 2.3
			S1K	18									6 x 2.8
			S1K	19									6 x 2.8
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
			S1K	30									8 x 3.3
SS1.5-60 ● SS1.5-60 J15 ● SS1.5-60 J16 ● SS1.5-60 J18 ● SS1.5-60 J19 ● SS1.5-60 J20 ● SS1.5-60 J22 ● SS1.5-60 J25 ● SS1.5-60 J28 ● SS1.5-60 J30	m1.5	60	S1	15	50	90	93	15	10	25	—	—	—
			S1K	15									5 x 2.3
			S1K	16									5 x 2.3
			S1K	18									6 x 2.8
			S1K	19									6 x 2.8
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
			S1K	30									8 x 3.3
SS1.5-62 ● SS1.5-62 J15 ● SS1.5-62 J16 ● SS1.5-62 J18 ● SS1.5-62 J19 ● SS1.5-62 J20 ● SS1.5-62 J22 ● SS1.5-62 J25 ● SS1.5-62 J28 ● SS1.5-62 J30 ● SS1.5-62 J32	m1.5	62	S1	15	55	93	96	15	10	25	—	—	—
			S1K	15									5 x 2.3
			S1K	16									5 x 2.3
			S1K	18									6 x 2.8
			S1K	19									6 x 2.8
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
			S1K	30									8 x 3.3
S1K	32	10 x 3.3											

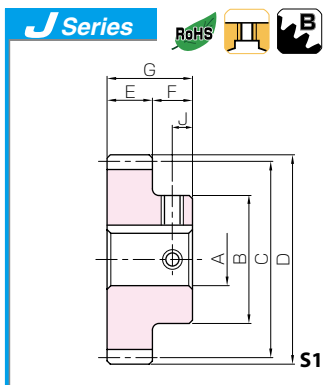
[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations]

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- ② Avoid performing secondary operations that narrow the tooth width, as it affects precision and strength.





### Steel Spur Gears



Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—						0.75	<b>SS1.5-55</b>
M4*	5						0.74	● <b>SS1.5-55 J15</b>
M4*	5						0.74	● <b>SS1.5-55 J16</b>
M5	5						0.73	● <b>SS1.5-55 J18</b>
M5	5	73.7	9.96	7.51	1.02	0.14~0.32	0.72	● <b>SS1.5-55 J19</b>
M5	5						0.72	● <b>SS1.5-55 J20</b>
M5	5						0.70	● <b>SS1.5-55 J22</b>
M6	5						0.68	● <b>SS1.5-55 J25</b>
M6	5						0.65	● <b>SS1.5-55 J28</b>
M6	5						0.64	● <b>SS1.5-55 J30</b>
—	—						0.77	<b>SS1.5-56</b>
M4*	5						0.76	● <b>SS1.5-56 J15</b>
M4*	5						0.76	● <b>SS1.5-56 J16</b>
M5	5						0.75	● <b>SS1.5-56 J18</b>
M5	5	75.3	10.4	7.68	1.06	0.14~0.32	0.74	● <b>SS1.5-56 J19</b>
M5	5						0.74	● <b>SS1.5-56 J20</b>
M5	5						0.73	● <b>SS1.5-56 J22</b>
M6	5						0.70	● <b>SS1.5-56 J25</b>
M6	5						0.68	● <b>SS1.5-56 J28</b>
M6	5						0.66	● <b>SS1.5-56 J30</b>
—	—						0.82	<b>SS1.5-58</b>
M4*	5						0.81	● <b>SS1.5-58 J15</b>
M4*	5						0.81	● <b>SS1.5-58 J16</b>
M5	5						0.80	● <b>SS1.5-58 J18</b>
M5	5	78.5	11.2	8.01	1.14	0.14~0.32	0.79	● <b>SS1.5-58 J19</b>
M5	5						0.79	● <b>SS1.5-58 J20</b>
M5	5						0.77	● <b>SS1.5-58 J22</b>
M6	5						0.75	● <b>SS1.5-58 J25</b>
M6	5						0.73	● <b>SS1.5-58 J28</b>
M6	5						0.71	● <b>SS1.5-58 J30</b>
—	—						0.87	<b>SS1.5-60</b>
M4*	5						0.86	● <b>SS1.5-60 J15</b>
M4*	5						0.86	● <b>SS1.5-60 J16</b>
M5	5						0.85	● <b>SS1.5-60 J18</b>
M5	5	81.8	12.0	8.34	1.22	0.14~0.32	0.84	● <b>SS1.5-60 J19</b>
M5	5						0.84	● <b>SS1.5-60 J20</b>
M5	5						0.82	● <b>SS1.5-60 J22</b>
M6	5						0.80	● <b>SS1.5-60 J25</b>
M6	5						0.77	● <b>SS1.5-60 J28</b>
M6	5						0.76	● <b>SS1.5-60 J30</b>
—	—						0.95	<b>SS1.5-62</b>
M4*	5						0.94	● <b>SS1.5-62 J15</b>
M4*	5						0.94	● <b>SS1.5-62 J16</b>
M5*	5						0.93	● <b>SS1.5-62 J18</b>
M5*	5	85.0	12.8	8.67	1.31	0.14~0.32	0.92	● <b>SS1.5-62 J19</b>
M5*	5						0.92	● <b>SS1.5-62 J20</b>
M5	5						0.90	● <b>SS1.5-62 J22</b>
M6	5						0.88	● <b>SS1.5-62 J25</b>
M6	5						0.86	● <b>SS1.5-62 J28</b>
M6	5						0.84	● <b>SS1.5-62 J30</b>
M8	5						0.82	● <b>SS1.5-62 J32</b>

**[Caution on J series]**

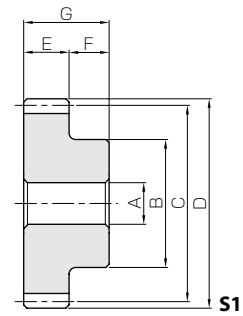
- ① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).
- ⑤ Areas of products which have been re-worked will not be black oxide coated.
- ⑥ For products having a tapped hole, a set screw is included.

- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB

\* The precision grade of J Series products is equivalent to the value shown in the table.

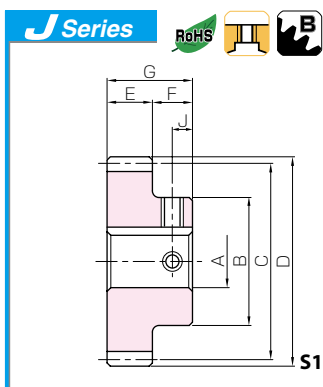


- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	H	I	Width×Depth
SS1.5-64 ● SS1.5-64 J15 ● SS1.5-64 J16 ● SS1.5-64 J18 ● SS1.5-64 J19 ● SS1.5-64 J20 ● SS1.5-64 J22 ● SS1.5-64 J25 ● SS1.5-64 J28 ● SS1.5-64 J30 ● SS1.5-64 J32	m1.5	64	S1	15	55	96	99	15	10	25	—	—	—
			S1K	15									5 × 2.3
			S1K	16									5 × 2.3
			S1K	18									6 × 2.8
			S1K	19									6 × 2.8
			S1K	20									6 × 2.8
			S1K	22									6 × 2.8
			S1K	25									8 × 3.3
			S1K	28									8 × 3.3
			S1K	30									8 × 3.3
S1K	32	10 × 3.3											
SS1.5-65 ● SS1.5-65 J15 ● SS1.5-65 J16 ● SS1.5-65 J18 ● SS1.5-65 J19 ● SS1.5-65 J20 ● SS1.5-65 J22 ● SS1.5-65 J25 ● SS1.5-65 J28 ● SS1.5-65 J30 ● SS1.5-65 J32	m1.5	65	S1	15	55	97.5	100.5	15	10	25	—	—	—
			S1K	15									5 × 2.3
			S1K	16									5 × 2.3
			S1K	18									6 × 2.8
			S1K	19									6 × 2.8
			S1K	20									6 × 2.8
			S1K	22									6 × 2.8
			S1K	25									8 × 3.3
			S1K	28									8 × 3.3
			S1K	30									8 × 3.3
S1K	32	10 × 3.3											
SS1.5-66 ● SS1.5-66 J15 ● SS1.5-66 J16 ● SS1.5-66 J18 ● SS1.5-66 J19 ● SS1.5-66 J20 ● SS1.5-66 J22 ● SS1.5-66 J25 ● SS1.5-66 J28 ● SS1.5-66 J30 ● SS1.5-66 J32	m1.5	66	S1	15	55	99	102	15	10	25	—	—	—
			S1K	15									5 × 2.3
			S1K	16									5 × 2.3
			S1K	18									6 × 2.8
			S1K	19									6 × 2.8
			S1K	20									6 × 2.8
			S1K	22									6 × 2.8
			S1K	25									8 × 3.3
			S1K	28									8 × 3.3
			S1K	30									8 × 3.3
S1K	32	10 × 3.3											
SS1.5-68 ● SS1.5-68 J15 ● SS1.5-68 J16 ● SS1.5-68 J18 ● SS1.5-68 J19 ● SS1.5-68 J20 ● SS1.5-68 J22 ● SS1.5-68 J25 ● SS1.5-68 J28 ● SS1.5-68 J30 ● SS1.5-68 J32	m1.5	68	S1	15	55	102	105	15	10	25	—	—	—
			S1K	15									5 × 2.3
			S1K	16									5 × 2.3
			S1K	18									6 × 2.8
			S1K	19									6 × 2.8
			S1K	20									6 × 2.8
			S1K	22									6 × 2.8
			S1K	25									8 × 3.3
			S1K	28									8 × 3.3
			S1K	30									8 × 3.3
S1K	32	10 × 3.3											
SS1.5-70 ● SS1.5-70 J15 ● SS1.5-70 J16 ● SS1.5-70 J18 ● SS1.5-70 J19 ● SS1.5-70 J20 ● SS1.5-70 J22 ● SS1.5-70 J25 ● SS1.5-70 J28 ● SS1.5-70 J30 ● SS1.5-70 J32	m1.5	70	S1	15	55	105	108	15	10	25	—	—	—
			S1K	15									5 × 2.3
			S1K	16									5 × 2.3
			S1K	18									6 × 2.8
			S1K	19									6 × 2.8
			S1K	20									6 × 2.8
			S1K	22									6 × 2.8
			S1K	25									8 × 3.3
			S1K	28									8 × 3.3
			S1K	30									8 × 3.3
S1K	32	10 × 3.3											

[Caution on Product Characteristics] ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.  
 ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.  
 ② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.



### Steel Spur Gears



Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

Bevel Gearboxes

Other Products

Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—	88.3	13.7	9.00	1.40	0.14~0.32	1.00	<b>SS1.5-64</b>
M4*	5							●SS1.5-64 J15
M4*	5							●SS1.5-64 J16
M5*	5							●SS1.5-64 J18
M5*	5							●SS1.5-64 J19
M5*	5							●SS1.5-64 J20
M5	5							●SS1.5-64 J22
M6	5							●SS1.5-64 J25
M6	5							●SS1.5-64 J28
M6	5							●SS1.5-64 J30
M8	5	●SS1.5-64 J32						
—	—	89.9	14.2	9.17	1.45	0.14~0.32	1.03	<b>SS1.5-65</b>
M4*	5							●SS1.5-65 J15
M4*	5							●SS1.5-65 J16
M5*	5							●SS1.5-65 J18
M5*	5							●SS1.5-65 J19
M5*	5							●SS1.5-65 J20
M5	5							●SS1.5-65 J22
M6	5							●SS1.5-65 J25
M6	5							●SS1.5-65 J28
M6	5							●SS1.5-65 J30
M8	5	●SS1.5-65 J32						
—	—	91.5	14.6	9.33	1.49	0.14~0.32	1.06	<b>SS1.5-66</b>
M4*	5							●SS1.5-66 J15
M4*	5							●SS1.5-66 J16
M5*	5							●SS1.5-66 J18
M5*	5							●SS1.5-66 J19
M5*	5							●SS1.5-66 J20
M5	5							●SS1.5-66 J22
M6	5							●SS1.5-66 J25
M6	5							●SS1.5-66 J28
M6	5							●SS1.5-66 J30
M8	5	●SS1.5-66 J32						
—	—	94.8	15.6	9.66	1.59	0.14~0.32	1.11	<b>SS1.5-68</b>
M4*	5							●SS1.5-68 J15
M4*	5							●SS1.5-68 J16
M5*	5							●SS1.5-68 J18
M5*	5							●SS1.5-68 J19
M5*	5							●SS1.5-68 J20
M5	5							●SS1.5-68 J22
M6	5							●SS1.5-68 J25
M6	5							●SS1.5-68 J28
M6	5							●SS1.5-68 J30
M8	5	●SS1.5-68 J32						
—	—	98.0	16.6	10.0	1.69	0.14~0.32	1.17	<b>SS1.5-70</b>
M4*	5							●SS1.5-70 J15
M4*	5							●SS1.5-70 J16
M5*	5							●SS1.5-70 J18
M5*	5							●SS1.5-70 J19
M5*	5							●SS1.5-70 J20
M5	5							●SS1.5-70 J22
M6	5							●SS1.5-70 J25
M6	5							●SS1.5-70 J28
M6	5							●SS1.5-70 J30
M8	5	●SS1.5-70 J32						

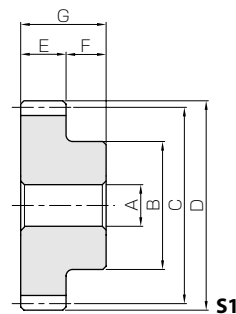
**[Caution on J series]**

- ① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).
- ⑤ Areas of products which have been re-worked will not be black oxide coated.
- ⑥ For products having a tapped hole, a set screw is included.



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB

\* The precision grade of J Series products is equivalent to the value shown in the table.



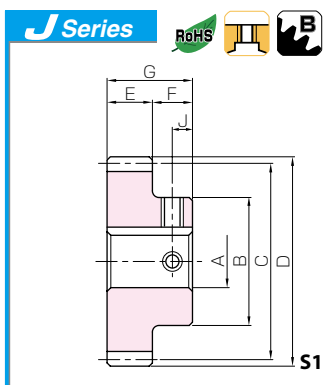
Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	H	I	Width×Depth
SS1.5-72 ● SS1.5-72 J15 ● SS1.5-72 J16 ● SS1.5-72 J18 ● SS1.5-72 J19 ● SS1.5-72 J20 ● SS1.5-72 J22 ● SS1.5-72 J25 ● SS1.5-72 J28 ● SS1.5-72 J30 ● SS1.5-72 J32	m1.5	72	S1	15	55	108	111	15	10	25	—	—	—
			S1K	15									5 × 2.3
			S1K	16									5 × 2.3
			S1K	18									6 × 2.8
			S1K	19									6 × 2.8
			S1K	20									6 × 2.8
			S1K	22									6 × 2.8
			S1K	25									8 × 3.3
			S1K	28									8 × 3.3
			S1K	30									8 × 3.3
			S1K	32									10 × 3.3
SS1.5-75 ● SS1.5-75 J15 ● SS1.5-75 J16 ● SS1.5-75 J18 ● SS1.5-75 J19 ● SS1.5-75 J20 ● SS1.5-75 J22 ● SS1.5-75 J25 ● SS1.5-75 J28 ● SS1.5-75 J30 ● SS1.5-75 J32 ● SS1.5-75 J35	m1.5	75	S1	15	60	112.5	115.5	15	10	25	—	—	—
			S1K	15									5 × 2.3
			S1K	16									5 × 2.3
			S1K	18									6 × 2.8
			S1K	19									6 × 2.8
			S1K	20									6 × 2.8
			S1K	22									6 × 2.8
			S1K	25									8 × 3.3
			S1K	28									8 × 3.3
			S1K	30									8 × 3.3
			S1K	32									10 × 3.3
S1K	35	10 × 3.3											
SS1.5-76 ● SS1.5-76 J15 ● SS1.5-76 J16 ● SS1.5-76 J18 ● SS1.5-76 J19 ● SS1.5-76 J20 ● SS1.5-76 J22 ● SS1.5-76 J25 ● SS1.5-76 J28 ● SS1.5-76 J30 ● SS1.5-76 J32 ● SS1.5-76 J35	m1.5	76	S1	15	60	114	117	15	10	25	—	—	—
			S1K	15									5 × 2.3
			S1K	16									5 × 2.3
			S1K	18									6 × 2.8
			S1K	19									6 × 2.8
			S1K	20									6 × 2.8
			S1K	22									6 × 2.8
			S1K	25									8 × 3.3
			S1K	28									8 × 3.3
			S1K	30									8 × 3.3
			S1K	32									10 × 3.3
S1K	35	10 × 3.3											
SS1.5-80 ● SS1.5-80 J15 ● SS1.5-80 J16 ● SS1.5-80 J18 ● SS1.5-80 J19 ● SS1.5-80 J20 ● SS1.5-80 J22 ● SS1.5-80 J25 ● SS1.5-80 J28 ● SS1.5-80 J30 ● SS1.5-80 J32 ● SS1.5-80 J35	m1.5	80	S1	15	60	120	123	15	10	25	—	—	—
			S1K	15									5 × 2.3
			S1K	16									5 × 2.3
			S1K	18									6 × 2.8
			S1K	19									6 × 2.8
			S1K	20									6 × 2.8
			S1K	22									6 × 2.8
			S1K	25									8 × 3.3
			S1K	28									8 × 3.3
			S1K	30									8 × 3.3
			S1K	32									10 × 3.3
S1K	35	10 × 3.3											

[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.



### Steel Spur Gears



Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—						1.23	<b>SS1.5-72</b>
M4*	5						1.22	● <b>SS1.5-72 J15</b>
M4*	5						1.22	● <b>SS1.5-72 J16</b>
M5*	5						1.21	● <b>SS1.5-72 J18</b>
M5*	5						1.20	● <b>SS1.5-72 J19</b>
M5*	5	101	17.6	10.3	1.79	0.14~0.32	1.20	● <b>SS1.5-72 J20</b>
M5	5						1.18	● <b>SS1.5-72 J22</b>
M6	5						1.16	● <b>SS1.5-72 J25</b>
M6	5						1.14	● <b>SS1.5-72 J28</b>
M6	5						1.12	● <b>SS1.5-72 J30</b>
M8	5						1.10	● <b>SS1.5-72 J32</b>
—	—						1.36	<b>SS1.5-75</b>
M4*	5						1.35	● <b>SS1.5-75 J15</b>
M4*	5						1.34	● <b>SS1.5-75 J16</b>
M5*	5						1.33	● <b>SS1.5-75 J18</b>
M5*	5						1.33	● <b>SS1.5-75 J19</b>
M5*	5	106	19.2	10.8	1.95	0.14~0.32	1.32	● <b>SS1.5-75 J20</b>
M5*	5						1.31	● <b>SS1.5-75 J22</b>
M6	5						1.29	● <b>SS1.5-75 J25</b>
M6	5						1.26	● <b>SS1.5-75 J28</b>
M6	5						1.24	● <b>SS1.5-75 J30</b>
M8	5						1.22	● <b>SS1.5-75 J32</b>
M8	5						1.19	● <b>SS1.5-75 J35</b>
—	—						1.39	<b>SS1.5-76</b>
M4*	5						1.38	● <b>SS1.5-76 J15</b>
M4*	5						1.37	● <b>SS1.5-76 J16</b>
M5*	5						1.36	● <b>SS1.5-76 J18</b>
M5*	5						1.36	● <b>SS1.5-76 J19</b>
M5*	5	108	19.7	11.0	2.01	0.14~0.32	1.35	● <b>SS1.5-76 J20</b>
M5*	5						1.34	● <b>SS1.5-76 J22</b>
M6	5						1.32	● <b>SS1.5-76 J25</b>
M6	5						1.29	● <b>SS1.5-76 J28</b>
M6	5						1.28	● <b>SS1.5-76 J30</b>
M8	5						1.25	● <b>SS1.5-76 J32</b>
M8	5						1.22	● <b>SS1.5-76 J35</b>
—	—						1.52	<b>SS1.5-80</b>
M4*	5						1.51	● <b>SS1.5-80 J15</b>
M4*	5						1.50	● <b>SS1.5-80 J16</b>
M5*	5						1.49	● <b>SS1.5-80 J18</b>
M5*	5						1.49	● <b>SS1.5-80 J19</b>
M5*	5	114	22.0	11.7	2.24	0.14~0.32	1.48	● <b>SS1.5-80 J20</b>
M5*	5						1.47	● <b>SS1.5-80 J22</b>
M6	5						1.45	● <b>SS1.5-80 J25</b>
M6	5						1.42	● <b>SS1.5-80 J28</b>
M6	5						1.41	● <b>SS1.5-80 J30</b>
M8	5						1.38	● <b>SS1.5-80 J32</b>
M8	5						1.35	● <b>SS1.5-80 J35</b>

**[Caution on J series]**

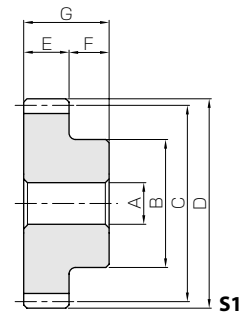
- ① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).
- ⑤ Areas of products which have been re-worked will not be black oxide coated.
- ⑥ For products having a tapped hole, a set screw is included.

- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB

\* The precision grade of J Series products is equivalent to the value shown in the table.

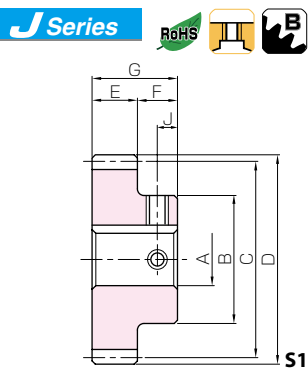


- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	H	I	WidthxDepth
<b>SS1.5-84</b> ● <b>SS1.5-84 J15</b> ● <b>SS1.5-84 J16</b> ● <b>SS1.5-84 J18</b> ● <b>SS1.5-84 J19</b> ● <b>SS1.5-84 J20</b> ● <b>SS1.5-84 J22</b> ● <b>SS1.5-84 J25</b> ● <b>SS1.5-84 J28</b> ● <b>SS1.5-84 J30</b> ● <b>SS1.5-84 J32</b> ● <b>SS1.5-84 J35</b>	m1.5	84	S1	15	60	126	129	15	10	25	—	—	—
			S1K	15									5 x 2.3
			S1K	16									5 x 2.3
			S1K	18									6 x 2.8
			S1K	19									6 x 2.8
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
			S1K	30									8 x 3.3
			S1K	32									10 x 3.3
			S1K	35									10 x 3.3
<b>SS1.5-85</b> ● <b>SS1.5-85 J15</b> ● <b>SS1.5-85 J16</b> ● <b>SS1.5-85 J18</b> ● <b>SS1.5-85 J19</b> ● <b>SS1.5-85 J20</b> ● <b>SS1.5-85 J22</b> ● <b>SS1.5-85 J25</b> ● <b>SS1.5-85 J28</b> ● <b>SS1.5-85 J30</b> ● <b>SS1.5-85 J32</b> ● <b>SS1.5-85 J35</b>	m1.5	85	S1	15	60	127.5	130.5	15	10	25	—	—	—
			S1K	15									5 x 2.3
			S1K	16									5 x 2.3
			S1K	18									6 x 2.8
			S1K	19									6 x 2.8
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
			S1K	30									8 x 3.3
			S1K	32									10 x 3.3
			S1K	35									10 x 3.3
<b>SS1.5-88</b> ● <b>SS1.5-88 J15</b> ● <b>SS1.5-88 J16</b> ● <b>SS1.5-88 J18</b> ● <b>SS1.5-88 J19</b> ● <b>SS1.5-88 J20</b> ● <b>SS1.5-88 J22</b> ● <b>SS1.5-88 J25</b> ● <b>SS1.5-88 J28</b> ● <b>SS1.5-88 J30</b> ● <b>SS1.5-88 J32</b> ● <b>SS1.5-88 J35</b>	m1.5	88	S1	15	60	132	135	15	10	25	—	—	—
			S1K	15									5 x 2.3
			S1K	16									5 x 2.3
			S1K	18									6 x 2.8
			S1K	19									6 x 2.8
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
			S1K	30									8 x 3.3
			S1K	32									10 x 3.3
			S1K	35									10 x 3.3
<b>SS1.5-90</b> ● <b>SS1.5-90 J15</b> ● <b>SS1.5-90 J16</b> ● <b>SS1.5-90 J18</b> ● <b>SS1.5-90 J19</b> ● <b>SS1.5-90 J20</b> ● <b>SS1.5-90 J22</b> ● <b>SS1.5-90 J25</b> ● <b>SS1.5-90 J28</b> ● <b>SS1.5-90 J30</b> ● <b>SS1.5-90 J32</b> ● <b>SS1.5-90 J35</b>	m1.5	90	S1	15	60	135	138	15	10	25	—	—	—
			S1K	15									5 x 2.3
			S1K	16									5 x 2.3
			S1K	18									6 x 2.8
			S1K	19									6 x 2.8
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
			S1K	30									8 x 3.3
			S1K	32									10 x 3.3
			S1K	35									10 x 3.3

[Caution on Product Characteristics] ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.  
 ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.  
 ② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.



## Steel Spur Gears



Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—						1.66	<b>SS1.5-84</b>
M4*	5						1.64	● <b>SS1.5-84 J15</b>
M4*	5						1.64	● <b>SS1.5-84 J16</b>
M5*	5						1.63	● <b>SS1.5-84 J18</b>
M5*	5						1.62	● <b>SS1.5-84 J19</b>
M5*	5	121	24.4	12.3	2.49	0.18~0.38	1.62	● <b>SS1.5-84 J20</b>
M5*	5						1.61	● <b>SS1.5-84 J22</b>
M6	5						1.58	● <b>SS1.5-84 J25</b>
M6	5						1.56	● <b>SS1.5-84 J28</b>
M6	5						1.54	● <b>SS1.5-84 J30</b>
M8	5						1.52	● <b>SS1.5-84 J32</b>
M8	5						1.49	● <b>SS1.5-84 J35</b>
—	—						1.69	<b>SS1.5-85</b>
M4*	5						1.68	● <b>SS1.5-85 J15</b>
M4*	5						1.68	● <b>SS1.5-85 J16</b>
M5*	5						1.66	● <b>SS1.5-85 J18</b>
M5*	5						1.66	● <b>SS1.5-85 J19</b>
M5*	5	123	25.1	12.5	2.56	0.18~0.38	1.65	● <b>SS1.5-85 J20</b>
M5*	5						1.64	● <b>SS1.5-85 J22</b>
M6	5						1.62	● <b>SS1.5-85 J25</b>
M6	5						1.59	● <b>SS1.5-85 J28</b>
M6	5						1.58	● <b>SS1.5-85 J30</b>
M8	5						1.55	● <b>SS1.5-85 J32</b>
M8	5						1.52	● <b>SS1.5-85 J35</b>
—	—						1.80	<b>SS1.5-88</b>
M4*	5						1.79	● <b>SS1.5-88 J15</b>
M4*	5						1.78	● <b>SS1.5-88 J16</b>
M5*	5						1.77	● <b>SS1.5-88 J18</b>
M5*	5						1.77	● <b>SS1.5-88 J19</b>
M5*	5	128	27.0	13.0	2.75	0.18~0.38	1.76	● <b>SS1.5-88 J20</b>
M5*	5						1.75	● <b>SS1.5-88 J22</b>
M6	5						1.73	● <b>SS1.5-88 J25</b>
M6	5						1.70	● <b>SS1.5-88 J28</b>
M6	5						1.69	● <b>SS1.5-88 J30</b>
M8	5						1.66	● <b>SS1.5-88 J32</b>
M8	5						1.63	● <b>SS1.5-88 J35</b>
—	—						1.87	<b>SS1.5-90</b>
M4*	5						1.86	● <b>SS1.5-90 J15</b>
M4*	5						1.86	● <b>SS1.5-90 J16</b>
M5*	5						1.85	● <b>SS1.5-90 J18</b>
M5*	5						1.84	● <b>SS1.5-90 J19</b>
M5*	5	131	28.3	13.3	2.89	0.18~0.38	1.84	● <b>SS1.5-90 J20</b>
M5*	5						1.82	● <b>SS1.5-90 J22</b>
M6	5						1.80	● <b>SS1.5-90 J25</b>
M6	5						1.78	● <b>SS1.5-90 J28</b>
M6	5						1.76	● <b>SS1.5-90 J30</b>
M8	5						1.74	● <b>SS1.5-90 J32</b>
M8	5						1.71	● <b>SS1.5-90 J35</b>

**[Caution on J series]**

① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order.

Please allow additional shipping time to get to your local distributor.

② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.

③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.

④ Certain products which would otherwise have a very long tapped hole are conerbored to reduce the length of the tap. (Products marked with "\*" are tap size).

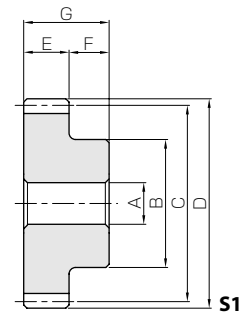
⑤ Areas of products which have been re-worked will not be black oxide coated.

⑥ For products having a tapped hole, a set screw is included.



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB

\* The precision grade of J Series products is equivalent to the value shown in the table.



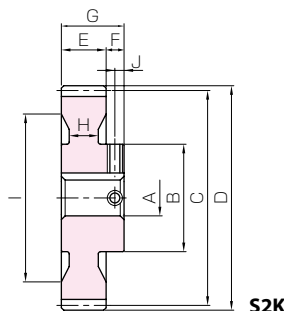
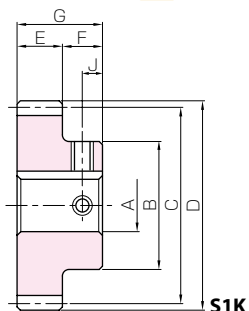
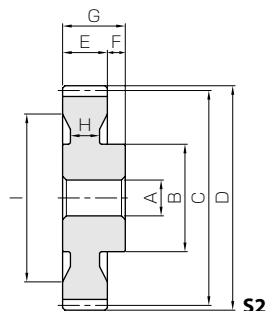
- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	H	I	Width×Depth
<b>SS1.5-95</b> ● <b>SS1.5-95 J15</b> ● <b>SS1.5-95 J16</b> ● <b>SS1.5-95 J18</b> ● <b>SS1.5-95 J19</b> ● <b>SS1.5-95 J20</b> ● <b>SS1.5-95 J22</b> ● <b>SS1.5-95 J25</b> ● <b>SS1.5-95 J28</b> ● <b>SS1.5-95 J30</b> ● <b>SS1.5-95 J32</b> ● <b>SS1.5-95 J35</b>	m1.5	95	S1	15	60	142.5	145.5	15	10	25	—	—	—
			S1K	15									5 x 2.3
			S1K	16									5 x 2.3
			S1K	18									6 x 2.8
			S1K	19									6 x 2.8
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
			S1K	30									8 x 3.3
			S1K	32									10 x 3.3
			S1K	35									10 x 3.3
<b>SS1.5-100</b> ● <b>SS1.5-100 J15</b> ● <b>SS1.5-100 J16</b> ● <b>SS1.5-100 J18</b> ● <b>SS1.5-100 J19</b> ● <b>SS1.5-100 J20</b> ● <b>SS1.5-100 J22</b> ● <b>SS1.5-100 J25</b> ● <b>SS1.5-100 J28</b> ● <b>SS1.5-100 J30</b> ● <b>SS1.5-100 J32</b> ● <b>SS1.5-100 J35</b>	m1.5	100	S2	15	60	150	153	15	10	25	9	125	—
			S2K	15									5 x 2.3
			S2K	16									5 x 2.3
			S2K	18									6 x 2.8
			S2K	19									6 x 2.8
			S2K	20									6 x 2.8
			S2K	22									6 x 2.8
			S2K	25									8 x 3.3
			S2K	28									8 x 3.3
			S2K	30									8 x 3.3
			S2K	32									10 x 3.3
			S2K	35									10 x 3.3
<b>SS1.5-120</b> ● <b>SS1.5-120 J15</b> ● <b>SS1.5-120 J16</b> ● <b>SS1.5-120 J18</b> ● <b>SS1.5-120 J19</b> ● <b>SS1.5-120 J20</b> ● <b>SS1.5-120 J22</b> ● <b>SS1.5-120 J25</b> ● <b>SS1.5-120 J28</b> ● <b>SS1.5-120 J30</b> ● <b>SS1.5-120 J32</b> ● <b>SS1.5-120 J35</b>	m1.5	120	S2	15	70	180	183	15	10	25	10	153	—
			S2K	15									5 x 2.3
			S2K	16									5 x 2.3
			S2K	18									6 x 2.8
			S2K	19									6 x 2.8
			S2K	20									6 x 2.8
			S2K	22									6 x 2.8
			S2K	25									8 x 3.3
			S2K	28									8 x 3.3
			S2K	30									8 x 3.3
			S2K	32									10 x 3.3
			S2K	35									10 x 3.3
<b>SS1.5-150</b>	150	S1	20	180	225	228	15	10	25	—	—	—	
<b>SS1.5-200</b>	200	S1	25	240	300	303	15	10	25	—	—	—	

- [Caution on Product Characteristics]
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  - ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

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  - ② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.





Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—	139	31.8	14.2	3.24	0.18~0.38	2.07 2.05 2.05 2.04 2.03 2.03 2.02 1.99 1.97 1.95 1.93 1.90	SS1.5-95 ● SS1.5-95 J15 ● SS1.5-95 J16 ● SS1.5-95 J18 ● SS1.5-95 J19 ● SS1.5-95 J20 ● SS1.5-95 J22 ● SS1.5-95 J25 ● SS1.5-95 J28 ● SS1.5-95 J30 ● SS1.5-95 J32 ● SS1.5-95 J35
M4*	5							
M4*	5							
M5*	5							
M5*	5							
M5*	5							
M5*	5							
M6	5							
M6	5							
M6	5							
M8	5							
M8	5							
—	—	147	35.5	15.0	3.62	0.18~0.38	1.88 1.87 1.86 1.85 1.84 1.84 1.83 1.80 1.78 1.76 1.74 1.71	SS1.5-100 ● SS1.5-100 J15 ● SS1.5-100 J16 ● SS1.5-100 J18 ● SS1.5-100 J19 ● SS1.5-100 J20 ● SS1.5-100 J22 ● SS1.5-100 J25 ● SS1.5-100 J28 ● SS1.5-100 J30 ● SS1.5-100 J32 ● SS1.5-100 J35
M4*	5							
M4*	5							
M5*	5							
M5*	5							
M5*	5							
M5*	5							
M6	5							
M6	5							
M6	5							
M8	5							
M8	5							
—	—	180	52.3	18.4	5.33	0.18~0.38	2.74 2.72 2.72 2.71 2.70 2.70 2.69 2.66 2.64 2.62 2.60 2.57	SS1.5-120 ● SS1.5-120 J15 ● SS1.5-120 J16 ● SS1.5-120 J18 ● SS1.5-120 J19 ● SS1.5-120 J20 ● SS1.5-120 J22 ● SS1.5-120 J25 ● SS1.5-120 J28 ● SS1.5-120 J30 ● SS1.5-120 J32 ● SS1.5-120 J35
M4*	5							
M4*	5							
M5*	5							
M5*	5							
M5*	5							
M5*	5							
M6*	5							
M6*	5							
M6	5							
M8	5							
M8	5							
—	—	192	70.3	19.6	7.17	0.18~0.38	6.62	SS1.5-150
—	—	261	131	26.7	13.3	0.22~0.46	11.8	SS1.5-200

[Caution on J series]

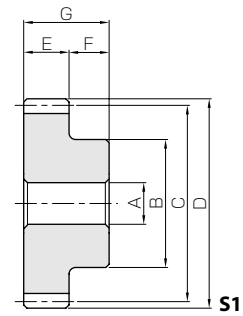
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- Bevel Gearboxes
- Other Products



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB

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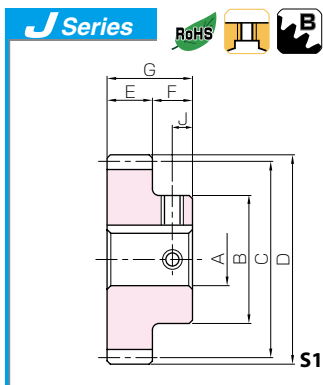


- Spur Gears
- Helical Gears
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- Worm Gear Pair
- Bevel Gearboxes
- Other Products

Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	H	I	Width×Depth
<b>SS2-12</b> ● <b>SS2-12 J10</b>	<b>m2</b>	12	S1	10	18	24	28	20	10	30	—	—	—
S1T2			10	—									
<b>SS2-13</b> ● <b>SS2-13 J10**</b> ● <b>SS2-13 J12</b>		13	S1	10	20	26	30	20	10	30	—	—	—
S1K S1T2			10 12	4 x 1.8 —									
<b>SS2-14</b> ● <b>SS2-14 J10</b> ● <b>SS2-14 J12**</b>		14	S1	10	20	28	32	20	10	30	—	—	—
S1K S1K			10 12	4 x 1.8 4 x 1.8									
<b>SS2-15</b> ● <b>SS2-15 J12</b> ● <b>SS2-15 J14**</b>		15	S1	12	24	30	34	20	10	30	—	—	—
S1K S1K			12 14	4 x 1.8 5 x 2.3									
<b>SS2-16</b> ● <b>SS2-16 J12</b> ● <b>SS2-16 J14</b> ● <b>SS2-16 J15**</b>		16	S1	12	26	32	36	20	10	30	—	—	—
S1K			12	4 x 1.8									
S1K			14	5 x 2.3									
S1K			15	5 x 2.3									
<b>SS2-17</b> ● <b>SS2-17 J12</b> ● <b>SS2-17 J14</b> ● <b>SS2-17 J15</b> ● <b>SS2-17 J16</b>		17	S1	12	28	34	38	20	10	30	—	—	—
S1K			12	4 x 1.8									
S1K			14	5 x 2.3									
S1K			15	5 x 2.3									
<b>SS2-18</b> ● <b>SS2-18 J12</b> ● <b>SS2-18 J14</b> ● <b>SS2-18 J15</b> ● <b>SS2-18 J16</b> ● <b>SS2-18 J18**</b>		18	S1	12	30	36	40	20	10	30	—	—	—
S1K			12	4 x 1.8									
S1K			14	5 x 2.3									
S1K			15	5 x 2.3									
S1K			16	5 x 2.3									
S1K	18	6 x 2.8											
<b>SS2-19</b> ● <b>SS2-19 J12</b> ● <b>SS2-19 J14</b> ● <b>SS2-19 J15</b> ● <b>SS2-19 J16</b> ● <b>SS2-19 J18</b>	19	S1	12	31	38	42	20	10	30	—	—	—	
S1K		12	4 x 1.8										
S1K		14	5 x 2.3										
S1K		15	5 x 2.3										
S1K		16	5 x 2.3										
<b>SS2-20</b> ● <b>SS2-20 J12</b> ● <b>SS2-20 J14</b> ● <b>SS2-20 J15</b> ● <b>SS2-20 J16</b> ● <b>SS2-20 J18</b> ● <b>SS2-20 J19</b>	20	S1	12	32	40	44	20	10	30	—	—	—	
S1K		12	4 x 1.8										
S1K		14	5 x 2.3										
S1K		15	5 x 2.3										
S1K		16	5 x 2.3										
S1K		18	6 x 2.8										
<b>SS2-21</b> ● <b>SS2-21 J12</b> ● <b>SS2-21 J14</b> ● <b>SS2-21 J15</b> ● <b>SS2-21 J16</b> ● <b>SS2-21 J18</b> ● <b>SS2-21 J19</b> ● <b>SS2-21 J20</b>	21	S1	12	34	42	46	20	10	30	—	—	—	
S1K		12	4 x 1.8										
S1K		14	5 x 2.3										
S1K		15	5 x 2.3										
S1K		16	5 x 2.3										
S1K		18	6 x 2.8										
S1K		19	6 x 2.8										
S1K	20	6 x 2.8											

[Caution on Product Characteristics] ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.  
② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.  
② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.



### Steel Spur Gears



Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—	16.3	0.88	1.66	0.090	0.12~0.26	0.073 0.071	<b>SS2-12</b> ● <b>SS2-12 J10</b>
M4	5	21.0	1.07	2.14	0.11	0.12~0.26	0.090	<b>SS2-13</b>
M4	5						0.087	● <b>SS2-13 J10**</b>
M4	5	26.3	1.26	2.69	0.13	0.12~0.26	0.10	<b>SS2-14</b>
M4	5						0.10	● <b>SS2-14 J10</b>
M4	5	29.6	1.48	3.01	0.15	0.12~0.26	0.093	● <b>SS2-14 J12**</b>
M4	5						0.12	<b>SS2-15</b>
M4	5	32.7	1.71	3.34	0.17	0.12~0.26	0.12	● <b>SS2-15 J12</b>
M4	5						0.12	● <b>SS2-15 J14**</b>
M4	5	36.0	1.96	3.67	0.20	0.12~0.26	0.14	<b>SS2-16</b>
M4	5						0.14	● <b>SS2-16 J12</b>
M4	5						0.13	● <b>SS2-16 J14</b>
M4	5	39.3	2.23	4.01	0.23	0.12~0.26	0.12	● <b>SS2-16 J15**</b>
M4	5						0.16	<b>SS2-17</b>
M4	5						0.16	● <b>SS2-17 J12</b>
M4	5						0.15	● <b>SS2-17 J14</b>
M4	5	42.6	2.52	4.35	0.26	0.12~0.26	0.15	● <b>SS2-17 J15</b>
M4	5						0.14	● <b>SS2-17 J16</b>
M4	5						0.19	<b>SS2-18</b>
M4	5						0.19	● <b>SS2-18 J12</b>
M4	5						0.18	● <b>SS2-18 J14</b>
M4	5	46.0	2.83	4.69	0.29	0.12~0.26	0.18	● <b>SS2-18 J15</b>
M4	5						0.17	● <b>SS2-18 J16</b>
M4	5						0.16	● <b>SS2-18 J18**</b>
M5	5	49.4	3.15	5.04	0.32	0.14~0.30	0.15	● <b>SS2-18 J18**</b>
M5	5						0.21	<b>SS2-19</b>
M5	5						0.21	● <b>SS2-19 J12</b>
M5	5						0.20	● <b>SS2-19 J14</b>
M5	5						0.19	● <b>SS2-19 J15</b>
M5	5	46.0	2.83	4.69	0.29	0.12~0.26	0.19	● <b>SS2-19 J16</b>
M5	5						0.19	● <b>SS2-19 J18</b>
M5	5						0.23	<b>SS2-20</b>
M5	5						0.23	● <b>SS2-20 J12</b>
M5	5	49.4	3.15	5.04	0.32	0.14~0.30	0.23	● <b>SS2-20 J14</b>
M5	5						0.22	● <b>SS2-20 J15</b>
M5	5						0.22	● <b>SS2-20 J16</b>
M5	5						0.21	● <b>SS2-20 J18</b>
M5	5						0.20	● <b>SS2-20 J19</b>
M5	5	49.4	3.15	5.04	0.32	0.14~0.30	0.23	<b>SS2-21</b>
M5	5						0.26	● <b>SS2-21 J12</b>
M5	5						0.26	● <b>SS2-21 J14</b>
M5	5						0.25	● <b>SS2-21 J15</b>
M5	5	49.4	3.15	5.04	0.32	0.14~0.30	0.24	● <b>SS2-21 J16</b>
M5	5						0.24	● <b>SS2-21 J18</b>
M5	5						0.22	● <b>SS2-21 J19</b>
M5	5	49.4	3.15	5.04	0.32	0.14~0.30	0.22	● <b>SS2-21 J20</b>
M5	5						0.22	● <b>SS2-21 J20</b>

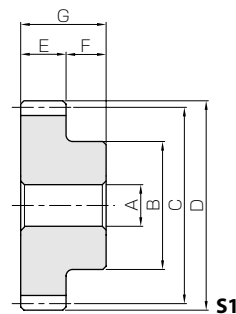
**[Caution on J series]**

- ① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with " \* " are tap size).
- ⑤ Areas of products which have been re-worked will not be black oxide coated.
- ⑥ For products having a tapped hole, a set screw is included.
- ⑦ Products marked with "\*\*\*" have a small amount of material between the corner of the keyway and the tooth root. This mode of failure must be considered when selecting these gears. For details, please see our web site.



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB

\* The precision grade of J Series products is equivalent to the value shown in the table.



Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

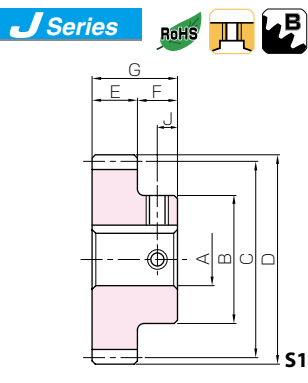
Bevel Gearboxes

Other Products

Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	H	I	Width×Depth
SS2-22 ● SS2-22 J12 ● SS2-22 J14 ● SS2-22 J15 ● SS2-22 J16 ● SS2-22 J18 ● SS2-22 J19 ● SS2-22 J20	m2	22	S1	12	36	44	48	20	10	30	—	—	—
			S1K	12									4 x 1.8
			S1K	14									5 x 2.3
			S1K	15									5 x 2.3
			S1K	16									5 x 2.3
			S1K	18									6 x 2.8
			S1K	19									6 x 2.8
S1K	20	6 x 2.8											
SS2-23 ● SS2-23 J12 ● SS2-23 J14 ● SS2-23 J15 ● SS2-23 J16 ● SS2-23 J18 ● SS2-23 J19 ● SS2-23 J20 ● SS2-23 J22	23	S1	12	37	46	50	20	10	30	—	—	—	
		S1K	12									4 x 1.8	
		S1K	14									5 x 2.3	
		S1K	15									5 x 2.3	
		S1K	16									5 x 2.3	
		S1K	18									6 x 2.8	
		S1K	19									6 x 2.8	
S1K	20	6 x 2.8											
S1K	22	6 x 2.8											
SS2-24 ● SS2-24 J12 ● SS2-24 J14 ● SS2-24 J15 ● SS2-24 J16 ● SS2-24 J18 ● SS2-24 J19 ● SS2-24 J20 ● SS2-24 J22	24	S1	12	38	48	52	20	10	30	—	—	—	
		S1K	12									4 x 1.8	
		S1K	14									5 x 2.3	
		S1K	15									5 x 2.3	
		S1K	16									5 x 2.3	
		S1K	18									6 x 2.8	
		S1K	19									6 x 2.8	
S1K	20	6 x 2.8											
S1K	22	6 x 2.8											
SS2-25 ● SS2-25 J12 ● SS2-25 J14 ● SS2-25 J15 ● SS2-25 J16 ● SS2-25 J18 ● SS2-25 J19 ● SS2-25 J20 ● SS2-25 J22	25	S1	12	40	50	54	20	10	30	—	—	—	
		S1K	12									4 x 1.8	
		S1K	14									5 x 2.3	
		S1K	15									5 x 2.3	
		S1K	16									5 x 2.3	
		S1K	18									6 x 2.8	
		S1K	19									6 x 2.8	
S1K	20	6 x 2.8											
S1K	22	6 x 2.8											
SS2-26 ● SS2-26 J12 ● SS2-26 J14 ● SS2-26 J15 ● SS2-26 J16 ● SS2-26 J18 ● SS2-26 J19 ● SS2-26 J20 ● SS2-26 J22 ● SS2-26 J25	26	S1	12	42	52	56	20	10	30	—	—	—	
		S1K	12									4 x 1.8	
		S1K	14									5 x 2.3	
		S1K	15									5 x 2.3	
		S1K	16									5 x 2.3	
		S1K	18									6 x 2.8	
		S1K	19									6 x 2.8	
S1K	20	6 x 2.8											
S1K	22	6 x 2.8											
S1K	25	8 x 3.3											
SS2-27 ● SS2-27 J12 ● SS2-27 J14 ● SS2-27 J15 ● SS2-27 J16 ● SS2-27 J18 ● SS2-27 J19 ● SS2-27 J20 ● SS2-27 J22 ● SS2-27 J25	27	S1	12	45	54	58	20	10	30	—	—	—	
		S1K	12									4 x 1.8	
		S1K	14									5 x 2.3	
		S1K	15									5 x 2.3	
		S1K	16									5 x 2.3	
		S1K	18									6 x 2.8	
		S1K	19									6 x 2.8	
S1K	20	6 x 2.8											
S1K	22	6 x 2.8											
S1K	25	8 x 3.3											

[Caution on Product Characteristics] ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.  
② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.  
② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.



## Steel Spur Gears



Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—							<b>SS2-22</b>
M4	5	52.8	3.50	5.39	0.36	0.14~0.30	0.29	● <b>SS2-22 J12</b>
M4	5							● <b>SS2-22 J14</b>
M4	5							● <b>SS2-22 J15</b>
M4	5							● <b>SS2-22 J16</b>
M5	5							● <b>SS2-22 J18</b>
M5	5							● <b>SS2-22 J19</b>
M5	5							● <b>SS2-22 J20</b>
—	—							<b>SS2-23</b>
M4	5	56.3	3.86	5.74	0.39	0.14~0.30	0.32	● <b>SS2-23 J12</b>
M4	5							● <b>SS2-23 J14</b>
M4	5							● <b>SS2-23 J15</b>
M4	5							● <b>SS2-23 J16</b>
M5	5							● <b>SS2-23 J18</b>
M5	5							● <b>SS2-23 J19</b>
M5	5							● <b>SS2-23 J20</b>
M5	5							● <b>SS2-23 J22</b>
—	—							<b>SS2-24</b>
M4	5	59.8	4.24	6.09	0.43	0.14~0.30	0.35	● <b>SS2-24 J12</b>
M4	5							● <b>SS2-24 J14</b>
M4	5							● <b>SS2-24 J15</b>
M4	5							● <b>SS2-24 J16</b>
M5	5							● <b>SS2-24 J18</b>
M5	5							● <b>SS2-24 J19</b>
M5	5							● <b>SS2-24 J20</b>
M5	5							● <b>SS2-24 J22</b>
—	—							<b>SS2-25</b>
M4	5	63.3	4.64	6.45	0.47	0.14~0.30	0.38	● <b>SS2-25 J12</b>
M4	5							● <b>SS2-25 J14</b>
M4	5							● <b>SS2-25 J15</b>
M4	5							● <b>SS2-25 J16</b>
M5	5							● <b>SS2-25 J18</b>
M5	5							● <b>SS2-25 J19</b>
M5	5							● <b>SS2-25 J20</b>
M5	5							● <b>SS2-25 J22</b>
—	—							<b>SS2-26</b>
M4*	5	66.8	5.04	6.81	0.51	0.14~0.30	0.42	● <b>SS2-26 J12</b>
M4	5							● <b>SS2-26 J14</b>
M4	5							● <b>SS2-26 J15</b>
M4	5							● <b>SS2-26 J16</b>
M5	5							● <b>SS2-26 J18</b>
M5	5							● <b>SS2-26 J19</b>
M5	5							● <b>SS2-26 J20</b>
M5	5							● <b>SS2-26 J22</b>
M5	5							● <b>SS2-26 J25</b>
M6	5							● <b>SS2-26 J25</b>
—	—							<b>SS2-27</b>
M4*	5	70.4	5.45	7.17	0.56	0.14~0.30	0.46	● <b>SS2-27 J12</b>
M4*	5							● <b>SS2-27 J14</b>
M4*	5							● <b>SS2-27 J15</b>
M4*	5							● <b>SS2-27 J16</b>
M5	5							● <b>SS2-27 J18</b>
M5	5							● <b>SS2-27 J19</b>
M5	5							● <b>SS2-27 J20</b>
M5	5							● <b>SS2-27 J22</b>
M5	5							● <b>SS2-27 J25</b>
M6	5							● <b>SS2-27 J25</b>

**[Caution on J series]**

① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order.

Please allow additional shipping time to get to your local distributor.

② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.

③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.

④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).

⑤ Areas of products which have been re-worked will not be black oxide coated.

⑥ For products having a tapped hole, a set screw is included.

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks &amp; Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

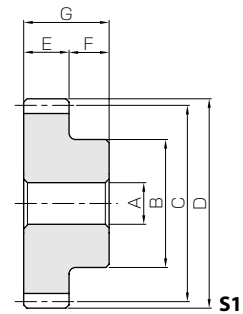
Bevel Gearboxes

Other Products



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB

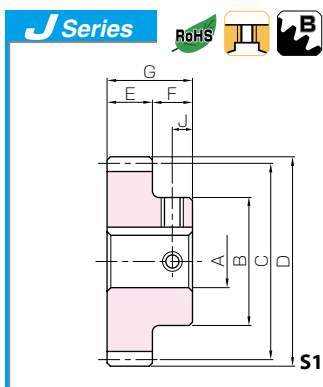
\* The precision grade of J Series products is equivalent to the value shown in the table.



- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	H	I	Width×Depth
<b>SS2-28</b> ● <b>SS2-28 J12</b> ● <b>SS2-28 J14</b> ● <b>SS2-28 J15</b> ● <b>SS2-28 J16</b> ● <b>SS2-28 J18</b> ● <b>SS2-28 J19</b> ● <b>SS2-28 J20</b> ● <b>SS2-28 J22</b> ● <b>SS2-28 J25</b>	<i>m2</i>	28	S1	12	45	56	60	20	10	30	—	—	—
			S1K	12									4 x 1.8
			S1K	14									5 x 2.3
			S1K	15									5 x 2.3
			S1K	16									5 x 2.3
			S1K	18									6 x 2.8
			S1K	19									6 x 2.8
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
S1K	25	8 x 3.3											
<b>SS2-29</b> ● <b>SS2-29 J12</b> ● <b>SS2-29 J14</b> ● <b>SS2-29 J15</b> ● <b>SS2-29 J16</b> ● <b>SS2-29 J18</b> ● <b>SS2-29 J19</b> ● <b>SS2-29 J20</b> ● <b>SS2-29 J22</b> ● <b>SS2-29 J25</b> ● <b>SS2-29 J28</b>	<i>m2</i>	29	S1	12	47	58	62	20	10	30	—	—	—
			S1K	12									4 x 1.8
			S1K	14									5 x 2.3
			S1K	15									5 x 2.3
			S1K	16									5 x 2.3
			S1K	18									6 x 2.8
			S1K	19									6 x 2.8
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
S1K	25	8 x 3.3											
S1K	28	8 x 3.3											
<b>SS2-30</b> ● <b>SS2-30 J12</b> ● <b>SS2-30 J14</b> ● <b>SS2-30 J15</b> ● <b>SS2-30 J16</b> ● <b>SS2-30 J18</b> ● <b>SS2-30 J19</b> ● <b>SS2-30 J20</b> ● <b>SS2-30 J22</b> ● <b>SS2-30 J25</b> ● <b>SS2-30 J28</b> ● <b>SS2-30 J30</b>	<i>m2</i>	30	S1	12	50	60	64	20	10	30	—	—	—
			S1K	12									4 x 1.8
			S1K	14									5 x 2.3
			S1K	15									5 x 2.3
			S1K	16									5 x 2.3
			S1K	18									6 x 2.8
			S1K	19									6 x 2.8
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
S1K	25	8 x 3.3											
S1K	28	8 x 3.3											
S1K	30	8 x 3.3											
<b>SS2-32</b> ● <b>SS2-32 J12</b> ● <b>SS2-32 J14</b> ● <b>SS2-32 J15</b> ● <b>SS2-32 J16</b> ● <b>SS2-32 J18</b> ● <b>SS2-32 J19</b> ● <b>SS2-32 J20</b> ● <b>SS2-32 J22</b> ● <b>SS2-32 J25</b> ● <b>SS2-32 J28</b> ● <b>SS2-32 J30</b>	<i>m2</i>	32	S1	12	50	64	68	20	10	30	—	—	—
			S1K	12									4 x 1.8
			S1K	14									5 x 2.3
			S1K	15									5 x 2.3
			S1K	16									5 x 2.3
			S1K	18									6 x 2.8
			S1K	19									6 x 2.8
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
S1K	25	8 x 3.3											
S1K	28	8 x 3.3											
S1K	30	8 x 3.3											

- [Caution on Product Characteristics]
- The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
  - The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.
- [Caution on Secondary Operations]
- Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
  - Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.



### Steel Spur Gears



Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—						0.48	<b>SS2-28</b>
M4*	5						0.48	● <b>SS2-28 J12</b>
M4*	5						0.47	● <b>SS2-28 J14</b>
M4*	5						0.46	● <b>SS2-28 J15</b>
M4*	5						0.46	● <b>SS2-28 J16</b>
M5	5	73.9	5.89	7.54	0.60	0.14~0.30	0.44	● <b>SS2-28 J18</b>
M5	5						0.44	● <b>SS2-28 J19</b>
M5	5						0.43	● <b>SS2-28 J20</b>
M5	5						0.42	● <b>SS2-28 J22</b>
M6	5						0.39	● <b>SS2-28 J25</b>
—	—						0.52	<b>SS2-29</b>
M4*	5						0.52	● <b>SS2-29 J12</b>
M4*	5						0.51	● <b>SS2-29 J14</b>
M4*	5						0.50	● <b>SS2-29 J15</b>
M4*	5						0.50	● <b>SS2-29 J16</b>
M5	5	77.5	6.33	7.91	0.65	0.14~0.30	0.48	● <b>SS2-29 J18</b>
M5	5						0.48	● <b>SS2-29 J19</b>
M5	5						0.47	● <b>SS2-29 J20</b>
M5	5						0.46	● <b>SS2-29 J22</b>
M6	5						0.43	● <b>SS2-29 J25</b>
M6	5						0.40	● <b>SS2-29 J28</b>
—	—						0.57	<b>SS2-30</b>
M4*	5						0.56	● <b>SS2-30 J12</b>
M4*	5						0.55	● <b>SS2-30 J14</b>
M4*	5						0.55	● <b>SS2-30 J15</b>
M4*	5						0.54	● <b>SS2-30 J16</b>
M5	5	81.1	6.80	8.27	0.69	0.14~0.30	0.53	● <b>SS2-30 J18</b>
M5	5						0.52	● <b>SS2-30 J19</b>
M5	5						0.52	● <b>SS2-30 J20</b>
M5	5						0.50	● <b>SS2-30 J22</b>
M6	5						0.47	● <b>SS2-30 J25</b>
M6	5						0.44	● <b>SS2-30 J28</b>
M6	5						0.42	● <b>SS2-30 J30</b>
—	—						0.63	<b>SS2-32</b>
M4*	5						0.62	● <b>SS2-32 J12</b>
M4*	5						0.61	● <b>SS2-32 J14</b>
M4*	5						0.61	● <b>SS2-32 J15</b>
M4*	5						0.60	● <b>SS2-32 J16</b>
M5	5	88.4	7.78	9.01	0.79	0.14~0.30	0.59	● <b>SS2-32 J18</b>
M5	5						0.59	● <b>SS2-32 J19</b>
M5	5						0.58	● <b>SS2-32 J20</b>
M5	5						0.56	● <b>SS2-32 J22</b>
M6	5						0.53	● <b>SS2-32 J25</b>
M6	5						0.51	● <b>SS2-32 J28</b>
M6	5						0.48	● <b>SS2-32 J30</b>

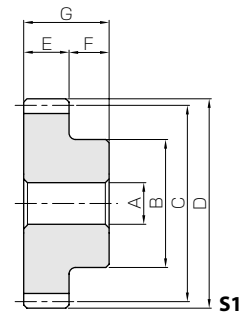
**[Caution on J series]**

- ① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).
- ⑤ Areas of products which have been re-worked will not be black oxide coated.
- ⑥ For products having a tapped hole, a set screw is included.



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB

\* The precision grade of J Series products is equivalent to the value shown in the table.



- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	H	I	Width×Depth
SS2-34 ● SS2-34 J12 ● SS2-34 J14 ● SS2-34 J15 ● SS2-34 J16 ● SS2-34 J18 ● SS2-34 J19 ● SS2-34 J20 ● SS2-34 J22 ● SS2-34 J25 ● SS2-34 J28 ● SS2-34 J30	m2	34	S1	12	50	68	72	20	10	30	—	—	—
			S1K	12									4 x 1.8
			S1K	14									5 x 2.3
			S1K	15									5 x 2.3
			S1K	16									5 x 2.3
			S1K	18									6 x 2.8
			S1K	19									6 x 2.8
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
SS2-35 ● SS2-35 J12 ● SS2-35 J14 ● SS2-35 J15 ● SS2-35 J16 ● SS2-35 J18 ● SS2-35 J19 ● SS2-35 J20 ● SS2-35 J22 ● SS2-35 J25 ● SS2-35 J28 ● SS2-35 J30	m2	35	S1	12	52	70	74	20	10	30	—	—	—
			S1K	12									4 x 1.8
			S1K	14									5 x 2.3
			S1K	15									5 x 2.3
			S1K	16									5 x 2.3
			S1K	18									6 x 2.8
			S1K	19									6 x 2.8
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
SS2-36 ● SS2-36 J12 ● SS2-36 J14 ● SS2-36 J15 ● SS2-36 J16 ● SS2-36 J18 ● SS2-36 J19 ● SS2-36 J20 ● SS2-36 J22 ● SS2-36 J25 ● SS2-36 J28 ● SS2-36 J30 ● SS2-36 J32	m2	36	S1	12	55	72	76	20	10	30	—	—	—
			S1K	12									4 x 1.8
			S1K	14									5 x 2.3
			S1K	15									5 x 2.3
			S1K	16									5 x 2.3
			S1K	18									6 x 2.8
			S1K	19									6 x 2.8
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
S1K	28	8 x 3.3											
S1K	30	8 x 3.3											
S1K	32	10 x 3.3											
SS2-38 ● SS2-38 J12 ● SS2-38 J14 ● SS2-38 J15 ● SS2-38 J16 ● SS2-38 J18 ● SS2-38 J19 ● SS2-38 J20 ● SS2-38 J22 ● SS2-38 J25 ● SS2-38 J28 ● SS2-38 J30 ● SS2-38 J32	m2	38	S1	12	55	76	80	20	10	30	—	—	—
			S1K	12									4 x 1.8
			S1K	14									5 x 2.3
			S1K	15									5 x 2.3
			S1K	16									5 x 2.3
			S1K	18									6 x 2.8
			S1K	19									6 x 2.8
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
S1K	28	8 x 3.3											
S1K	30	8 x 3.3											
S1K	32	10 x 3.3											

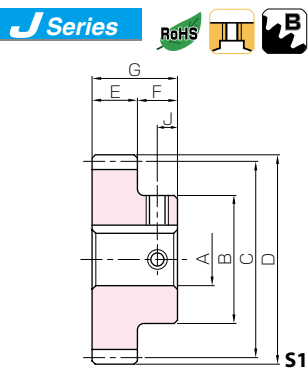
[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.





## Steel Spur Gears



Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)					
Size	J	Bending strength	Surface durability	Bending strength	Surface durability								
—	—						0.70	<b>SS2-34</b>					
M4*	5						0.69	● <b>SS2-34 J12</b>					
M4*	5						0.68	● <b>SS2-34 J14</b>					
M4*	5						0.67	● <b>SS2-34 J15</b>					
M4*	5						0.67	● <b>SS2-34 J16</b>					
M5	5	95.7	8.84	9.76	0.90	0.14~0.30	0.66	● <b>SS2-34 J18</b>					
M5	5						0.65	● <b>SS2-34 J19</b>					
M5	5						0.64	● <b>SS2-34 J20</b>					
M5	5						0.63	● <b>SS2-34 J22</b>					
M6	5						0.60	● <b>SS2-34 J25</b>					
M6	5						0.57	● <b>SS2-34 J28</b>					
M6	5						0.55	● <b>SS2-34 J30</b>					
—	—											0.74	<b>SS2-35</b>
M4*	5											0.74	● <b>SS2-35 J12</b>
M4*	5											0.73	● <b>SS2-35 J14</b>
M4*	5						0.72	● <b>SS2-35 J15</b>					
M4*	5						0.72	● <b>SS2-35 J16</b>					
M5	5	99.3	9.39	10.1	0.96	0.14~0.30	0.70	● <b>SS2-35 J18</b>					
M5	5						0.70	● <b>SS2-35 J19</b>					
M5	5						0.69	● <b>SS2-35 J20</b>					
M5	5						0.67	● <b>SS2-35 J22</b>					
M6	5						0.65	● <b>SS2-35 J25</b>					
M6	5						0.62	● <b>SS2-35 J28</b>					
M6	5						0.60	● <b>SS2-35 J30</b>					
—	—											0.80	<b>SS2-36</b>
M4*	5											0.79	● <b>SS2-36 J12</b>
M4*	5											0.78	● <b>SS2-36 J14</b>
M4*	5						0.77	● <b>SS2-36 J15</b>					
M4*	5						0.77	● <b>SS2-36 J16</b>					
M5*	5	103	9.96	10.5	1.02	0.14~0.30	0.76	● <b>SS2-36 J18</b>					
M5*	5						0.75	● <b>SS2-36 J19</b>					
M5*	5						0.74	● <b>SS2-36 J20</b>					
M5	5						0.73	● <b>SS2-36 J22</b>					
M6	5						0.70	● <b>SS2-36 J25</b>					
M6	5						0.67	● <b>SS2-36 J28</b>					
M6	5						0.65	● <b>SS2-36 J30</b>					
M8	5						0.62	● <b>SS2-36 J32</b>					
—	—											0.87	<b>SS2-38</b>
M4*	5											0.86	● <b>SS2-38 J12</b>
M4*	5						0.85	● <b>SS2-38 J14</b>					
M4*	5						0.85	● <b>SS2-38 J15</b>					
M4*	5						0.84	● <b>SS2-38 J16</b>					
M5*	5	111	11.2	11.3	1.14	0.14~0.30	0.83	● <b>SS2-38 J18</b>					
M5*	5						0.82	● <b>SS2-38 J19</b>					
M5*	5						0.82	● <b>SS2-38 J20</b>					
M5	5						0.80	● <b>SS2-38 J22</b>					
M6	5						0.77	● <b>SS2-38 J25</b>					
M6	5						0.74	● <b>SS2-38 J28</b>					
M6	5						0.72	● <b>SS2-38 J30</b>					
M8	5						0.70	● <b>SS2-38 J32</b>					

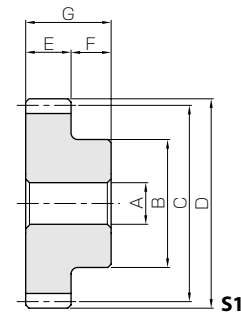
**[Caution on J series]**

- ① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order.  
Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).
- ⑤ Areas of products which have been re-worked will not be black oxide coated.
- ⑥ For products having a tapped hole, a set screw is included.



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB

\* The precision grade of J Series products is equivalent to the value shown in the table.

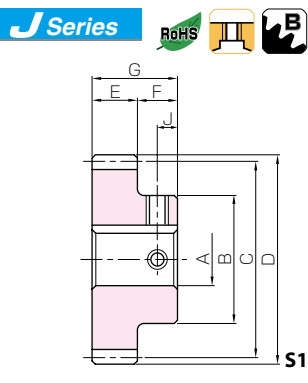


- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	H	I	Width×Depth
<b>SS2-40</b> ● <b>SS2-40 J15</b> ● <b>SS2-40 J16</b> ● <b>SS2-40 J18</b> ● <b>SS2-40 J19</b> ● <b>SS2-40 J20</b> ● <b>SS2-40 J22</b> ● <b>SS2-40 J25</b> ● <b>SS2-40 J28</b> ● <b>SS2-40 J30</b> ● <b>SS2-40 J32</b>	<b>m2</b>	40	S1	15	55	80	84	20	10	30	—	—	—
			S1K	15									5 × 2.3
			S1K	16									5 × 2.3
			S1K	18									6 × 2.8
			S1K	19									6 × 2.8
			S1K	20									6 × 2.8
			S1K	22									6 × 2.8
			S1K	25									8 × 3.3
			S1K	28									8 × 3.3
			S1K	30									8 × 3.3
			S1K	32									10 × 3.3
			<b>SS2-42</b> ● <b>SS2-42 J15</b> ● <b>SS2-42 J16</b> ● <b>SS2-42 J18</b> ● <b>SS2-42 J19</b> ● <b>SS2-42 J20</b> ● <b>SS2-42 J22</b> ● <b>SS2-42 J25</b> ● <b>SS2-42 J28</b> ● <b>SS2-42 J30</b> ● <b>SS2-42 J32</b>	42									S1
S1K	15	5 × 2.3											
S1K	16	5 × 2.3											
S1K	18	6 × 2.8											
S1K	19	6 × 2.8											
S1K	20	6 × 2.8											
S1K	22	6 × 2.8											
S1K	25	8 × 3.3											
S1K	28	8 × 3.3											
S1K	30	8 × 3.3											
S1K	32	10 × 3.3											
<b>SS2-44</b> ● <b>SS2-44 J15</b> ● <b>SS2-44 J16</b> ● <b>SS2-44 J18</b> ● <b>SS2-44 J19</b> ● <b>SS2-44 J20</b> ● <b>SS2-44 J22</b> ● <b>SS2-44 J25</b> ● <b>SS2-44 J28</b> ● <b>SS2-44 J30</b> ● <b>SS2-44 J32</b>	44	S1			15	55	88	92	20	10	30	—	—
		S1K	15	5 × 2.3									
		S1K	16	5 × 2.3									
		S1K	18	6 × 2.8									
		S1K	19	6 × 2.8									
		S1K	20	6 × 2.8									
		S1K	22	6 × 2.8									
		S1K	25	8 × 3.3									
		S1K	28	8 × 3.3									
		S1K	30	8 × 3.3									
		S1K	32	10 × 3.3									
		<b>SS2-45</b> ● <b>SS2-45 J15</b> ● <b>SS2-45 J16</b> ● <b>SS2-45 J18</b> ● <b>SS2-45 J19</b> ● <b>SS2-45 J20</b> ● <b>SS2-45 J22</b> ● <b>SS2-45 J25</b> ● <b>SS2-45 J28</b> ● <b>SS2-45 J30</b> ● <b>SS2-45 J32</b>	45	S1	15								
S1K	15			5 × 2.3									
S1K	16			5 × 2.3									
S1K	18			6 × 2.8									
S1K	19			6 × 2.8									
S1K	20			6 × 2.8									
S1K	22			6 × 2.8									
S1K	25			8 × 3.3									
S1K	28			8 × 3.3									
S1K	30			8 × 3.3									
S1K	32			10 × 3.3									
<b>SS2-46</b> ● <b>SS2-46 J15</b> ● <b>SS2-46 J16</b> ● <b>SS2-46 J18</b> ● <b>SS2-46 J19</b> ● <b>SS2-46 J20</b> ● <b>SS2-46 J22</b> ● <b>SS2-46 J25</b> ● <b>SS2-46 J28</b> ● <b>SS2-46 J30</b> ● <b>SS2-46 J32</b>	46			S1	15	55	92	96	20	10	30	—	—
		S1K	15	5 × 2.3									
		S1K	16	5 × 2.3									
		S1K	18	6 × 2.8									
		S1K	19	6 × 2.8									
		S1K	20	6 × 2.8									
		S1K	22	6 × 2.8									
		S1K	25	8 × 3.3									
		S1K	28	8 × 3.3									
		S1K	30	8 × 3.3									
		S1K	32	10 × 3.3									

[Caution on Product Characteristics] ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.  
 ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.  
 ② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.



## Steel Spur Gears



Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—	118	12.5	12.0	1.27	0.14~0.30	0.93	<b>SS2-40</b>
M4*	5							●SS2-40 J15
M4*	5							●SS2-40 J16
M5*	5							●SS2-40 J18
M5*	5							●SS2-40 J19
M5*	5							●SS2-40 J20
M5	5							●SS2-40 J22
M6	5							●SS2-40 J25
M6	5							●SS2-40 J28
M6	5							●SS2-40 J30
M8	5	●SS2-40 J32						
—	—	125	13.8	12.8	1.41	0.18~0.36	1.01	<b>SS2-42</b>
M4*	5							●SS2-42 J15
M4*	5							●SS2-42 J16
M5*	5							●SS2-42 J18
M5*	5							●SS2-42 J19
M5*	5							●SS2-42 J20
M5	5							●SS2-42 J22
M6	5							●SS2-42 J25
M6	5							●SS2-42 J28
M6	5							●SS2-42 J30
M8	5	●SS2-42 J32						
—	—	133	15.2	13.6	1.55	0.18~0.36	1.10	<b>SS2-44</b>
M4*	5							●SS2-44 J15
M4*	5							●SS2-44 J16
M5*	5							●SS2-44 J18
M5*	5							●SS2-44 J19
M5*	5							●SS2-44 J20
M5	5							●SS2-44 J22
M6	5							●SS2-44 J25
M6	5							●SS2-44 J28
M6	5							●SS2-44 J30
M8	5	●SS2-44 J32						
—	—	137	16.0	13.9	1.63	0.18~0.36	1.14	<b>SS2-45</b>
M4*	5							●SS2-45 J15
M4*	5							●SS2-45 J16
M5*	5							●SS2-45 J18
M5*	5							●SS2-45 J19
M5*	5							●SS2-45 J20
M5	5							●SS2-45 J22
M6	5							●SS2-45 J25
M6	5							●SS2-45 J28
M6	5							●SS2-45 J30
M8	5	●SS2-45 J32						
—	—	140	16.7	14.3	1.71	0.18~0.36	1.19	<b>SS2-46</b>
M4*	5							●SS2-46 J15
M4*	5							●SS2-46 J16
M5*	5							●SS2-46 J18
M5*	5							●SS2-46 J19
M5*	5							●SS2-46 J20
M5	5							●SS2-46 J22
M6	5							●SS2-46 J25
M6	5							●SS2-46 J28
M6	5							●SS2-46 J30
M8	5	●SS2-46 J32						

**[Caution on J series]**

① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order.

Please allow additional shipping time to get to your local distributor.

② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.

③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.

④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).

⑤ Areas of products which have been re-worked will not be black oxide coated.

⑥ For products having a tapped hole, a set screw is included.

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks &amp; Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

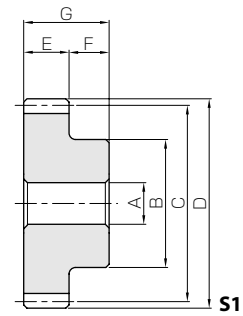
Bevel Gearboxes

Other Products



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB

\* The precision grade of J Series products is equivalent to the value shown in the table.

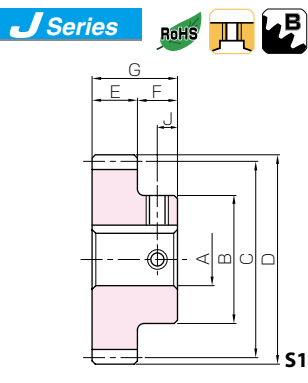


- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	H	I	Width×Depth
<b>SS2-48</b> ● <b>SS2-48 J15</b> ● <b>SS2-48 J16</b> ● <b>SS2-48 J18</b> ● <b>SS2-48 J19</b> ● <b>SS2-48 J20</b> ● <b>SS2-48 J22</b> ● <b>SS2-48 J25</b> ● <b>SS2-48 J28</b> ● <b>SS2-48 J30</b> ● <b>SS2-48 J32</b>	<b>m2</b>	48	S1	15	55	96	100	20	10	30	—	—	—
			S1K	15									5 x 2.3
			S1K	16									5 x 2.3
			S1K	18									6 x 2.8
			S1K	19									6 x 2.8
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
			S1K	30									8 x 3.3
			S1K	32									10 x 3.3
			<b>SS2-50</b> ● <b>SS2-50 J15</b> ● <b>SS2-50 J16</b> ● <b>SS2-50 J18</b> ● <b>SS2-50 J19</b> ● <b>SS2-50 J20</b> ● <b>SS2-50 J22</b> ● <b>SS2-50 J25</b> ● <b>SS2-50 J28</b> ● <b>SS2-50 J30</b> ● <b>SS2-50 J32</b>	<b>m2</b>									50
S1K	15	5 x 2.3											
S1K	16	5 x 2.3											
S1K	18	6 x 2.8											
S1K	19	6 x 2.8											
S1K	20	6 x 2.8											
S1K	22	6 x 2.8											
S1K	25	8 x 3.3											
S1K	28	8 x 3.3											
S1K	30	8 x 3.3											
S1K	32	10 x 3.3											
<b>SS2-52</b> ● <b>SS2-52 J15</b> ● <b>SS2-52 J16</b> ● <b>SS2-52 J18</b> ● <b>SS2-52 J19</b> ● <b>SS2-52 J20</b> ● <b>SS2-52 J22</b> ● <b>SS2-52 J25</b> ● <b>SS2-52 J28</b> ● <b>SS2-52 J30</b> ● <b>SS2-52 J32</b>	<b>m2</b>	52			S1	15	55	104	108	20	10	30	
			S1K	15	5 x 2.3								
			S1K	16	5 x 2.3								
			S1K	18	6 x 2.8								
			S1K	19	6 x 2.8								
			S1K	20	6 x 2.8								
			S1K	22	6 x 2.8								
			S1K	25	8 x 3.3								
			S1K	28	8 x 3.3								
			S1K	30	8 x 3.3								
			S1K	32	10 x 3.3								
			<b>SS2-54</b> ● <b>SS2-54 J15</b> ● <b>SS2-54 J16</b> ● <b>SS2-54 J18</b> ● <b>SS2-54 J19</b> ● <b>SS2-54 J20</b> ● <b>SS2-54 J22</b> ● <b>SS2-54 J25</b> ● <b>SS2-54 J28</b> ● <b>SS2-54 J30</b> ● <b>SS2-54 J32</b>	<b>m2</b>	54	S1							15
S1K	15	5 x 2.3											
S1K	16	5 x 2.3											
S1K	18	6 x 2.8											
S1K	19	6 x 2.8											
S1K	20	6 x 2.8											
S1K	22	6 x 2.8											
S1K	25	8 x 3.3											
S1K	28	8 x 3.3											
S1K	30	8 x 3.3											
S1K	32	10 x 3.3											
<b>SS2-55</b> ● <b>SS2-55 J15</b> ● <b>SS2-55 J16</b> ● <b>SS2-55 J18</b> ● <b>SS2-55 J19</b> ● <b>SS2-55 J20</b> ● <b>SS2-55 J22</b> ● <b>SS2-55 J25</b> ● <b>SS2-55 J28</b> ● <b>SS2-55 J30</b> ● <b>SS2-55 J32</b>	<b>m2</b>	55				S1	15	55	110	114	20	10	30
			S1K	15	5 x 2.3								
			S1K	16	5 x 2.3								
			S1K	18	6 x 2.8								
			S1K	19	6 x 2.8								
			S1K	20	6 x 2.8								
			S1K	22	6 x 2.8								
			S1K	25	8 x 3.3								
			S1K	28	8 x 3.3								
			S1K	30	8 x 3.3								
			S1K	32	10 x 3.3								

[Caution on Product Characteristics] ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.  
 ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.  
 ② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.



## Steel Spur Gears



Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—	148	18.3	15.1	1.87	0.18~0.36	1.28	<b>SS2-48</b>
M4*	5						1.27	●SS2-48 J15
M4*	5						1.27	●SS2-48 J16
M5*	5						1.25	●SS2-48 J18
M5*	5						1.25	●SS2-48 J19
M5*	5						1.24	●SS2-48 J20
M5	5						1.23	●SS2-48 J22
M6	5						1.20	●SS2-48 J25
M6	5						1.17	●SS2-48 J28
M6	5						1.15	●SS2-48 J30
M8	5	1.12	●SS2-48 J32					
—	—	156	19.9	15.9	2.03	0.18~0.36	1.38	<b>SS2-50</b>
M4*	5						1.37	●SS2-50 J15
M4*	5						1.36	●SS2-50 J16
M5*	5						1.35	●SS2-50 J18
M5*	5						1.34	●SS2-50 J19
M5*	5						1.34	●SS2-50 J20
M5	5						1.32	●SS2-50 J22
M6	5						1.29	●SS2-50 J25
M6	5						1.26	●SS2-50 J28
M6	5						1.24	●SS2-50 J30
M8	5	1.22	●SS2-50 J32					
—	—	163	21.7	16.6	2.21	0.18~0.36	1.48	<b>SS2-52</b>
M4*	5						1.47	●SS2-52 J15
M4*	5						1.46	●SS2-52 J16
M5*	5						1.45	●SS2-52 J18
M5*	5						1.44	●SS2-52 J19
M5*	5						1.44	●SS2-52 J20
M5	5						1.42	●SS2-52 J22
M6	5						1.39	●SS2-52 J25
M6	5						1.37	●SS2-52 J28
M6	5						1.34	●SS2-52 J30
M8	5	1.32	●SS2-52 J32					
—	—	171	23.4	17.4	2.39	0.18~0.36	1.58	<b>SS2-54</b>
M4*	5						1.57	●SS2-54 J15
M4*	5						1.57	●SS2-54 J16
M5*	5						1.56	●SS2-54 J18
M5*	5						1.55	●SS2-54 J19
M5*	5						1.54	●SS2-54 J20
M5	5						1.53	●SS2-54 J22
M6	5						1.50	●SS2-54 J25
M6	5						1.47	●SS2-54 J28
M6	5						1.45	●SS2-54 J30
M8	5	1.42	●SS2-54 J32					
—	—	175	24.4	17.8	2.48	0.18~0.36	1.64	<b>SS2-55</b>
M4*	5						1.63	●SS2-55 J15
M4*	5						1.62	●SS2-55 J16
M5*	5						1.61	●SS2-55 J18
M5*	5						1.60	●SS2-55 J19
M5*	5						1.60	●SS2-55 J20
M5	5						1.58	●SS2-55 J22
M6	5						1.55	●SS2-55 J25
M6	5						1.52	●SS2-55 J28
M6	5						1.50	●SS2-55 J30
M8	5	1.48	●SS2-55 J32					

**[Caution on J series]**

① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order.

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② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.

③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.

④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).

⑤ Areas of products which have been re-worked will not be black oxide coated.

⑥ For products having a tapped hole, a set screw is included.

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks &amp; Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

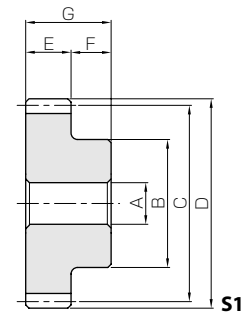
Bevel Gearboxes

Other Products



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB

\* The precision grade of J Series products is equivalent to the value shown in the table.



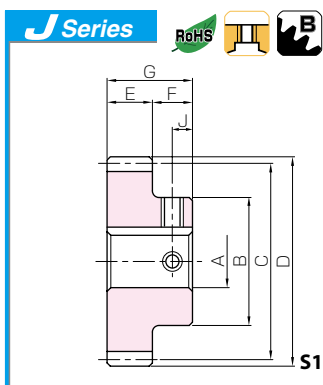
Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	H	I	Width×Depth
SS2-56 ● SS2-56 J15 ● SS2-56 J16 ● SS2-56 J18 ● SS2-56 J19 ● SS2-56 J20 ● SS2-56 J22 ● SS2-56 J25 ● SS2-56 J28 ● SS2-56 J30 ● SS2-56 J32	m2	56	S1	15	55	112	116	20	10	30	—	—	—
			S1K	15									5 x 2.3
			S1K	16									5 x 2.3
			S1K	18									6 x 2.8
			S1K	19									6 x 2.8
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
			S1K	30									8 x 3.3
S1K	32	8 x 3.3											
S1K	35	10 x 3.3											
SS2-58 ● SS2-58 J15 ● SS2-58 J16 ● SS2-58 J18 ● SS2-58 J19 ● SS2-58 J20 ● SS2-58 J22 ● SS2-58 J25 ● SS2-58 J28 ● SS2-58 J30 ● SS2-58 J32 ● SS2-58 J35	m2	58	S1	15	60	116	120	20	10	30	—	—	—
			S1K	15									5 x 2.3
			S1K	16									5 x 2.3
			S1K	18									6 x 2.8
			S1K	19									6 x 2.8
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
			S1K	30									8 x 3.3
S1K	32	8 x 3.3											
S1K	35	10 x 3.3											
SS2-60 ● SS2-60 J15 ● SS2-60 J16 ● SS2-60 J18 ● SS2-60 J19 ● SS2-60 J20 ● SS2-60 J22 ● SS2-60 J25 ● SS2-60 J28 ● SS2-60 J30 ● SS2-60 J32 ● SS2-60 J35	m2	60	S1	15	60	120	124	20	10	30	—	—	—
			S1K	15									5 x 2.3
			S1K	16									5 x 2.3
			S1K	18									6 x 2.8
			S1K	19									6 x 2.8
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
			S1K	30									8 x 3.3
S1K	32	10 x 3.3											
S1K	35	10 x 3.3											
SS2-62 ● SS2-62 J15 ● SS2-62 J16 ● SS2-62 J18 ● SS2-62 J19 ● SS2-62 J20 ● SS2-62 J22 ● SS2-62 J25 ● SS2-62 J28 ● SS2-62 J30 ● SS2-62 J32 ● SS2-62 J35	m2	62	S1	15	60	124	128	20	10	30	—	—	—
			S1K	15									5 x 2.3
			S1K	16									5 x 2.3
			S1K	18									6 x 2.8
			S1K	19									6 x 2.8
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
			S1K	30									8 x 3.3
S1K	32	10 x 3.3											
S1K	35	10 x 3.3											

[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.



### Steel Spur Gears



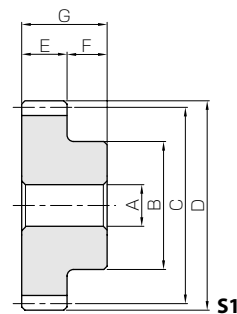
Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—	179	25.3	18.2	2.58	0.18~0.36	1.69	<b>SS2-56</b>
M4*	5						1.68	●SS2-56 J15
M4*	5						1.68	●SS2-56 J16
M5*	5						1.66	●SS2-56 J18
M5*	5						1.66	●SS2-56 J19
M5*	5						1.65	●SS2-56 J20
M5	5						1.64	●SS2-56 J22
M6	5						1.61	●SS2-56 J25
M6	5						1.58	●SS2-56 J28
M6	5						1.56	●SS2-56 J30
M8	5	1.53	●SS2-56 J32					
—	—	186	27.3	19.0	2.78	0.18~0.36	1.84	<b>SS2-58</b>
M4*	5						1.83	●SS2-58 J15
M4*	5						1.82	●SS2-58 J16
M5*	5						1.81	●SS2-58 J18
M5*	5						1.80	●SS2-58 J19
M5*	5						1.80	●SS2-58 J20
M5*	5						1.78	●SS2-58 J22
M6	5						1.75	●SS2-58 J25
M6	5						1.73	●SS2-58 J28
M6	5						1.70	●SS2-58 J30
M8	5	1.68	●SS2-58 J32					
M8	5	1.64	●SS2-58 J35					
—	—	194	29.3	19.8	2.99	0.18~0.36	1.96	<b>SS2-60</b>
M4*	5						1.94	●SS2-60 J15
M4*	5						1.94	●SS2-60 J16
M5*	5						1.93	●SS2-60 J18
M5*	5						1.92	●SS2-60 J19
M5*	5						1.91	●SS2-60 J20
M5*	5						1.90	●SS2-60 J22
M6	5						1.87	●SS2-60 J25
M6	5						1.84	●SS2-60 J28
M6	5						1.82	●SS2-60 J30
M8	5	1.79	●SS2-60 J32					
M8	5	1.76	●SS2-60 J35					
—	—	202	31.5	20.6	3.21	0.18~0.36	2.08	<b>SS2-62</b>
M4*	5						2.06	●SS2-62 J15
M4*	5						2.06	●SS2-62 J16
M5*	5						2.05	●SS2-62 J18
M5*	5						2.04	●SS2-62 J19
M5*	5						2.03	●SS2-62 J20
M5*	5						2.02	●SS2-62 J22
M6	5						1.99	●SS2-62 J25
M6	5						1.96	●SS2-62 J28
M6	5						1.94	●SS2-62 J30
M8	5	1.91	●SS2-62 J32					
M8	5	1.88	●SS2-62 J35					

- [Caution on J series]**
- ① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
  - ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
  - ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
  - ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).
  - ⑤ Areas of products which have been re-worked will not be black oxide coated.
  - ⑥ For products having a tapped hole, a set screw is included.



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB

\* The precision grade of J Series products is equivalent to the value shown in the table.



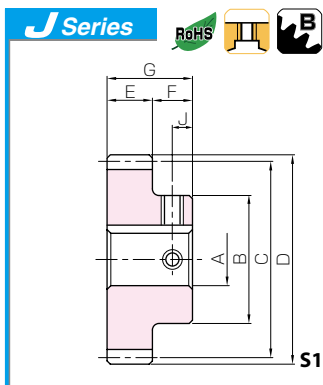
- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	H	I	Width×Depth
<b>SS2-64</b> ● <b>SS2-64 J15</b> ● <b>SS2-64 J16</b> ● <b>SS2-64 J18</b> ● <b>SS2-64 J19</b> ● <b>SS2-64 J20</b> ● <b>SS2-64 J22</b> ● <b>SS2-64 J25</b> ● <b>SS2-64 J28</b> ● <b>SS2-64 J30</b> ● <b>SS2-64 J32</b> ● <b>SS2-64 J35</b>	m2	64	S1	15	60	128	132	20	10	30	—	—	—
			S1K	15									5 x 2.3
			S1K	16									5 x 2.3
			S1K	18									6 x 2.8
			S1K	19									6 x 2.8
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
			S1K	30									8 x 3.3
			S1K	32									10 x 3.3
			S1K	35									10 x 3.3
			<b>SS2-65</b> ● <b>SS2-65 J15</b> ● <b>SS2-65 J16</b> ● <b>SS2-65 J18</b> ● <b>SS2-65 J19</b> ● <b>SS2-65 J20</b> ● <b>SS2-65 J22</b> ● <b>SS2-65 J25</b> ● <b>SS2-65 J28</b> ● <b>SS2-65 J30</b> ● <b>SS2-65 J32</b> ● <b>SS2-65 J35</b>	m2									65
S1K	15	5 x 2.3											
S1K	16	5 x 2.3											
S1K	18	6 x 2.8											
S1K	19	6 x 2.8											
S1K	20	6 x 2.8											
S1K	22	6 x 2.8											
S1K	25	8 x 3.3											
S1K	28	8 x 3.3											
S1K	30	8 x 3.3											
S1K	32	10 x 3.3											
S1K	35	10 x 3.3											
<b>SS2-66</b> ● <b>SS2-66 J15</b> ● <b>SS2-66 J16</b> ● <b>SS2-66 J18</b> ● <b>SS2-66 J19</b> ● <b>SS2-66 J20</b> ● <b>SS2-66 J22</b> ● <b>SS2-66 J25</b> ● <b>SS2-66 J28</b> ● <b>SS2-66 J30</b> ● <b>SS2-66 J32</b> ● <b>SS2-66 J35</b>	m2	66			S1	15	60	132	136	20	10	30	
			S1K	15	5 x 2.3								
			S1K	16	5 x 2.3								
			S1K	18	6 x 2.8								
			S1K	19	6 x 2.8								
			S1K	20	6 x 2.8								
			S1K	22	6 x 2.8								
			S1K	25	8 x 3.3								
			S1K	28	8 x 3.3								
			S1K	30	8 x 3.3								
			S1K	32	10 x 3.3								
			S1K	35	10 x 3.3								
			<b>SS2-68</b> ● <b>SS2-68 J15</b> ● <b>SS2-68 J16</b> ● <b>SS2-68 J18</b> ● <b>SS2-68 J19</b> ● <b>SS2-68 J20</b> ● <b>SS2-68 J22</b> ● <b>SS2-68 J25</b> ● <b>SS2-68 J28</b> ● <b>SS2-68 J30</b> ● <b>SS2-68 J32</b> ● <b>SS2-68 J35</b>	m2	68	S1							15
S1K	15	5 x 2.3											
S1K	16	5 x 2.3											
S1K	18	6 x 2.8											
S1K	19	6 x 2.8											
S1K	20	6 x 2.8											
S1K	22	6 x 2.8											
S1K	25	8 x 3.3											
S1K	28	8 x 3.3											
S1K	30	8 x 3.3											
S1K	32	10 x 3.3											
S1K	35	10 x 3.3											

[Caution on Product Characteristics] ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.  
 ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.  
 ② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.





Steel Spur Gears



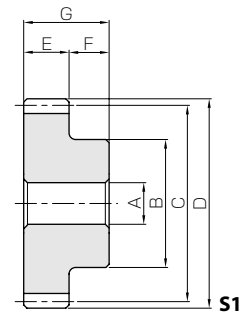
Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—	209	33.7	21.3	3.44	0.18~0.36	2.20 ●SS2-64 J15	●SS2-64 J16 ●SS2-64 J18 ●SS2-64 J19 ●SS2-64 J20 ●SS2-64 J22 ●SS2-64 J25 ●SS2-64 J28 ●SS2-64 J30 ●SS2-64 J32 ●SS2-64 J35
M4*	5							
M4*	5							
M5*	5							
M5*	5							
M5*	5							
M5*	5							
M6	5							
M6	5							
M6	5							
M8	5	213	34.8	21.7	3.55	0.18~0.36	2.26 ●SS2-65 J15	●SS2-65 J16 ●SS2-65 J18 ●SS2-65 J19 ●SS2-65 J20 ●SS2-65 J22 ●SS2-65 J25 ●SS2-65 J28 ●SS2-65 J30 ●SS2-65 J32 ●SS2-65 J35
M4*	5							
M4*	5							
M5*	5							
M5*	5							
M5*	5							
M5*	5							
M6	5							
M6	5							
M6	5							
M8	5	217	36.0	22.1	3.67	0.18~0.36	2.33 ●SS2-66 J15	●SS2-66 J16 ●SS2-66 J18 ●SS2-66 J19 ●SS2-66 J20 ●SS2-66 J22 ●SS2-66 J25 ●SS2-66 J28 ●SS2-66 J30 ●SS2-66 J32 ●SS2-66 J35
M4*	5							
M4*	5							
M5*	5							
M5*	5							
M5*	5							
M5*	5							
M6	5							
M6	5							
M6	5							
M8	5	225	38.4	22.9	3.91	0.18~0.36	2.46 ●SS2-68 J15	●SS2-68 J16 ●SS2-68 J18 ●SS2-68 J19 ●SS2-68 J20 ●SS2-68 J22 ●SS2-68 J25 ●SS2-68 J28 ●SS2-68 J30 ●SS2-68 J32 ●SS2-68 J35
M4*	5							
M4*	5							
M5*	5							
M5*	5							
M5*	5							
M5*	5							
M6	5							
M6	5							
M6	5							
M8	5							
M8	5							

- [Caution on J series]
- ① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
  - ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
  - ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
  - ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).
  - ⑤ Areas of products which have been re-worked will not be black oxide coated.
  - ⑥ For products having a tapped hole, a set screw is included.



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB

\* The precision grade of J Series products is equivalent to the value shown in the table.

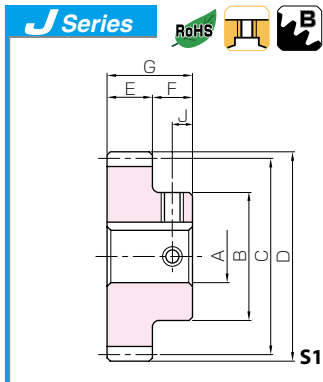


- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	H	I	Width×Depth
<b>SS2-70</b> ●SS2-70 J15 ●SS2-70 J16 ●SS2-70 J18 ●SS2-70 J19 ●SS2-70 J20 ●SS2-70 J22 ●SS2-70 J25 ●SS2-70 J28 ●SS2-70 J30 ●SS2-70 J32 ●SS2-70 J35	m2	70	S1	15	60	140	144	20	10	30	—	—	—
			S1K	15									5 x 2.3
			S1K	16									5 x 2.3
			S1K	18									6 x 2.8
			S1K	19									6 x 2.8
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
			S1K	30									8 x 3.3
S1K	32	10 x 3.3											
S1K	35	10 x 3.3											
<b>SS2-72</b> ●SS2-72 J15 ●SS2-72 J16 ●SS2-72 J18 ●SS2-72 J19 ●SS2-72 J20 ●SS2-72 J22 ●SS2-72 J25 ●SS2-72 J28 ●SS2-72 J30 ●SS2-72 J32 ●SS2-72 J35	m2	72	S1	15	60	144	148	20	10	30	—	—	—
			S1K	15									5 x 2.3
			S1K	16									5 x 2.3
			S1K	18									6 x 2.8
			S1K	19									6 x 2.8
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
			S1K	30									8 x 3.3
S1K	32	10 x 3.3											
S1K	35	10 x 3.3											
<b>SS2-75</b> ●SS2-75 J20 ●SS2-75 J22 ●SS2-75 J25 ●SS2-75 J28 ●SS2-75 J30 ●SS2-75 J32 ●SS2-75 J35	m2	75	S1	20	60	150	154	20	10	30	—	—	—
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
			S1K	30									8 x 3.3
			S1K	32									10 x 3.3
			S1K	35									10 x 3.3
<b>SS2-76</b> ●SS2-76 J20 ●SS2-76 J22 ●SS2-76 J25 ●SS2-76 J28 ●SS2-76 J30 ●SS2-76 J32 ●SS2-76 J35	m2	76	S1	20	60	152	156	20	10	30	—	—	—
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
			S1K	30									8 x 3.3
			S1K	32									10 x 3.3
			S1K	35									10 x 3.3
<b>SS2-80</b> ●SS2-80 J20 ●SS2-80 J22 ●SS2-80 J25 ●SS2-80 J28 ●SS2-80 J30 ●SS2-80 J32 ●SS2-80 J35	m2	80	S2	20	60	160	164	20	10	30	12	136	—
			S2K	20									6 x 2.8
			S2K	22									6 x 2.8
			S2K	25									8 x 3.3
			S2K	28									8 x 3.3
			S2K	30									8 x 3.3
			S2K	32									10 x 3.3
			S2K	35									10 x 3.3

[Caution on Product Characteristics] ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.  
 ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.  
 ② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.



### Steel Spur Gears



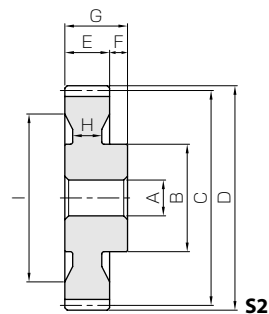
Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No.
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—	232	40.8	23.7	4.16	0.18~0.36	2.60 2.59 2.58 2.57 2.56 2.55 2.54 2.51 2.48 2.46 2.43 2.40	SS2-70 ● SS2-70 J15 ● SS2-70 J16 ● SS2-70 J18 ● SS2-70 J19 ● SS2-70 J20 ● SS2-70 J22 ● SS2-70 J25 ● SS2-70 J28 ● SS2-70 J30 ● SS2-70 J32 ● SS2-70 J35
M4*	5							
M4*	5							
M5*	5							
M5*	5							
M5*	5							
M5*	5							
M6	5							
M6	5							
M6	5							
M8	5	240	43.3	24.5	4.42	0.18~0.36	2.74 2.73 2.72 2.71 2.70 2.69 2.68 2.65 2.62 2.60 2.57 2.54	SS2-72 ● SS2-72 J15 ● SS2-72 J16 ● SS2-72 J18 ● SS2-72 J19 ● SS2-72 J20 ● SS2-72 J22 ● SS2-72 J25 ● SS2-72 J28 ● SS2-72 J30 ● SS2-72 J32 ● SS2-72 J35
M4*	5							
M4*	5							
M5*	5							
M5*	5							
M5*	5							
M5*	5							
M6	5							
M6	5							
M6	5							
M8	5	252	47.3	25.7	4.82	0.18~0.36	2.92 2.91 2.90 2.87 2.84 2.82 2.79 2.76	SS2-75 ● SS2-75 J20 ● SS2-75 J22 ● SS2-75 J25 ● SS2-75 J28 ● SS2-75 J30 ● SS2-75 J32 ● SS2-75 J35
M5*	5							
M5*	5							
M6	5							
M6	5							
M6	5							
M8	5							
M8	5	256	48.6	26.1	4.96	0.18~0.36	3.00 2.99 2.97 2.94 2.92 2.89 2.87 2.83	SS2-76 ● SS2-76 J20 ● SS2-76 J22 ● SS2-76 J25 ● SS2-76 J28 ● SS2-76 J30 ● SS2-76 J32 ● SS2-76 J35
M5*	5							
M5*	5							
M6	5							
M6	5							
M6	5							
M8	5							
M8	5	271	54.3	27.7	5.53	0.18~0.36	2.67 2.66 2.65 2.62 2.59 2.57 2.54 2.50	SS2-80 ● SS2-80 J20 ● SS2-80 J22 ● SS2-80 J25 ● SS2-80 J28 ● SS2-80 J30 ● SS2-80 J32 ● SS2-80 J35
M5*	5							
M5*	5							
M6	5							
M6	5							
M6	5							
M8	5							
M8	5							

- [Caution on J series]**
- ① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
  - ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
  - ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
  - ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).
  - ⑤ Areas of products which have been re-worked will not be black oxide coated.
  - ⑥ For products having a tapped hole, a set screw is included.



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB

\* J Series products corresponds to an 'equivalent'.



S2

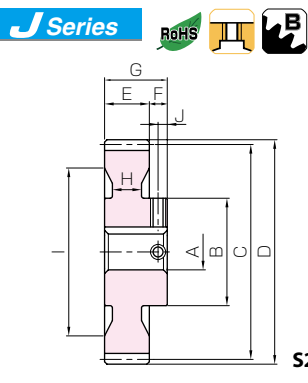
Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	H	I	WidthxDepth
SS2-84 ● SS2-84 J20 ● SS2-84 J22 ● SS2-84 J25 ● SS2-84 J28 ● SS2-84 J30 ● SS2-84 J32 ● SS2-84 J35	m2	84	S2	20	70	168	172	20	10	30	12	140	—
			S2K	20									6 x 2.8
			S2K	22									6 x 2.8
			S2K	25									8 x 3.3
			S2K	28									8 x 3.3
			S2K	30									8 x 3.3
			S2K	32									10 x 3.3
S2K	35	10 x 3.3											
SS2-85 ● SS2-85 J20 ● SS2-85 J22 ● SS2-85 J25 ● SS2-85 J28 ● SS2-85 J30 ● SS2-85 J32 ● SS2-85 J35	m2	85	S2	20	70	170	174	20	10	30	12	146	—
			S2K	20									6 x 2.8
			S2K	22									6 x 2.8
			S2K	25									8 x 3.3
			S2K	28									8 x 3.3
			S2K	30									8 x 3.3
			S2K	32									10 x 3.3
S2K	35	10 x 3.3											
SS2-88 ● SS2-88 J20 ● SS2-88 J22 ● SS2-88 J25 ● SS2-88 J28 ● SS2-88 J30 ● SS2-88 J32 ● SS2-88 J35	m2	88	S2	20	70	176	180	20	10	30	12	150	—
			S2K	20									6 x 2.8
			S2K	22									6 x 2.8
			S2K	25									8 x 3.3
			S2K	28									8 x 3.3
			S2K	30									8 x 3.3
			S2K	32									10 x 3.3
S2K	35	10 x 3.3											
SS2-90 ● SS2-90 J20 ● SS2-90 J22 ● SS2-90 J25 ● SS2-90 J28 ● SS2-90 J30 ● SS2-90 J32 ● SS2-90 J35	m2	90	S2	20	70	180	184	20	10	30	12	156	—
			S2K	20									6 x 2.8
			S2K	22									6 x 2.8
			S2K	25									8 x 3.3
			S2K	28									8 x 3.3
			S2K	30									8 x 3.3
			S2K	32									10 x 3.3
S2K	35	10 x 3.3											
SS2-95 ● SS2-95 J20 ● SS2-95 J22 ● SS2-95 J25 ● SS2-95 J28 ● SS2-95 J30 ● SS2-95 J32 ● SS2-95 J35	m2	95	S2	20	70	190	194	20	10	30	12	166	—
			S2K	20									6 x 2.8
			S2K	22									6 x 2.8
			S2K	25									8 x 3.3
			S2K	28									8 x 3.3
			S2K	30									8 x 3.3
			S2K	32									10 x 3.3
S2K	35	10 x 3.3											
SS2-100 ● SS2-100 J20 ● SS2-100 J22 ● SS2-100 J25 ● SS2-100 J28 ● SS2-100 J30 ● SS2-100 J32 ● SS2-100 J35	m2	100	S2	20	70	200	204	20	10	30	12	176	—
			S2K	20									6 x 2.8
			S2K	22									6 x 2.8
			S2K	25									8 x 3.3
			S2K	28									8 x 3.3
			S2K	30									8 x 3.3
			S2K	32									10 x 3.3
S2K	35	10 x 3.3											

[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.



## Steel Spur Gears



Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—	287	60.2	29.2	6.14	0.20~0.44	3.09 3.07 3.06 3.03 3.00 2.98 2.95 2.92	<b>SS2-84</b>
M5*	5							● <b>SS2-84 J20</b>
M5*	5							● <b>SS2-84 J22</b>
M6*	5							● <b>SS2-84 J25</b>
M6*	5							● <b>SS2-84 J28</b>
M6	5							● <b>SS2-84 J30</b>
M8	5							● <b>SS2-84 J32</b>
M8	5							● <b>SS2-84 J35</b>
—	—	291	61.7	29.6	6.30	0.20~0.44	3.09 3.08 3.06 3.03 3.01 2.99 2.96 2.92	<b>SS2-85</b>
M5*	5							● <b>SS2-85 J20</b>
M5*	5							● <b>SS2-85 J22</b>
M6*	5							● <b>SS2-85 J25</b>
M6*	5							● <b>SS2-85 J28</b>
M6	5							● <b>SS2-85 J30</b>
M8	5							● <b>SS2-85 J32</b>
M8	5							● <b>SS2-85 J35</b>
—	—	302	66.5	30.8	6.78	0.20~0.44	3.29 3.28 3.26 3.23 3.21 3.19 3.16 3.12	<b>SS2-88</b>
M5*	5							● <b>SS2-88 J20</b>
M5*	5							● <b>SS2-88 J22</b>
M6*	5							● <b>SS2-88 J25</b>
M6*	5							● <b>SS2-88 J28</b>
M6	5							● <b>SS2-88 J30</b>
M8	5							● <b>SS2-88 J32</b>
M8	5							● <b>SS2-88 J35</b>
—	—	310	69.7	31.6	7.11	0.20~0.44	3.38 3.37 3.35 3.32 3.30 3.28 3.25 3.21	<b>SS2-90</b>
M5*	5							● <b>SS2-90 J20</b>
M5*	5							● <b>SS2-90 J22</b>
M6*	5							● <b>SS2-90 J25</b>
M6*	5							● <b>SS2-90 J28</b>
M6	5							● <b>SS2-90 J30</b>
M8	5							● <b>SS2-90 J32</b>
M8	5							● <b>SS2-90 J35</b>
—	—	330	78.2	33.6	7.97	0.20~0.44	3.69 3.67 3.66 3.63 3.60 3.58 3.55 3.52	<b>SS2-95</b>
M5*	5							● <b>SS2-95 J20</b>
M5*	5							● <b>SS2-95 J22</b>
M6*	5							● <b>SS2-95 J25</b>
M6*	5							● <b>SS2-95 J28</b>
M6	5							● <b>SS2-95 J30</b>
M8	5							● <b>SS2-95 J32</b>
M8	5							● <b>SS2-95 J35</b>
—	—	291	72.7	29.7	7.42	0.20~0.44	4.01 3.99 3.98 3.95 3.92 3.90 3.87 3.84	<b>SS2-100</b>
M5*	5							● <b>SS2-100 J20</b>
M5*	5							● <b>SS2-100 J22</b>
M6*	5							● <b>SS2-100 J25</b>
M6*	5							● <b>SS2-100 J28</b>
M6	5							● <b>SS2-100 J30</b>
M8	5							● <b>SS2-100 J32</b>
M8	5							● <b>SS2-100 J35</b>

**[Caution on J series]**

① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order.

Please allow additional shipping time to get to your local distributor.

② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.

③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.

④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).

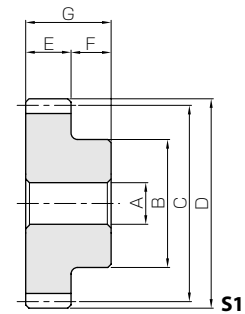
⑤ Areas of products which have been re-worked will not be black oxide coated.

⑥ For products having a tapped hole, a set screw is included.



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB

\* The precision grade of J Series products is equivalent to the value shown in the table.



Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	H	I	Width×Depth
<b>SS2-120</b>	<b>m2</b>	120	S2	20	90	240	244	20	10	30	12	210	—
● <b>SS2-120 J20</b>			S2K	20									6 x 2.8
● <b>SS2-120 J22</b>			S2K	22									6 x 2.8
● <b>SS2-120 J25</b>			S2K	25									8 x 3.3
● <b>SS2-120 J28</b>			S2K	28									8 x 3.3
● <b>SS2-120 J30</b>			S2K	30									8 x 3.3
● <b>SS2-120 J32</b>			S2K	32									10 x 3.3
● <b>SS2-120 J35</b>			S2K	35									10 x 3.3
<b>SS2-150</b>	150	S1	25	240	300	304	20	10	30	—	—	—	

[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

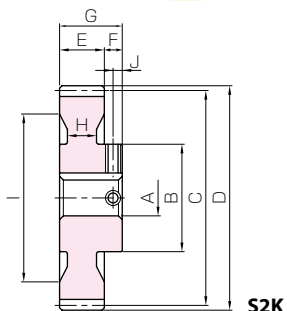
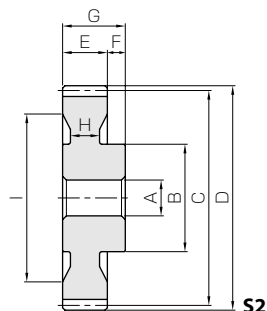
[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.

- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products



# Steel Spur Gears



Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No.	
Size	J	Bending strength	Surface durability	Bending strength	Surface durability				● : J Series (Available-on-request)
—	—	357	108	36.4	11.0	0.20~0.44	5.91	<b>SS2-120</b>	
M5*	5							5.89	● <b>SS2-120 J20</b>
M5*	5							5.87	● <b>SS2-120 J22</b>
M6*	5							5.84	● <b>SS2-120 J25</b>
M6*	5							5.82	● <b>SS2-120 J28</b>
M6*	5							5.80	● <b>SS2-120 J30</b>
M8	5	5.76	● <b>SS2-120 J32</b>						
M8	5	5.73	● <b>SS2-120 J35</b>						
—	—	455	174	46.4	17.7	0.20~0.44	14.5	<b>SS2-150</b>	

**[Caution on J series]**

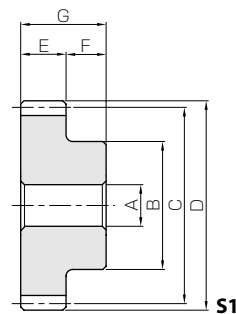
- ① As available-on-request products, requires a lead-time for shipping within **3 working-days (excludes the day ordered)**, after placing an order. Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is **1 to 20 units**. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).
- ⑤ Areas of products which have been re-worked will not be black oxide coated.
- ⑥ For products having a tapped hole, a set screw is included.

- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB

\* The precision grade of J Series products is equivalent to the value shown in the table.



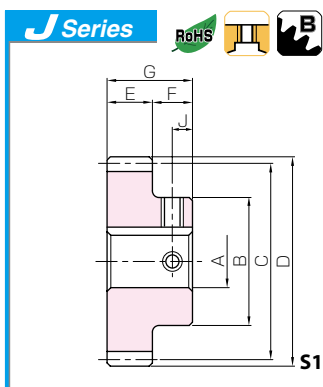
- Spur Gears
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- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	H	I	Width×Depth
<b>SS2.5-12</b> ● <b>SS2.5-12 J12**</b> <b>SS2.5-13</b> ● <b>SS2.5-13 J12</b> ● <b>SS2.5-13 J14</b> ● <b>SS2.5-13 J15</b> <b>SS2.5-14</b> ● <b>SS2.5-14 J12</b> ● <b>SS2.5-14 J14</b> ● <b>SS2.5-14 J15**</b> <b>SS2.5-15</b> ● <b>SS2.5-15 J15</b> ● <b>SS2.5-15 J16</b> ● <b>SS2.5-15 J18</b> <b>SS2.5-16</b> ● <b>SS2.5-16 J15</b> ● <b>SS2.5-16 J16</b> ● <b>SS2.5-16 J18</b> ● <b>SS2.5-16 J19**</b> <b>SS2.5-17</b> ● <b>SS2.5-17 J15</b> ● <b>SS2.5-17 J16</b> ● <b>SS2.5-17 J18</b> ● <b>SS2.5-17 J19</b> ● <b>SS2.5-17 J20</b> <b>SS2.5-18</b> ● <b>SS2.5-18 J15</b> ● <b>SS2.5-18 J16</b> ● <b>SS2.5-18 J18</b> ● <b>SS2.5-18 J19</b> ● <b>SS2.5-18 J20</b> ● <b>SS2.5-18 J22</b> <b>SS2.5-19</b> ● <b>SS2.5-19 J15</b> ● <b>SS2.5-19 J16</b> ● <b>SS2.5-19 J18</b> ● <b>SS2.5-19 J19</b> ● <b>SS2.5-19 J20</b> ● <b>SS2.5-19 J22</b> <b>SS2.5-20</b> ● <b>SS2.5-20 J15</b> ● <b>SS2.5-20 J16</b> ● <b>SS2.5-20 J18</b> ● <b>SS2.5-20 J19</b> ● <b>SS2.5-20 J20</b> ● <b>SS2.5-20 J22</b>	<b>m2.5</b>	12	S1 S1K	12 12	23	30	35	25	12	37	—	—	— 4 x 1.8
		13	S1 S1K S1T2 S1T2	12 12 14 15	25	32.5	37.5	25	12	37	—	—	— 4 x 1.8 — —
		14	S1 S1K S1K S1K	12 12 14 15	25	35	40	25	12	37	—	—	— 4 x 1.8 5 x 2.3 5 x 2.3
		15	S1 S1K S1K S1T2	15 15 16 18	30	37.5	42.5	25	12	37	—	—	— 5 x 2.3 5 x 2.3 —
		16	S1 S1K S1K S1K S1K	15 15 16 18 19	32	40	45	25	12	37	—	—	— 5 x 2.3 5 x 2.3 6 x 2.8 6 x 2.8
		17	S1 S1K S1K S1K S1K S1K	15 15 16 18 19 20	35	42.5	47.5	25	12	37	—	—	— 5 x 2.3 5 x 2.3 6 x 2.8 6 x 2.8 6 x 2.8
		18	S1 S1K S1K S1K S1K S1K S1K	15 15 16 18 19 20 22	38	45	50	25	12	37	—	—	— 5 x 2.3 5 x 2.3 6 x 2.8 6 x 2.8 6 x 2.8 6 x 2.8
		19	S1 S1K S1K S1K S1K S1K S1K	15 15 16 18 19 20 22	39	47.5	52.5	25	12	37	—	—	— 5 x 2.3 5 x 2.3 6 x 2.8 6 x 2.8 6 x 2.8 6 x 2.8
		20	S1 S1K S1K S1K S1K S1K S1K	15 15 16 18 19 20 22	40	50	55	25	12	37	—	—	— 5 x 2.3 5 x 2.3 6 x 2.8 6 x 2.8 6 x 2.8 6 x 2.8

[Caution on Product Characteristics] ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.  
② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.  
② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.





## Steel Spur Gears



Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—	31.8	1.77	3.24	0.18	0.14~0.28	0.15	SS2.5-12
M4	6							●SS2.5-12 J12**
—	—	40.9	2.14	4.17	0.22	0.14~0.28	0.18	SS2.5-13
M4	6							●SS2.5-13 J12
M4	6							●SS2.5-13 J14
M4	6							●SS2.5-13 J15
—	—	51.5	2.53	5.25	0.26	0.14~0.28	0.20	SS2.5-14
M4	6							●SS2.5-14 J12
M4	6							●SS2.5-14 J14
M4	6							●SS2.5-14 J15**
—	—	57.7	2.96	5.89	0.30	0.14~0.28	0.23	SS2.5-15
M4	6							●SS2.5-15 J15
M4	6							●SS2.5-15 J16
M5	6							●SS2.5-15 J18
—	—	64	3.43	6.52	0.35	0.14~0.28	0.27	SS2.5-16
M4	6							●SS2.5-16 J15
M4	6							●SS2.5-16 J16
M5	6							●SS2.5-16 J18
M5	6							●SS2.5-16 J19
M5	6	●SS2.5-16 J19**						
—	—	70.3	3.93	7.17	0.40	0.14~0.28	0.32	SS2.5-17
M4	6							●SS2.5-17 J15
M4	6							●SS2.5-17 J16
M5	6							●SS2.5-17 J18
M5	6							●SS2.5-17 J19
M5	6							●SS2.5-17 J20
—	—	76.7	4.47	7.82	0.46	0.14~0.28	0.37	SS2.5-18
M4	6							●SS2.5-18 J15
M4	6							●SS2.5-18 J16
M5	6							●SS2.5-18 J18
M5	6							●SS2.5-18 J19
M5	6							●SS2.5-18 J20
M5	6							●SS2.5-18 J22
—	—	83.2	5.05	8.49	0.51	0.14~0.28	0.41	SS2.5-19
M4	6							●SS2.5-19 J15
M4	6							●SS2.5-19 J16
M5	6							●SS2.5-19 J18
M5	6							●SS2.5-19 J19
M5	6							●SS2.5-19 J20
M5	6							●SS2.5-19 J22
—	—	89.8	5.66	9.16	0.58	0.14~0.28	0.45	SS2.5-20
M4	6							●SS2.5-20 J15
M4	6							●SS2.5-20 J16
M5	6							●SS2.5-20 J18
M5	6							●SS2.5-20 J19
M5	6							●SS2.5-20 J20
M5	6							●SS2.5-20 J22

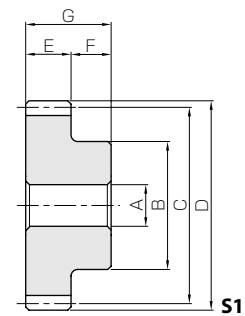
**[Caution on J series]**

- ① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with " \* " are tap size).
- ⑤ Areas of products which have been re-worked will not be black oxide coated.
- ⑥ For products having a tapped hole, a set screw is included.
- ⑦ Products marked with "\*\*\*" have a small amount of material between the corner of the keyway and the tooth root. This mode of failure must be considered when selecting these gears. For details, please see our web site.



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB

\* The precision grade of J Series products is equivalent to the value shown in the table.



- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

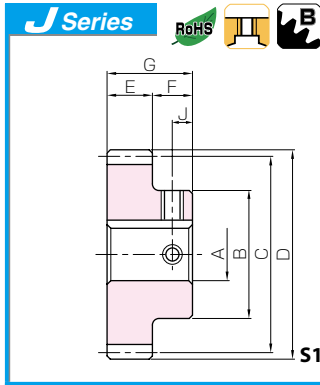
Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	H	I	Width×Depth
SS2.5-21 ● SS2.5-21 J15 ● SS2.5-21 J16 ● SS2.5-21 J18 ● SS2.5-21 J19 ● SS2.5-21 J20 ● SS2.5-21 J22 ● SS2.5-21 J25	m2.5	21	S1	15	42	52.5	57.5	25	12	37	—	—	—
			S1K	15									5 × 2.3
			S1K	16									5 × 2.3
			S1K	18									6 × 2.8
			S1K	19									6 × 2.8
			S1K	20									6 × 2.8
			S1K	22									6 × 2.8
S1K	25	8 × 3.3											
SS2.5-22 ● SS2.5-22 J15 ● SS2.5-22 J16 ● SS2.5-22 J18 ● SS2.5-22 J19 ● SS2.5-22 J20 ● SS2.5-22 J22 ● SS2.5-22 J25	m2.5	22	S1	15	44	55	60	25	12	37	—	—	—
			S1K	15									5 × 2.3
			S1K	16									5 × 2.3
			S1K	18									6 × 2.8
			S1K	19									6 × 2.8
			S1K	20									6 × 2.8
			S1K	22									6 × 2.8
S1K	25	8 × 3.3											
SS2.5-23 ● SS2.5-23 J15 ● SS2.5-23 J16 ● SS2.5-23 J18 ● SS2.5-23 J19 ● SS2.5-23 J20 ● SS2.5-23 J22 ● SS2.5-23 J25	m2.5	23	S1	15	46	57.5	62.5	25	12	37	—	—	—
			S1K	15									5 × 2.3
			S1K	16									5 × 2.3
			S1K	18									6 × 2.8
			S1K	19									6 × 2.8
			S1K	20									6 × 2.8
			S1K	22									6 × 2.8
S1K	25	8 × 3.3											
SS2.5-24 ● SS2.5-24 J15 ● SS2.5-24 J16 ● SS2.5-24 J18 ● SS2.5-24 J19 ● SS2.5-24 J20 ● SS2.5-24 J22 ● SS2.5-24 J25 ● SS2.5-24 J28	m2.5	24	S1	15	48	60	65	25	12	37	—	—	—
			S1K	15									5 × 2.3
			S1K	16									5 × 2.3
			S1K	18									6 × 2.8
			S1K	19									6 × 2.8
			S1K	20									6 × 2.8
			S1K	22									6 × 2.8
S1K	25	8 × 3.3											
S1K	28	8 × 3.3											
SS2.5-25 ● SS2.5-25 J15 ● SS2.5-25 J16 ● SS2.5-25 J18 ● SS2.5-25 J19 ● SS2.5-25 J20 ● SS2.5-25 J22 ● SS2.5-25 J25 ● SS2.5-25 J28 ● SS2.5-25 J30	m2.5	25	S1	15	50	62.5	67.5	25	12	37	—	—	—
			S1K	15									5 × 2.3
			S1K	16									5 × 2.3
			S1K	18									6 × 2.8
			S1K	19									6 × 2.8
			S1K	20									6 × 2.8
			S1K	22									6 × 2.8
S1K	25	8 × 3.3											
S1K	28	8 × 3.3											
S1K	30	8 × 3.3											
SS2.5-26 ● SS2.5-26 J15 ● SS2.5-26 J16 ● SS2.5-26 J18 ● SS2.5-26 J19 ● SS2.5-26 J20 ● SS2.5-26 J22 ● SS2.5-26 J25 ● SS2.5-26 J28 ● SS2.5-26 J30 ● SS2.5-26 J32	m2.5	26	S1	15	55	65	70	25	12	37	—	—	—
			S1K	15									5 × 2.3
			S1K	16									5 × 2.3
			S1K	18									6 × 2.8
			S1K	19									6 × 2.8
			S1K	20									6 × 2.8
			S1K	22									6 × 2.8
S1K	25	8 × 3.3											
S1K	28	8 × 3.3											
S1K	30	8 × 3.3											
S1K	32	10 × 3.3											

[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.



### Steel Spur Gears



Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

Bevel Gearboxes

Other Products

Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—	96.4	6.30	9.83	0.64	0.16~0.34	0.50	<b>SS2.5-21</b>
M4	6						0.50	● <b>SS2.5-21 J15</b>
M4	6						0.49	● <b>SS2.5-21 J16</b>
M5	6						0.47	● <b>SS2.5-21 J18</b>
M5	6						0.47	● <b>SS2.5-21 J19</b>
M5	6						0.46	● <b>SS2.5-21 J20</b>
M5	6						0.44	● <b>SS2.5-21 J22</b>
M6	6	0.40	● <b>SS2.5-21 J25</b>					
—	—	103	6.99	10.5	0.71	0.16~0.34	0.56	<b>SS2.5-22</b>
M4*	6						0.55	● <b>SS2.5-22 J15</b>
M4	6						0.55	● <b>SS2.5-22 J16</b>
M5	6						0.53	● <b>SS2.5-22 J18</b>
M5	6						0.52	● <b>SS2.5-22 J19</b>
M5	6						0.51	● <b>SS2.5-22 J20</b>
M5	6						0.49	● <b>SS2.5-22 J22</b>
M6	6	0.46	● <b>SS2.5-22 J25</b>					
—	—	110	7.71	11.2	0.79	0.16~0.34	0.61	<b>SS2.5-23</b>
M4*	6						0.61	● <b>SS2.5-23 J15</b>
M4*	6						0.60	● <b>SS2.5-23 J16</b>
M5	6						0.58	● <b>SS2.5-23 J18</b>
M5	6						0.58	● <b>SS2.5-23 J19</b>
M5	6						0.57	● <b>SS2.5-23 J20</b>
M5	6						0.55	● <b>SS2.5-23 J22</b>
M6	6	0.51	● <b>SS2.5-23 J25</b>					
—	—	117	8.47	11.9	0.86	0.16~0.34	0.67	<b>SS2.5-24</b>
M4*	6						0.67	● <b>SS2.5-24 J15</b>
M4*	6						0.66	● <b>SS2.5-24 J16</b>
M5	6						0.64	● <b>SS2.5-24 J18</b>
M5	6						0.64	● <b>SS2.5-24 J19</b>
M5	6						0.63	● <b>SS2.5-24 J20</b>
M5	6						0.61	● <b>SS2.5-24 J22</b>
M6	6	0.57	● <b>SS2.5-24 J25</b>					
M6	6	0.54	● <b>SS2.5-24 J28</b>					
—	—	124	9.26	12.6	0.94	0.16~0.34	0.74	<b>SS2.5-25</b>
M4*	6						0.73	● <b>SS2.5-25 J15</b>
M4*	6						0.72	● <b>SS2.5-25 J16</b>
M5	6						0.71	● <b>SS2.5-25 J18</b>
M5	6						0.70	● <b>SS2.5-25 J19</b>
M5	6						0.69	● <b>SS2.5-25 J20</b>
M5	6						0.67	● <b>SS2.5-25 J22</b>
M6	6	0.63	● <b>SS2.5-25 J25</b>					
M6	6	0.60	● <b>SS2.5-25 J28</b>					
M6	6	0.57	● <b>SS2.5-25 J30</b>					
—	—	130	10.1	13.3	1.03	0.16~0.34	0.82	<b>SS2.5-26</b>
M4*	6						0.81	● <b>SS2.5-26 J15</b>
M4*	6						0.81	● <b>SS2.5-26 J16</b>
M5*	6						0.79	● <b>SS2.5-26 J18</b>
M5*	6						0.78	● <b>SS2.5-26 J19</b>
M5*	6						0.77	● <b>SS2.5-26 J20</b>
M5	6						0.76	● <b>SS2.5-26 J22</b>
M6	6	0.72	● <b>SS2.5-26 J25</b>					
M6	6	0.68	● <b>SS2.5-26 J28</b>					
M6	6	0.66	● <b>SS2.5-26 J30</b>					
M8	6	0.63	● <b>SS2.5-26 J32</b>					

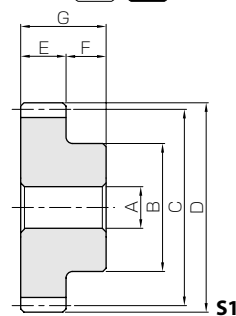
**[Caution on J series]**

- ① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ Certain products which would otherwise have a very long tapped hole are conbored to reduce the length of the tap. (Products marked with "\*" are tap size).
- ⑤ Areas of products which have been re-worked will not be black oxide coated.
- ⑥ For products having a tapped hole, a set screw is included.



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB

\* The precision grade of J Series products is equivalent to the value shown in the table.



S1

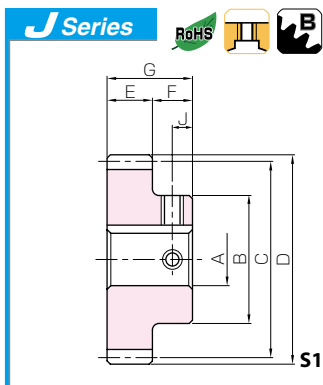
Catalog No. ●: J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	H	I	WidthxDepth
SS2.5-27 ●SS2.5-27 J15 ●SS2.5-27 J16 ●SS2.5-27 J18 ●SS2.5-27 J19 ●SS2.5-27 J20 ●SS2.5-27 J22 ●SS2.5-27 J25 ●SS2.5-27 J28 ●SS2.5-27 J30 ●SS2.5-27 J32 ●SS2.5-27 J35	m2.5	27	S1	15	60	67.5	72.5	25	12	37	—	—	—
			S1K	15									5 x 2.3
			S1K	16									5 x 2.3
			S1K	18									6 x 2.8
			S1K	19									6 x 2.8
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
			S1K	30									8 x 3.3
			S1K	32									10 x 3.3
S1K	35	10 x 3.3											
SS2.5-28 ●SS2.5-28 J15 ●SS2.5-28 J16 ●SS2.5-28 J18 ●SS2.5-28 J19 ●SS2.5-28 J20 ●SS2.5-28 J22 ●SS2.5-28 J25 ●SS2.5-28 J28 ●SS2.5-28 J30 ●SS2.5-28 J32 ●SS2.5-28 J35	m2.5	28	S1	15	60	70	75	25	12	37	—	—	—
			S1K	15									5 x 2.3
			S1K	16									5 x 2.3
			S1K	18									6 x 2.8
			S1K	19									6 x 2.8
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
			S1K	30									8 x 3.3
			S1K	32									10 x 3.3
S1K	35	10 x 3.3											
SS2.5-29 ●SS2.5-29 J15 ●SS2.5-29 J16 ●SS2.5-29 J18 ●SS2.5-29 J19 ●SS2.5-29 J20 ●SS2.5-29 J22 ●SS2.5-29 J25 ●SS2.5-29 J28 ●SS2.5-29 J30 ●SS2.5-29 J32 ●SS2.5-29 J35	m2.5	29	S1	15	62	72.5	77.5	25	12	37	—	—	—
			S1K	15									5 x 2.3
			S1K	16									5 x 2.3
			S1K	18									6 x 2.8
			S1K	19									6 x 2.8
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
			S1K	30									8 x 3.3
			S1K	32									10 x 3.3
S1K	35	10 x 3.3											
SS2.5-30 ●SS2.5-30 J15 ●SS2.5-30 J16 ●SS2.5-30 J18 ●SS2.5-30 J19 ●SS2.5-30 J20 ●SS2.5-30 J22 ●SS2.5-30 J25 ●SS2.5-30 J28 ●SS2.5-30 J30 ●SS2.5-30 J32 ●SS2.5-30 J35	m2.5	30	S1	15	65	75	80	25	12	37	—	—	—
			S1K	15									5 x 2.3
			S1K	16									5 x 2.3
			S1K	18									6 x 2.8
			S1K	19									6 x 2.8
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
			S1K	30									8 x 3.3
			S1K	32									10 x 3.3
S1K	35	10 x 3.3											

[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
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### Steel Spur Gears



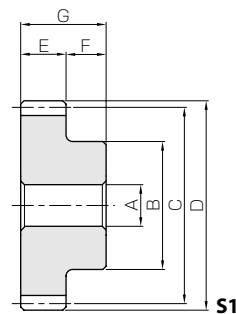
Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—	137	10.9	14.0	1.11	0.16~0.34	0.92	<b>SS2.5-27</b>
M4*	6							● <b>SS2.5-27 J15</b>
M4*	6							● <b>SS2.5-27 J16</b>
M5*	6							● <b>SS2.5-27 J18</b>
M5*	6							● <b>SS2.5-27 J19</b>
M5*	6							● <b>SS2.5-27 J20</b>
M5*	6							● <b>SS2.5-27 J22</b>
M6	6							● <b>SS2.5-27 J25</b>
M6	6							● <b>SS2.5-27 J28</b>
M6	6							● <b>SS2.5-27 J30</b>
M8	6							● <b>SS2.5-27 J32</b>
M8	6							● <b>SS2.5-27 J35</b>
—	—	144	11.7	14.7	1.20	0.16~0.34	0.97	<b>SS2.5-28</b>
M4*	6							● <b>SS2.5-28 J15</b>
M4*	6							● <b>SS2.5-28 J16</b>
M5*	6							● <b>SS2.5-28 J18</b>
M5*	6							● <b>SS2.5-28 J19</b>
M5*	6							● <b>SS2.5-28 J20</b>
M5*	6							● <b>SS2.5-28 J22</b>
M6	6							● <b>SS2.5-28 J25</b>
M6	6							● <b>SS2.5-28 J28</b>
M6	6							● <b>SS2.5-28 J30</b>
M8	6							● <b>SS2.5-28 J32</b>
M8	6							● <b>SS2.5-28 J35</b>
—	—	151	12.6	15.4	1.29	0.16~0.34	1.04	<b>SS2.5-29</b>
M4*	6							● <b>SS2.5-29 J15</b>
M4*	6							● <b>SS2.5-29 J16</b>
M5*	6							● <b>SS2.5-29 J18</b>
M5*	6							● <b>SS2.5-29 J19</b>
M5*	6							● <b>SS2.5-29 J20</b>
M5*	6							● <b>SS2.5-29 J22</b>
M6	6							● <b>SS2.5-29 J25</b>
M6	6							● <b>SS2.5-29 J28</b>
M6	6							● <b>SS2.5-29 J30</b>
M8	6							● <b>SS2.5-29 J32</b>
M8	6							● <b>SS2.5-29 J35</b>
—	—	159	13.6	16.2	1.39	0.16~0.34	1.13	<b>SS2.5-30</b>
M4*	6							● <b>SS2.5-30 J15</b>
M4*	6							● <b>SS2.5-30 J16</b>
M5*	6							● <b>SS2.5-30 J18</b>
M5*	6							● <b>SS2.5-30 J19</b>
M5*	6							● <b>SS2.5-30 J20</b>
M5*	6							● <b>SS2.5-30 J22</b>
M6	6							● <b>SS2.5-30 J25</b>
M6	6							● <b>SS2.5-30 J28</b>
M6	6							● <b>SS2.5-30 J30</b>
M8	6							● <b>SS2.5-30 J32</b>
M8	6							● <b>SS2.5-30 J35</b>

- [Caution on J series]**
- ① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
  - ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
  - ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
  - ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).
  - ⑤ Areas of products which have been re-worked will not be black oxide coated.
  - ⑥ For products having a tapped hole, a set screw is included.



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB

\* The precision grade of J Series products is equivalent to the value shown in the table.

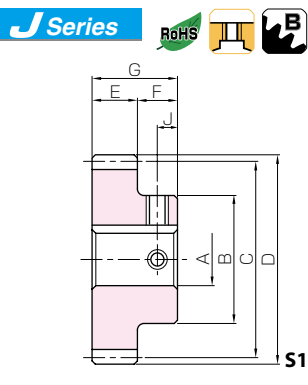


- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

Catalog No. ●: J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	H	I	Width×Depth
SS2.5-32 ●SS2.5-32 J15 ●SS2.5-32 J16 ●SS2.5-32 J18 ●SS2.5-32 J19 ●SS2.5-32 J20 ●SS2.5-32 J22 ●SS2.5-32 J25 ●SS2.5-32 J28 ●SS2.5-32 J30 ●SS2.5-32 J32 ●SS2.5-32 J35 ●SS2.5-32 J40	m2.5	32	S1	15	70	80	85	25	12	37	—	—	—
			S1K	15									5 x 2.3
			S1K	16									5 x 2.3
			S1K	18									6 x 2.8
			S1K	19									6 x 2.8
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
			S1K	30									8 x 3.3
			S1K	32									10 x 3.3
			S1K	35									10 x 3.3
			S1K	40									12 x 3.3
SS2.5-34 ●SS2.5-34 J15 ●SS2.5-34 J16 ●SS2.5-34 J18 ●SS2.5-34 J19 ●SS2.5-34 J20 ●SS2.5-34 J22 ●SS2.5-34 J25 ●SS2.5-34 J28 ●SS2.5-34 J30 ●SS2.5-34 J32 ●SS2.5-34 J35 ●SS2.5-34 J40	m2.5	34	S1	15	70	85	90	25	12	37	—	—	—
			S1K	15									5 x 2.3
			S1K	16									5 x 2.3
			S1K	18									6 x 2.8
			S1K	19									6 x 2.8
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
			S1K	30									8 x 3.3
			S1K	32									10 x 3.3
			S1K	35									10 x 3.3
			S1K	40									12 x 3.3
SS2.5-35 ●SS2.5-35 J15 ●SS2.5-35 J16 ●SS2.5-35 J18 ●SS2.5-35 J19 ●SS2.5-35 J20 ●SS2.5-35 J22 ●SS2.5-35 J25 ●SS2.5-35 J28 ●SS2.5-35 J30 ●SS2.5-35 J32 ●SS2.5-35 J35 ●SS2.5-35 J40	m2.5	35	S1	15	70	87.5	92.5	25	12	37	—	—	—
			S1K	15									5 x 2.3
			S1K	16									5 x 2.3
			S1K	18									6 x 2.8
			S1K	19									6 x 2.8
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
			S1K	30									8 x 3.3
			S1K	32									10 x 3.3
			S1K	35									10 x 3.3
			S1K	40									12 x 3.3
SS2.5-36 ●SS2.5-36 J15 ●SS2.5-36 J16 ●SS2.5-36 J18 ●SS2.5-36 J19 ●SS2.5-36 J20 ●SS2.5-36 J22 ●SS2.5-36 J25 ●SS2.5-36 J28 ●SS2.5-36 J30 ●SS2.5-36 J32 ●SS2.5-36 J35 ●SS2.5-36 J40	m2.5	36	S1	15	70	90	95	25	12	37	—	—	—
			S1K	15									5 x 2.3
			S1K	16									5 x 2.3
			S1K	18									6 x 2.8
			S1K	19									6 x 2.8
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
			S1K	30									8 x 3.3
			S1K	32									10 x 3.3
			S1K	35									10 x 3.3
			S1K	40									12 x 3.3

[Caution on Product Characteristics] ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.  
② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

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② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.



## Steel Spur Gears



Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—	173	15.6	17.6	1.59	0.16~0.34	1.30 1.28 1.28 1.26 1.25 1.24 1.22 1.19 1.15 1.13 1.10 1.05 0.97	SS2.5-32 ● SS2.5-32 J15 ● SS2.5-32 J16 ● SS2.5-32 J18 ● SS2.5-32 J19 ● SS2.5-32 J20 ● SS2.5-32 J22 ● SS2.5-32 J25 ● SS2.5-32 J28 ● SS2.5-32 J30 ● SS2.5-32 J32 ● SS2.5-32 J35 ● SS2.5-32 J40
M4*	6							
M4*	6							
M5*	6							
M5*	6							
M5*	6							
M5*	6							
M6*	6							
M6*	6							
M6	6							
M8	6							
M8	6							
—	—							187
M4*	6							
M4*	6							
M5*	6							
M5*	6							
M5*	6							
M5*	6							
M6*	6							
M6*	6							
M6	6							
M8	6							
M8	6							
—	—	194	18.8	19.8	1.92	0.16~0.34	1.49 1.48 1.47 1.45 1.44 1.44 1.44 1.42 1.38 1.35 1.32 1.29 1.24 1.16	
M4*	6							
M4*	6							
M5*	6							
M5*	6							
M5*	6							
M5*	6							
M6*	6							
M6*	6							
M6	6							
M8	6							
M8	6							
—	—							201
M4*	6							
M4*	6							
M5*	6							
M5*	6							
M5*	6							
M5*	6							
M6*	6							
M6*	6							
M6	6							
M8	6							
M8	6							
M8	6							

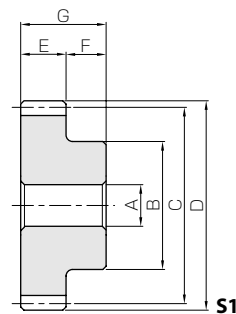
## [Caution on J series]

- ① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).
- ⑤ Areas of products which have been re-worked will not be black oxide coated.
- ⑥ For products having a tapped hole, a set screw is included.



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB

\* The precision grade of J Series products is equivalent to the value shown in the table.



- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	H	I	Width×Depth
SS2.5-38 ● SS2.5-38 J20 ● SS2.5-38 J22 ● SS2.5-38 J25 ● SS2.5-38 J28 ● SS2.5-38 J30 ● SS2.5-38 J32 ● SS2.5-38 J35 ● SS2.5-38 J40	m2.5	38	S1	20	70	95	100	25	12	37	—	—	—
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
			S1K	30									8 x 3.3
			S1K	32									10 x 3.3
			S1K	40									12 x 3.3
SS2.5-40 ● SS2.5-40 J20 ● SS2.5-40 J22 ● SS2.5-40 J25 ● SS2.5-40 J28 ● SS2.5-40 J30 ● SS2.5-40 J32 ● SS2.5-40 J35 ● SS2.5-40 J40	m2.5	40	S1	20	70	100	105	25	12	37	—	—	—
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
			S1K	30									8 x 3.3
			S1K	32									10 x 3.3
			S1K	40									12 x 3.3
SS2.5-42 ● SS2.5-42 J20 ● SS2.5-42 J22 ● SS2.5-42 J25 ● SS2.5-42 J28 ● SS2.5-42 J30 ● SS2.5-42 J32 ● SS2.5-42 J35 ● SS2.5-42 J40	m2.5	42	S1	20	70	105	110	25	12	37	—	—	—
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
			S1K	30									8 x 3.3
			S1K	32									10 x 3.3
			S1K	40									12 x 3.3
SS2.5-44 ● SS2.5-44 J20 ● SS2.5-44 J22 ● SS2.5-44 J25 ● SS2.5-44 J28 ● SS2.5-44 J30 ● SS2.5-44 J32 ● SS2.5-44 J35 ● SS2.5-44 J40	m2.5	44	S1	20	70	110	115	25	12	37	—	—	—
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
			S1K	30									8 x 3.3
			S1K	32									10 x 3.3
			S1K	40									12 x 3.3
SS2.5-45 ● SS2.5-45 J20 ● SS2.5-45 J22 ● SS2.5-45 J25 ● SS2.5-45 J28 ● SS2.5-45 J30 ● SS2.5-45 J32 ● SS2.5-45 J35 ● SS2.5-45 J40	m2.5	45	S1	20	70	112.5	117.5	25	12	37	—	—	—
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
			S1K	30									8 x 3.3
			S1K	32									10 x 3.3
			S1K	40									12 x 3.3
SS2.5-46 ● SS2.5-46 J20 ● SS2.5-46 J22 ● SS2.5-46 J25 ● SS2.5-46 J28 ● SS2.5-46 J30 ● SS2.5-46 J32 ● SS2.5-46 J35 ● SS2.5-46 J40	m2.5	46	S1	20	70	115	120	25	12	37	—	—	—
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
			S1K	30									8 x 3.3
			S1K	32									10 x 3.3
			S1K	40									12 x 3.3

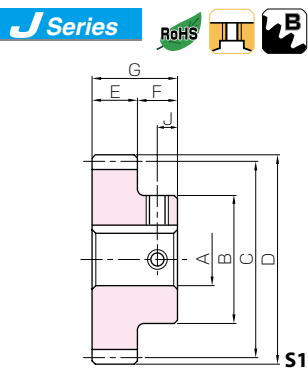
[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.





## Steel Spur Gears



Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—						1.66	<b>SS2.5-38</b>
M5*	6						1.65	● <b>SS2.5-38 J20</b>
M5*	6						1.63	● <b>SS2.5-38 J22</b>
M6*	6						1.59	● <b>SS2.5-38 J25</b>
M6*	6	216	22.4	22.0	2.28	0.16~0.34	1.56	● <b>SS2.5-38 J28</b>
M6	6						1.53	● <b>SS2.5-38 J30</b>
M8	6						1.50	● <b>SS2.5-38 J32</b>
M8	6						1.46	● <b>SS2.5-38 J35</b>
M8	6						1.37	● <b>SS2.5-38 J40</b>
—	—						1.81	<b>SS2.5-40</b>
M5*	6						1.80	● <b>SS2.5-40 J20</b>
M5*	6						1.78	● <b>SS2.5-40 J22</b>
M6*	6						1.74	● <b>SS2.5-40 J25</b>
M6*	6	230	24.9	23.5	2.54	0.16~0.34	1.71	● <b>SS2.5-40 J28</b>
M6	6						1.68	● <b>SS2.5-40 J30</b>
M8	6						1.65	● <b>SS2.5-40 J32</b>
M8	6						1.61	● <b>SS2.5-40 J35</b>
M8	6						1.52	● <b>SS2.5-40 J40</b>
—	—						1.97	<b>SS2.5-42</b>
M5*	6						1.95	● <b>SS2.5-42 J20</b>
M5*	6						1.94	● <b>SS2.5-42 J22</b>
M6*	6						1.90	● <b>SS2.5-42 J25</b>
M6*	6	245	27.6	25.0	2.82	0.18~0.40	1.87	● <b>SS2.5-42 J28</b>
M6	6						1.84	● <b>SS2.5-42 J30</b>
M8	6						1.81	● <b>SS2.5-42 J32</b>
M8	6						1.76	● <b>SS2.5-42 J35</b>
M8	6						1.68	● <b>SS2.5-42 J40</b>
—	—						2.14	<b>SS2.5-44</b>
M5*	6						2.12	● <b>SS2.5-44 J20</b>
M5*	6						2.10	● <b>SS2.5-44 J22</b>
M6*	6						2.07	● <b>SS2.5-44 J25</b>
M6*	6	260	30.5	26.5	3.11	0.18~0.40	2.03	● <b>SS2.5-44 J28</b>
M6	6						2.01	● <b>SS2.5-44 J30</b>
M8	6						1.97	● <b>SS2.5-44 J32</b>
M8	6						1.93	● <b>SS2.5-44 J35</b>
M8	6						1.84	● <b>SS2.5-44 J40</b>
—	—						2.22	<b>SS2.5-45</b>
M5*	6						2.21	● <b>SS2.5-45 J20</b>
M5*	6						2.19	● <b>SS2.5-45 J22</b>
M6*	6						2.15	● <b>SS2.5-45 J25</b>
M6*	6	267	31.9	27.2	3.26	0.18~0.40	2.12	● <b>SS2.5-45 J28</b>
M6	6						2.09	● <b>SS2.5-45 J30</b>
M8	6						2.06	● <b>SS2.5-45 J32</b>
M8	6						2.02	● <b>SS2.5-45 J35</b>
M8	6						1.93	● <b>SS2.5-45 J40</b>
—	—						2.31	<b>SS2.5-46</b>
M5*	6						2.29	● <b>SS2.5-46 J20</b>
M5*	6						2.28	● <b>SS2.5-46 J22</b>
M6*	6						2.24	● <b>SS2.5-46 J25</b>
M6*	6	274	33.5	28.0	3.41	0.18~0.40	2.21	● <b>SS2.5-46 J28</b>
M6	6						2.18	● <b>SS2.5-46 J30</b>
M8	6						2.15	● <b>SS2.5-46 J32</b>
M8	6						2.10	● <b>SS2.5-46 J35</b>
M8	6						2.02	● <b>SS2.5-46 J40</b>

## [Caution on J series]

① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order.

Please allow additional shipping time to get to your local distributor.

② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.

③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.

④ Certain products which would otherwise have a very long tapped hole are conbored to reduce the length of the tap. (Products marked with "\*" are tap size).

⑤ Areas of products which have been re-worked will not be black oxide coated.

⑥ For products having a tapped hole, a set screw is included.

GCSW for Web (Gear Calculation Software) is now available.

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks &amp; Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

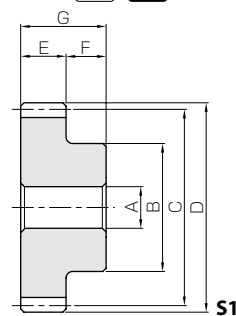
Bevel Gearboxes

Other Products



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB

\* The precision grade of J Series products is equivalent to the value shown in the table.



Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks &amp; Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

Bevel Gearboxes

Other Products

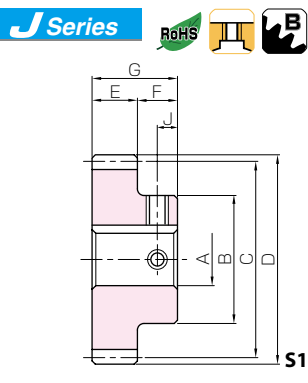
Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	H	I	Width×Depth
SS2.5-48 ● SS2.5-48 J20 ● SS2.5-48 J22 ● SS2.5-48 J25 ● SS2.5-48 J28 ● SS2.5-48 J30 ● SS2.5-48 J32 ● SS2.5-48 J35 ● SS2.5-48 J40	m2.5	48	S1	20	70	120	125	25	12	37	—	—	—
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
			S1K	30									8 x 3.3
			S1K	32									10 x 3.3
			S1K	35									10 x 3.3
			S1K	40									12 x 3.3
SS2.5-50 ● SS2.5-50 J20 ● SS2.5-50 J22 ● SS2.5-50 J25 ● SS2.5-50 J28 ● SS2.5-50 J30 ● SS2.5-50 J32 ● SS2.5-50 J35 ● SS2.5-50 J40	m2.5	50	S1	20	70	125	130	25	12	37	—	—	—
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
			S1K	30									8 x 3.3
			S1K	32									10 x 3.3
			S1K	35									10 x 3.3
			S1K	40									12 x 3.3
SS2.5-52 ● SS2.5-52 J20 ● SS2.5-52 J22 ● SS2.5-52 J25 ● SS2.5-52 J28 ● SS2.5-52 J30 ● SS2.5-52 J32 ● SS2.5-52 J35 ● SS2.5-52 J40	m2.5	52	S1	20	70	130	135	25	12	37	—	—	—
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
			S1K	30									8 x 3.3
			S1K	32									10 x 3.3
			S1K	35									10 x 3.3
			S1K	40									12 x 3.3
SS2.5-54 ● SS2.5-54 J20 ● SS2.5-54 J22 ● SS2.5-54 J25 ● SS2.5-54 J28 ● SS2.5-54 J30 ● SS2.5-54 J32 ● SS2.5-54 J35 ● SS2.5-54 J40	m2.5	54	S1	20	70	135	140	25	12	37	—	—	—
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
			S1K	30									8 x 3.3
			S1K	32									10 x 3.3
			S1K	35									10 x 3.3
			S1K	40									12 x 3.3
SS2.5-55 ● SS2.5-55 J20 ● SS2.5-55 J22 ● SS2.5-55 J25 ● SS2.5-55 J28 ● SS2.5-55 J30 ● SS2.5-55 J32 ● SS2.5-55 J35 ● SS2.5-55 J40	m2.5	55	S1	20	70	137.5	142.5	25	12	37	—	—	—
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
			S1K	30									8 x 3.3
			S1K	32									10 x 3.3
			S1K	35									10 x 3.3
			S1K	40									12 x 3.3
SS2.5-56 ● SS2.5-56 J20 ● SS2.5-56 J22 ● SS2.5-56 J25 ● SS2.5-56 J28 ● SS2.5-56 J30 ● SS2.5-56 J32 ● SS2.5-56 J35 ● SS2.5-56 J40	m2.5	56	S1	20	70	140	145	25	12	37	—	—	—
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
			S1K	30									8 x 3.3
			S1K	32									10 x 3.3
			S1K	35									10 x 3.3
			S1K	40									12 x 3.3

[Caution on Product Characteristics]

- The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations]

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- Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.



## Steel Spur Gears



Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—						2.49	<b>SS2.5-48</b>
M5*	6						2.48	● <b>SS2.5-48 J20</b>
M5*	6						2.46	● <b>SS2.5-48 J22</b>
M6*	6						2.42	● <b>SS2.5-48 J25</b>
M6*	6	289	36.7	29.5	3.74	0.18~0.40	2.39	● <b>SS2.5-48 J28</b>
M6	6						2.36	● <b>SS2.5-48 J30</b>
M8	6						2.33	● <b>SS2.5-48 J32</b>
M8	6						2.28	● <b>SS2.5-48 J35</b>
M8	6						2.20	● <b>SS2.5-48 J40</b>
—	—						2.68	<b>SS2.5-50</b>
M5*	6						2.66	● <b>SS2.5-50 J20</b>
M5*	6						2.65	● <b>SS2.5-50 J22</b>
M6*	6	304	40.0	31.0	4.08	0.18~0.40	2.61	● <b>SS2.5-50 J25</b>
M6*	6						2.58	● <b>SS2.5-50 J28</b>
M6	6						2.55	● <b>SS2.5-50 J30</b>
M8	6						2.52	● <b>SS2.5-50 J32</b>
M8	6						2.47	● <b>SS2.5-50 J35</b>
M8	6	2.39	● <b>SS2.5-50 J40</b>					
—	—						2.88	<b>SS2.5-52</b>
M5*	6						2.86	● <b>SS2.5-52 J20</b>
M5*	6						2.84	● <b>SS2.5-52 J22</b>
M6*	6	319	43.5	32.5	4.44	0.18~0.40	2.81	● <b>SS2.5-52 J25</b>
M6*	6						2.77	● <b>SS2.5-52 J28</b>
M6	6						2.75	● <b>SS2.5-52 J30</b>
M8	6						2.71	● <b>SS2.5-52 J32</b>
M8	6						2.67	● <b>SS2.5-52 J35</b>
M8	6	2.58	● <b>SS2.5-52 J40</b>					
—	—						3.08	<b>SS2.5-54</b>
M5*	6						3.06	● <b>SS2.5-54 J20</b>
M5*	6						3.05	● <b>SS2.5-54 J22</b>
M6*	6	334	47.2	34.0	4.81	0.18~0.40	3.01	● <b>SS2.5-54 J25</b>
M6*	6						2.98	● <b>SS2.5-54 J28</b>
M6	6						2.95	● <b>SS2.5-54 J30</b>
M8	6						2.92	● <b>SS2.5-54 J32</b>
M8	6						2.87	● <b>SS2.5-54 J35</b>
M8	6	2.79	● <b>SS2.5-54 J40</b>					
—	—						3.19	<b>SS2.5-55</b>
M5*	6						3.17	● <b>SS2.5-55 J20</b>
M5*	6						3.15	● <b>SS2.5-55 J22</b>
M6*	6	341	49.1	34.8	5.01	0.18~0.40	3.12	● <b>SS2.5-55 J25</b>
M6*	6						3.08	● <b>SS2.5-55 J28</b>
M6	6						3.06	● <b>SS2.5-55 J30</b>
M8	6						3.02	● <b>SS2.5-55 J32</b>
M8	6						2.98	● <b>SS2.5-55 J35</b>
M8	6	2.89	● <b>SS2.5-55 J40</b>					
—	—						3.29	<b>SS2.5-56</b>
M5*	6						3.28	● <b>SS2.5-56 J20</b>
M5*	6						3.26	● <b>SS2.5-56 J22</b>
M6*	6	349	51.0	35.6	5.20	0.18~0.40	3.22	● <b>SS2.5-56 J25</b>
M6*	6						3.19	● <b>SS2.5-56 J28</b>
M6	6						3.16	● <b>SS2.5-56 J30</b>
M8	6						3.13	● <b>SS2.5-56 J32</b>
M8	6						3.09	● <b>SS2.5-56 J35</b>
M8	6	3.00	● <b>SS2.5-56 J40</b>					

## [Caution on J series]

① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order.

Please allow additional shipping time to get to your local distributor.

② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.

③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.

④ Certain products which would otherwise have a very long tapped hole are conbored to reduce the length of the tap. (Products marked with "\*" are tap size).

⑤ Areas of products which have been re-worked will not be black oxide coated.

⑥ For products having a tapped hole, a set screw is included.

GCSW for Web (Gear Calculation Software) is now available.

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks &amp; Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

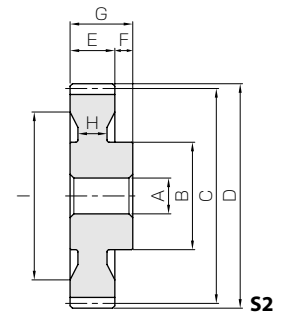
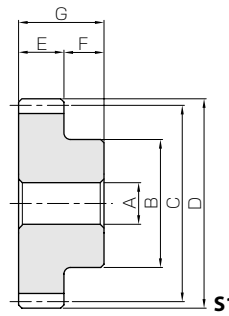
Bevel Gearboxes

Other Products



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB

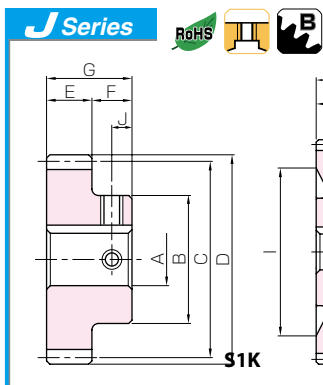
\* The precision grade of J Series products is equivalent to the value shown in the table.



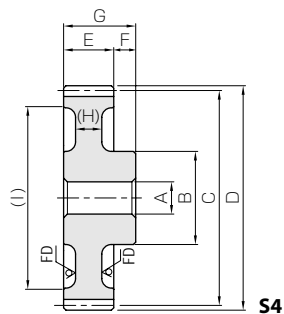
- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	H	I	WidthxDepth
SS2.5-58 ● SS2.5-58 J20 ● SS2.5-58 J22 ● SS2.5-58 J25 ● SS2.5-58 J28 ● SS2.5-58 J30 ● SS2.5-58 J32 ● SS2.5-58 J35 ● SS2.5-58 J40	m2.5	58	S1	20	70	145	150	25	12	37	—	—	—
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
			S1K	30									8 x 3.3
			S1K	32									10 x 3.3
			S1K	35									10 x 3.3
S1K	40	12 x 3.3											
SS2.5-60 ● SS2.5-60 J25 ● SS2.5-60 J28 ● SS2.5-60 J30 ● SS2.5-60 J32 ● SS2.5-60 J35 ● SS2.5-60 J40	m2.5	60	S4	25	70	150	155	25	12	37	(10)	(127)	—
			S4K	25									8 x 3.3
			S4K	28									8 x 3.3
			S4K	30									8 x 3.3
			S4K	32									10 x 3.3
			S4K	35									10 x 3.3
S4K	40	12 x 3.3											
SS2.5-62 ● SS2.5-62 J25 ● SS2.5-62 J28 ● SS2.5-62 J30 ● SS2.5-62 J32 ● SS2.5-62 J35 ● SS2.5-62 J40	m2.5	62	S2	25	80	155	160	25	12	37	15	130	—
			S2K	25									8 x 3.3
			S2K	28									8 x 3.3
			S2K	30									8 x 3.3
			S2K	32									10 x 3.3
			S2K	35									10 x 3.3
S2K	40	12 x 3.3											
SS2.5-64 ● SS2.5-64 J25 ● SS2.5-64 J28 ● SS2.5-64 J30 ● SS2.5-64 J32 ● SS2.5-64 J35 ● SS2.5-64 J40	m2.5	64	S2	25	80	160	165	25	12	37	15	131	—
			S2K	25									8 x 3.3
			S2K	28									8 x 3.3
			S2K	30									8 x 3.3
			S2K	32									10 x 3.3
			S2K	35									10 x 3.3
S2K	40	12 x 3.3											
SS2.5-65 ● SS2.5-65 J25 ● SS2.5-65 J28 ● SS2.5-65 J30 ● SS2.5-65 J32 ● SS2.5-65 J35 ● SS2.5-65 J40	m2.5	65	S2	25	80	162.5	167.5	25	12	37	15	134	—
			S2K	25									8 x 3.3
			S2K	28									8 x 3.3
			S2K	30									8 x 3.3
			S2K	32									10 x 3.3
			S2K	35									10 x 3.3
S2K	40	12 x 3.3											
SS2.5-66 ● SS2.5-66 J25 ● SS2.5-66 J28 ● SS2.5-66 J30 ● SS2.5-66 J32 ● SS2.5-66 J35 ● SS2.5-66 J40	m2.5	66	S2	25	80	165	170	25	12	37	15	140	—
			S2K	25									8 x 3.3
			S2K	28									8 x 3.3
			S2K	30									8 x 3.3
			S2K	32									10 x 3.3
			S2K	35									10 x 3.3
S2K	40	12 x 3.3											
SS2.5-68 ● SS2.5-68 J25 ● SS2.5-68 J28 ● SS2.5-68 J30 ● SS2.5-68 J32 ● SS2.5-68 J35 ● SS2.5-68 J40	m2.5	68	S2	25	80	170	175	25	12	37	15	140	—
			S2K	25									8 x 3.3
			S2K	28									8 x 3.3
			S2K	30									8 x 3.3
			S2K	32									10 x 3.3
			S2K	35									10 x 3.3
S2K	40	12 x 3.3											

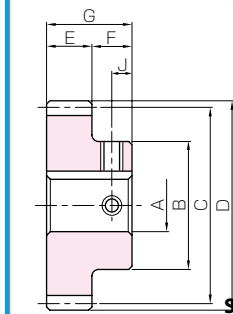
- [Caution on Product Characteristics] ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.  
 ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.
- [Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.  
 ② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.



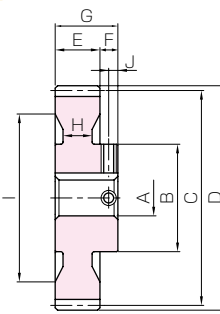
# Steel Spur Gears



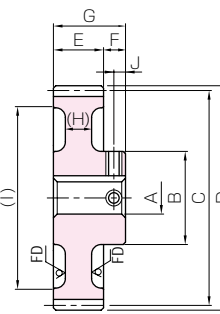
S4



S1K



S2K



S4K \* FD has die-forged finish.



\* FD has die-forged finish.

Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—	364	55.0	37.1	5.61	0.18~0.40	3.51	SS2.5-58
M5*	6							● SS2.5-58 J20
M5*	6							● SS2.5-58 J22
M6*	6							● SS2.5-58 J25
M6*	6							● SS2.5-58 J28
M6	6							● SS2.5-58 J30
M8	6							● SS2.5-58 J32
M8	6							● SS2.5-58 J35
M8	6	● SS2.5-58 J40						
—	—	379	59.1	38.6	6.03	0.18~0.40	2.80	SS2.5-60
M6*	6							● SS2.5-60 J25
M6*	6							● SS2.5-60 J28
M6	6							● SS2.5-60 J30
M8	6							● SS2.5-60 J32
M8	6	● SS2.5-60 J35						
M8	6	● SS2.5-60 J40						
—	—	394	63.4	40.1	6.46	0.18~0.40	3.54	SS2.5-62
M6*	6							● SS2.5-62 J25
M6*	6							● SS2.5-62 J28
M6*	6							● SS2.5-62 J30
M8	6							● SS2.5-62 J32
M8	6	● SS2.5-62 J35						
M8	6	● SS2.5-62 J40						
—	—	409	67.8	41.7	6.92	0.18~0.40	3.76	SS2.5-64
M6*	6							● SS2.5-64 J25
M6*	6							● SS2.5-64 J28
M6*	6							● SS2.5-64 J30
M8	6							● SS2.5-64 J32
M8	6	● SS2.5-64 J35						
M8	6	● SS2.5-64 J40						
—	—	416	70.1	42.4	7.15	0.18~0.40	3.84	SS2.5-65
M6*	6							● SS2.5-65 J25
M6*	6							● SS2.5-65 J28
M6*	6							● SS2.5-65 J30
M8	6							● SS2.5-65 J32
M8	6	● SS2.5-65 J35						
M8	6	● SS2.5-65 J40						
—	—	424	72.4	43.2	7.39	0.18~0.40	3.87	SS2.5-66
M6*	6							● SS2.5-66 J25
M6*	6							● SS2.5-66 J28
M6*	6							● SS2.5-66 J30
M8	6							● SS2.5-66 J32
M8	6	● SS2.5-66 J35						
M8	6	● SS2.5-66 J40						
—	—	439	77.2	44.7	7.87	0.18~0.40	4.13	SS2.5-68
M6*	6							● SS2.5-68 J25
M6*	6							● SS2.5-68 J28
M6*	6							● SS2.5-68 J30
M8	6							● SS2.5-68 J32
M8	6	● SS2.5-68 J35						
M8	6	● SS2.5-68 J40						

**[Caution on J series]**

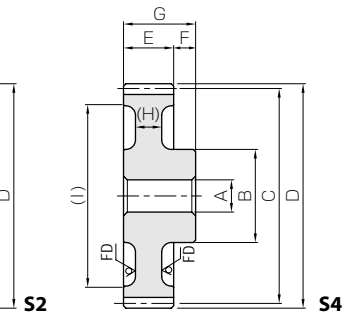
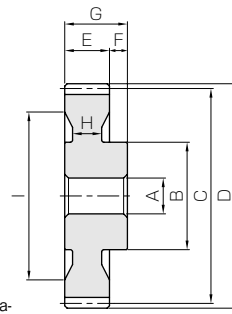
- ① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).
- ⑤ Areas of products which have been re-worked will not be black oxide coated.
- ⑥ For products having a tapped hole, a set screw is included.

- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB

\* The precision grade of J Series products is equivalent to the value shown in the table.



\* FD has die-forged finish.

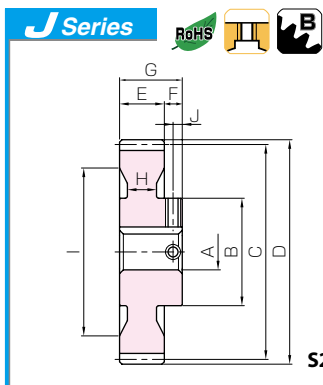
Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	H	I	WidthxDepth
<b>SS2.5-70</b> ● <b>SS2.5-70 J25</b> ● <b>SS2.5-70 J28</b> ● <b>SS2.5-70 J30</b> ● <b>SS2.5-70 J32</b> ● <b>SS2.5-70 J35</b> ● <b>SS2.5-70 J40</b>	<b>m2.5</b>	70	S2	25	80	175	180	25	12	37	15	146	—
S2K			25	8 x 3.3									
S2K			28	8 x 3.3									
S2K			30	8 x 3.3									
S2K			32	10 x 3.3									
S2K			35	10 x 3.3									
S2K		40	12 x 3.3										
<b>SS2.5-72</b> ● <b>SS2.5-72 J25</b> ● <b>SS2.5-72 J28</b> ● <b>SS2.5-72 J30</b> ● <b>SS2.5-72 J32</b> ● <b>SS2.5-72 J35</b> ● <b>SS2.5-72 J40</b>		72	S2	25	80	180	185	25	12	37	15	151	—
S2K			25	8 x 3.3									
S2K			28	8 x 3.3									
S2K			30	8 x 3.3									
S2K			32	10 x 3.3									
S2K	35		10 x 3.3										
S2K	40	12 x 3.3											
<b>SS2.5-75</b> ● <b>SS2.5-75 J25</b> ● <b>SS2.5-75 J28</b> ● <b>SS2.5-75 J30</b> ● <b>SS2.5-75 J32</b> ● <b>SS2.5-75 J35</b> ● <b>SS2.5-75 J40</b>	75	S2	25	80	187.5	192.5	25	12	37	15	159	—	
S2K		25	8 x 3.3										
S2K		28	8 x 3.3										
S2K		30	8 x 3.3										
S2K		32	10 x 3.3										
S2K		35	10 x 3.3										
S2K	40	12 x 3.3											
<b>SS2.5-76</b> ● <b>SS2.5-76 J25</b> ● <b>SS2.5-76 J28</b> ● <b>SS2.5-76 J30</b> ● <b>SS2.5-76 J32</b> ● <b>SS2.5-76 J35</b> ● <b>SS2.5-76 J40</b>	76	S2	25	80	190	195	25	12	37	15	160	—	
S2K		25	8 x 3.3										
S2K		28	8 x 3.3										
S2K		30	8 x 3.3										
S2K		32	10 x 3.3										
S2K		35	10 x 3.3										
S2K	40	12 x 3.3											
<b>SS2.5-80</b> ● <b>SS2.5-80 J25</b> ● <b>SS2.5-80 J28</b> ● <b>SS2.5-80 J30</b> ● <b>SS2.5-80 J32</b> ● <b>SS2.5-80 J35</b> ● <b>SS2.5-80 J40</b>	80	S4	25	80	200	205	25	12	37	(10)	(177)	—	
S4K		25	8 x 3.3										
S4K		28	8 x 3.3										
S4K		30	8 x 3.3										
S4K		32	10 x 3.3										
S4K		35	10 x 3.3										
S4K	40	12 x 3.3											
<b>SS2.5-90</b> ● <b>SS2.5-90 J30</b> ● <b>SS2.5-90 J32</b> ● <b>SS2.5-90 J35</b> ● <b>SS2.5-90 J40</b>	90	S4	30	90	225	230	25	12	37	(10)	(202)	—	
S4K		30	8 x 3.3										
S4K		32	10 x 3.3										
S4K		35	10 x 3.3										
S4K		35	10 x 3.3										
S4K		40	12 x 3.3										
<b>SS2.5-100</b> ● <b>SS2.5-100 J30</b> ● <b>SS2.5-100 J32</b> ● <b>SS2.5-100 J35</b> ● <b>SS2.5-100 J40</b>	100	S4	30	90	250	255	25	12	37	(10)	(227)	—	
S4K		30	8 x 3.3										
S4K		32	10 x 3.3										
S4K		35	10 x 3.3										
S4K		35	10 x 3.3										
S4K		40	12 x 3.3										
<b>SS2.5-120</b> ● <b>SS2.5-120 J30</b> ● <b>SS2.5-120 J32</b> ● <b>SS2.5-120 J35</b> ● <b>SS2.5-120 J40</b>	120	S4	30	100	300	305	25	12	37	(10)	(277)	—	
S4K		30	8 x 3.3										
S4K		32	10 x 3.3										
S4K		35	10 x 3.3										
S4K		35	10 x 3.3										
S4K		40	12 x 3.3										

[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.



### Steel Spur Gears



S4K \* FD has die-forged finish.

Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—						4.30	<b>SS2.5-70</b>
M6*	6	454	82.1	46.3	8.37	0.18~0.4	4.28	● <b>SS2.5-70 J25</b>
M6*	6						4.24	● <b>SS2.5-70 J28</b>
M6*	6						4.22	● <b>SS2.5-70 J30</b>
M8	6						4.19	● <b>SS2.5-70 J32</b>
M8	6						4.14	● <b>SS2.5-70 J35</b>
M8	6						4.06	● <b>SS2.5-70 J40</b>
—	—						4.49	<b>SS2.5-72</b>
M6*	6	469	87.1	47.8	8.89	0.18~0.4	4.47	● <b>SS2.5-72 J25</b>
M6*	6						4.43	● <b>SS2.5-72 J28</b>
M6*	6						4.41	● <b>SS2.5-72 J30</b>
M8	6						4.37	● <b>SS2.5-72 J32</b>
M8	6						4.33	● <b>SS2.5-72 J35</b>
M8	6						4.24	● <b>SS2.5-72 J40</b>
—	—						4.77	<b>SS2.5-75</b>
M6*	6	492	95.0	50.1	9.69	0.18~0.4	4.75	● <b>SS2.5-75 J25</b>
M6*	6						4.71	● <b>SS2.5-75 J28</b>
M6*	6						4.69	● <b>SS2.5-75 J30</b>
M8	6						4.66	● <b>SS2.5-75 J32</b>
M8	6						4.61	● <b>SS2.5-75 J35</b>
M8	6						4.53	● <b>SS2.5-75 J40</b>
—	—						4.90	<b>SS2.5-76</b>
M6*	6	499	97.7	50.9	9.97	0.18~0.4	4.88	● <b>SS2.5-76 J25</b>
M6*	6						4.84	● <b>SS2.5-76 J28</b>
M6*	6						4.82	● <b>SS2.5-76 J30</b>
M8	6						4.78	● <b>SS2.5-76 J32</b>
M8	6						4.74	● <b>SS2.5-76 J35</b>
M8	6						4.65	● <b>SS2.5-76 J40</b>
—	—						4.42	<b>SS2.5-80</b>
M6*	6	441	90.9	45.0	9.27	0.18~0.4	4.40	● <b>SS2.5-80 J25</b>
M6*	6						4.36	● <b>SS2.5-80 J28</b>
M6*	6						4.34	● <b>SS2.5-80 J30</b>
M8	6						4.31	● <b>SS2.5-80 J32</b>
M8	6						4.26	● <b>SS2.5-80 J35</b>
M8	6						4.18	● <b>SS2.5-80 J40</b>
—	—						5.64	<b>SS2.5-90</b>
M6*	6	505	117	51.5	12.0	0.22~0.48	5.62	● <b>SS2.5-90 J30</b>
M8*	6						5.58	● <b>SS2.5-90 J32</b>
M8*	6						5.54	● <b>SS2.5-90 J35</b>
M8*	6						5.46	● <b>SS2.5-90 J40</b>
M8	6							
—	—						6.78	<b>SS2.5-100</b>
M6*	6	569	147	58.0	15.0	0.22~0.48	6.76	● <b>SS2.5-100 J30</b>
M8*	6						6.72	● <b>SS2.5-100 J32</b>
M8*	6						6.68	● <b>SS2.5-100 J35</b>
M8	6						6.60	● <b>SS2.5-100 J40</b>
—	—						9.38	<b>SS2.5-120</b>
M6*	6	696	218	71.0	22.2	0.22~0.48	9.35	● <b>SS2.5-120 J30</b>
M8*	6						9.31	● <b>SS2.5-120 J32</b>
M8*	6						9.27	● <b>SS2.5-120 J35</b>
M8*	6						9.18	● <b>SS2.5-120 J40</b>
M8*	6							

**[Caution on J series]**

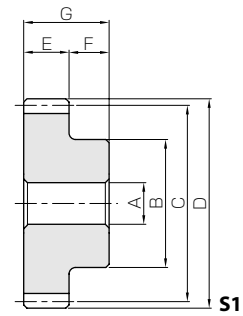
- ① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).
- ⑤ Areas of products which have been re-worked will not be black oxide coated.
- ⑥ For products having a tapped hole, a set screw is included.

- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB

\* The precision grade of J Series products is equivalent to the value shown in the table.



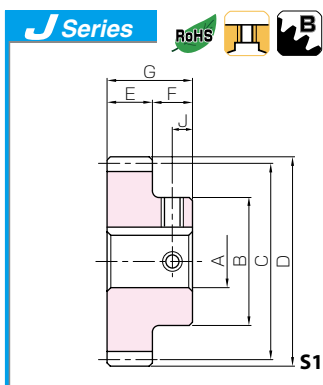
- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.	Keyway		
				A <sub>H7</sub>	B	C	D	E	F	G	H	I	Width×Depth		
<b>SS3-12</b> ● <b>SS3-12 J15</b> ● <b>SS3-12 J16</b>	<b>m3</b>	12	S1	15	28	36	42	30	15	45	—	—	—		
			S1T2	15									—		
			S1T2	16									—		
		<b>SS3-13</b> ● <b>SS3-13 J15**</b> ● <b>SS3-13 J16**</b> ● <b>SS3-13 J18</b>	13	13	S1	15	30	39	45	30	15	45	—	—	—
					S1K	15									5 x 2.3
					S1K	16									5 x 2.3
					S1T2	18									—
		<b>SS3-14</b> ● <b>SS3-14 J15</b> ● <b>SS3-14 J16</b> ● <b>SS3-14 J18**</b> ● <b>SS3-14 J19</b>	14	14	S1	15	32	42	48	30	15	45	—	—	—
					S1K	15									5 x 2.3
					S1K	16									5 x 2.3
					S1K	18									6 x 2.8
					S1T2	19									—
<b>SS3-15</b> ● <b>SS3-15 J15</b> ● <b>SS3-15 J16</b> ● <b>SS3-15 J18</b> ● <b>SS3-15 J19</b> ● <b>SS3-15 J20**</b>	15	15	S1	15	36	45	51	30	15	45	—	—	—		
			S1K	15									5 x 2.3		
			S1K	16									5 x 2.3		
			S1K	18									6 x 2.8		
			S1K	19									6 x 2.8		
			S1K	20									6 x 2.8		
<b>SS3-16</b> ● <b>SS3-16 J15</b> ● <b>SS3-16 J16</b> ● <b>SS3-16 J18</b> ● <b>SS3-16 J19</b> ● <b>SS3-16 J20</b> ● <b>SS3-16 J22</b>	16	16	S1	15	38	48	54	30	15	45	—	—	—		
			S1K	15									5 x 2.3		
			S1K	16									5 x 2.3		
			S1K	18									6 x 2.8		
			S1K	19									6 x 2.8		
			S1K	20									6 x 2.8		
<b>SS3-17</b> ● <b>SS3-17 J15</b> ● <b>SS3-17 J16</b> ● <b>SS3-17 J18</b> ● <b>SS3-17 J19</b> ● <b>SS3-17 J20</b> ● <b>SS3-17 J22</b>	17	17	S1	15	39	51	57	30	15	45	—	—	—		
			S1K	15									5 x 2.3		
			S1K	16									5 x 2.3		
			S1K	18									6 x 2.8		
			S1K	19									6 x 2.8		
			S1K	20									6 x 2.8		
<b>SS3-18</b> ● <b>SS3-18 J15</b> ● <b>SS3-18 J16</b> ● <b>SS3-18 J18</b> ● <b>SS3-18 J19</b> ● <b>SS3-18 J20</b> ● <b>SS3-18 J22</b>	18	18	S1	15	40	54	60	30	15	45	—	—	—		
			S1K	15									5 x 2.3		
			S1K	16									5 x 2.3		
			S1K	18									6 x 2.8		
			S1K	19									6 x 2.8		
			S1K	20									6 x 2.8		
<b>SS3-19</b> ● <b>SS3-19 J15</b> ● <b>SS3-19 J16</b> ● <b>SS3-19 J18</b> ● <b>SS3-19 J19</b> ● <b>SS3-19 J20</b> ● <b>SS3-19 J22</b> ● <b>SS3-19 J25</b>	19	19	S1	15	45	57	63	30	15	45	—	—	—		
			S1K	15									5 x 2.3		
			S1K	16									5 x 2.3		
			S1K	18									6 x 2.8		
			S1K	19									6 x 2.8		
			S1K	20									6 x 2.8		
S1K	22	6 x 2.8													
S1K	25	8 x 3.3													

[Caution on Product Characteristics] ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.  
② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.  
② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.





## Steel Spur Gears



Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—							<b>SS3-12</b>
M4	7.5	54.9	3.12	5.59	0.32	0.14~0.32	0.25	● <b>SS3-12 J15</b>
M4	7.5						0.25	● <b>SS3-12 J16</b>
M4	7.5	70.7	3.77	7.21	0.38	0.14~0.32	0.30	● <b>SS3-13 J15**</b>
M4	7.5						0.30	● <b>SS3-13 J16**</b>
M5	7.5						0.29	● <b>SS3-13 J18</b>
M5	7.5						0.27	● <b>SS3-13 J18</b>
M4	7.5	88.9	4.47	9.07	0.46	0.14~0.32	0.36	● <b>SS3-14 J15</b>
M4	7.5						0.35	● <b>SS3-14 J16</b>
M5	7.5						0.35	● <b>SS3-14 J18**</b>
M5	7.5						0.32	● <b>SS3-14 J19</b>
M5	7.5						0.31	● <b>SS3-14 J19</b>
M4	7.5	99.7	5.23	10.2	0.53	0.14~0.32	0.43	● <b>SS3-15 J15</b>
M4	7.5						0.43	● <b>SS3-15 J15</b>
M4	7.5						0.42	● <b>SS3-15 J16</b>
M5	7.5						0.42	● <b>SS3-15 J16</b>
M5	7.5						0.40	● <b>SS3-15 J18</b>
M5	7.5						0.39	● <b>SS3-15 J19</b>
M5	7.5						0.38	● <b>SS3-15 J20**</b>
M5	7.5						0.38	● <b>SS3-15 J20**</b>
M4	7.5	111	6.05	11.3	0.62	0.14~0.32	0.50	● <b>SS3-16 J15</b>
M4	7.5						0.49	● <b>SS3-16 J15</b>
M4	7.5						0.48	● <b>SS3-16 J16</b>
M5	7.5						0.48	● <b>SS3-16 J16</b>
M5	7.5						0.46	● <b>SS3-16 J18</b>
M5	7.5						0.45	● <b>SS3-16 J18</b>
M5	7.5						0.45	● <b>SS3-16 J19</b>
M5	7.5						0.44	● <b>SS3-16 J20</b>
M5	7.5						0.44	● <b>SS3-16 J20</b>
M5	7.5						0.42	● <b>SS3-16 J22</b>
M4	7.5	122	6.93	12.4	0.71	0.14~0.32	0.56	● <b>SS3-17 J15</b>
M4	7.5						0.55	● <b>SS3-17 J15</b>
M4	7.5						0.55	● <b>SS3-17 J16</b>
M5	7.5						0.55	● <b>SS3-17 J16</b>
M5	7.5						0.52	● <b>SS3-17 J18</b>
M5	7.5						0.52	● <b>SS3-17 J18</b>
M5	7.5						0.51	● <b>SS3-17 J19</b>
M5	7.5						0.50	● <b>SS3-17 J20</b>
M5	7.5						0.50	● <b>SS3-17 J20</b>
M5	7.5						0.48	● <b>SS3-17 J22</b>
M4	7.5	133	7.87	13.5	0.80	0.14~0.32	0.62	● <b>SS3-18 J15</b>
M4	7.5						0.62	● <b>SS3-18 J15</b>
M4	7.5						0.61	● <b>SS3-18 J16</b>
M5	7.5						0.61	● <b>SS3-18 J16</b>
M5	7.5						0.59	● <b>SS3-18 J18</b>
M5	7.5						0.58	● <b>SS3-18 J18</b>
M5	7.5						0.57	● <b>SS3-18 J20</b>
M5	7.5						0.57	● <b>SS3-18 J20</b>
M5	7.5						0.55	● <b>SS3-18 J22</b>
M4*	7.5	144	8.88	14.7	0.91	0.14~0.32	0.73	● <b>SS3-19 J15</b>
M4*	7.5						0.72	● <b>SS3-19 J15</b>
M4*	7.5						0.71	● <b>SS3-19 J16</b>
M5	7.5						0.71	● <b>SS3-19 J16</b>
M5	7.5						0.69	● <b>SS3-19 J18</b>
M5	7.5						0.69	● <b>SS3-19 J18</b>
M5	7.5						0.68	● <b>SS3-19 J19</b>
M5	7.5						0.67	● <b>SS3-19 J20</b>
M5	7.5						0.67	● <b>SS3-19 J20</b>
M5	7.5						0.65	● <b>SS3-19 J22</b>
M6	7.5						0.60	● <b>SS3-19 J25</b>

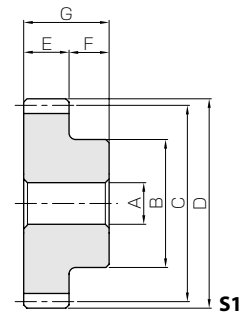
**[Caution on J series]**

- ① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with " \* " are tap size).
- ⑤ Areas of products which have been re-worked will not be black oxide coated.
- ⑥ For products having a tapped hole, a set screw is included.
- ⑦ Products marked with "\*\*\*" have a small amount of material between the corner of the keyway and the tooth root. This mode of failure must be considered when selecting these gears. For details, please see our web site.



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB

\* The precision grade of J Series products is equivalent to the value shown in the table.

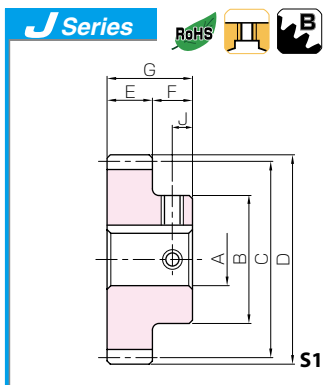


- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	H	I	Width×Depth
SS3-20 ● SS3-20 J15 ● SS3-20 J16 ● SS3-20 J18 ● SS3-20 J19 ● SS3-20 J20 ● SS3-20 J22 ● SS3-20 J25 ● SS3-20 J28 ● SS3-20 J30	m3	20	S1	15	50	60	66	30	15	45	—	—	—
			S1K	15									5 x 2.3
			S1K	16									5 x 2.3
			S1K	18									6 x 2.8
			S1K	19									6 x 2.8
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
			S1K	30									8 x 3.3
SS3-21 ● SS3-21 J15 ● SS3-21 J16 ● SS3-21 J18 ● SS3-21 J19 ● SS3-21 J20 ● SS3-21 J22 ● SS3-21 J25 ● SS3-21 J28 ● SS3-21 J30	m3	21	S1	15	52	63	69	30	15	45	—	—	—
			S1K	15									5 x 2.3
			S1K	16									5 x 2.3
			S1K	18									6 x 2.8
			S1K	19									6 x 2.8
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
			S1K	30									8 x 3.3
SS3-22 ● SS3-22 J15 ● SS3-22 J16 ● SS3-22 J18 ● SS3-22 J19 ● SS3-22 J20 ● SS3-22 J22 ● SS3-22 J25 ● SS3-22 J28 ● SS3-22 J30 ● SS3-22 J32	m3	22	S1	15	54	66	72	30	15	45	—	—	—
			S1K	15									5 x 2.3
			S1K	16									5 x 2.3
			S1K	18									6 x 2.8
			S1K	19									6 x 2.8
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
			S1K	30									8 x 3.3
S1K	32	10 x 3.3											
SS3-23 ● SS3-23 J15 ● SS3-23 J16 ● SS3-23 J18 ● SS3-23 J19 ● SS3-23 J20 ● SS3-23 J22 ● SS3-23 J25 ● SS3-23 J28 ● SS3-23 J30 ● SS3-23 J32	m3	23	S1	15	56	69	75	30	15	45	—	—	—
			S1K	15									5 x 2.3
			S1K	16									5 x 2.3
			S1K	18									6 x 2.8
			S1K	19									6 x 2.8
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
			S1K	30									8 x 3.3
S1K	32	10 x 3.3											
SS3-24 ● SS3-24 J15 ● SS3-24 J16 ● SS3-24 J18 ● SS3-24 J19 ● SS3-24 J20 ● SS3-24 J22 ● SS3-24 J25 ● SS3-24 J28 ● SS3-24 J30 ● SS3-24 J32	m3	24	S1	15	58	72	78	30	15	45	—	—	—
			S1K	15									5 x 2.3
			S1K	16									5 x 2.3
			S1K	18									6 x 2.8
			S1K	19									6 x 2.8
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
			S1K	30									8 x 3.3
S1K	32	10 x 3.3											

[Caution on Product Characteristics] ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.  
② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

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② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.



### Steel Spur Gears



Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)	
Size	J	Bending strength	Surface durability	Bending strength	Surface durability				
—	—	155	9.95	15.8	1.02	0.14~0.32	0.83	<b>SS3-20</b>	
M4*	7.5							0.83	●SS3-20 J15
M4*	7.5							0.82	●SS3-20 J16
M5	7.5							0.80	●SS3-20 J18
M5	7.5							0.79	●SS3-20 J19
M5	7.5							0.78	●SS3-20 J20
M5	7.5							0.75	●SS3-20 J22
M6	7.5							0.71	●SS3-20 J25
M6	7.5							0.67	●SS3-20 J28
M6	7.5							0.64	●SS3-20 J30
—	—	167	11.1	17.0	1.13	0.18~0.38	0.92	<b>SS3-21</b>	
M4*	7.5							0.91	●SS3-21 J15
M4*	7.5							0.90	●SS3-21 J16
M5	7.5							0.89	●SS3-21 J18
M5	7.5							0.87	●SS3-21 J19
M5	7.5							0.86	●SS3-21 J20
M5	7.5							0.84	●SS3-21 J22
M6	7.5							0.80	●SS3-21 J25
M6	7.5							0.75	●SS3-21 J28
M6	7.5							0.72	●SS3-21 J30
—	—	178	12.3	18.2	1.25	0.18~0.38	1.01	<b>SS3-22</b>	
M4*	7.5							1.00	●SS3-22 J15
M4*	7.5							0.99	●SS3-22 J16
M5*	7.5							0.97	●SS3-22 J18
M5*	7.5							0.96	●SS3-22 J19
M5	7.5							0.96	●SS3-22 J20
M5	7.5							0.93	●SS3-22 J22
M6	7.5							0.89	●SS3-22 J25
M6	7.5							0.85	●SS3-22 J28
M6	7.5							0.81	●SS3-22 J30
—	—	190	13.6	19.4	1.38	0.18~0.38	1.11	<b>SS3-23</b>	
M4*	7.5							1.10	●SS3-23 J15
M4*	7.5							1.09	●SS3-23 J16
M5*	7.5							1.07	●SS3-23 J18
M5*	7.5							1.06	●SS3-23 J19
M5*	7.5							1.05	●SS3-23 J20
M5	7.5							1.03	●SS3-23 J22
M6	7.5							0.98	●SS3-23 J25
M6	7.5							0.94	●SS3-23 J28
M6	7.5							0.91	●SS3-23 J30
—	—	202	14.9	20.6	1.52	0.18~0.38	1.21	<b>SS3-24</b>	
M4*	7.5							1.20	●SS3-24 J15
M4*	7.5							1.19	●SS3-24 J16
M5*	7.5							1.17	●SS3-24 J18
M5*	7.5							1.16	●SS3-24 J19
M5*	7.5							1.15	●SS3-24 J20
M5*	7.5							1.12	●SS3-24 J22
M6	7.5							1.08	●SS3-24 J25
M6	7.5							1.04	●SS3-24 J28
M6	7.5							1.01	●SS3-24 J30
M8	7.5	0.97	●SS3-24 J32						

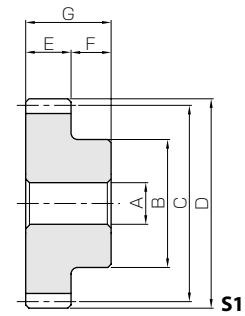
**[Caution on J series]**

- ① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with " \* " are tap size).
- ⑤ Areas of products which have been re-worked will not be black oxide coated.
- ⑥ For products having a tapped hole, a set screw is included.



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB

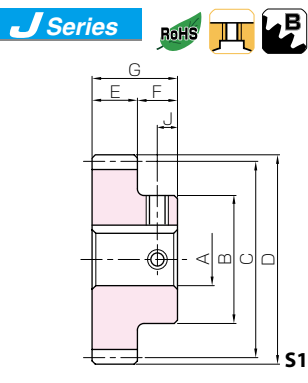
\* The precision grade of J Series products is equivalent to the value shown in the table.



- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

Catalog No. ●: J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	H	I	Width×Depth
SS3-25 ●SS3-25 J20 ●SS3-25 J22 ●SS3-25 J25 ●SS3-25 J28 ●SS3-25 J30 ●SS3-25 J32 ●SS3-25 J35	m3	25	S1	20	60	75	81	30	15	45	—	—	—
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
			S1K	30									8 x 3.3
			S1K	32									10 x 3.3
S1K	35	10 x 3.3											
SS3-26 ●SS3-26 J20 ●SS3-26 J22 ●SS3-26 J25 ●SS3-26 J28 ●SS3-26 J30 ●SS3-26 J32 ●SS3-26 J35	26	26	S1	20	65	78	84	30	15	45	—	—	—
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
			S1K	30									8 x 3.3
			S1K	32									10 x 3.3
S1K	35	10 x 3.3											
SS3-27 ●SS3-27 J20 ●SS3-27 J22 ●SS3-27 J25 ●SS3-27 J28 ●SS3-27 J30 ●SS3-27 J32 ●SS3-27 J35	27	27	S1	20	65	81	87	30	15	45	—	—	—
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
			S1K	30									8 x 3.3
			S1K	32									10 x 3.3
S1K	35	10 x 3.3											
SS3-28 ●SS3-28 J20 ●SS3-28 J22 ●SS3-28 J25 ●SS3-28 J28 ●SS3-28 J30 ●SS3-28 J32 ●SS3-28 J35 ●SS3-28 J40	28	28	S1	20	70	84	90	30	15	45	—	—	—
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
			S1K	30									8 x 3.3
			S1K	32									10 x 3.3
S1K	35	10 x 3.3											
S1K	40	12 x 3.3											
SS3-29 ●SS3-29 J20 ●SS3-29 J22 ●SS3-29 J25 ●SS3-29 J28 ●SS3-29 J30 ●SS3-29 J32 ●SS3-29 J35 ●SS3-29 J40	29	29	S1	20	70	87	93	30	15	45	—	—	—
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
			S1K	30									8 x 3.3
			S1K	32									10 x 3.3
S1K	35	10 x 3.3											
S1K	40	12 x 3.3											
SS3-30 ●SS3-30 J20 ●SS3-30 J22 ●SS3-30 J25 ●SS3-30 J28 ●SS3-30 J30 ●SS3-30 J32 ●SS3-30 J35 ●SS3-30 J40 ●SS3-30 J45	30	30	S1	20	75	90	96	30	15	45	—	—	—
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
			S1K	30									8 x 3.3
			S1K	32									10 x 3.3
S1K	35	10 x 3.3											
S1K	40	12 x 3.3											
S1K	45	14 x 3.8											

- [Caution on Product Characteristics] ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.  
 ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.
- [Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.  
 ② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.



## Steel Spur Gears



Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—						1.26	<b>SS3-25</b>
M5*	7.5						1.25	● <b>SS3-25 J20</b>
M5*	7.5						1.23	● <b>SS3-25 J22</b>
M6	7.5	214	16.3	21.8	1.66	0.18~0.38	1.19	● <b>SS3-25 J25</b>
M6	7.5						1.14	● <b>SS3-25 J28</b>
M6	7.5						1.11	● <b>SS3-25 J30</b>
M8	7.5						1.07	● <b>SS3-25 J32</b>
M8	7.5						1.02	● <b>SS3-25 J35</b>
—	—							
M5*	7.5	226	17.7	23.0	1.81	0.18~0.38	1.39	● <b>SS3-26 J20</b>
M5*	7.5						1.37	● <b>SS3-26 J22</b>
M6	7.5						1.33	● <b>SS3-26 J25</b>
M6	7.5						1.28	● <b>SS3-26 J28</b>
M6	7.5						1.25	● <b>SS3-26 J30</b>
M8	7.5						1.21	● <b>SS3-26 J32</b>
M8	7.5						1.16	● <b>SS3-26 J35</b>
—	—							
M5*	7.5	237	19.2	24.2	1.96	0.18~0.38	1.48	● <b>SS3-27 J20</b>
M5*	7.5						1.46	● <b>SS3-27 J22</b>
M6	7.5						1.42	● <b>SS3-27 J25</b>
M6	7.5						1.37	● <b>SS3-27 J28</b>
M6	7.5						1.34	● <b>SS3-27 J30</b>
M8	7.5						1.30	● <b>SS3-27 J32</b>
M8	7.5						1.25	● <b>SS3-27 J35</b>
—	—							
M5*	7.5	250	20.7	25.4	2.11	0.18~0.38	1.63	● <b>SS3-28 J20</b>
M5*	7.5						1.61	● <b>SS3-28 J22</b>
M6*	7.5						1.57	● <b>SS3-28 J25</b>
M6*	7.5						1.52	● <b>SS3-28 J28</b>
M6	7.5						1.49	● <b>SS3-28 J30</b>
M8	7.5						1.45	● <b>SS3-28 J32</b>
M8	7.5						1.40	● <b>SS3-28 J35</b>
M8	7.5						1.29	● <b>SS3-28 J40</b>
—	—						1.74	<b>SS3-29</b>
M5*	7.5	262	22.3	26.7	2.27	0.18~0.38	1.73	● <b>SS3-29 J20</b>
M5*	7.5						1.70	● <b>SS3-29 J22</b>
M6*	7.5						1.66	● <b>SS3-29 J25</b>
M6*	7.5						1.62	● <b>SS3-29 J28</b>
M6	7.5						1.59	● <b>SS3-29 J30</b>
M8	7.5						1.55	● <b>SS3-29 J32</b>
M8	7.5						1.49	● <b>SS3-29 J35</b>
M8	7.5						1.39	● <b>SS3-29 J40</b>
—	—						1.91	<b>SS3-30</b>
M5*	7.5	274	24.0	27.9	2.44	0.18~0.38	1.89	● <b>SS3-30 J20</b>
M5*	7.5						1.87	● <b>SS3-30 J22</b>
M6*	7.5						1.82	● <b>SS3-30 J25</b>
M6*	7.5						1.78	● <b>SS3-30 J28</b>
M6*	7.5						1.75	● <b>SS3-30 J30</b>
M8	7.5						1.71	● <b>SS3-30 J32</b>
M8	7.5						1.66	● <b>SS3-30 J35</b>
M8	7.5						1.55	● <b>SS3-30 J40</b>
M10	7.5						1.43	● <b>SS3-30 J45</b>

**[Caution on J series]**

- ① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with " \* " are tap size).
- ⑤ Areas of products which have been re-worked will not be black oxide coated.
- ⑥ For products having a tapped hole, a set screw is included.

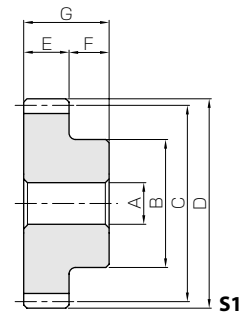


# Steel Spur Gears



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB

\* The precision grade of J Series products is equivalent to the value shown in the table.

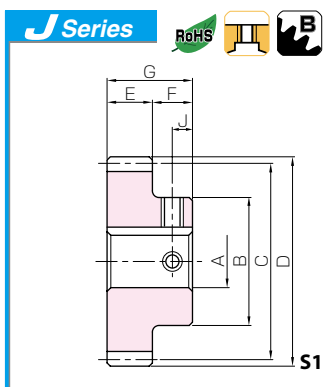


- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

Catalog No. ●: J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	H	I	Width×Depth
SS3-32 ●SS3-32 J20 ●SS3-32 J22 ●SS3-32 J25 ●SS3-32 J28 ●SS3-32 J30 ●SS3-32 J32 ●SS3-32 J35 ●SS3-32 J40 ●SS3-32 J45	m3	32	S1	20	75	96	102	30	15	45	—	—	—
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
			S1K	30									8 x 3.3
			S1K	32									10 x 3.3
			S1K	35									10 x 3.3
			S1K	40									12 x 3.3
S1K	45	14 x 3.8											
SS3-34 ●SS3-34 J20 ●SS3-34 J22 ●SS3-34 J25 ●SS3-34 J28 ●SS3-34 J30 ●SS3-34 J32 ●SS3-34 J35 ●SS3-34 J40 ●SS3-34 J45	m3	34	S1	20	80	102	108	30	15	45	—	—	—
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
			S1K	30									8 x 3.3
			S1K	32									10 x 3.3
			S1K	35									10 x 3.3
			S1K	40									12 x 3.3
S1K	45	14 x 3.8											
SS3-35 ●SS3-35 J20 ●SS3-35 J22 ●SS3-35 J25 ●SS3-35 J28 ●SS3-35 J30 ●SS3-35 J32 ●SS3-35 J35 ●SS3-35 J40 ●SS3-35 J45	m3	35	S1	20	80	105	111	30	15	45	—	—	—
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
			S1K	30									8 x 3.3
			S1K	32									10 x 3.3
			S1K	35									10 x 3.3
			S1K	40									12 x 3.3
S1K	45	14 x 3.8											
SS3-36 ●SS3-36 J20 ●SS3-36 J22 ●SS3-36 J25 ●SS3-36 J28 ●SS3-36 J30 ●SS3-36 J32 ●SS3-36 J35 ●SS3-36 J40 ●SS3-36 J45	m3	36	S1	20	80	108	114	30	15	45	—	—	—
			S1K	20									6 x 2.8
			S1K	22									6 x 2.8
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
			S1K	30									8 x 3.3
			S1K	32									10 x 3.3
			S1K	35									10 x 3.3
			S1K	40									12 x 3.3
S1K	45	14 x 3.8											
SS3-38 ●SS3-38 J25 ●SS3-38 J28 ●SS3-38 J30 ●SS3-38 J32 ●SS3-38 J35 ●SS3-38 J40 ●SS3-38 J45	m3	38	S1	25	80	114	120	30	15	45	—	—	—
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
			S1K	30									8 x 3.3
			S1K	32									10 x 3.3
			S1K	35									10 x 3.3
S1K	40	12 x 3.3											
S1K	45	14 x 3.8											

[Caution on Product Characteristics] ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.  
② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.  
② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.



### Steel Spur Gears



Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—	298	27.4	30.4	2.80	0.18~0.38	2.11	<b>SS3-32</b>
M5*	7.5						2.10	● <b>SS3-32 J20</b>
M5*	7.5						2.07	● <b>SS3-32 J22</b>
M6*	7.5						2.03	● <b>SS3-32 J25</b>
M6*	7.5						1.99	● <b>SS3-32 J28</b>
M6*	7.5						1.96	● <b>SS3-32 J30</b>
M8	7.5						1.92	● <b>SS3-32 J32</b>
M8	7.5						1.86	● <b>SS3-32 J35</b>
M8	7.5						1.76	● <b>SS3-32 J40</b>
M10	7.5						1.63	● <b>SS3-32 J45</b>
—	—	323	31.2	32.9	3.18	0.18~0.38	2.41	<b>SS3-34</b>
M5*	7.5						2.38	● <b>SS3-34 J20</b>
M5*	7.5						2.36	● <b>SS3-34 J22</b>
M6*	7.5						2.32	● <b>SS3-34 J25</b>
M6*	7.5						2.28	● <b>SS3-34 J28</b>
M6*	7.5						2.25	● <b>SS3-34 J30</b>
M8	7.5						2.21	● <b>SS3-34 J32</b>
M8	7.5						2.15	● <b>SS3-34 J35</b>
M8	7.5						2.05	● <b>SS3-34 J40</b>
M10	7.5						1.92	● <b>SS3-34 J45</b>
—	—	335	33.1	34.2	3.38	0.18~0.38	2.52	<b>SS3-35</b>
M5*	7.5						2.50	● <b>SS3-35 J20</b>
M5*	7.5						2.48	● <b>SS3-35 J22</b>
M6*	7.5						2.44	● <b>SS3-35 J25</b>
M6*	7.5						2.39	● <b>SS3-35 J28</b>
M6*	7.5						2.36	● <b>SS3-35 J30</b>
M8	7.5						2.32	● <b>SS3-35 J32</b>
M8	7.5						2.27	● <b>SS3-35 J35</b>
M8	7.5						2.16	● <b>SS3-35 J40</b>
M10	7.5						2.04	● <b>SS3-35 J45</b>
—	—	348	35.2	35.5	3.59	0.18~0.38	2.64	<b>SS3-36</b>
M5*	7.5						2.62	● <b>SS3-36 J20</b>
M5*	7.5						2.60	● <b>SS3-36 J22</b>
M6*	7.5						2.55	● <b>SS3-36 J25</b>
M6*	7.5						2.51	● <b>SS3-36 J28</b>
M6*	7.5						2.48	● <b>SS3-36 J30</b>
M8	7.5						2.44	● <b>SS3-36 J32</b>
M8	7.5						2.39	● <b>SS3-36 J35</b>
M8	7.5						2.28	● <b>SS3-36 J40</b>
M10	7.5						2.16	● <b>SS3-36 J45</b>
—	—	373	39.4	38.0	4.02	0.18~0.38	2.82	<b>SS3-38</b>
M6*	7.5						2.80	● <b>SS3-38 J25</b>
M6*	7.5						2.76	● <b>SS3-38 J28</b>
M6*	7.5						2.73	● <b>SS3-38 J30</b>
M8	7.5						2.69	● <b>SS3-38 J32</b>
M8	7.5						2.63	● <b>SS3-38 J35</b>
M8	7.5						2.53	● <b>SS3-38 J40</b>
M10	7.5						2.40	● <b>SS3-38 J45</b>

- [Caution on J series]**
- ① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
  - ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
  - ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
  - ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).
  - ⑤ Areas of products which have been re-worked will not be black oxide coated.
  - ⑥ For products having a tapped hole, a set screw is included.

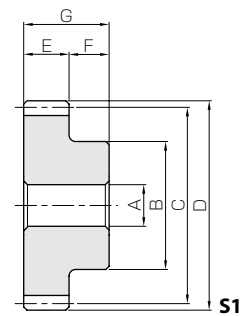


# Steel Spur Gears



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB

\* The precision grade of J Series products is equivalent to the value shown in the table.



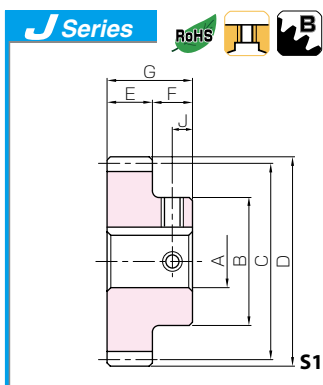
- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

Catalog No. ●: J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	H	I	WidthxDepth
SS3-40 ●SS3-40 J25 ●SS3-40 J28 ●SS3-40 J30 ●SS3-40 J32 ●SS3-40 J35 ●SS3-40 J40 ●SS3-40 J45	m3	40	S1	25	80	120	126	30	15	45	—	—	—
			S1K	25									8 x 3.3
			S1K	28									8 x 3.3
			S1K	30									8 x 3.3
			S1K	32									10 x 3.3
			S1K	35									10 x 3.3
			S1K	40									12 x 3.3
S1K	45	14 x 3.8											
SS3-42 ●SS3-42 J25 ●SS3-42 J28 ●SS3-42 J30 ●SS3-42 J32 ●SS3-42 J35 ●SS3-42 J40 ●SS3-42 J45	42	S1	25	80	126	132	30	15	45	—	—	—	
		S1K	25									8 x 3.3	
		S1K	28									8 x 3.3	
		S1K	30									8 x 3.3	
		S1K	32									10 x 3.3	
		S1K	35									10 x 3.3	
		S1K	40									12 x 3.3	
S1K	45	14 x 3.8											
SS3-44 ●SS3-44 J25 ●SS3-44 J28 ●SS3-44 J30 ●SS3-44 J32 ●SS3-44 J35 ●SS3-44 J40 ●SS3-44 J45	44	S1	25	80	132	138	30	15	45	—	—	—	
		S1K	25									8 x 3.3	
		S1K	28									8 x 3.3	
		S1K	30									8 x 3.3	
		S1K	32									10 x 3.3	
		S1K	35									10 x 3.3	
		S1K	40									12 x 3.3	
S1K	45	14 x 3.8											
SS3-45 ●SS3-45 J25 ●SS3-45 J28 ●SS3-45 J30 ●SS3-45 J32 ●SS3-45 J35 ●SS3-45 J40 ●SS3-45 J45	45	S1	25	80	135	141	30	15	45	—	—	—	
		S1K	25									8 x 3.3	
		S1K	28									8 x 3.3	
		S1K	30									8 x 3.3	
		S1K	32									10 x 3.3	
		S1K	35									10 x 3.3	
		S1K	40									12 x 3.3	
S1K	45	14 x 3.8											
SS3-46 ●SS3-46 J25 ●SS3-46 J28 ●SS3-46 J30 ●SS3-46 J32 ●SS3-46 J35 ●SS3-46 J40 ●SS3-46 J45	46	S1	25	80	138	144	30	15	45	—	—	—	
		S1K	25									8 x 3.3	
		S1K	28									8 x 3.3	
		S1K	30									8 x 3.3	
		S1K	32									10 x 3.3	
		S1K	35									10 x 3.3	
		S1K	40									12 x 3.3	
S1K	45	14 x 3.8											
SS3-48 ●SS3-48 J25 ●SS3-48 J28 ●SS3-48 J30 ●SS3-48 J32 ●SS3-48 J35 ●SS3-48 J40 ●SS3-48 J45	48	S1	25	80	144	150	30	15	45	—	—	—	
		S1K	25									8 x 3.3	
		S1K	28									8 x 3.3	
		S1K	30									8 x 3.3	
		S1K	32									10 x 3.3	
		S1K	35									10 x 3.3	
		S1K	40									12 x 3.3	
S1K	45	14 x 3.8											

[Caution on Product Characteristics] ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.  
② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.  
② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.





## Steel Spur Gears



Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—	398	44.0	40.6	4.49	0.18~0.38	3.08 3.06 3.02 2.98 2.95 2.89 2.79 2.66	<b>SS3-40</b>
M6*	7.5							●SS3-40 J25
M6*	7.5							●SS3-40 J28
M6*	7.5							●SS3-40 J30
M8	7.5							●SS3-40 J32
M8	7.5							●SS3-40 J35
M8	7.5							●SS3-40 J40
M10	7.5	●SS3-40 J45						
—	—	423	48.9	43.2	4.98	0.20~0.44	3.35 3.33 3.29 3.26 3.22 3.16 3.06 2.93	<b>SS3-42</b>
M6*	7.5							●SS3-42 J25
M6*	7.5							●SS3-42 J28
M6*	7.5							●SS3-42 J30
M8	7.5							●SS3-42 J32
M8	7.5							●SS3-42 J35
M8	7.5							●SS3-42 J40
M10	7.5	●SS3-42 J45						
—	—	449	54.0	45.7	5.50	0.20~0.44	3.64 3.62 3.58 3.54 3.51 3.45 3.35 3.22	<b>SS3-44</b>
M6*	7.5							●SS3-44 J25
M6*	7.5							●SS3-44 J28
M6*	7.5							●SS3-44 J30
M8	7.5							●SS3-44 J32
M8	7.5							●SS3-44 J35
M8	7.5							●SS3-44 J40
M10	7.5	●SS3-44 J45						
—	—	461	56.6	47.0	5.78	0.20~0.44	3.79 3.77 3.72 3.69 3.65 3.60 3.50 3.37	<b>SS3-45</b>
M6*	7.5							●SS3-45 J25
M6*	7.5							●SS3-45 J28
M6*	7.5							●SS3-45 J30
M8	7.5							●SS3-45 J32
M8	7.5							●SS3-45 J35
M8	7.5							●SS3-45 J40
M10	7.5	●SS3-45 J45						
—	—	474	59.4	48.3	6.05	0.20~0.44	3.94 3.92 3.88 3.84 3.81 3.75 3.65 3.52	<b>SS3-46</b>
M6*	7.5							●SS3-46 J25
M6*	7.5							●SS3-46 J28
M6*	7.5							●SS3-46 J30
M8	7.5							●SS3-46 J32
M8	7.5							●SS3-46 J35
M8	7.5							●SS3-46 J40
M10	7.5	●SS3-46 J45						
—	—	500	65.0	50.9	6.63	0.20~0.44	4.25 4.23 4.19 4.16 4.12 4.06 3.96 3.83	<b>SS3-48</b>
M6*	7.5							●SS3-48 J25
M6*	7.5							●SS3-48 J28
M6*	7.5							●SS3-48 J30
M8	7.5							●SS3-48 J32
M8	7.5							●SS3-48 J35
M8	7.5							●SS3-48 J40
M10	7.5	●SS3-48 J45						

## [Caution on J series]

① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order.

Please allow additional shipping time to get to your local distributor.

② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.

③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.

④ Certain products which would otherwise have a very long tapped hole are conerbored to reduce the length of the tap. (Products marked with "\*" are tap size).

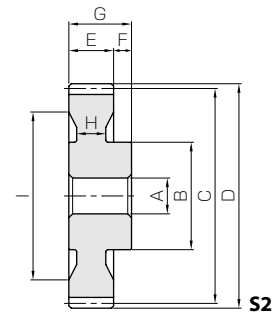
⑤ Areas of products which have been re-worked will not be black oxide coated.

⑥ For products having a tapped hole, a set screw is included.



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB

\* The precision grade of J Series products is equivalent to the value shown in the table.



S2

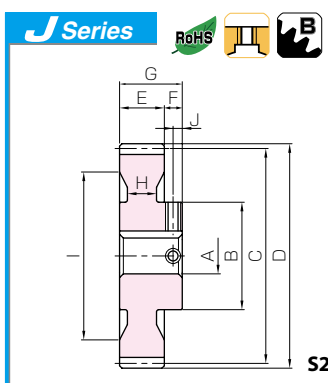
Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	H	I	Width×Depth
SS3-50 ● SS3-50 J25 ● SS3-50 J28 ● SS3-50 J30 ● SS3-50 J32 ● SS3-50 J35 ● SS3-50 J40 ● SS3-50 J45	m3	50	S4	25	80	150	156	30	15	45	(10)	(123)	—
			S4K	25									8 x 3.3
			S4K	28									8 x 3.3
			S4K	30									8 x 3.3
			S4K	32									10 x 3.3
			S4K	35									10 x 3.3
			S4K	40									12 x 3.3
S4K	45	14 x 3.8											
SS3-52 ● SS3-52 J25 ● SS3-52 J28 ● SS3-52 J30 ● SS3-52 J32 ● SS3-52 J35 ● SS3-52 J40 ● SS3-52 J45	52	S2	25	80	156	162	30	15	45	16	126	—	
		S2K	25									8 x 3.3	
		S2K	28									8 x 3.3	
		S2K	30									8 x 3.3	
		S2K	32									10 x 3.3	
		S2K	35									10 x 3.3	
		S2K	40									12 x 3.3	
S2K	45	14 x 3.8											
SS3-54 ● SS3-54 J25 ● SS3-54 J28 ● SS3-54 J30 ● SS3-54 J32 ● SS3-54 J35 ● SS3-54 J40 ● SS3-54 J45	54	S2	25	80	162	168	30	15	45	16	132	—	
		S2K	25									8 x 3.3	
		S2K	28									8 x 3.3	
		S2K	30									8 x 3.3	
		S2K	32									10 x 3.3	
		S2K	35									10 x 3.3	
		S2K	40									12 x 3.3	
S2K	45	14 x 3.8											
SS3-55 ● SS3-55 J25 ● SS3-55 J28 ● SS3-55 J30 ● SS3-55 J32 ● SS3-55 J35 ● SS3-55 J40 ● SS3-55 J45	55	S2	25	80	165	171	30	15	45	16	131	—	
		S2K	25									8 x 3.3	
		S2K	28									8 x 3.3	
		S2K	30									8 x 3.3	
		S2K	32									10 x 3.3	
		S2K	35									10 x 3.3	
		S2K	40									12 x 3.3	
S2K	45	14 x 3.8											
SS3-56 ● SS3-56 J25 ● SS3-56 J28 ● SS3-56 J30 ● SS3-56 J32 ● SS3-56 J35 ● SS3-56 J40 ● SS3-56 J45	56	S2	25	80	168	174	30	15	45	16	134	—	
		S2K	25									8 x 3.3	
		S2K	28									8 x 3.3	
		S2K	30									8 x 3.3	
		S2K	32									10 x 3.3	
		S2K	35									10 x 3.3	
		S2K	40									12 x 3.3	
S2K	45	14 x 3.8											
SS3-58 ● SS3-58 J25 ● SS3-58 J28 ● SS3-58 J30 ● SS3-58 J32 ● SS3-58 J35 ● SS3-58 J40 ● SS3-58 J45	58	S2	25	80	174	180	30	15	45	16	144	—	
		S2K	25									8 x 3.3	
		S2K	28									8 x 3.3	
		S2K	30									8 x 3.3	
		S2K	32									10 x 3.3	
		S2K	35									10 x 3.3	
		S2K	40									12 x 3.3	
S2K	45	14 x 3.8											

[Caution on Product Characteristics]

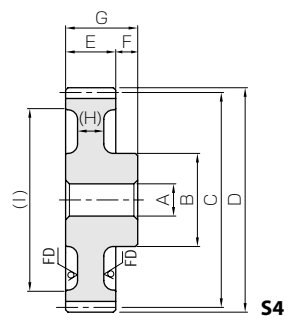
- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations]

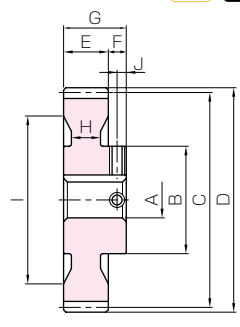
- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.



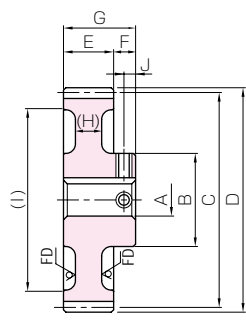
Steel Spur Gears



S4



S2K



S4K \* FD has die-forged finish.

\* FD has die-forged finish.

Set Screw	Allowable torque (N-m)	Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No.		
		Bending strength	Surface durability					
Size	J	Bending strength	Surface durability	Bending strength	Surface durability	● : J Series (Available-on-request)		
—	—	525	70.9	53.6	7.23	0.20~0.44	3.72	SS3-50
M6*	7.5						3.70	●SS3-50 J25
M6*	7.5						3.65	●SS3-50 J28
M6*	7.5						3.62	●SS3-50 J30
M8	7.5						3.58	●SS3-50 J32
M8	7.5						3.53	●SS3-50 J35
M8	7.5						3.43	●SS3-50 J40
M10	7.5	3.30	●SS3-50 J45					
—	—	551	77.1	56.2	7.86	0.20~0.44	4.38	SS3-52
M6*	7.5						4.36	●SS3-52 J25
M6*	7.5						4.31	●SS3-52 J28
M6*	7.5						4.28	●SS3-52 J30
M8	7.5						4.24	●SS3-52 J32
M8	7.5						4.19	●SS3-52 J35
M8	7.5						4.08	●SS3-52 J40
M10	7.5	3.96	●SS3-52 J45					
—	—	577	83.6	58.8	8.52	0.20~0.44	4.61	SS3-54
M6*	7.5						4.59	●SS3-54 J25
M6*	7.5						4.55	●SS3-54 J28
M6*	7.5						4.52	●SS3-54 J30
M8	7.5						4.48	●SS3-54 J32
M8	7.5						4.42	●SS3-54 J35
M8	7.5						4.32	●SS3-54 J40
M10	7.5	4.19	●SS3-54 J45					
—	—	590	86.9	60.1	8.86	0.20~0.44	4.81	SS3-55
M6*	7.5						4.79	●SS3-55 J25
M6*	7.5						4.75	●SS3-55 J28
M6*	7.5						4.72	●SS3-55 J30
M8	7.5						4.68	●SS3-55 J32
M8	7.5						4.62	●SS3-55 J35
M8	7.5						4.52	●SS3-55 J40
M10	7.5	4.39	●SS3-55 J45					
—	—	602	90.3	61.4	9.21	0.20~0.44	4.94	SS3-56
M6*	7.5						4.91	●SS3-56 J25
M6*	7.5						4.87	●SS3-56 J28
M6*	7.5						4.84	●SS3-56 J30
M8	7.5						4.80	●SS3-56 J32
M8	7.5						4.75	●SS3-56 J35
M8	7.5						4.64	●SS3-56 J40
M10	7.5	4.52	●SS3-56 J45					
—	—	628	97.3	64.1	9.92	0.20~0.44	5.10	SS3-58
M6*	7.5						5.08	●SS3-58 J25
M6*	7.5						5.04	●SS3-58 J28
M6*	7.5						5.00	●SS3-58 J30
M8	7.5						4.97	●SS3-58 J32
M8	7.5						4.91	●SS3-58 J35
M8	7.5						4.81	●SS3-58 J40
M10	7.5	4.68	●SS3-58 J45					

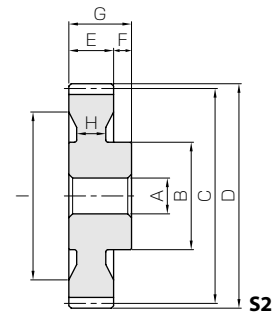
- [Caution on J series]
- ① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
  - ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
  - ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
  - ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).
  - ⑤ Areas of products which have been re-worked will not be black oxide coated.
  - ⑥ For products having a tapped hole, a set screw is included.

- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB

\* The precision grade of J Series products is equivalent to the value shown in the table.



S2

Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	H	I	Width×Depth
SS3-60 ● SS3-60 J25 ● SS3-60 J28 ● SS3-60 J30 ● SS3-60 J32 ● SS3-60 J35 ● SS3-60 J40 ● SS3-60 J45	m3	60	S4	25	80	180	186	30	15	45	(10)	(153)	—
			S4K	25									8 x 3.3
			S4K	28									8 x 3.3
			S4K	30									8 x 3.3
			S4K	32									10 x 3.3
			S4K	35									10 x 3.3
			S4K	40									12 x 3.3
S4K	45	14 x 3.8											
SS3-62 ● SS3-62 J25 ● SS3-62 J28 ● SS3-62 J30 ● SS3-62 J32 ● SS3-62 J35 ● SS3-62 J40 ● SS3-62 J45	62	S2	25	80	186	192	30	15	45	16	150	—	
		S2K	25									8 x 3.3	
		S2K	28									8 x 3.3	
		S2K	30									8 x 3.3	
		S2K	32									10 x 3.3	
		S2K	35									10 x 3.3	
		S2K	40									12 x 3.3	
S2K	45	14 x 3.8											
SS3-64 ● SS3-64 J25 ● SS3-64 J28 ● SS3-64 J30 ● SS3-64 J32 ● SS3-64 J35 ● SS3-64 J40 ● SS3-64 J45	64	S2	25	80	192	198	30	15	45	16	158	—	
		S2K	25									8 x 3.3	
		S2K	28									8 x 3.3	
		S2K	30									8 x 3.3	
		S2K	32									10 x 3.3	
		S2K	35									10 x 3.3	
		S2K	40									12 x 3.3	
S2K	45	14 x 3.8											
SS3-65 ● SS3-65 J25 ● SS3-65 J28 ● SS3-65 J30 ● SS3-65 J32 ● SS3-65 J35 ● SS3-65 J40 ● SS3-65 J45	65	S2	25	80	195	201	30	15	45	16	161	—	
		S2K	25									8 x 3.3	
		S2K	28									8 x 3.3	
		S2K	30									8 x 3.3	
		S2K	32									10 x 3.3	
		S2K	35									10 x 3.3	
		S2K	40									12 x 3.3	
S2K	45	14 x 3.8											
SS3-66 ● SS3-66 J25 ● SS3-66 J28 ● SS3-66 J30 ● SS3-66 J32 ● SS3-66 J35 ● SS3-66 J40 ● SS3-66 J45 ● SS3-66 J50	66	S2	25	90	198	204	30	15	45	16	160	—	
		S2K	25									8 x 3.3	
		S2K	28									8 x 3.3	
		S2K	30									8 x 3.3	
		S2K	32									10 x 3.3	
		S2K	35									10 x 3.3	
		S2K	40									12 x 3.3	
S2K	45	14 x 3.8											
S2K	50	14 x 3.8											
SS3-68 ● SS3-68 J25 ● SS3-68 J28 ● SS3-68 J30 ● SS3-68 J32 ● SS3-68 J35 ● SS3-68 J40 ● SS3-68 J45 ● SS3-68 J50	68	S2	25	90	204	210	30	15	45	16	170	—	
		S2K	25									8 x 3.3	
		S2K	28									8 x 3.3	
		S2K	30									8 x 3.3	
		S2K	32									10 x 3.3	
		S2K	35									10 x 3.3	
		S2K	40									12 x 3.3	
S2K	45	14 x 3.8											
S2K	50	14 x 3.8											

[Caution on Product Characteristics]

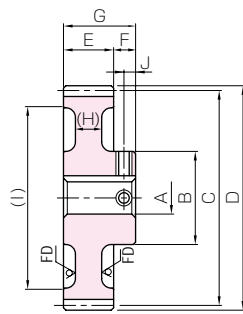
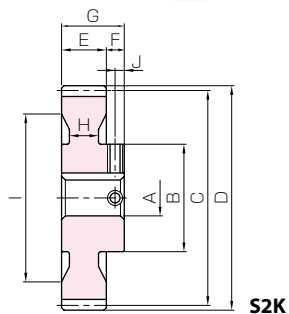
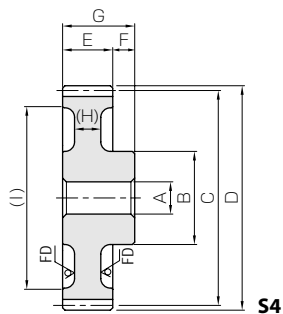
- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.



# Steel Spur Gears



\* FD has die-forged finish.

S4K \* FD has die-forged finish.

Set Screw	Allowable torque (N-m)	Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No.
		Bending strength	Surface durability			
—	—	—	—	—	—	—
M6*	7.5	654	105	66.7	10.7	0.20~0.44
M6*	7.5					
M6*	7.5					
M8	7.5					
M8	7.5					
M8	7.5					
M8	7.5					
M10	7.5					
—	—	—	—	—	—	—
M6*	7.5	680	112	69.4	11.4	0.20~0.44
M6*	7.5					
M6*	7.5					
M8	7.5					
M8	7.5					
M8	7.5					
M8	7.5					
M10	7.5					
—	—	—	—	—	—	—
M6*	7.5	588	99.9	60.0	10.2	0.20~0.44
M6*	7.5					
M6*	7.5					
M8	7.5					
M8	7.5					
M8	7.5					
M8	7.5					
M10	7.5					
—	—	—	—	—	—	—
M6*	7.5	599	103	61.1	10.5	0.20~0.44
M6*	7.5					
M6*	7.5					
M8	7.5					
M8	7.5					
M8	7.5					
M8	7.5					
M10	7.5					
—	—	—	—	—	—	—
M6*	7.5	610	107	62.2	10.9	0.20~0.44
M6*	7.5					
M6*	7.5					
M8*	7.5					
M8*	7.5					
M8	7.5					
M8	7.5					
M10	7.5					
M10	7.5					
—	—	—	—	—	—	—
M6*	7.5	632	114	64.4	11.6	0.20~0.44
M6*	7.5					
M6*	7.5					
M8*	7.5					
M8*	7.5					
M8	7.5					
M8	7.5					
M10	7.5					
M10	7.5					

**[Caution on J series]**

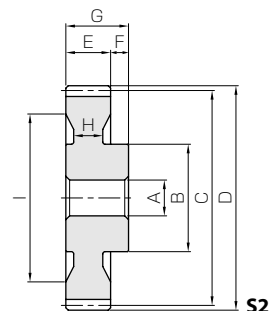
- ① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).
- ⑤ Areas of products which have been re-worked will not be black oxide coated.
- ⑥ For products having a tapped hole, a set screw is included.

- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB

\* The precision grade of J Series products is equivalent to the value shown in the table.



S2

Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	H	I	WidthxDepth
SS3-70 ● SS3-70 J25 ● SS3-70 J28 ● SS3-70 J30 ● SS3-70 J32 ● SS3-70 J35 ● SS3-70 J40 ● SS3-70 J45 ● SS3-70 J50	m3	70	S2	25	90	210	216	30	15	45	16	176	—
			S2K	25									8 x 3.3
			S2K	28									8 x 3.3
			S2K	30									8 x 3.3
			S2K	32									10 x 3.3
			S2K	35									10 x 3.3
			S2K	40									12 x 3.3
			S2K	45									14 x 3.8
S2K	50	14 x 3.8											
SS3-72 ● SS3-72 J25 ● SS3-72 J28 ● SS3-72 J30 ● SS3-72 J32 ● SS3-72 J35 ● SS3-72 J40 ● SS3-72 J45 ● SS3-72 J50	m3	72	S2	25	90	216	222	30	15	45	16	182	—
			S2K	25									8 x 3.3
			S2K	28									8 x 3.3
			S2K	30									8 x 3.3
			S2K	32									10 x 3.3
			S2K	35									10 x 3.3
			S2K	40									12 x 3.3
			S2K	45									14 x 3.8
S2K	50	14 x 3.8											
SS3-75 ● SS3-75 J25 ● SS3-75 J28 ● SS3-75 J30 ● SS3-75 J32 ● SS3-75 J35 ● SS3-75 J40 ● SS3-75 J45 ● SS3-75 J50	m3	75	S2	25	90	225	231	30	15	45	16	190	—
			S2K	25									8 x 3.3
			S2K	28									8 x 3.3
			S2K	30									8 x 3.3
			S2K	32									10 x 3.3
			S2K	35									10 x 3.3
			S2K	40									12 x 3.3
			S2K	45									14 x 3.8
S2K	50	14 x 3.8											
SS3-76 ● SS3-76 J25 ● SS3-76 J28 ● SS3-76 J30 ● SS3-76 J32 ● SS3-76 J35 ● SS3-76 J40 ● SS3-76 J45 ● SS3-76 J50	m3	76	S2	25	90	228	234	30	15	45	16	190	—
			S2K	25									8 x 3.3
			S2K	28									8 x 3.3
			S2K	30									8 x 3.3
			S2K	32									10 x 3.3
			S2K	35									10 x 3.3
			S2K	40									12 x 3.3
			S2K	45									14 x 3.8
S2K	50	14 x 3.8											
SS3-80 ● SS3-80 J30 ● SS3-80 J32 ● SS3-80 J35 ● SS3-80 J40 ● SS3-80 J45 ● SS3-80 J50	m3	80	S4	30	90	240	246	30	15	45	(10)	(213)	—
			S4K	30									8 x 3.3
			S4K	32									10 x 3.3
			S4K	35									10 x 3.3
			S4K	40									12 x 3.3
			S4K	45									14 x 3.8
S4K	50	14 x 3.8											
SS3-90 ● SS3-90 J30 ● SS3-90 J32 ● SS3-90 J35 ● SS3-90 J40 ● SS3-90 J45 ● SS3-90 J50	m3	90	S2	30	100	270	276	30	15	45	16	240	—
			S2K	30									8 x 3.3
			S2K	32									10 x 3.3
			S2K	35									10 x 3.3
			S2K	40									12 x 3.3
			S2K	45									14 x 3.8
S2K	50	14 x 3.8											

[Caution on Product Characteristics]

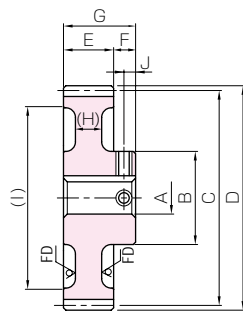
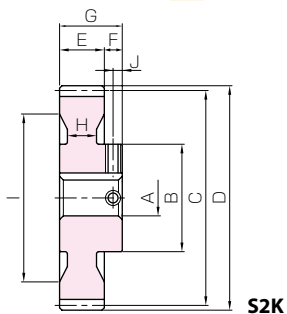
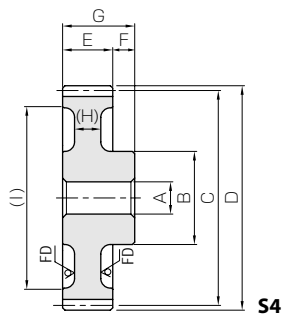
- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
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# Steel Spur Gears



\* FD has die-forged finish.

S4K \* FD has die-forged finish.

Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)						
Size	J	Bending strength	Surface durability	Bending strength	Surface durability									
—	—	654	121	66.6	12.4	0.20~0.44	7.15	<b>SS3-70</b>						
M6*	7.5							●SS3-70 J25						
M6*	7.5							●SS3-70 J28						
M6*	7.5							●SS3-70 J30						
M8*	7.5							●SS3-70 J32						
M8*	7.5							●SS3-70 J35						
M8	7.5							●SS3-70 J40						
M10	7.5							●SS3-70 J45						
M10	7.5							●SS3-70 J50						
—	—							675	129	68.9	13.1	0.20~0.44	7.46	<b>SS3-72</b>
M6*	7.5	●SS3-72 J25												
M6*	7.5	●SS3-72 J28												
M6*	7.5	●SS3-72 J30												
M8*	7.5	●SS3-72 J32												
M8*	7.5	●SS3-72 J35												
M8	7.5	●SS3-72 J40												
M10	7.5	●SS3-72 J45												
M10	7.5	●SS3-72 J50												
—	—	708	141	72.2	14.3	0.20~0.44	7.95							<b>SS3-75</b>
M6*	7.5							●SS3-75 J25						
M6*	7.5							●SS3-75 J28						
M6*	7.5							●SS3-75 J30						
M8*	7.5							●SS3-75 J32						
M8*	7.5							●SS3-75 J35						
M8	7.5							●SS3-75 J40						
M10	7.5							●SS3-75 J45						
M10	7.5							●SS3-75 J50						
—	—							719	145	73.3	14.8	0.20~0.44	8.20	<b>SS3-76</b>
M6*	7.5	●SS3-76 J25												
M6*	7.5	●SS3-76 J28												
M6*	7.5	●SS3-76 J30												
M8*	7.5	●SS3-76 J32												
M8*	7.5	●SS3-76 J35												
M8	7.5	●SS3-76 J40												
M10	7.5	●SS3-76 J45												
M10	7.5	●SS3-76 J50												
—	—	763	162	77.8	16.5	0.20~0.44	6.92							<b>SS3-80</b>
M6*	7.5							●SS3-80 J30						
M8*	7.5							●SS3-80 J32						
M8*	7.5							●SS3-80 J35						
M8	7.5							●SS3-80 J40						
M10	7.5							●SS3-80 J45						
M10	7.5							●SS3-80 J50						
—	—							872	208	89.0	21.2	0.26~0.52	10.6	<b>SS3-90</b>
M6*	7.5													●SS3-90 J30
M8*	7.5													●SS3-90 J32
M8*	7.5	●SS3-90 J35												
M8*	7.5	●SS3-90 J40												
M10	7.5	●SS3-90 J45												
M10	7.5	●SS3-90 J50												

**[Caution on J series]**

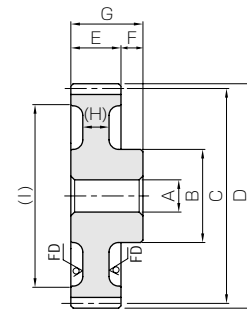
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- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).
- ⑤ Areas of products which have been re-worked will not be black oxide coated.
- ⑥ For products having a tapped hole, a set screw is included.

- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB

\* The precision grade of J Series products is equivalent to the value shown in the table.



**S4**

\* FD has die-forged finish.

Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	H	I	Width×Depth
<b>SS3-100</b> ● <b>SS3-100 J30</b> ● <b>SS3-100 J32</b> ● <b>SS3-100 J35</b> ● <b>SS3-100 J40</b> ● <b>SS3-100 J45</b> ● <b>SS3-100 J50</b>	<b>m3</b>	100	S4	30	100	300	306	30	15	45	(10)	(273)	—
			S4K	30									8 x 3.3
			S4K	32									10 x 3.3
			S4K	35									10 x 3.3
			S4K	40									12 x 3.3
			S4K	45									14 x 3.8
S4K	50	14 x 3.8											
<b>SS3-120</b> ● <b>SS3-120 J30</b> ● <b>SS3-120 J32</b> ● <b>SS3-120 J35</b> ● <b>SS3-120 J40</b> ● <b>SS3-120 J45</b> ● <b>SS3-120 J50</b>	<b>m3</b>	120	S4	30	130	360	366	30	15	45	(10)	(333)	—
			S4K	30									8 x 3.3
			S4K	32									10 x 3.3
			S4K	35									10 x 3.3
			S4K	40									12 x 3.3
			S4K	45									14 x 3.8
S4K	50	14 x 3.8											

[Caution on Product Characteristics]

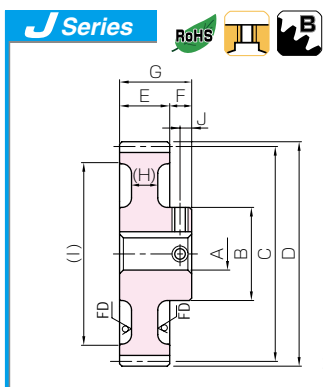
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Spur Gears  
Helical Gears  
Internal Gears  
Racks  
CP Racks & Pinions  
Miter Gears  
Bevel Gears  
Screw Gears  
Worm Gear Pair  
Bevel Gearboxes  
Other Products





**S4K** \* FD has die-forged finish.

### Steel Spur Gears



Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—	983	261	100	26.6	0.26~0.52	10.78	<b>SS3-100</b>
M6*	7.5						10.7	● <b>SS3-100 J30</b>
M8*	7.5						10.6	● <b>SS3-100 J32</b>
M8*	7.5						10.6	● <b>SS3-100 J35</b>
M8*	7.5						10.5	● <b>SS3-100 J40</b>
M10	7.5						10.3	● <b>SS3-100 J45</b>
M10	7.5						10.2	● <b>SS3-100 J50</b>
—	—	1200	386	123	39.4	0.26~0.52	15.7	<b>SS3-120</b>
M6*	7.5						15.5	● <b>SS3-120 J30</b>
M8*	7.5						15.5	● <b>SS3-120 J32</b>
M8*	7.5						15.4	● <b>SS3-120 J35</b>
M8*	7.5						15.3	● <b>SS3-120 J40</b>
M10*	7.5						15.2	● <b>SS3-120 J45</b>
M10*	7.5						15.1	● <b>SS3-120 J50</b>

**[Caution on J series]**

- ① As available-on-request products, requires a lead-time for shipping within **3 working-days (excludes the day ordered)**, after placing an order. Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is **1 to 20 units**. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with " \* " are tap size).
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- ⑥ For products having a tapped hole, a set screw is included.

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

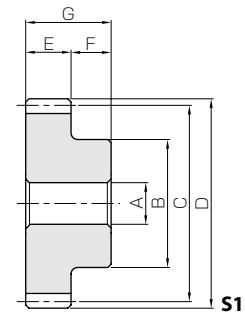
Worm Gear Pair

Bevel Gearboxes

Other Products



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB

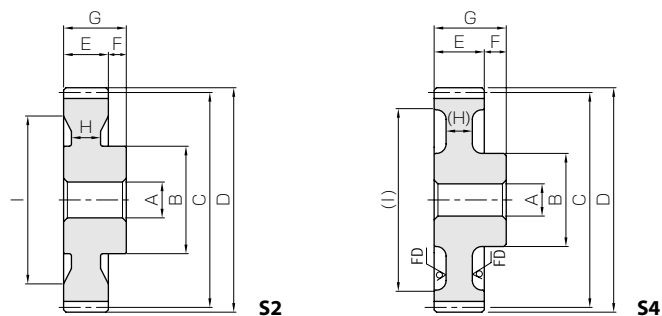


Spur Gears  
 Helical Gears  
 Internal Gears  
 Racks  
 CP Racks & Pinions  
 Miter Gears  
 Bevel Gears  
 Screw Gears  
 Worm Gear Pair  
 Bevel Gearboxes  
 Other Products

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.
				A <sub>H7</sub>	B	C	D	E	F	G	(H)	(I)
SS4-12	m4	12	S1	20	35	48	56	40	20	60	—	—
SS4-13		13	S1	20	38	52	60	40	20	60	—	—
SS4-14		14	S1	20	40	56	64	40	20	60	—	—
SS4-15		15	S1	20	45	60	68	40	20	60	—	—
SS4-16		16	S1	20	50	64	72	40	20	60	—	—
SS4-17		17	S1	20	53	68	76	40	20	60	—	—
SS4-18		18	S1	20	55	72	80	40	20	60	—	—
SS4-19		19	S1	20	60	76	84	40	20	60	—	—
SS4-20		20	S1	20	65	80	88	40	20	60	—	—
SS4-21		21	S1	20	69	84	92	40	20	60	—	—
SS4-22		22	S1	20	73	88	96	40	20	60	—	—
SS4-23		23	S1	20	77	92	100	40	20	60	—	—
SS4-24		24	S1	20	80	96	104	40	20	60	—	—
SS4-25		25	S1	20	84	100	108	40	20	60	—	—
SS4-26		26	S1	20	87	104	112	40	20	60	—	—
SS4-27		27	S1	20	90	108	116	40	20	60	—	—
SS4-28		28	S1	20	95	112	120	40	20	60	—	—
SS4-29		29	S1	20	95	116	124	40	20	60	—	—
SS4-30		30	S1	20	100	120	128	40	20	60	—	—
SS4-32		32	S1	22	100	128	136	40	16	56	—	—
SS4-34		34	S1	22	100	136	144	40	16	56	—	—
SS4-35		35	S1	22	100	140	148	40	16	56	—	—
SS4-36		36	S1	22	100	144	152	40	16	56	—	—
SS4-38		38	S1	22	100	152	160	40	16	56	—	—
SS4-40		40	S1	25	100	160	168	40	16	56	—	—
SS4-42		42	S1	25	100	168	176	40	16	56	—	—
SS4-44		44	S1	25	100	176	184	40	16	56	—	—
SS4-45		45	S1	25	100	180	188	40	16	56	—	—
SS4-46		46	S1	25	100	184	192	40	16	56	—	—
SS4-48		48	S2	25	100	192	200	40	16	56	26	150
SS4-50		50	S4	30	100	200	208	40	16	56	(12)	(168)
SS4-52		52	S2	30	100	208	216	40	16	56	26	165
SS4-54		54	S2	30	100	216	224	40	16	56	26	175
SS4-55		55	S2	30	100	220	228	40	16	56	26	178
SS4-56		56	S2	30	100	224	232	40	16	56	26	182
SS4-58		58	S2	30	110	232	240	40	16	56	26	190
SS4-60		60	S4	30	110	240	248	40	16	56	(12)	(208)
SS4-62		62	S2	30	110	248	256	40	16	56	20	210
SS4-64		64	S2	30	110	256	264	40	16	56	16	214
SS4-65		65	S2	30	110	260	268	40	16	56	16	218
SS4-66	66	S2	30	120	264	272	40	16	56	16	220	
SS4-68	68	S2	30	120	272	280	40	16	56	16	225	
SS4-70	70	S4	30	120	280	288	40	16	56	(12)	(248)	
SS4-80	80	S4	30	120	320	328	40	16	56	(12)	(288)	

[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.



\* FD has die-forged finish.

Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No.
Bending strength	Surface durability	Bending strength	Surface durability			
130	7.62	13.3	0.78	0.18~0.38	0.57	SS4-12
168	9.22	17.1	0.94	0.18~0.38	0.70	SS4-13
211	10.9	21.5	1.11	0.18~0.38	0.82	SS4-14
236	12.8	24.1	1.30	0.18~0.38	0.99	SS4-15
262	14.7	26.7	1.50	0.18~0.38	1.17	SS4-16
288	16.9	29.4	1.72	0.18~0.38	1.34	SS4-17
314	19.2	32.0	1.96	0.18~0.38	1.50	SS4-18
341	21.7	34.8	2.21	0.18~0.38	1.72	SS4-19
368	24.3	37.5	2.48	0.18~0.38	1.95	SS4-20
395	27.1	40.3	2.76	0.20~0.44	2.18	SS4-21
423	30.1	43.1	3.06	0.20~0.44	2.42	SS4-22
450	33.2	45.9	3.38	0.20~0.44	2.67	SS4-23
478	36.4	48.8	3.72	0.20~0.44	2.91	SS4-24
506	39.9	51.6	4.07	0.20~0.44	3.19	SS4-25
534	43.3	54.5	4.42	0.20~0.44	3.45	SS4-26
563	46.9	57.4	4.78	0.20~0.44	3.73	SS4-27
591	50.6	60.3	5.16	0.20~0.44	4.06	SS4-28
620	54.5	63.2	5.56	0.20~0.44	4.28	SS4-29
649	58.7	66.2	5.98	0.20~0.44	4.64	SS4-30
707	67.4	72.1	6.87	0.20~0.44	4.86	SS4-32
766	76.7	78.1	7.82	0.20~0.44	5.38	SS4-34
795	81.6	81.1	8.32	0.20~0.44	5.65	SS4-35
825	86.7	84.1	8.84	0.20~0.44	5.93	SS4-36
884	97.3	90.1	9.92	0.20~0.44	6.52	SS4-38
943	109	96.2	11.1	0.20~0.44	7.08	SS4-40
1000	120	102	12.3	0.24~0.52	7.73	SS4-42
1060	133	108	13.6	0.24~0.52	8.41	SS4-44
1090	139	112	14.2	0.24~0.52	8.76	SS4-45
1120	146	115	14.9	0.24~0.52	9.12	SS4-46
987	133	101	13.6	0.24~0.52	9.12	SS4-48
1040	146	106	14.8	0.24~0.52	8.00	SS4-50
1090	158	111	16.1	0.24~0.52	10.2	SS4-52
1140	172	116	17.5	0.24~0.52	10.8	SS4-54
1160	179	119	18.2	0.24~0.52	11.1	SS4-55
1190	186	121	18.9	0.24~0.52	11.5	SS4-56
1240	200	127	20.4	0.24~0.52	12.5	SS4-58
1290	215	132	22	0.24~0.52	10.7	SS4-60
1340	231	137	23.6	0.24~0.52	13.1	SS4-62
1390	248	142	25.2	0.24~0.52	13.4	SS4-64
1420	256	145	26.1	0.24~0.52	13.7	SS4-65
1450	265	148	27	0.24~0.52	14.7	SS4-66
1500	282	153	28.8	0.24~0.52	15.5	SS4-68
1550	300	158	30.6	0.24~0.52	13.6	SS4-70
1810	400	184	40.8	0.24~0.52	16.3	SS4-80

[Caution on Secondary Operations]

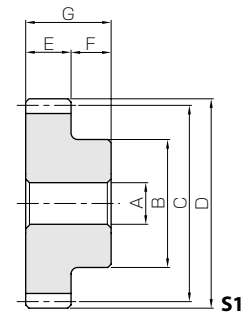
- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.



# SS Steel Spur Gears



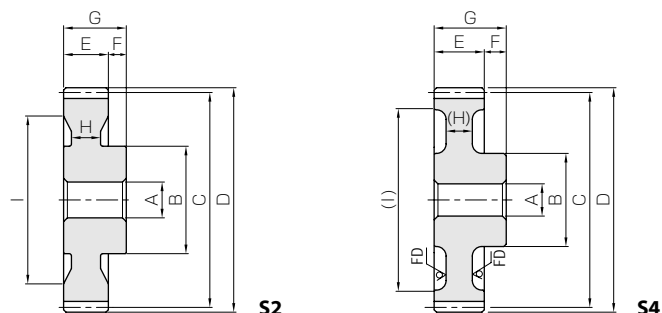
Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB



- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.
				A <sub>H7</sub>	B	C	D	E	F	G	(H)	(I)
SS5-12	m5	12	S1	22	46	60	70	50	25	75	—	—
SS5-13		13	S1	22	50	65	75	50	25	75	—	—
SS5-14		14	S1	22	52	70	80	50	25	75	—	—
SS5-15		15	S1	22	60	75	85	50	25	75	—	—
SS5-16		16	S1	22	65	80	90	50	25	75	—	—
SS5-17		17	S1	22	68	85	95	50	25	75	—	—
SS5-18		18	S1	22	70	90	100	50	25	75	—	—
SS5-19		19	S1	22	76	95	105	50	25	75	—	—
SS5-20		20	S1	22	82	100	110	50	25	75	—	—
SS5-21		21	S1	25	90	105	115	50	25	75	—	—
SS5-22		22	S1	25	95	110	120	50	25	75	—	—
SS5-23		23	S1	25	100	115	125	50	25	75	—	—
SS5-24		24	S1	25	100	120	130	50	25	75	—	—
SS5-25		25	S1	25	105	125	135	50	25	75	—	—
SS5-26		26	S1	25	110	130	140	50	25	75	—	—
SS5-27		27	S1	25	110	135	145	50	25	75	—	—
SS5-28		28	S1	25	110	140	150	50	25	75	—	—
SS5-29		29	S1	25	115	145	155	50	25	75	—	—
SS5-30		30	S1	25	120	150	160	50	25	75	—	—
SS5-32		32	S1	30	120	160	170	50	21	71	—	—
SS5-34		34	S1	30	120	170	180	50	21	71	—	—
SS5-35		35	S1	30	120	175	185	50	21	71	—	—
SS5-36		36	S1	30	120	180	190	50	21	71	—	—
SS5-38		38	S1	30	120	190	200	50	21	71	—	—
SS5-40		40	S2	30	120	200	210	50	21	71	36	160
SS5-42		42	S2	30	120	210	220	50	21	71	36	170
SS5-44		44	S2	30	120	220	230	50	21	71	36	175
SS5-45		45	S2	30	120	225	235	50	21	71	36	185
SS5-46		46	S2	30	120	230	240	50	21	71	30	185
SS5-48		48	S2	30	120	240	250	50	21	71	30	200
SS5-50		50	S4	30	120	250	260	50	21	71	(16)	(212)
SS5-52		52	S2	30	130	260	270	50	21	71	30	220
SS5-54		54	S2	30	130	270	280	50	21	71	30	230
SS5-55		55	S2	30	130	275	285	50	21	71	30	235
SS5-56		56	S2	30	130	280	290	50	21	71	30	240
SS5-58		58	S2	30	130	290	300	50	21	71	30	240
SS5-60		60	S4	30	130	300	310	50	21	71	(20)	(260)

[Caution on Product Characteristics] ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.  
 ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.



\* FD has die-forged finish.

Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No.
Bending strength	Surface durability	Bending strength	Surface durability			
254	15.2	25.9	1.55	0.20~0.44	1.21	<b>SS5-12</b>
327	18.4	33.4	1.88	0.20~0.44	1.46	<b>SS5-13</b>
412	21.8	42.0	2.22	0.20~0.44	1.70	<b>SS5-14</b>
462	25.5	47.1	2.60	0.20~0.44	2.07	<b>SS5-15</b>
512	29.5	52.2	3.01	0.20~0.44	2.40	<b>SS5-16</b>
562	33.8	57.3	3.45	0.20~0.44	2.72	<b>SS5-17</b>
614	38.4	62.6	3.92	0.20~0.44	3.03	<b>SS5-18</b>
666	43.4	67.9	4.42	0.20~0.44	3.45	<b>SS5-19</b>
718	48.6	73.3	4.96	0.20~0.44	3.90	<b>SS5-20</b>
772	54.2	78.7	5.53	0.24~0.50	4.36	<b>SS5-21</b>
825	60.1	84.1	6.13	0.24~0.50	4.83	<b>SS5-22</b>
879	66.3	89.7	6.77	0.24~0.50	5.33	<b>SS5-23</b>
934	73.0	95.2	7.45	0.24~0.50	5.69	<b>SS5-24</b>
989	80.0	101	8.16	0.24~0.50	6.23	<b>SS5-25</b>
1040	87.1	106	8.88	0.24~0.50	6.79	<b>SS5-26</b>
1100	94.4	112	9.62	0.24~0.50	7.19	<b>SS5-27</b>
1160	102	118	10.4	0.24~0.50	7.62	<b>SS5-28</b>
1210	110	124	11.2	0.24~0.50	8.23	<b>SS5-29</b>
1270	118	129	12.1	0.24~0.50	8.87	<b>SS5-30</b>
1380	136	141	13.8	0.24~0.50	9.36	<b>SS5-32</b>
1500	154	153	15.7	0.24~0.50	10.4	<b>SS5-34</b>
1550	164	158	16.7	0.24~0.50	10.9	<b>SS5-35</b>
1610	174	164	17.8	0.24~0.50	11.5	<b>SS5-36</b>
1730	195	176	19.9	0.24~0.50	12.6	<b>SS5-38</b>
1540	182	157	18.5	0.24~0.50	13.2	<b>SS5-40</b>
1630	202	167	20.6	0.28~0.58	14.2	<b>SS5-42</b>
1730	223	177	22.8	0.28~0.58	15.4	<b>SS5-44</b>
1780	234	182	23.9	0.28~0.58	15.8	<b>SS5-45</b>
1830	246	187	25.1	0.28~0.58	16.2	<b>SS5-46</b>
1930	269	197	27.5	0.28~0.58	17.0	<b>SS5-48</b>
2030	294	207	30.0	0.28~0.58	15.0	<b>SS5-50</b>
2130	320	217	32.6	0.28~0.58	19.8	<b>SS5-52</b>
2220	347	227	35.4	0.28~0.58	20.9	<b>SS5-54</b>
2270	361	232	36.8	0.28~0.58	21.5	<b>SS5-55</b>
2320	375	237	38.3	0.28~0.58	22.0	<b>SS5-56</b>
2420	405	247	41.3	0.28~0.58	23.8	<b>SS5-58</b>
2520	435	257	44.4	0.28~0.58	21.4	<b>SS5-60</b>

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks &amp; Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

Bevel Gearboxes

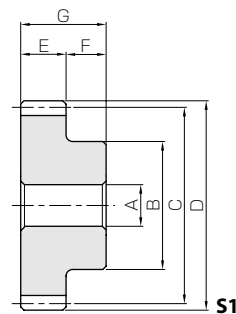
Other Products



# SS Steel Spur Gears



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB



- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.	
				A <sub>H7</sub>	B	C	D	E	F	G	H	I	
SS6-12	m6	12	S1	25	55	72	84	60	28	88	—	—	
SS6-13		13	S1	25	58	78	90	60	28	88	—	—	
SS6-14		14	S1	25	60	84	96	60	28	88	—	—	
SS6-15		15	S1	25	70	90	102	60	28	88	—	—	
SS6-16		16	S1	25	75	96	108	60	28	88	—	—	
SS6-17		17	S1	25	78	102	114	60	28	88	—	—	
SS6-18		18	S1	25	80	108	120	60	28	88	—	—	
SS6-19		19	S1	25	90	114	126	60	28	88	—	—	
SS6-20		20	S1	25	100	120	132	60	28	88	—	—	
SS6-21		21	S1	28	105	126	138	60	28	88	—	—	
SS6-22		22	S1	28	110	132	144	60	28	88	—	—	
SS6-23		23	S1	28	115	138	150	60	28	88	—	—	
SS6-24		24	S1	28	120	144	156	60	28	88	—	—	
SS6-25		25	S1	28	125	150	162	60	28	88	—	—	
SS6-26		26	S1	28	130	156	168	60	28	88	—	—	
SS6-27		27	S1	28	135	162	174	60	28	88	—	—	
SS6-28		28	S1	28	140	168	180	60	28	88	—	—	
SS6-30		30	S1	30	150	180	192	60	28	88	—	—	
SS6-32		32	S1	30	150	192	204	60	23	83	—	—	
SS6-34		34	S1	30	150	204	216	60	23	83	—	—	
SS6-35		35	S1	30	150	210	222	60	23	83	—	—	
SS6-36		36	S1	30	150	216	228	60	23	83	—	—	
SS6-38		38	S1	30	150	228	240	60	23	83	—	—	
SS6-40		40	S1	30	150	240	252	60	23	83	—	—	
SS6-42		42	S1	40	150	252	264	60	23	83	—	—	
SS6-44		44	S1	40	150	264	276	60	23	83	—	—	
SS6-45		45	S1	40	180	270	282	60	23	83	—	—	
SS6-46		46	S1	40	180	276	288	60	23	83	—	—	
SS6-48		48	S1	40	180	288	300	60	23	83	—	—	
SS6-50		50	S1	40	180	300	312	60	23	83	—	—	
SS8-12	m8	12	S1	28	75	96	112	75	35	110	—	—	
SS8-13		13	S1	28	80	104	120	75	35	110	—	—	
SS8-14		14	S1	28	85	112	128	75	35	110	—	—	
SS8-15		15	S1	28	90	120	136	75	35	110	—	—	
SS8-16		16	S1	28	100	128	144	75	35	110	—	—	
SS8-17		17	S1	28	105	136	152	75	35	110	—	—	
SS8-18		18	S1	28	110	144	160	75	35	110	—	—	
SS8-19		19	S1	28	120	152	168	75	35	110	—	—	
SS8-20		20	S1	28	130	160	176	75	35	110	—	—	
SS8-21		21	S1	30	140	168	184	75	35	110	—	—	
SS8-22		22	S1	30	150	176	192	75	35	110	—	—	
SS8-23		23	S1	30	155	184	200	75	35	110	—	—	
SS8-24		24	S1	30	160	192	208	75	35	110	—	—	
SS8-25		25	S1	30	170	200	216	75	35	110	—	—	
SS8-26		26	S1	30	170	208	224	75	35	110	—	—	
SS8-27		27	S1	30	170	216	232	75	35	110	—	—	
SS8-28		28	S1	30	180	224	240	75	35	110	—	—	
SS8-30		30	S1	30	180	240	256	75	35	110	—	—	
SS10-15		m10	15	S1	30	115	150	170	90	40	130	—	—
SS10-20			20	S1	30	165	200	220	90	40	130	—	—
SS10-25			25	S1	40	200	250	270	90	40	130	—	—

[Caution on Product Characteristics] ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.  
② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

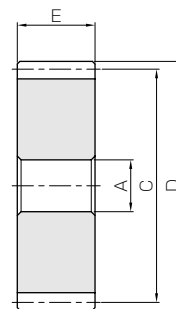
Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No.
Bending strength	Surface durability	Bending strength	Surface durability			
439	26.8	44.8	2.73	0.22~0.48	2.10	<b>SS6-12</b>
566	32.4	57.7	3.31	0.22~0.48	2.49	<b>SS6-13</b>
711	38.4	72.5	3.92	0.22~0.48	2.89	<b>SS6-14</b>
798	44.9	81.4	4.58	0.22~0.48	3.50	<b>SS6-15</b>
884	52	90.2	5.3	0.22~0.48	4.04	<b>SS6-16</b>
972	59.6	99.1	6.07	0.22~0.48	4.56	<b>SS6-17</b>
1060	67.7	108	6.9	0.22~0.48	5.08	<b>SS6-18</b>
1150	76.4	117	7.79	0.22~0.48	5.87	<b>SS6-19</b>
1240	85.9	127	8.75	0.22~0.48	6.71	<b>SS6-20</b>
1330	95.9	136	9.78	0.26~0.56	7.35	<b>SS6-21</b>
1430	107	145	10.9	0.26~0.56	8.11	<b>SS6-22</b>
1520	118	155	12	0.26~0.56	8.90	<b>SS6-23</b>
1610	129	165	13.2	0.26~0.56	9.73	<b>SS6-24</b>
1710	142	174	14.5	0.26~0.56	10.6	<b>SS6-25</b>
1800	154	184	15.7	0.26~0.56	11.5	<b>SS6-26</b>
1900	167	194	17	0.26~0.56	12.4	<b>SS6-27</b>
2000	181	204	18.4	0.26~0.56	13.4	<b>SS6-28</b>
2190	209	223	21.3	0.26~0.56	15.4	<b>SS6-30</b>
1990	200	203	20.4	0.26~0.56	16.4	<b>SS6-32</b>
2150	228	220	23.2	0.26~0.56	18.1	<b>SS6-34</b>
2240	242	228	24.7	0.26~0.56	19.0	<b>SS6-35</b>
2320	258	237	26.3	0.26~0.56	20.0	<b>SS6-36</b>
2490	289	254	29.5	0.26~0.56	22.0	<b>SS6-38</b>
2650	323	271	33	0.26~0.56	24.0	<b>SS6-40</b>
2820	359	288	36.6	0.30~0.64	25.9	<b>SS6-42</b>
2990	397	305	40.5	0.30~0.64	28.2	<b>SS6-44</b>
3080	416	314	42.5	0.30~0.64	30.7	<b>SS6-45</b>
3160	436	322	44.5	0.30~0.64	32.0	<b>SS6-46</b>
3330	478	340	48.8	0.30~0.64	34.5	<b>SS6-48</b>
3500	522	357	53.2	0.30~0.64	37.1	<b>SS6-50</b>
975	62.6	99.5	6.39	0.28~0.58	4.94	<b>SS8-12</b>
1260	75.2	128	7.66	0.28~0.58	5.85	<b>SS8-13</b>
1580	88.9	161	9.06	0.28~0.58	6.83	<b>SS8-14</b>
1770	104	181	10.6	0.28~0.58	7.87	<b>SS8-15</b>
1970	121	200	12.3	0.28~0.58	9.20	<b>SS8-16</b>
2160	139	220	14.1	0.28~0.58	10.4	<b>SS8-17</b>
2360	158	240	16.1	0.28~0.58	11.7	<b>SS8-18</b>
2560	178	261	18.2	0.28~0.58	13.3	<b>SS8-19</b>
2760	200	281	20.4	0.28~0.58	15.0	<b>SS8-20</b>
2960	223	302	22.8	0.32~0.66	16.7	<b>SS8-21</b>
3170	248	323	25.3	0.32~0.66	18.6	<b>SS8-22</b>
3380	273	344	27.9	0.32~0.66	20.2	<b>SS8-23</b>
2990	250	305	25.5	0.32~0.66	22.0	<b>SS8-24</b>
3160	273	323	27.8	0.32~0.66	24.1	<b>SS8-25</b>
3340	297	341	30.3	0.32~0.66	25.6	<b>SS8-26</b>
3520	322	359	32.8	0.32~0.66	27.2	<b>SS8-27</b>
3700	348	377	35.5	0.32~0.66	29.6	<b>SS8-28</b>
4060	404	414	41.2	0.32~0.66	33.0	<b>SS8-30</b>
3330	203	339	20.7	0.34~0.68	15.0	<b>SS10-15</b>
4310	323	440	33	0.34~0.68	28.2	<b>SS10-20</b>
5930	529	605	54	0.36~0.76	43.3	<b>SS10-25</b>

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB



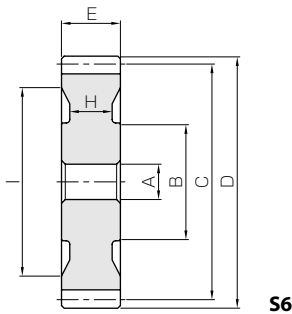
S5

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Web thickness	Web O.D.
				A <sub>H7</sub>	B	C	D	E	H	I
<b>SSA1-20</b>	<b>m1</b>	20	S5	8	—	20	22	10	—	—
<b>SSA1-24</b>		24	S5	8	—	24	26	10	—	—
<b>SSA1-25</b>		25	S5	8	—	25	27	10	—	—
<b>SSA1-28</b>		28	S5	8	—	28	30	10	—	—
<b>SSA1-30</b>		30	S5	8	—	30	32	10	—	—
<b>SSA1-32</b>		32	S5	8	—	32	34	10	—	—
<b>SSA1-35</b>		35	S5	8	—	35	37	10	—	—
<b>SSA1-36</b>		36	S5	8	—	36	38	10	—	—
<b>SSA1-40</b>		40	S5	8	—	40	42	10	—	—
<b>SSA1-45</b>		45	S5	8	—	45	47	10	—	—
<b>SSA1-48</b>		48	S5	8	—	48	50	10	—	—
<b>SSA1-50</b>		50	S5	10	—	50	52	10	—	—
<b>SSA1-55</b>	55	S5	10	—	55	57	10	—	—	
<b>SSA1-56</b>	56	S5	10	—	56	58	10	—	—	
<b>SSA1-60</b>	60	S5	10	—	60	62	10	—	—	
<b>SSA1-70</b>	70	S5	10	—	70	72	10	—	—	
<b>SSA1-80</b>	80	S5	10	—	80	82	10	—	—	
<b>SSA1-100</b>	100	S5	10	—	100	102	10	—	—	
<b>SSA1-120</b>	120	S5	10	—	120	122	10	—	—	
<b>SSA1.5-20</b>	<b>m1.5</b>	20	S5	10	—	30	33	15	—	—
<b>SSA1.5-24</b>		24	S5	10	—	36	39	15	—	—
<b>SSA1.5-25</b>		25	S5	10	—	37.5	40.5	15	—	—
<b>SSA1.5-28</b>		28	S5	10	—	42	45	15	—	—
<b>SSA1.5-30</b>		30	S5	10	—	45	48	15	—	—
<b>SSA1.5-32</b>		32	S5	10	—	48	51	15	—	—
<b>SSA1.5-35</b>		35	S5	10	—	52.5	55.5	15	—	—
<b>SSA1.5-36</b>		36	S5	10	—	54	57	15	—	—
<b>SSA1.5-40</b>		40	S5	15	—	60	63	15	—	—
<b>SSA1.5-45</b>		45	S5	15	—	67.5	70.5	15	—	—
<b>SSA1.5-48</b>		48	S5	15	—	72	75	15	—	—
<b>SSA1.5-50</b>		50	S5	15	—	75	78	15	—	—
<b>SSA1.5-55</b>	55	S5	15	—	82.5	85.5	15	—	—	
<b>SSA1.5-56</b>	56	S5	15	—	84	87	15	—	—	
<b>SSA1.5-60</b>	60	S5	15	—	90	93	15	—	—	
<b>SSA1.5-70</b>	70	S5	15	—	105	108	15	—	—	
<b>SSA1.5-80</b>	80	S5	15	—	120	123	15	—	—	
<b>SSA1.5-100</b>	100	S6	15	70	150	153	15	9	125	

[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.





S6

Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No.
Bending strength	Surface durability	Bending strength	Surface durability			
5.75	0.33	0.59	0.033	0.08~0.18	0.021	<b>SSA1-20</b>
7.47	0.49	0.76	0.050		0.032	<b>SSA1-24</b>
7.91	0.54	0.81	0.055		0.035	<b>SSA1-25</b>
9.24	0.68	0.94	0.070		0.044	<b>SSA1-28</b>
10.1	0.79	1.03	0.081		0.052	<b>SSA1-30</b>
11.1	0.90	1.13	0.092	0.08~0.18	0.059	<b>SSA1-32</b>
12.4	1.09	1.27	0.11		0.072	<b>SSA1-35</b>
12.9	1.16	1.31	0.12		0.076	<b>SSA1-36</b>
14.7	1.45	1.50	0.15		0.095	<b>SSA1-40</b>
17.1	1.86	1.74	0.19		0.12	<b>SSA1-45</b>
18.5	2.13	1.89	0.22	0.08~0.18	0.14	<b>SSA1-48</b>
19.5	2.32	1.98	0.24		0.15	<b>SSA1-50</b>
21.8	2.83	2.23	0.29		0.18	<b>SSA1-55</b>
22.3	2.94	2.28	0.30		0.19	<b>SSA1-56</b>
24.2	3.40	2.47	0.35		0.22	<b>SSA1-60</b>
29.1	4.70	2.96	0.48	0.08~0.18	0.30	<b>SSA1-70</b>
33.9	6.23	3.46	0.63		0.39	<b>SSA1-80</b>
43.7	9.97	4.45	1.02		0.61	<b>SSA1-100</b>
53.5	14.7	5.45	1.50		0.88	<b>SSA1-120</b>
19.4	1.15	1.98	0.12		0.10~0.22	0.074
25.2	1.73	2.57	0.18	0.12~0.26	0.11	<b>SSA1.5-24</b>
26.7	1.90	2.72	0.19	0.12~0.26	0.12	<b>SSA1.5-25</b>
31.2	2.41	3.18	0.25	0.12~0.26	0.15	<b>SSA1.5-28</b>
34.2	2.79	3.49	0.28	0.12~0.26	0.18	<b>SSA1.5-30</b>
37.3	3.19	3.80	0.33	0.12~0.26	0.20	<b>SSA1.5-32</b>
41.9	3.85	4.28	0.39	0.12~0.26	0.25	<b>SSA1.5-35</b>
43.5	4.09	4.43	0.42	0.12~0.26	0.26	<b>SSA1.5-36</b>
49.8	5.10	5.07	0.52	0.12~0.26	0.31	<b>SSA1.5-40</b>
57.7	6.53	5.88	0.67	0.14~0.32	0.40	<b>SSA1.5-45</b>
62.4	7.47	6.37	0.76	0.14~0.32	0.46	<b>SSA1.5-48</b>
65.7	8.15	6.69	0.83	0.14~0.32	0.50	<b>SSA1.5-50</b>
73.7	9.96	7.51	1.02	0.14~0.32	0.61	<b>SSA1.5-55</b>
75.3	10.4	7.68	1.06	0.14~0.32	0.63	<b>SSA1.5-56</b>
81.8	12.0	8.34	1.22	0.14~0.32	0.73	<b>SSA1.5-60</b>
98.0	16.6	10.0	1.69	0.14~0.32	1.00	<b>SSA1.5-70</b>
114	22.0	11.7	2.24	0.14~0.32	1.31	<b>SSA1.5-80</b>
147	35.5	15.0	3.62	0.18~0.38	1.72	<b>SSA1.5-100</b>

- [Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks &amp; Pinions

Miter Gears

Bevel Gears

Screw Gears

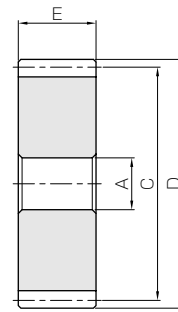
Worm Gear Pair

Bevel Gearboxes

Other Products



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB

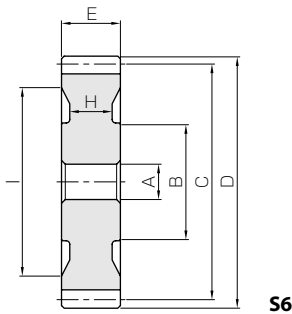


S5

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Web thickness	Web O.D.
				A <sub>H7</sub>	B	C	D	E	H	I
<b>SSA2-20</b>	<b>m2</b>	20	S5	12	—	40	44	20	—	—
<b>SSA2-24</b>		24	S5	12	—	48	52	20	—	—
<b>SSA2-25</b>		25	S5	12	—	50	54	20	—	—
<b>SSA2-28</b>		28	S5	15	—	56	60	20	—	—
<b>SSA2-30</b>		30	S5	15	—	60	64	20	—	—
<b>SSA2-32</b>		32	S5	15	—	64	68	20	—	—
<b>SSA2-35</b>		35	S5	15	—	70	74	20	—	—
<b>SSA2-36</b>		36	S5	15	—	72	76	20	—	—
<b>SSA2-40</b>		40	S5	18	—	80	84	20	—	—
<b>SSA2-45</b>		45	S5	18	—	90	94	20	—	—
<b>SSA2-48</b>		48	S5	18	—	96	100	20	—	—
<b>SSA2-50</b>		50	S5	18	—	100	104	20	—	—
<b>SSA2-55</b>		55	S5	18	—	110	114	20	—	—
<b>SSA2-56</b>		56	S5	18	—	112	116	20	—	—
<b>SSA2-60</b>		60	S5	18	—	120	124	20	—	—
<b>SSA2-70</b>	70	S5	18	—	140	144	20	—	—	
<b>SSA2-80</b>	80	S6	18	70	160	164	20	12	136	
<b>SSA2-100</b>	100	S6	18	90	200	204	20	12	176	
<b>SSA2.5-20</b>	<b>m2.5</b>	20	S5	15	—	50	55	25	—	—
<b>SSA2.5-24</b>		24	S5	15	—	60	65	25	—	—
<b>SSA2.5-25</b>		25	S5	15	—	62.5	67.5	25	—	—
<b>SSA2.5-28</b>		28	S5	18	—	70	75	25	—	—
<b>SSA2.5-30</b>		30	S5	18	—	75	80	25	—	—
<b>SSA2.5-32</b>		32	S5	18	—	80	85	25	—	—
<b>SSA2.5-35</b>		35	S5	18	—	87.5	92.5	25	—	—
<b>SSA2.5-36</b>		36	S5	18	—	90	95	25	—	—
<b>SSA2.5-40</b>		40	S5	22	—	100	105	25	—	—
<b>SSA2.5-45</b>		45	S5	22	—	112.5	117.5	25	—	—
<b>SSA2.5-48</b>		48	S5	22	—	120	125	25	—	—
<b>SSA2.5-50</b>		50	S5	22	—	125	130	25	—	—
<b>SSA2.5-55</b>		55	S5	22	—	137.5	142.5	25	—	—
<b>SSA2.5-56</b>		56	S5	22	—	140	145	25	—	—
<b>SSA2.5-60</b>		60	S6	22	70	150	155	25	15	121
<b>SSA2.5-70</b>	70	S6	22	80	175	180	25	15	146	
<b>SSA2.5-80</b>	80	S6	22	90	200	205	25	15	171	

[Caution on Product Characteristics] ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.  
② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

## Steel Hubless Spur Gears



S6

Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No.
Bending strength	Surface durability	Bending strength	Surface durability			
46.0	2.83	4.69	0.29	0.12~0.26	0.18	<b>SSA2-20</b>
59.8	4.24	6.09	0.43	0.14~0.30	0.27	<b>SSA2-24</b>
63.3	4.64	6.45	0.47	0.14~0.30	0.29	<b>SSA2-25</b>
73.9	5.89	7.54	0.60	0.14~0.30	0.36	<b>SSA2-28</b>
81.1	6.80	8.27	0.69	0.14~0.30	0.42	<b>SSA2-30</b>
88.4	7.78	9.01	0.79	0.14~0.30	0.48	<b>SSA2-32</b>
99.3	9.39	10.1	0.96	0.14~0.30	0.58	<b>SSA2-35</b>
103	9.96	10.5	1.02	0.14~0.30	0.61	<b>SSA2-36</b>
118	12.5	12.0	1.27	0.14~0.30	0.75	<b>SSA2-40</b>
137	16.0	13.9	1.63	0.18~0.36	0.96	<b>SSA2-45</b>
148	18.3	15.1	1.87	0.18~0.36	1.10	<b>SSA2-48</b>
156	19.9	15.9	2.03	0.18~0.36	1.19	<b>SSA2-50</b>
175	24.4	17.8	2.48	0.18~0.36	1.45	<b>SSA2-55</b>
179	25.3	18.2	2.58	0.18~0.36	1.51	<b>SSA2-56</b>
194	29.3	19.8	2.99	0.18~0.36	1.74	<b>SSA2-60</b>
232	40.8	23.7	4.16	0.18~0.36	2.38	<b>SSA2-70</b>
271	54.3	27.7	5.53	0.18~0.36	2.55	<b>SSA2-80</b>
291	72.7	29.7	7.42	0.20~0.44	3.90	<b>SSA2-100</b>
89.8	5.66	9.16	0.58	0.14~0.28	0.35	<b>SSA2.5-20</b>
117	8.47	11.9	0.86	0.16~0.34	0.52	<b>SSA2.5-24</b>
124	9.26	12.6	0.94	0.16~0.34	0.57	<b>SSA2.5-25</b>
144	11.7	14.7	1.20	0.16~0.34	0.71	<b>SSA2.5-28</b>
159	13.6	16.2	1.39	0.16~0.34	0.82	<b>SSA2.5-30</b>
173	15.6	17.6	1.59	0.16~0.34	0.94	<b>SSA2.5-32</b>
194	18.8	19.8	1.92	0.16~0.34	1.13	<b>SSA2.5-35</b>
201	20.0	20.5	2.04	0.16~0.34	1.20	<b>SSA2.5-36</b>
230	24.9	23.5	2.54	0.16~0.34	1.47	<b>SSA2.5-40</b>
267	31.9	27.2	3.26	0.18~0.40	1.88	<b>SSA2.5-45</b>
289	36.7	29.5	3.74	0.18~0.40	2.14	<b>SSA2.5-48</b>
304	40.0	31.0	4.08	0.18~0.40	2.33	<b>SSA2.5-50</b>
341	49.1	34.8	5.01	0.18~0.40	2.84	<b>SSA2.5-55</b>
349	51.0	35.6	5.20	0.18~0.40	2.95	<b>SSA2.5-56</b>
379	59.1	38.6	6.03	0.18~0.40	2.93	<b>SSA2.5-60</b>
454	82.1	46.3	8.37	0.18~0.40	3.89	<b>SSA2.5-70</b>
441	90.9	45.0	9.27	0.18~0.40	4.99	<b>SSA2.5-80</b>

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks &amp; Pinions

Miter Gears

Bevel Gears

Screw Gears

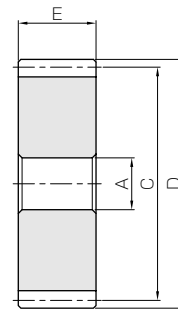
Worm Gear Pair

Bevel Gearboxes

Other Products



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB



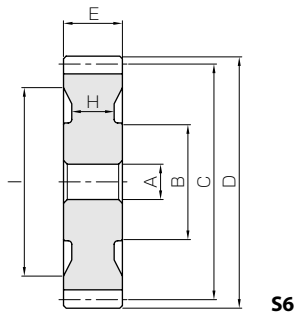
S5

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Web thickness	Web O.D.	
				A <sub>H7</sub>	B	C	D	E	H	I	
<b>SSA3-20</b>	<b>m3</b>	20	S5	15	—	60	66	30	—	—	
<b>SSA3-24</b>		24	S5	15	—	72	78	30	—	—	
<b>SSA3-25</b>		25	S5	15	—	75	81	30	—	—	
<b>SSA3-28</b>		28	S5	20	—	84	90	30	—	—	
<b>SSA3-30</b>		30	S5	20	—	90	96	30	—	—	
<b>SSA3-32</b>		32	S5	20	—	96	102	30	—	—	
<b>SSA3-35</b>		35	S5	20	—	105	111	30	—	—	
<b>SSA3-36</b>		36	S5	20	—	108	114	30	—	—	
<b>SSA3-40</b>		40	S5	25	—	120	126	30	—	—	
<b>SSA3-45</b>		45	S5	25	—	135	141	30	—	—	
<b>SSA3-48</b>		48	S5	25	—	144	150	30	—	—	
<b>SSA3-50</b>		50	S6	25	70	150	156	30	18	116	
<b>SSA3-55</b>		55	S6	25	80	165	171	30	18	131	
<b>SSA3-56</b>		56	S6	25	80	168	174	30	18	134	
<b>SSA3-60</b>		60	S6	25	90	180	186	30	18	146	
<b>SSA3-70</b>		70	S6	25	90	210	216	30	18	176	
<b>SSA3-80</b>		80	S6	25	90	240	246	30	18	205	
<b>SSA4-20</b>		<b>m4</b>	20	S5	20	—	80	88	40	—	—
<b>SSA4-24</b>			24	S5	20	—	96	104	40	—	—
<b>SSA4-25</b>			25	S5	20	—	100	108	40	—	—
<b>SSA4-28</b>	28		S5	25	—	112	120	40	—	—	
<b>SSA4-30</b>	30		S5	25	—	120	128	40	—	—	
<b>SSA4-32</b>	32		S5	25	—	128	136	40	—	—	
<b>SSA4-35</b>	35		S5	25	—	140	148	40	—	—	
<b>SSA4-36</b>	36		S5	25	—	144	152	40	—	—	
<b>SSA4-40</b>	40		S6	30	80	160	168	40	26	118	
<b>SSA4-45</b>	45		S6	30	100	180	188	40	26	138	
<b>SSA4-48</b>	48		S6	30	100	192	200	40	26	150	
<b>SSA4-50</b>	50		S6	30	100	200	208	40	26	158	
<b>SSA4-55</b>	55		S6	30	110	220	228	40	26	178	
<b>SSA4-56</b>	56		S6	30	110	224	232	40	26	182	
<b>SSA4-60</b>	60		S6	30	120	240	248	40	26	198	
<b>SSA5-20</b>	<b>m5</b>		20	S5	22	—	100	110	50	—	—
<b>SSA5-24</b>			24	S5	22	—	120	130	50	—	—
<b>SSA5-25</b>			25	S5	22	—	125	135	50	—	—
<b>SSA5-28</b>			28	S5	25	—	140	150	50	—	—
<b>SSA5-30</b>			30	S5	25	—	150	160	50	—	—
<b>SSA5-32</b>		32	S5	25	—	160	170	50	—	—	
<b>SSA5-35</b>		35	S5	25	—	175	185	50	—	—	
<b>SSA5-36</b>		36	S5	25	—	180	190	50	—	—	
<b>SSA5-40</b>		40	S6	30	100	200	210	50	36	160	
<b>SSA5-45</b>		45	S6	30	120	225	235	50	36	185	
<b>SSA5-48</b>		48	S6	30	120	240	250	50	36	200	
<b>SSA5-50</b>		50	S6	30	130	250	260	50	36	210	

[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

## Steel Hubless Spur Gears



S6

Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No.
Bending strength	Surface durability	Bending strength	Surface durability			
155	9.95	15.8	1.02	0.14~0.32	0.62	<b>SSA3-20</b>
202	14.9	20.6	1.52	0.18~0.38	0.92	<b>SSA3-24</b>
214	16.3	21.8	1.66	0.18~0.38	1.00	<b>SSA3-25</b>
250	20.7	25.4	2.11	0.18~0.38	1.23	<b>SSA3-28</b>
274	24.0	27.9	2.44	0.18~0.38	1.42	<b>SSA3-30</b>
298	27.4	30.4	2.80	0.18~0.38	1.63	<b>SSA3-32</b>
335	33.1	34.2	3.38	0.18~0.38	1.97	<b>SSA3-35</b>
348	35.2	35.5	3.59	0.18~0.38	2.08	<b>SSA3-36</b>
398	44.0	40.6	4.49	0.18~0.38	2.55	<b>SSA3-40</b>
461	56.6	47	5.78	0.20~0.44	3.26	<b>SSA3-45</b>
500	65.0	50.9	6.63	0.20~0.44	3.72	<b>SSA3-48</b>
525	70.9	53.6	7.23	0.20~0.44	3.60	<b>SSA3-50</b>
590	86.9	60.1	8.86	0.20~0.44	4.34	<b>SSA3-55</b>
602	90.3	61.4	9.21	0.20~0.44	4.47	<b>SSA3-56</b>
654	105	66.7	10.7	0.20~0.44	5.14	<b>SSA3-60</b>
654	121	66.6	12.4	0.20~0.44	6.64	<b>SSA3-70</b>
763	162	77.8	16.5	0.20~0.44	8.37	<b>SSA3-80</b>
368	24.3	37.5	2.48	0.18~0.38	1.48	<b>SSA4-20</b>
478	36.4	48.8	3.72	0.20~0.44	2.17	<b>SSA4-24</b>
506	39.9	51.6	4.07	0.20~0.44	2.37	<b>SSA4-25</b>
591	50.6	60.3	5.16	0.20~0.44	2.94	<b>SSA4-28</b>
649	58.7	66.2	5.98	0.20~0.44	3.40	<b>SSA4-30</b>
707	67.4	72.1	6.87	0.20~0.44	3.89	<b>SSA4-32</b>
795	81.6	81.1	8.32	0.20~0.44	4.68	<b>SSA4-35</b>
825	86.7	84.1	8.84	0.20~0.44	4.96	<b>SSA4-36</b>
943	109	96.2	11.1	0.20~0.44	5.70	<b>SSA4-40</b>
1090	139	112	14.2	0.24~0.52	7.29	<b>SSA4-45</b>
987	133	101	13.6	0.24~0.52	8.12	<b>SSA4-48</b>
1040	146	106	14.8	0.24~0.52	8.70	<b>SSA4-50</b>
1160	179	119	18.2	0.24~0.52	10.4	<b>SSA4-55</b>
1190	186	121	18.9	0.24~0.52	10.7	<b>SSA4-56</b>
1290	215	132	22.0	0.24~0.52	12.3	<b>SSA4-60</b>
718	48.6	73.3	4.96	0.20~0.44	2.93	<b>SSA5-20</b>
934	73.0	95.2	7.45	0.24~0.50	4.29	<b>SSA5-24</b>
989	80.0	101	8.16	0.24~0.50	4.67	<b>SSA5-25</b>
1160	102	118	10.4	0.24~0.50	5.85	<b>SSA5-28</b>
1270	118	129	12.1	0.24~0.50	6.74	<b>SSA5-30</b>
1380	136	141	13.8	0.24~0.50	7.70	<b>SSA5-32</b>
1550	164	158	16.7	0.24~0.50	9.25	<b>SSA5-35</b>
1610	174	164	17.8	0.24~0.50	9.80	<b>SSA5-36</b>
1540	182	157	18.5	0.24~0.50	11.1	<b>SSA5-40</b>
1780	234	182	23.9	0.28~0.58	14.0	<b>SSA5-45</b>
1930	269	197	27.5	0.28~0.58	15.7	<b>SSA5-48</b>
2030	294	207	30.0	0.28~0.58	17.1	<b>SSA5-50</b>

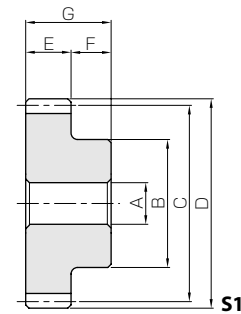
[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB

\* The precision grade of products with a module of less than 0.8 is equivalent to the value shown in the table.

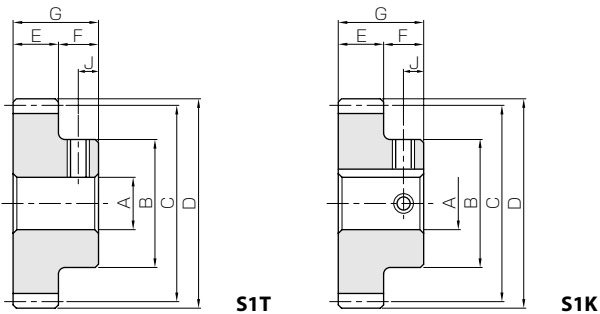


- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	Width×Depth
SSY0.8-20 SSY0.8-20A	m0.8	20	S1	5	13.5	16	17.6	4	8	12	—
			S1T	5							—
SSY0.8-25 SSY0.8-25A		25	S1	5	17	20	21.6	4	8	12	—
			S1T	5							—
SSY0.8-30 SSY0.8-30A		30	S1	5	20	24	25.6	4	8	12	—
			S1T	5							—
SSY0.8-40 SSY0.8-40A		40	S1	5	25	32	33.6	4	8	12	—
			S1T	6							—
SSY0.8-50 SSY0.8-50A		50	S1	5	25	40	41.6	4	8	12	—
			S1T	6							—
SSY1-12 SSY1-12A	m1	12	S1	5	9	12	14	6	8	14	—
			S1T	5							—
SSY1-14 SSY1-14A		14	S1	5	11	14	16	6	8	14	—
			S1T	5							—
SSY1-15 SSY1-15A		15	S1	6	12	15	17	6	8	14	—
			S1T	6							—
SSY1-16 SSY1-16A		16	S1	6	13	16	18	6	8	14	—
			S1T	6							—
SSY1-18 SSY1-18A		18	S1	6	14	18	20	6	8	14	—
			S1T	6							—
SSY1-20 SSY1-20A SSY1-20B		20	S1	6	16	20	22	6	8	14	—
			S1T	6							—
			S1T	8							—
SSY1-24 SSY1-24A SSY1-24B		24	S1	6	16	24	26	6	8	14	—
			S1T	6							—
			S1T	8							—
SSY1-25 SSY1-25A		25	S1	6	16	25	27	6	8	14	—
			S1T	6							—
SSY1-28 SSY1-28A		28	S1	6	16	28	30	6	8	14	—
			S1T	6							—
SSY1-30 SSY1-30A SSY1-30B	30	S1	6	25	30	32	6	8	14	—	
		S1T	6							—	
		S1T	8							—	
SSY1-32 SSY1-32A	32	S1	6	25	32	34	6	8	14	—	
		S1T	6							—	
SSY1-35 SSY1-35A SSY1-35B	35	S1	6	25	35	37	6	8	14	—	
		S1T	8							—	
		S1K	10							4 x 1.8	
SSY1-36 SSY1-36A SSY1-36B	36	S1	6	25	36	38	6	8	14	—	
		S1T	8							—	
		S1K	10							4 x 1.8	
SSY1-40 SSY1-40A SSY1-40B	40	S1	8	28	40	42	6	8	14	—	
		S1T	8							—	
		S1K	10							4 x 1.8	
SSY1-45 SSY1-45A	45	S1	8	28	45	47	6	8	14	—	
		S1T	8							—	
SSY1-48 SSY1-48A	48	S1	8	28	48	50	6	8	14	—	
		S1T	8							—	

[Caution on Product Characteristics] ① For products with a tapped hole, a set screw is included.  
 ② The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.  
 ③ The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

## Steel Thin Face Spur Gears



S1T

S1K

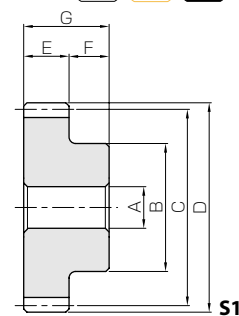
Set Screw		Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No.
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
— M4	— 4	1.47	0.085	0.15	0.0087	0 ~0.10	490 690	<b>SSY0.8-20</b> <b>SSY0.8-20A</b>
— M4	— 4	2.03	0.134	0.21	0.014	0 ~0.10	530 730	<b>SSY0.8-25</b> <b>SSY0.8-25A</b>
— M4	— 4	2.60	0.197	0.27	0.020	0 ~0.10	610 790	<b>SSY0.8-30</b> <b>SSY0.8-30A</b>
— M4	— 4	3.77	0.362	0.39	0.037	0 ~0.10	750 950	<b>SSY0.8-40</b> <b>SSY0.8-40A</b>
— M4	— 4	4.98	0.580	0.51	0.059	0 ~0.10	920 1,150	<b>SSY0.8-50</b> <b>SSY0.8-50A</b>
— M4	— 4	1.22	0.069	0.12	0.0070	0.08~0.18	340 490	<b>SSY1-12</b> <b>SSY1-12A</b>
— M4	— 4	1.98	0.096	0.20	0.010	0.08~0.18	360 500	<b>SSY1-14</b> <b>SSY1-14A</b>
— M4	— 4	2.22	0.11	0.23	0.011	0.08~0.18	370 510	<b>SSY1-15</b> <b>SSY1-15A</b>
— M4	— 4	2.46	0.13	0.25	0.013	0.08~0.18	380 510	<b>SSY1-16</b> <b>SSY1-16A</b>
— M4	— 4	2.95	0.16	0.30	0.017	0.08~0.18	390 510	<b>SSY1-18</b> <b>SSY1-18A</b>
— M4 M5	— 4 4	3.45	0.20	0.35	0.021	0.08~0.18	420 560 560	<b>SSY1-20</b> <b>SSY1-20A</b> <b>SSY1-20B</b>
— M4 M5	— 4 4	4.48	0.30	0.46	0.030	0.08~0.18	450 590 590	<b>SSY1-24</b> <b>SSY1-24A</b> <b>SSY1-24B</b>
— M4	— 4	4.74	0.32	0.48	0.033	0.08~0.18	460 590	<b>SSY1-25</b> <b>SSY1-25A</b>
— M4	— 4	5.55	0.41	0.57	0.042	0.08~0.18	490 630	<b>SSY1-28</b> <b>SSY1-28A</b>
— M4 M5	— 4 4	6.08	0.47	0.62	0.048	0.08~0.18	500 660 660	<b>SSY1-30</b> <b>SSY1-30A</b> <b>SSY1-30B</b>
— M4	— 4	6.63	0.54	0.68	0.055	0.08~0.18	510 690	<b>SSY1-32</b> <b>SSY1-32A</b>
— M5 M4	— 4 4	7.45	0.66	0.76	0.067	0.08~0.18	540 740 860	<b>SSY1-35</b> <b>SSY1-35A</b> <b>SSY1-35B</b>
— M5 M4	— 4 4	7.73	0.70	0.79	0.071	0.08~0.18	570 750 870	<b>SSY1-36</b> <b>SSY1-36A</b> <b>SSY1-36B</b>
— M5 M4	— 4 4	8.84	0.87	0.90	0.089	0.08~0.18	610 840 1,070	<b>SSY1-40</b> <b>SSY1-40A</b> <b>SSY1-40B</b>
— M5	— 4	10.3	1.12	1.05	0.11	0.08~0.18	690 940	<b>SSY1-45</b> <b>SSY1-45A</b>
— M5	— 4	11.1	1.28	1.13	0.13	0.08~0.18	780 1,020	<b>SSY1-48</b> <b>SSY1-48A</b>

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② When performing secondary operations, be aware of deflection and distortion as the tooth is thin in width; deflection might occur if heat treated.
- ③ Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB

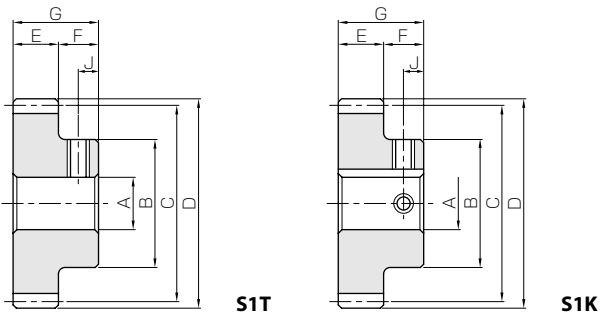


Spur Gears  
Helical Gears  
Internal Gears  
Racks  
CP Racks & Pinions  
Miter Gears  
Bevel Gears  
Screw Gears  
Worm Gear Pair  
Bevel Gearboxes  
Other Products

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	Width×Depth
<b>SSY1-50</b> <b>SSY1-50A</b>	<b>m1</b>	50	S1 S1T	8 8	28	50	52	6	8	14	— —
<b>SSY1-55</b> <b>SSY1-55A</b>		55	S1 S1K	8 10	28	55	57	6	8	14	— 4 x 1.8
<b>SSY1-56</b> <b>SSY1-56A</b>		56	S1 S1K	8 10	28	56	58	6	8	14	— 4 x 1.8
<b>SSY1-60</b> <b>SSY1-60A</b> <b>SSY1-60B</b>		60	S1 S1K S1K	8 10 12	35	60	62	6	8	14	— 4 x 1.8 4 x 1.8
<b>SSY1-64</b> <b>SSY1-64A</b>		64	S1 S1K	8 10	35	64	66	6	8	14	— 4 x 1.8
<b>SSY1-65</b> <b>SSY1-65A</b>		65	S1 S1K	8 10	35	65	67	6	8	14	— 4 x 1.8
<b>SSY1-70</b> <b>SSY1-70A</b>		70	S1 S1K	8 10	35	70	72	6	8	14	— 4 x 1.8
<b>SSY1-72</b> <b>SSY1-72A</b>		72	S1 S1K	8 10	35	72	74	6	8	14	— 4 x 1.8
<b>SSY1-75</b> <b>SSY1-75A</b>		75	S1 S1K	8 10	35	75	77	6	8	14	— 4 x 1.8
<b>SSY1-80</b> <b>SSY1-80A</b>		80	S1 S1K	10 12	40 35	80	82	6	8	14	— 4 x 1.8
<b>SSY1-85</b> <b>SSY1-85A</b>		85	S1 S1K	10 12	40 35	85	87	6	8	14	— 4 x 1.8
<b>SSY1-90</b> <b>SSY1-90A</b>		90	S1 S1K	10 12	40 35	90	92	6	8	14	— 4 x 1.8
<b>SSY1-95</b> <b>SSY1-95A</b>		95	S1 S1K	10 12	40 35	95	97	6	8	14	— 4 x 1.8
<b>SSY1-96</b> <b>SSY1-96A</b>		96	S1 S1K	10 12	40 35	96	98	6	8	14	— 4 x 1.8
<b>SSY1-100</b> <b>SSY1-100A</b>		100	S1 S1K	10 12	50 35	100	102	6	8	14	— 4 x 1.8
<b>SSY1-110</b> <b>SSY1-110A</b>		110	S1 S1K	10 12	50 35	110	112	6	8	14	— 4 x 1.8
<b>SSY1-120</b> <b>SSY1-120A</b>	120	S1 S1K	10 12	50 35	120	122	6	8	14	— 4 x 1.8	

- [Caution on Product Characteristics]
- ① For products with a tapped hole, a set screw is included.
  - ② The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
  - ③ The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.





Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

Bevel Gearboxes

Other Products

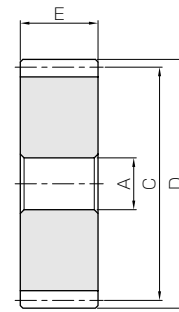
Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No.
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
M5	4	11.7	1.39	1.19	0.14	0.08~0.18	0.13 0.12	SSY1-50 SSY1-50A
M4	4	13.1	1.70	1.34	0.17	0.08~0.18	0.15 0.14	SSY1-55 SSY1-55A
M4	4	13.4	1.77	1.37	0.18	0.08~0.18	0.15 0.14	SSY1-56 SSY1-56A
M4	4	14.5	2.04	1.48	0.21	0.08~0.18	0.19 0.18 0.18	SSY1-60 SSY1-60A SSY1-60B
M4	4	15.7	2.34	1.60	0.24	0.08~0.18	0.21 0.20	SSY1-64 SSY1-64A
M4	4	16.0	2.41	1.63	0.25	0.08~0.18	0.21 0.21	SSY1-65 SSY1-65A
M4	4	17.4	2.82	1.78	0.29	0.08~0.18	0.24 0.23	SSY1-70 SSY1-70A
M4	4	18.0	2.99	1.84	0.30	0.08~0.18	0.25 0.24	SSY1-72 SSY1-72A
M4	4	18.9	3.26	1.93	0.33	0.08~0.18	0.26 0.26	SSY1-75 SSY1-75A
M4	4	20.3	3.74	2.07	0.38	0.08~0.18	0.31 0.28	SSY1-80 SSY1-80A
M4	4	21.8	4.25	2.22	0.43	0.08~0.18	0.34 0.31	SSY1-85 SSY1-85A
M4	4	23.3	4.79	2.37	0.49	0.08~0.18	0.37 0.35	SSY1-90 SSY1-90A
M4	4	24.7	5.37	2.52	0.55	0.08~0.18	0.40 0.38	SSY1-95 SSY1-95A
M4	4	25.0	5.49	2.55	0.56	0.08~0.18	0.41 0.39	SSY1-96 SSY1-96A
M4	4	26.2	5.98	2.67	0.61	0.08~0.18	0.48 0.42	SSY1-100 SSY1-100A
M4	4	29.1	7.31	2.97	0.75	0.08~0.18	0.56 0.49	SSY1-110 SSY1-110A
M4	4	32.1	8.80	3.27	0.90	0.08~0.18	0.65 0.58	SSY1-120 SSY1-120A

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② When performing secondary operations, be aware of deflection and distortion as the tooth is thin in width; deflection might occur if heat treated.
- ③ Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB



S5

Catalog No.	Module	No. of teeth	Shape	Bore	Pitch dia.	Outside dia.	Face width	Allowable torque (N·m)		Allowable torque (kgf·m)	
				A <sub>H7</sub>	C	D	E	Bending strength	Surface durability	Bending strength	Surface durability
<b>SSAY1-20</b>	<b>m1</b>	20	S5	6	20	22	6	3.45	0.20	0.35	0.021
<b>SSAY1-24</b>		24	S5	6	24	26	6	4.48	0.30	0.46	0.030
<b>SSAY1-25</b>		25	S5	6	25	27	6	4.74	0.32	0.48	0.033
<b>SSAY1-28</b>		28	S5	6	28	30	6	5.55	0.41	0.57	0.042
<b>SSAY1-30</b>		30	S5	6	30	32	6	6.08	0.47	0.62	0.048
<b>SSAY1-32</b>		32	S5	6	32	34	6	6.63	0.54	0.68	0.055
<b>SSAY1-35</b>		35	S5	6	35	37	6	7.45	0.66	0.76	0.067
<b>SSAY1-36</b>		36	S5	6	36	38	6	7.73	0.70	0.79	0.071
<b>SSAY1-40</b>		40	S5	6	40	42	6	8.84	0.87	0.90	0.089
<b>SSAY1-45</b>		45	S5	6	45	47	6	10.3	1.12	1.05	0.11
<b>SSAY1-48</b>		48	S5	6	48	50	6	11.1	1.28	1.13	0.13
<b>SSAY1-50</b>		50	S5	8	50	52	6	11.7	1.39	1.19	0.14
<b>SSAY1-55</b>		55	S5	8	55	57	6	13.1	1.70	1.34	0.17
<b>SSAY1-56</b>		56	S5	8	56	58	6	13.4	1.77	1.37	0.18
<b>SSAY1-60</b>		60	S5	8	60	62	6	14.5	2.04	1.48	0.21
<b>SSAY1-70</b>		70	S5	8	70	72	6	17.4	2.82	1.78	0.29
<b>SSAY1-80</b>	80	S5	10	80	82	6	20.3	3.74	2.07	0.38	
<b>SSAY1-100</b>	100	S5	10	100	102	6	26.2	5.98	2.67	0.61	

[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

## Steel Hubless Thin Face Spur Gears

Backlash (mm)	Weight (kg)	Catalog No.
0.08~0.18	0.013	<b>SSAY1-20</b>
	0.020	<b>SSAY1-24</b>
	0.022	<b>SSAY1-25</b>
	0.028	<b>SSAY1-28</b>
	0.032	<b>SSAY1-30</b>
0.08~0.18	0.037	<b>SSAY1-32</b>
	0.044	<b>SSAY1-35</b>
	0.047	<b>SSAY1-36</b>
	0.058	<b>SSAY1-40</b>
	0.074	<b>SSAY1-45</b>
0.08~0.18	0.084	<b>SSAY1-48</b>
	0.090	<b>SSAY1-50</b>
	0.11	<b>SSAY1-55</b>
	0.11	<b>SSAY1-56</b>
	0.13	<b>SSAY1-60</b>
0.08~0.18	0.18	<b>SSAY1-70</b>
	0.23	<b>SSAY1-80</b>
	0.37	<b>SSAY1-100</b>

- [Caution on Secondary Operations]
- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
  - ② When performing secondary operations, be aware of deflection and distortion as the tooth is thin in width; deflection might occur if heat treated.
  - ③ Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.

Spur  
GearsHelical  
GearsInternal  
Gears

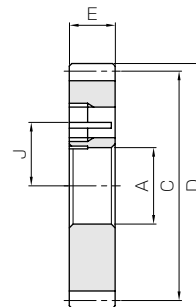
Racks

CP Racks  
& PinionsMiter  
GearsBevel  
GearsScrew  
GearsWorm  
Gear PairBevel  
GearboxesOther  
Products



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB

\* The gear grade listed is the value before clamping. The precision grade of products with a module of less than 0.8 is equivalent to the value shown in the table.



S5

Catalog No.	Module	No. of teeth	Shape	Bore		Pitch dia.		Outside dia.		Face width		Set Screw		Allowable torque (N·m)	
				AH7	C	D	E	Size	J	Bending strength	Surface durability				
SSAY0.8-28/K6	m0.8	28	S5	6	22.4	24	6	M5	6.3	3.55	0.26				
SSAY0.8-30/K6 /K8		30	S5	6 8	24	25.6	6	M5	6.3 7.3	3.89	0.30				
SSAY0.8-32/K6 /K8		32	S5	6 8	25.6	27.2	6	M5	6.3 7.3	4.24	0.34				
SSAY0.8-35/K6 /K8		35	S5	6 8	28	29.6	6	M5	6.3 7.3	4.77	0.41				
SSAY0.8-36/K6 /K8		36	S5	6 8	28.8	30.4	6	M5	6.3 7.3	4.95	0.43				
SSAY0.8-40/K6 /K8 /K10		40	S5	6 8 10	32	33.6	6	M5	6.3 7.3 8.3	5.66	0.54				
SSAY0.8-45/K6 /K8 /K10		45	S5	6 8 10	36	37.6	6	M5	6.3 7.3 8.3	6.56	0.70				
SSAY0.8-48/K6 /K8 /K10		48	S5	6 8 10	38.4	40	6	M5	6.3 7.3 8.3	7.11	0.80				
SSAY0.8-50/K6 /K8 /K10		50	S5	6 8 10	40	41.6	6	M5	6.3 7.3 8.3	7.47	0.87				
SSAY0.8-55/K6 /K8 /K10		55	S5	6 8 10	44	45.6	6	M5	6.3 7.3 8.3	8.39	1.06				
SSAY0.8-56/K6 /K8 /K10		56	S5	6 8 10	44.8	46.4	6	M5	6.3 7.3 8.3	8.57	1.10				
SSAY0.8-60/K6 /K8 /K10		60	S5	6 8 10	48	49.6	6	M5	6.3 7.3 8.3	9.30	1.28				

[Caution on Product Characteristics]

- ① For products with a tapped hole, a set screw is included.
- ② The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ③ The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.
- ④ The reference slipping torques shown in the table are experimentally obtained by attaching the gears to shafts with g6 tolerance and 0.4a surface finish.
- ⑤ Do not tighten the clamping screw without inserting a shaft, or the bore will be permanently deformed and will not accept a shaft.

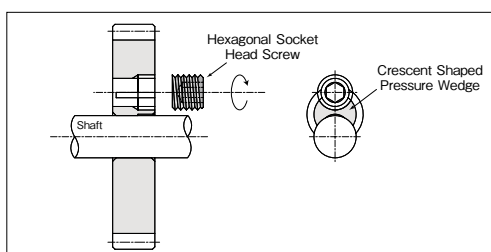


Allowable torque (kgf·m)		Reference slipping torque (N·m)		Backlash (mm)	Weight (kg)	Catalog No.
Bending strength	Surface durability	Screw fastening torque	Ref. slipping torque			
0.36	0.026	2.8	2.4	0 ~ 0.10	0.017	<b>SSAY0.8-28/K6</b>
0.40	0.030	2.8	2.4 3.7	0 ~ 0.10	0.020 0.019	<b>SSAY0.8-30/K6</b> <b>/K8</b>
0.43	0.035	2.8	2.4 3.7	0 ~ 0.10	0.023 0.022	<b>SSAY0.8-32/K6</b> <b>/K8</b>
0.49	0.042	2.8	2.4 3.7	0 ~ 0.10	0.028 0.027	<b>SSAY0.8-35/K6</b> <b>/K8</b>
0.50	0.044	2.8	2.4 3.7	0 ~ 0.10	0.029 0.028	<b>SSAY0.8-36/K6</b> <b>/K8</b>
0.58	0.055	2.8	2.4 3.7 3.9	0 ~ 0.10	0.037 0.036 0.034	<b>SSAY0.8-40/K6</b> <b>/K8</b> <b>/K10</b>
0.67	0.071	2.8	2.4 3.7 3.9	0 ~ 0.10	0.047 0.046 0.044	<b>SSAY0.8-45/K6</b> <b>/K8</b> <b>/K10</b>
0.72	0.081	2.8	2.4 3.7 3.9	0 ~ 0.10	0.053 0.052 0.051	<b>SSAY0.8-48/K6</b> <b>/K8</b> <b>/K10</b>
0.76	0.089	2.8	2.4 3.7 3.9	0 ~ 0.10	0.058 0.057 0.055	<b>SSAY0.8-50/K6</b> <b>/K8</b> <b>/K10</b>
0.86	0.11	2.8	2.4 3.7 3.9	0 ~ 0.10	0.070 0.069 0.068	<b>SSAY0.8-55/K6</b> <b>/K8</b> <b>/K10</b>
0.87	0.11	2.8	2.4 3.7 3.9	0 ~ 0.10	0.073 0.072 0.071	<b>SSAY0.8-56/K6</b> <b>/K8</b> <b>/K10</b>
0.95	0.13	2.8	2.4 3.7 3.9	0 ~ 0.10	0.084 0.083 0.082	<b>SSAY0.8-60/K6</b> <b>/K8</b> <b>/K10</b>

- [Caution on Secondary Operations] ① As these are finished products, avoid performing secondary operations on the bore, with the exception of adding a keyway.  
② Perform secondary operations carefully as to not to distort the clamping groove.

## How does the K-Clamp work?

The K-Clamp uses a crescent shaped piece, appropriate for the size of the shaft as the pressure wedge to secure the gear on the shaft.



## Application Hints

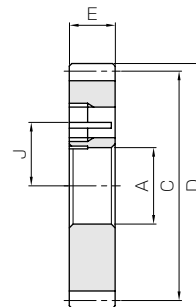
1. The slipping torque is affected by the fitting and clamping surface conditions. Remove as much lubricant as possible, and use the same size shaft as the bore, within h7 tolerances.
2. K-Clamp gears are suitable for relatively small gears in light loads with the bore size ranging between  $\phi 6$  and  $\phi 12$ mm. The gear will slip on the shaft when the actual load exceeds the slipping torque. The use of a key in addition to the K-Clamp is recommended for heavier loads or large bores sizes.





Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB

\* The gear grade listed is the value before clamping. The precision grade of products with a module of less than 0.8 is equivalent to the value shown in the table.



S5

Catalog No.	Module	No. of teeth	Shape	Bore			Face width	Set Screw		Allowable torque (N·m)	
				AH7	C	D		E	J	Bending strength	Surface durability
SSAY1-24/K6	m1	24	S5	6	24	26	6	M5	6.3	4.48	0.30
SSAY1-25/K6 /K8		25	S5	6 8	25	27	6	M5	6.3 7.3	4.74	0.32
SSAY1-28/K6 /K8 /K10		28	S5	6 8 10	28	30	6	M5	6.3 7.3 8.3	5.55	0.41
SSAY1-30/K6 /K8 /K10		30	S5	6 8 10	30	32	6	M5	6.3 7.3 8.3	6.08	0.47
SSAY1-32/K6 /K8 /K10		32	S5	6 8 10	32	34	6	M5	6.3 7.3 8.3	6.63	0.54
SSAY1-35/K6 /K8 /K10		35	S5	6 8 10	35	37	6	M5	6.3 7.3 8.3	7.45	0.66
SSAY1-36/K6 /K8 /K10		36	S5	6 8 10	36	38	6	M5	6.3 7.3 8.3	7.73	0.70
SSAY1-40/K6 /K8 /K10		40	S5	6 8 10	40	42	6	M5	6.3 7.3 8.3	8.84	0.87
SSAY1-45/K6 /K8 /K10		45	S5	6 8 10	45	47	6	M5	6.3 7.3 8.3	10.3	1.12
SSAY1-48/K6 /K8 /K10		48	S5	6 8 10	48	50	6	M5	6.3 7.3 8.3	11.1	1.28
SSAY1-50/K8 /K10 /K12		50	S5	8 10 12	50	52	6	M5 M5 M6	7.3 8.3 9.9	11.7	1.39
SSAY1-55/K8 /K10 /K12		55	S5	8 10 12	55	57	6	M5 M5 M6	7.3 8.3 9.9	13.1	1.70
SSAY1-56/K8 /K10 /K12		56	S5	8 10 12	56	58	6	M5 M5 M6	7.3 8.3 9.9	13.4	1.77
SSAY1-60/K8 /K10 /K12		60	S5	8 10 12	60	62	6	M5 M5 M6	7.3 8.3 9.9	14.5	2.04

[Caution on Product Characteristics]

- ① For products with a tapped hole, a set screw is included.
- ② The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ③ The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.
- ④ The reference slipping torques shown in the table are experimentally obtained by attaching the gears to shafts with g6 tolerance and 0.4a surface finish.
- ⑤ Do not tighten the clamping screw without inserting a shaft, or the bore will be permanently deformed and will not accept a shaft.

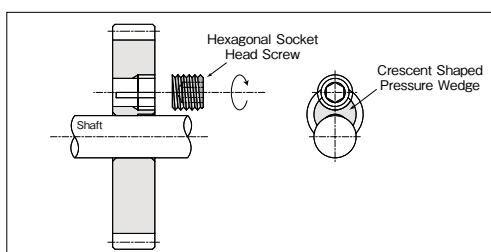


Allowable torque (kgf·m)		Reference slipping torque (N·m)		Backlash (mm)	Weight (kg)	Catalog No.
Bending strength	Surface durability	Screw fastening torque	Ref. slipping torque			
0.46	0.030	2.8	2.4	0.08~0.18	0.020	SSAY1-24/K6
0.48	0.033	2.8	2.4	0.08~0.18	0.022	SSAY1-25/K6 /K8
		2.8	3.7		0.021	
0.57	0.042	2.8	2.4	0.08~0.18	0.028	SSAY1-28/K6 /K8 /K10
		2.8	3.7		0.027	
		2.8	3.9		0.025	
0.62	0.048	2.8	2.4	0.08~0.18	0.032	SSAY1-30/K6 /K8 /K10
		2.8	3.7		0.031	
		2.8	3.9		0.030	
0.68	0.055	2.8	2.4	0.08~0.18	0.037	SSAY1-32/K6 /K8 /K10
		2.8	3.7		0.036	
		2.8	3.9		0.034	
0.76	0.067	2.8	2.4	0.08~0.18	0.044	SSAY1-35/K6 /K8 /K10
		2.8	3.7		0.043	
		2.8	3.9		0.042	
0.79	0.071	2.8	2.4	0.08~0.18	0.047	SSAY1-36/K6 /K8 /K10
		2.8	3.7		0.046	
		2.8	3.9		0.044	
0.90	0.089	2.8	2.4	0.08~0.18	0.058	SSAY1-40/K6 /K8 /K10
		2.8	3.7		0.057	
		2.8	3.9		0.055	
1.05	0.11	2.8	2.4	0.08~0.18	0.074	SSAY1-45/K6 /K8 /K10
		2.8	3.7		0.073	
		2.8	3.9		0.071	
1.13	0.13	2.8	2.4	0.08~0.18	0.084	SSAY1-48/K6 /K8 /K10
		2.8	3.7		0.083	
		2.8	3.9		0.082	
1.19	0.14	2.8	3.7	0.08~0.18	0.090	SSAY1-50/K8 /K10 /K12
		2.8	3.9		0.089	
		4	6.6		0.087	
1.34	0.17	2.8	3.7	0.08~0.18	0.11	SSAY1-55/K8 /K10 /K12
		2.8	3.9		0.11	
		4	6.6		0.11	
1.37	0.18	2.8	3.7	0.08~0.18	0.11	SSAY1-56/K8 /K10 /K12
		2.8	3.9		0.11	
		4	6.6		0.11	
1.48	0.21	2.8	3.7	0.08~0.18	0.13	SSAY1-60/K8 /K10 /K12
		2.8	3.9		0.13	
		4	6.6		0.13	

[Caution on Secondary Operations] ① As these are finished products, avoid performing secondary operations on the bore, with the exception of adding a keyway.  
② Perform secondary operations carefully as to not to distort the clamping groove.

## How does the K-Clamp work?

The K-Clamp uses a crescent shaped piece, appropriate for the size of the shaft as the pressure wedge to secure the gear on the shaft.



## Application Hints

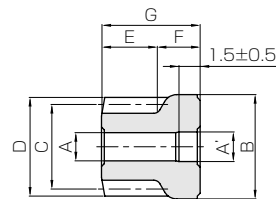
- The slipping torque is affected by the fitting and clamping surface conditions. Remove as much lubricant as possible, and use the same size shaft as the bore, within h7 tolerances.
- K-Clamp gears are suitable for relatively small gears in light loads with the bore size ranging between  $\phi 6$  and  $\phi 12$ mm. The gear will slip on the shaft when the actual load exceeds the slipping torque. The use of a key in addition to the K-Clamp is recommended for heavier loads or large bores sizes.





Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	SMF5040(Equivalent to S45C)
Heat treatment	—
Tooth hardness	70 ~ 95HRB

\* The precision grade of products with a module of less than 0.8 is equivalent to the value shown in the table.



S3

Catalog No.	Module	No. of teeth	Shape	Bore 1	Bore 2	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness
				A <sup>-0.005 -0.020</sup>	A'±0.1	B	C	D	E	F	G	H
<b>LS0.5-12</b>	<b>m0.5</b>	12	S3	2	2.1	7.4	6	7	4	3	7	—
<b>LS0.5-16</b>		16	S3	2	2.1	9.4	8	9	4	3	7	—
<b>LS0.5-20</b>		20	S3	3	3.1	11.4	10	11	4	4	8	—
<b>LS0.5-25</b>		25	S1	3	3.1	8.5	12.5	13.5	3	4	7	—
<b>LS0.5-30</b>		30	S1	3	3.1	9	15	16	3	4	7	—
<b>LS0.5-40</b>		40	S9	3	3.1	9	20	21	3	4	7	1.5
<b>LS0.5-50</b>	50	S9	4	4.1	12	25	26	3	5	8	1.5	
<b>LS0.5-60</b>	60	S9	4	4.1	12	30	31	3	5	8	1.5	
<b>LS0.5-70</b>	70	S9	4	4.1	12	35	36	3	5	8	1.5	
<b>LS0.5-80</b>	80	S9	4	4.1	12	40	41	3	5	8	1.5	
<b>LS0.8-12</b>	<b>m0.8</b>	12	S3	3	3.1	11.6	9.6	11.2	5	4	9	—
<b>LS0.8-16</b>		16	S1	3	3.1	8	12.8	14.4	4	4	8	—
<b>LS0.8-20</b>		20	S1	3	3.1	9	16	17.6	4	4	8	—
<b>LS0.8-25</b>		25	S1	3	3.1	9	20	21.6	4	4	8	—
<b>LS0.8-30</b>		30	S1	4	4.1	12	24	25.6	4	5	9	—
<b>LS0.8-40</b>		40	S9	4	4.1	12	32	33.6	4	5	9	2
<b>LS0.8-50</b>	50	S9	4	4.1	12	40	41.6	4	5	9	2	
<b>LS0.8-60</b>	60	S9	4	4.1	12	48	49.6	4	5	9	2	
<b>LS0.8-70</b>	70	S9	5	5.1	15	56	57.6	4	6	10	2	
<b>LS0.8-80</b>	80	S9	5	5.1	15	64	65.6	4	6	10	2	

[Caution on Product Characteristics]

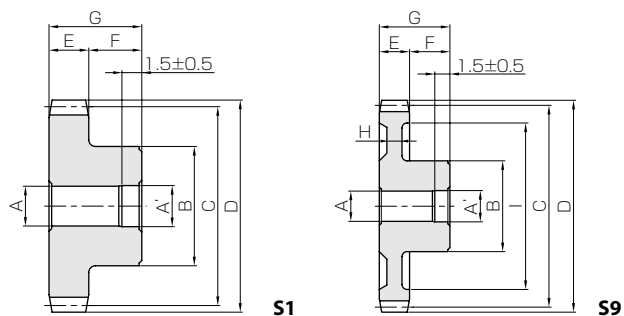
- ① Although the sintering process allows for the inclusion of oil to maintain lubricity, these gears have not been oil impregnated.
- ② The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ③ The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.
- ④ Since the bore is finished with a minus tolerance, you can use a shaft with a force fit

### ■ Characteristics of LS Sintered Steel Spur gears

1. Cost is minimized due to the elimination of machining and reduction in waste material.
2. Reliable, high precision sintered products (JIS N8 Class) maintain precision.
3. Being porous by oil-impregnated sintering, lubrication is maintained.



## Sintered Metal Spur Gears



Web O.D. l	Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (g)	Catalog No.
	Bending strength	Surface durability	Bending strength	Surface durability			
—	0.11	0.0078	0.011	0.0008	0.06~0.16	1.61	<b>LS0.5-12</b>
—	0.23	0.015	0.023	0.0015	0.06~0.16	2.84	<b>LS0.5-16</b>
—	0.32	0.023	0.032	0.0024	0.06~0.16	4.89	<b>LS0.5-20</b>
—	0.33	0.027	0.033	0.0028	0.10~0.20	4.01	<b>LS0.5-25</b>
—	0.42	0.040	0.043	0.0040	0.10~0.20	5.40	<b>LS0.5-30</b>
16.5	0.61	0.072	0.062	0.0073	0.10~0.20	6.77	<b>LS0.5-40</b>
21.5	0.81	0.11	0.082	0.012	0.12~0.24	11.5	<b>LS0.5-50</b>
26.5	1.00	0.17	0.10	0.017	0.12~0.24	14.2	<b>LS0.5-60</b>
31.5	1.20	0.23	0.12	0.024	0.12~0.24	17.3	<b>LS0.5-70</b>
36.5	1.41	0.31	0.14	0.032	0.12~0.24	20.8	<b>LS0.5-80</b>
—	0.36	0.026	0.037	0.0027	0.06~0.16	5.29	<b>LS0.8-12</b>
—	0.58	0.038	0.059	0.0039	0.06~0.16	4.84	<b>LS0.8-16</b>
—	0.81	0.060	0.083	0.0061	0.06~0.16	7.36	<b>LS0.8-20</b>
—	1.12	0.095	0.11	0.0097	0.10~0.20	10.7	<b>LS0.8-25</b>
—	1.43	0.14	0.15	0.014	0.10~0.20	16.6	<b>LS0.8-30</b>
26.4	2.09	0.26	0.21	0.026	0.10~0.20	20.6	<b>LS0.8-40</b>
34.4	2.75	0.41	0.28	0.042	0.12~0.24	28.3	<b>LS0.8-50</b>
42.4	3.43	0.60	0.35	0.062	0.12~0.24	37.4	<b>LS0.8-60</b>
50.4	4.11	0.84	0.42	0.085	0.12~0.24	52.0	<b>LS0.8-70</b>
58.4	4.80	1.11	0.49	0.11	0.12~0.24	64.1	<b>LS0.8-80</b>

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.
- ③ The rust prevention process involves treating the gears with steam (in effect, creating surface oxidation). A black oxide treatment cannot be done on these gears.

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks &amp; Pinions

Miter Gears

Bevel Gears

Screw Gears

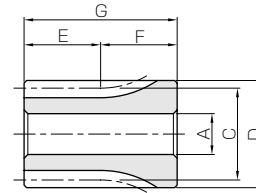
Worm Gear Pair

Bevel Gearboxes

Other Products



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	SUS303
Heat treatment	—
Tooth hardness	less than 187HB



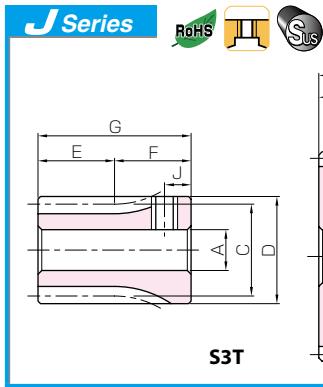
\* The precision grade of J Series products is equivalent to the value shown in the table.

S3

Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	Width×Depth
<b>SUS1-15</b> ● <b>SUS1-15J8</b>	m1	15	S3 S3T	8 8	17	15	17	10	20	30	— —
<b>SUS1-16</b> ● <b>SUS1-16J8</b>		16	S3 S3T	8 8	18	16	18	10	20	30	— —
<b>SUS1-18</b> ● <b>SUS1-18J8</b>		18	S3 S3T	8 8	20	18	20	10	20	30	— —
<b>SUS1-20</b> ● <b>SUS1-20J8</b>		20	S1 S1T	8 8	16	20	22	10	10	20	— —
<b>SUS1-22</b> ● <b>SUS1-22J8</b>		22	S1 S1T	8 8	18	22	24	10	10	20	— —
<b>SUS1-24</b> ● <b>SUS1-24J8</b>		24	S1 S1T	8 8	20	24	26	10	10	20	— —
<b>SUS1-25</b> ● <b>SUS1-25J8</b>		25	S1 S1T	8 8	20	25	27	10	10	20	— —
<b>SUS1-28</b> ● <b>SUS1-28J8</b> ● <b>SUS1-28J10</b> ● <b>SUS1-28J12</b>		28	S1 S1T S1K S1K	8 8 10 12	23	28	30	10	10	20	— — 4 x 1.8 4 x 1.8
<b>SUS1-30</b> ● <b>SUS1-30J8</b> ● <b>SUS1-30J10</b> ● <b>SUS1-30J12</b>		30	S1 S1T S1K S1K	8 8 10 12	25	30	32	10	10	20	— — 4 x 1.8 4 x 1.8
<b>SUS1-32</b> ● <b>SUS1-32J8</b> ● <b>SUS1-32J10</b> ● <b>SUS1-32J12</b> ● <b>SUS1-32J14</b>		32	S1 S1T S1K S1K S1K	8 8 10 12 14	26	32	34	10	10	20	— — 4 x 1.8 4 x 1.8 5 x 2.3
<b>SUS1-35</b> ● <b>SUS1-35J8</b> ● <b>SUS1-35J10</b> ● <b>SUS1-35J12</b> ● <b>SUS1-35J14</b>		35	S1 S1T S1K S1K S1K	8 8 10 12 14	26	35	37	10	10	20	— — 4 x 1.8 4 x 1.8 5 x 2.3
<b>SUS1-36</b> ● <b>SUS1-36J8</b> ● <b>SUS1-36J10</b> ● <b>SUS1-36J12</b> ● <b>SUS1-36J14</b> ● <b>SUS1-36J15</b> ● <b>SUS1-36J16</b>		36	S1 S1T S1K S1K S1K S1K S1K	8 8 10 12 14 15 16	28	36	38	10	10	20	— — 4 x 1.8 4 x 1.8 5 x 2.3 5 x 2.3 5 x 2.3
<b>SUS1-40</b> ● <b>SUS1-40J10</b> ● <b>SUS1-40J12</b> ● <b>SUS1-40J14</b> ● <b>SUS1-40J15</b> ● <b>SUS1-40J16</b> ● <b>SUS1-40J18</b> ● <b>SUS1-40J19</b> ● <b>SUS1-40J20</b>		40	S1 S1K S1K S1K S1K S1K S1K S1K S1K	10 10 12 14 15 16 18 19 20	35	40	42	10	10	20	— 4 x 1.8 4 x 1.8 5 x 2.3 5 x 2.3 5 x 2.3 6 x 2.8 6 x 2.8 6 x 2.8
<b>SUS1-42</b> ● <b>SUS1-42J10</b> ● <b>SUS1-42J12</b> ● <b>SUS1-42J14</b> ● <b>SUS1-42J15</b> ● <b>SUS1-42J16</b> ● <b>SUS1-42J18</b> ● <b>SUS1-42J19</b> ● <b>SUS1-42J20</b>		42	S1 S1K S1K S1K S1K S1K S1K S1K S1K	10 10 12 14 15 16 18 19 20	35	42	44	10	10	20	— 4 x 1.8 4 x 1.8 5 x 2.3 5 x 2.3 5 x 2.3 6 x 2.8 6 x 2.8 6 x 2.8

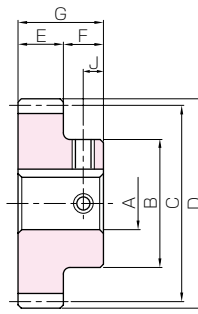
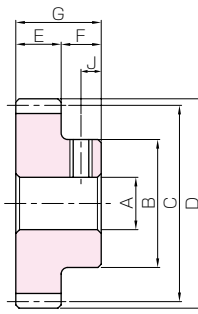
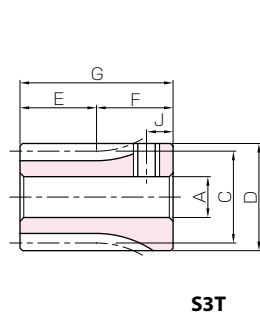
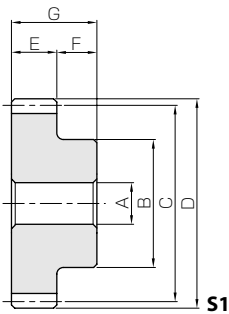
[Caution on Product Characteristics] ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.  
② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.  
② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.



Stainless Steel Spur Gears

Newly added



Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—	2.04	0.12	0.21	0.013	0.08~0.18	0.037 0.037	<b>SUS1-15</b> ● <b>SUS1-15J8</b>
M5	5	2.26	0.14	0.23	0.015	0.08~0.18	0.044 0.043	<b>SUS1-16</b> ● <b>SUS1-16J8</b>
—	—	2.71	0.18	0.28	0.019	0.08~0.18	0.057 0.056	<b>SUS1-18</b> ● <b>SUS1-18J8</b>
M5	5	3.18	0.23	0.32	0.024	0.08~0.18	0.032 0.032	<b>SUS1-20</b> ● <b>SUS1-20J8</b>
—	—	3.65	0.29	0.37	0.029	0.08~0.18	0.042 0.041	<b>SUS1-22</b> ● <b>SUS1-22J8</b>
M5	5	4.13	0.35	0.42	0.036	0.08~0.18	0.052 0.051	<b>SUS1-24</b> ● <b>SUS1-24J8</b>
—	—	4.37	0.38	0.45	0.039	0.08~0.18	0.055 0.054	<b>SUS1-25</b> ● <b>SUS1-25J8</b>
—	—	5.11	0.48	0.52	0.049	0.08~0.18	0.073 0.071 0.066 0.061	<b>SUS1-28</b> ● <b>SUS1-28J8</b> ● <b>SUS1-28J10</b> ● <b>SUS1-28J12</b>
—	—	5.6	0.56	0.57	0.057	0.08~0.18	0.086 0.084 0.079 0.073	<b>SUS1-30</b> ● <b>SUS1-30J8</b> ● <b>SUS1-30J10</b> ● <b>SUS1-30J12</b>
—	—	6.11	0.64	0.62	0.066	0.08~0.18	0.096 0.095 0.089 0.084 0.077	<b>SUS1-32</b> ● <b>SUS1-32J8</b> ● <b>SUS1-32J10</b> ● <b>SUS1-32J12</b> ● <b>SUS1-32J14</b>
—	—	6.87	0.78	0.70	0.079	0.08~0.18	0.11 0.11 0.10 0.096 0.089	<b>SUS1-35</b> ● <b>SUS1-35J8</b> ● <b>SUS1-35J10</b> ● <b>SUS1-35J12</b> ● <b>SUS1-35J14</b>
—	—	7.12	0.82	0.73	0.084	0.08~0.18	0.12 0.12 0.11 0.11 0.10 0.097 0.093	<b>SUS1-36</b> ● <b>SUS1-36J8</b> ● <b>SUS1-36J10</b> ● <b>SUS1-36J12</b> ● <b>SUS1-36J14</b> ● <b>SUS1-36J15</b> ● <b>SUS1-36J16</b>
—	—	8.15	1.03	0.83	0.11	0.08~0.18	0.16 0.16 0.15 0.15 0.14 0.14 0.14 0.13 0.12 0.12	<b>SUS1-40</b> ● <b>SUS1-40J10</b> ● <b>SUS1-40J12</b> ● <b>SUS1-40J14</b> ● <b>SUS1-40J15</b> ● <b>SUS1-40J16</b> ● <b>SUS1-40J18</b> ● <b>SUS1-40J19</b> ● <b>SUS1-40J20</b>
—	—	8.66	1.14	0.88	0.12	0.08~0.18	0.17 0.17 0.16 0.16 0.16 0.15 0.15 0.15 0.14 0.13 0.13	<b>SUS1-42</b> ● <b>SUS1-42J10</b> ● <b>SUS1-42J12</b> ● <b>SUS1-42J14</b> ● <b>SUS1-42J15</b> ● <b>SUS1-42J16</b> ● <b>SUS1-42J18</b> ● <b>SUS1-42J19</b> ● <b>SUS1-42J20</b>

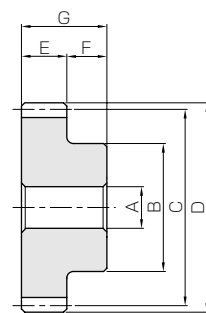
- [Caution on J series]
- ① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
  - ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
  - ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
  - ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).
  - ⑤ For products having a tapped hole, a set screw is included.

Spur Gears  
Helical Gears  
Internal Gears  
Racks  
CP Racks & Pinions  
Miter Gears  
Bevel Gears  
Screw Gears  
Worm Gear Pair  
Bevel Gearboxes  
Other Products



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	SUS303
Heat treatment	—
Tooth hardness	less than 187HB

\* The precision grade of J Series products is equivalent to the value shown in the table.



S1

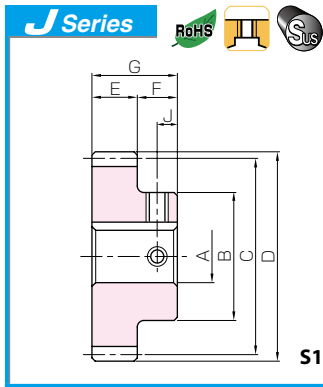
Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	Width×Depth
<b>SUS1-45</b> ● SUS1-45J10 ● SUS1-45J12 ● SUS1-45J14 ● SUS1-45J15 ● SUS1-45J16 ● SUS1-45J18 ● SUS1-45J19 ● SUS1-45J20	m1	45	S1	10	35	45	47	10	10	20	—
			S1K	10							4 × 1.8
			S1K	12							4 × 1.8
			S1K	14							5 × 2.3
			S1K	15							5 × 2.3
			S1K	16							5 × 2.3
			S1K	18							6 × 2.8
			S1K	19							6 × 2.8
			S1K	20							6 × 2.8
			<b>SUS1-48</b> ● SUS1-48J10 ● SUS1-48J12 ● SUS1-48J14 ● SUS1-48J15 ● SUS1-48J16 ● SUS1-48J18 ● SUS1-48J19 ● SUS1-48J20	m1							48
S1K	10	4 × 1.8									
S1K	12	4 × 1.8									
S1K	14	5 × 2.3									
S1K	15	5 × 2.3									
S1K	16	5 × 2.3									
S1K	18	6 × 2.8									
S1K	19	6 × 2.8									
S1K	20	6 × 2.8									
<b>SUS1-50</b> ● SUS1-50J10 ● SUS1-50J12 ● SUS1-50J14 ● SUS1-50J15 ● SUS1-50J16 ● SUS1-50J18 ● SUS1-50J19 ● SUS1-50J20	m1	50			S1	10	35	50	52	10	
			S1K	10	4 × 1.8						
			S1K	12	4 × 1.8						
			S1K	14	5 × 2.3						
			S1K	15	5 × 2.3						
			S1K	16	5 × 2.3						
			S1K	18	6 × 2.8						
			S1K	19	6 × 2.8						
			S1K	20	6 × 2.8						
			<b>SUS1-55</b> ● SUS1-55J10 ● SUS1-55J12 ● SUS1-55J14 ● SUS1-55J15 ● SUS1-55J16 ● SUS1-55J18 ● SUS1-55J19 ● SUS1-55J20 ● SUS1-55J22	m1	55	S1					10
S1K	10	4 × 1.8									
S1K	12	4 × 1.8									
S1K	14	5 × 2.3									
S1K	15	5 × 2.3									
S1K	16	5 × 2.3									
S1K	18	6 × 2.8									
S1K	19	6 × 2.8									
S1K	20	6 × 2.8									
S1K	22	6 × 2.8									
<b>SUS1-56</b> ● SUS1-56J10 ● SUS1-56J12 ● SUS1-56J14 ● SUS1-56J15 ● SUS1-56J16 ● SUS1-56J18 ● SUS1-56J19 ● SUS1-56J20 ● SUS1-56J22	m1	56	S1	10	40	56	58	10	10	20	—
			S1K	10							4 × 1.8
			S1K	12							4 × 1.8
			S1K	14							5 × 2.3
			S1K	15							5 × 2.3
			S1K	16							5 × 2.3
			S1K	18							6 × 2.8
			S1K	19							6 × 2.8
			S1K	20							6 × 2.8
			S1K	22							6 × 2.8
<b>SUS1-60</b> ● SUS1-60J10 ● SUS1-60J12 ● SUS1-60J14 ● SUS1-60J15 ● SUS1-60J16 ● SUS1-60J18 ● SUS1-60J19 ● SUS1-60J20 ● SUS1-60J22	m1	60	S1	10	40	60	62	10	10	20	—
			S1K	10							4 × 1.8
			S1K	12							4 × 1.8
			S1K	14							5 × 2.3
			S1K	15							5 × 2.3
			S1K	16							5 × 2.3
			S1K	18							6 × 2.8
			S1K	19							6 × 2.8
			S1K	20							6 × 2.8
			S1K	22							6 × 2.8

[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations]

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- ② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.



Stainless Steel Spur Gears

Newly added



Spur Gears

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Internal Gears

Racks

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Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

Bevel Gearboxes

Other Products

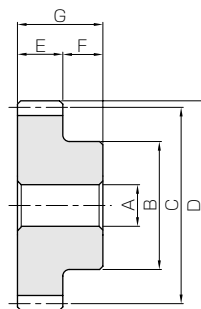
Set Screw		Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—	9.44	1.32	0.96	0.13	0.08~0.18	0.19 0.18 0.18 0.17 0.17 0.16 0.15 0.15 0.15	<b>SUS1-45</b>
M4	5							●SUS1-45J10
M4	5							●SUS1-45J12
M4	5							●SUS1-45J14
M4	5							●SUS1-45J15
M4	5							●SUS1-45J16
M5	5							●SUS1-45J18
M5	5							●SUS1-45J19
M5	5	●SUS1-45J20						
—	—	10.2	1.51	1.04	0.15	0.08~0.18	0.20 0.20 0.20 0.19 0.18 0.18 0.17 0.17 0.16	<b>SUS1-48</b>
M4	5							●SUS1-48J10
M4	5							●SUS1-48J12
M4	5							●SUS1-48J14
M4	5							●SUS1-48J15
M4	5							●SUS1-48J16
M5	5							●SUS1-48J18
M5	5							●SUS1-48J19
M5	5	●SUS1-48J20						
—	—	10.8	1.65	1.10	0.17	0.08~0.18	0.22 0.21 0.21 0.20 0.20 0.20 0.19 0.18 0.18 0.17	<b>SUS1-50</b>
M4	5							●SUS1-50J10
M4	5							●SUS1-50J12
M4	5							●SUS1-50J14
M4	5							●SUS1-50J15
M4	5							●SUS1-50J16
M5	5							●SUS1-50J18
M5	5							●SUS1-50J19
M5	5	●SUS1-50J20						
—	—	12.1	2.01	1.23	0.21	0.08~0.18	0.27 0.27 0.26 0.25 0.25 0.25 0.25 0.24 0.23 0.23 0.22	<b>SUS1-55</b>
M4*	5							●SUS1-55J10
M4	5							●SUS1-55J12
M4	5							●SUS1-55J14
M4	5							●SUS1-55J15
M4	5							●SUS1-55J16
M5	5							●SUS1-55J18
M5	5							●SUS1-55J19
M5	5	●SUS1-55J20						
M5	5	●SUS1-55J22						
—	—	12.3	2.09	1.26	0.21	0.08~0.18	0.28 0.27 0.27 0.26 0.26 0.26 0.25 0.25 0.24 0.24 0.24 0.23	<b>SUS1-56</b>
M4*	5							●SUS1-56J10
M4	5							●SUS1-56J12
M4	5							●SUS1-56J14
M4	5							●SUS1-56J15
M4	5							●SUS1-56J16
M5	5							●SUS1-56J18
M5	5							●SUS1-56J19
M5	5	●SUS1-56J20						
M5	5	●SUS1-56J22						
—	—	13.4	2.42	1.37	0.25	0.08~0.18	0.31 0.30 0.30 0.29 0.29 0.29 0.28 0.27 0.27 0.26 0.25	<b>SUS1-60</b>
M4*	5							●SUS1-60J10
M4	5							●SUS1-60J12
M4	5							●SUS1-60J14
M4	5							●SUS1-60J15
M4	5							●SUS1-60J16
M5	5							●SUS1-60J18
M5	5							●SUS1-60J19
M5	5	●SUS1-60J20						
M5	5	●SUS1-60J22						

- [Caution on J series]
- ① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
  - ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
  - ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
  - ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).
  - ⑤ For products having a tapped hole, a set screw is included.



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	SUS303
Heat treatment	—
Tooth hardness	less than 187HB

\* The precision grade of J Series products is equivalent to the value shown in the table.



S1

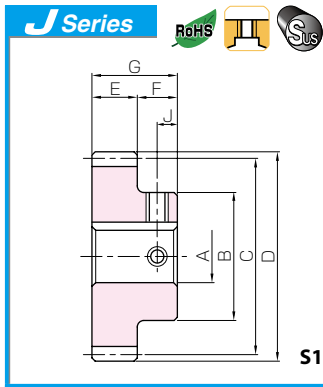
Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway									
				A <sub>H7</sub>	B	C	D	E	F	G	WidthxDepth									
<b>SUS1-64</b> ● SUS1-64J10 ● SUS1-64J12 ● SUS1-64J14 ● SUS1-64J15 ● SUS1-64J16 ● SUS1-64J18 ● SUS1-64J19 ● SUS1-64J20 ● SUS1-64J22 ● SUS1-64J25	m1	64	S1	10	45	64	66	10	10	20	—									
			S1K	10							4 x 1.8									
			S1K	12							4 x 1.8									
			S1K	14							5 x 2.3									
			S1K	15							5 x 2.3									
			S1K	16							5 x 2.3									
			S1K	18							6 x 2.8									
			S1K	19							6 x 2.8									
			S1K	20							6 x 2.8									
			S1K	22							6 x 2.8									
			S1K	25							8 x 3.3									
			<b>SUS1-70</b> ● SUS1-70J10 ● SUS1-70J12 ● SUS1-70J14 ● SUS1-70J15 ● SUS1-70J16 ● SUS1-70J18 ● SUS1-70J19 ● SUS1-70J20 ● SUS1-70J22 ● SUS1-70J25 ● SUS1-70J28 ● SUS1-70J30	m1							70	S1	10	50	70	72	10	10	20	—
												S1K	10							4 x 1.8
S1K	12	4 x 1.8																		
S1K	14	5 x 2.3																		
S1K	15	5 x 2.3																		
S1K	16	5 x 2.3																		
S1K	18	6 x 2.8																		
S1K	19	6 x 2.8																		
S1K	20	6 x 2.8																		
S1K	22	6 x 2.8																		
S1K	25	8 x 3.3																		
S1K	28	8 x 3.3																		
S1K	30	8 x 3.3																		
<b>SUS1-75</b> ● SUS1-75J10 ● SUS1-75J12 ● SUS1-75J14 ● SUS1-75J15 ● SUS1-75J16 ● SUS1-75J18 ● SUS1-75J19 ● SUS1-75J20 ● SUS1-75J22 ● SUS1-75J25 ● SUS1-75J28 ● SUS1-75J30 ● SUS1-75J32	m1	75	S1	10	55	75	77	10	10	20	—									
			S1K	10							4 x 1.8									
			S1K	12							4 x 1.8									
			S1K	14							5 x 2.3									
			S1K	15							5 x 2.3									
			S1K	16							5 x 2.3									
			S1K	18							6 x 2.8									
			S1K	19							6 x 2.8									
			S1K	20							6 x 2.8									
			S1K	22							6 x 2.8									
			S1K	25							8 x 3.3									
			S1K	28							8 x 3.3									
			S1K	30							8 x 3.3									
S1K	32	10 x 3.3																		
<b>SUS1-80</b> ● SUS1-80J10 ● SUS1-80J12 ● SUS1-80J14 ● SUS1-80J15 ● SUS1-80J16 ● SUS1-80J18 ● SUS1-80J19 ● SUS1-80J20 ● SUS1-80J22 ● SUS1-80J25 ● SUS1-80J28 ● SUS1-80J30 ● SUS1-80J32 ● SUS1-80J35	m1	80	S1	10	60	80	82	10	10	20	—									
			S1K	10							4 x 1.8									
			S1K	12							4 x 1.8									
			S1K	14							5 x 2.3									
			S1K	15							5 x 2.3									
			S1K	16							5 x 2.3									
			S1K	18							6 x 2.8									
			S1K	19							6 x 2.8									
			S1K	20							6 x 2.8									
			S1K	22							6 x 2.8									
			S1K	25							8 x 3.3									
			S1K	28							8 x 3.3									
			S1K	30							8 x 3.3									
S1K	32	10 x 3.3																		
S1K	35	10 x 3.3																		

[Caution on Product Characteristics]

- The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations]

- Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.



**Stainless Steel Spur Gears**

**Newly added**



Set Screw		Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—	14.5	2.77	1.47	0.28	0.08~0.18	0.36	<b>SUS1-64</b>
M4*	5							● <b>SUS1-64J10</b>
M4*	5							● <b>SUS1-64J12</b>
M4*	5							● <b>SUS1-64J14</b>
M4*	5							● <b>SUS1-64J15</b>
M4*	5							● <b>SUS1-64J16</b>
M5	5							● <b>SUS1-64J18</b>
M5	5							● <b>SUS1-64J19</b>
M5	5							● <b>SUS1-64J20</b>
M5	5							● <b>SUS1-64J22</b>
M6	5							● <b>SUS1-64J25</b>
—	—							16.1
M4*	5	● <b>SUS1-70J10</b>						
M4*	5	● <b>SUS1-70J12</b>						
M4*	5	● <b>SUS1-70J14</b>						
M4*	5	● <b>SUS1-70J15</b>						
M4*	5	● <b>SUS1-70J16</b>						
M5	5	● <b>SUS1-70J18</b>						
M5	5	● <b>SUS1-70J19</b>						
M5	5	● <b>SUS1-70J20</b>						
M5	5	● <b>SUS1-70J22</b>						
M6	5	● <b>SUS1-70J25</b>						
M6	5	● <b>SUS1-70J28</b>						
M6	5	● <b>SUS1-70J30</b>						
—	—	17.4	3.86	1.77	0.39	0.08~0.18	0.52	<b>SUS1-75</b>
M4*	5							● <b>SUS1-75J10</b>
M4*	5							● <b>SUS1-75J12</b>
M4*	5							● <b>SUS1-75J14</b>
M4*	5							● <b>SUS1-75J15</b>
M4*	5							● <b>SUS1-75J16</b>
M5*	5							● <b>SUS1-75J18</b>
M5*	5							● <b>SUS1-75J19</b>
M5*	5							● <b>SUS1-75J20</b>
M5	5							● <b>SUS1-75J22</b>
M6	5							● <b>SUS1-75J25</b>
M6	5							● <b>SUS1-75J28</b>
M6	5	● <b>SUS1-75J30</b>						
M8	5	● <b>SUS1-75J32</b>						
—	—	18.7	4.42	1.91	0.45	0.08~0.18	0.60	<b>SUS1-80</b>
M4*	5							● <b>SUS1-80J10</b>
M4*	5							● <b>SUS1-80J12</b>
M4*	5							● <b>SUS1-80J14</b>
M4*	5							● <b>SUS1-80J15</b>
M4*	5							● <b>SUS1-80J16</b>
M5*	5							● <b>SUS1-80J18</b>
M5*	5							● <b>SUS1-80J19</b>
M5*	5							● <b>SUS1-80J20</b>
M5*	5							● <b>SUS1-80J22</b>
M6	5							● <b>SUS1-80J25</b>
M6	5							● <b>SUS1-80J28</b>
M6	5	● <b>SUS1-80J30</b>						
M8	5	● <b>SUS1-80J32</b>						
M8	5	● <b>SUS1-80J35</b>						

**[Caution on J series]** ① As available-on-request products, requires a lead-time for shipping within **3 working-days (excludes the day ordered)**, after placing an order. Please allow additional shipping time to get to your local distributor.

② Number of products we can process for one order is **1 to 20 units**. For quantities of 21 or more pieces, we need to quote price and lead time.

③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.

④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).

⑤ For products having a tapped hole, a set screw is included.

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

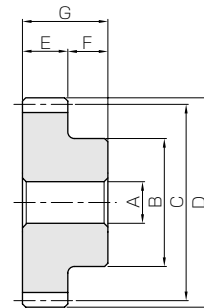
Bevel Gearboxes

Other Products



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	SUS303
Heat treatment	—
Tooth hardness	less than 187HB

\* The precision grade of J Series products is equivalent to the value shown in the table.



S1

Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	Width×Depth
<b>SUS1-90</b> ● SUS1-90J10 ● SUS1-90J12 ● SUS1-90J14 ● SUS1-90J15 ● SUS1-90J16 ● SUS1-90J18 ● SUS1-90J19 ● SUS1-90J20 ● SUS1-90J22 ● SUS1-90J25 ● SUS1-90J28 ● SUS1-90J30 ● SUS1-90J32 ● SUS1-90J35	m1	90	S1	10	60	90	92	10	10	20	—
S1K			10	4 × 1.8							
S1K			12	4 × 1.8							
S1K	14		5 × 2.3								
S1K	15		5 × 2.3								
S1K	16		5 × 2.3								
S1K	18		6 × 2.8								
S1K	19		6 × 2.8								
S1K	20		6 × 2.8								
S1K	22		6 × 2.8								
S1K	25		8 × 3.3								
S1K	28		8 × 3.3								
S1K	30		8 × 3.3								
S1K	32		10 × 3.3								
S1K	35		10 × 3.3								
<b>SUS1-100</b> ● SUS1-100J12 ● SUS1-100J14 ● SUS1-100J15 ● SUS1-100J16 ● SUS1-100J18 ● SUS1-100J19 ● SUS1-100J20 ● SUS1-100J22 ● SUS1-100J25 ● SUS1-100J28 ● SUS1-100J30 ● SUS1-100J32 ● SUS1-100J35	m1	100	S1	12	60	100	102	10	10	20	—
S1K			12	4 × 1.8							
S1K			14	5 × 2.3							
S1K	15		5 × 2.3								
S1K	16		5 × 2.3								
S1K	18		6 × 2.8								
S1K	19		6 × 2.8								
S1K	20		6 × 2.8								
S1K	22		6 × 2.8								
S1K	25		8 × 3.3								
S1K	28		8 × 3.3								
S1K	30		8 × 3.3								
S1K	32		10 × 3.3								
S1K	35		10 × 3.3								
<b>SUS1-120</b> ● SUS1-120J12 ● SUS1-120J14 ● SUS1-120J15 ● SUS1-120J16 ● SUS1-120J18 ● SUS1-120J19 ● SUS1-120J20 ● SUS1-120J22 ● SUS1-120J25 ● SUS1-120J28 ● SUS1-120J30 ● SUS1-120J32 ● SUS1-120J35	m1		120	S1							12
S1K		12		4 × 1.8							
S1K		14		5 × 2.3							
S1K	15	5 × 2.3									
S1K	16	5 × 2.3									
S1K	18	6 × 2.8									
S1K	19	6 × 2.8									
S1K	20	6 × 2.8									
S1K	22	6 × 2.8									
S1K	25	8 × 3.3									
S1K	28	8 × 3.3									
S1K	30	8 × 3.3									
S1K	32	10 × 3.3									
S1K	35	10 × 3.3									

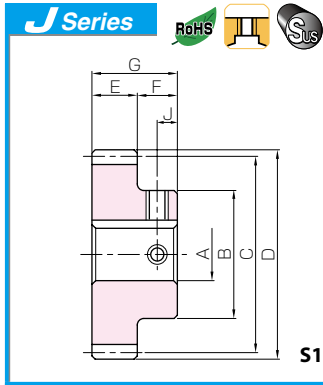
[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

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Stainless Steel Spur Gears

Newly added



Set Screw		Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)						
Size	J	Bending strength	Surface durability	Bending strength	Surface durability									
—	—	21.4	5.67	2.19	0.58	0.08~0.18	0.70	<b>SUS1-90</b>						
M4*	5							●SUS1-90J10						
M4*	5							●SUS1-90J12						
M4*	5							●SUS1-90J14						
M4*	5							●SUS1-90J15						
M4*	5							●SUS1-90J16						
M5*	5							●SUS1-90J18						
M5*	5							●SUS1-90J19						
M5*	5							●SUS1-90J20						
M5*	5							●SUS1-90J22						
M6	5							●SUS1-90J25						
M6	5							●SUS1-90J28						
M6	5							●SUS1-90J30						
M8	5							●SUS1-90J32						
M8	5							●SUS1-90J35						
—	—							24.1	7.08	2.46	0.72	0.08~0.18	0.82	<b>SUS1-100</b>
M4*	5													●SUS1-100J12
M4*	5													●SUS1-100J14
M4*	5	●SUS1-100J15												
M4*	5	●SUS1-100J16												
M5*	5	●SUS1-100J18												
M5*	5	●SUS1-100J19												
M5*	5	●SUS1-100J20												
M5*	5	●SUS1-100J22												
M6	5	●SUS1-100J25												
M6	5	●SUS1-100J28												
M6	5	●SUS1-100J30												
M8	5	●SUS1-100J32												
M8	5	●SUS1-100J35												
—	—	29.6	10.4	3.01	1.06	0.08~0.18	1.09							<b>SUS1-120</b>
M4*	5													●SUS1-120J12
M4*	5													●SUS1-120J14
M4*	5													●SUS1-120J15
M4*	5							●SUS1-120J16						
M5*	5							●SUS1-120J18						
M5*	5							●SUS1-120J19						
M5*	5							●SUS1-120J20						
M5*	5							●SUS1-120J22						
M6	5							●SUS1-120J25						
M6	5							●SUS1-120J28						
M6	5							●SUS1-120J30						
M8	5							●SUS1-120J32						
M8	5							●SUS1-120J35						

[Caution on J series]

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Spur Gears

Helical Gears

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Racks

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Worm Gear Pair

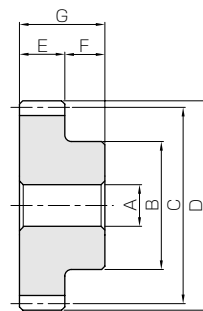
Bevel Gearboxes

Other Products



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	SUS303
Heat treatment	—
Tooth hardness	less than 187HB

\* The precision grade of J Series products is equivalent to the value shown in the table.



S1

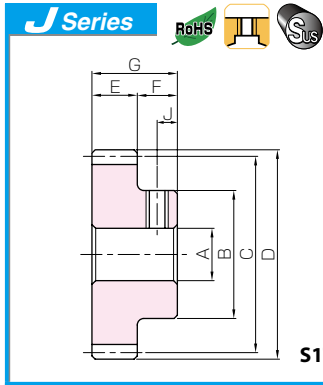
Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	WidthxDepth
<b>SUS1.5-15</b> ● <b>SUS1.5-15J8</b>	m1.5	15	S1 S1T	8 8	18	22.5	25.5	15	14	29	— —
<b>SUS1.5-16</b> ● <b>SUS1.5-16J8</b>		16	S1 S1T	8 8	20	24	27	15	14	29	— —
<b>SUS1.5-18</b> ● <b>SUS1.5-18J8</b> ● <b>SUS1.5-18J10</b>		18	S1 S1T S1K	8 8 10	22	27	30	15	14	29	— — 4 x 1.8
<b>SUS1.5-20</b> ● <b>SUS1.5-20J8</b> ● <b>SUS1.5-20J10</b> ● <b>SUS1.5-20J12</b>		20	S1 S1T S1K S1K	8 8 10 12	24	30	33	15	14	29	— — 4 x 1.8 4 x 1.8
<b>SUS1.5-22</b> ● <b>SUS1.5-22J8</b> ● <b>SUS1.5-22J10</b> ● <b>SUS1.5-22J12</b> ● <b>SUS1.5-22J14</b>		22	S1 S1T S1K S1K S1K	8 8 10 12 14	26	33	36	15	14	29	— — 4 x 1.8 4 x 1.8 5 x 2.3
<b>SUS1.5-24</b> ● <b>SUS1.5-24J8</b> ● <b>SUS1.5-24J10</b> ● <b>SUS1.5-24J12</b> ● <b>SUS1.5-24J14</b> ● <b>SUS1.5-24J15</b> ● <b>SUS1.5-24J16</b>		24	S1 S1T S1K S1K S1K S1K S1K	8 8 10 12 14 15 16	28	36	39	15	14	29	— — 4 x 1.8 4 x 1.8 5 x 2.3 5 x 2.3 5 x 2.3
<b>SUS1.5-25</b> ● <b>SUS1.5-25J8</b> ● <b>SUS1.5-25J10</b> ● <b>SUS1.5-25J12</b> ● <b>SUS1.5-25J14</b> ● <b>SUS1.5-25J15</b> ● <b>SUS1.5-25J16</b>		25	S1 S1T S1K S1K S1K S1K S1K	8 8 10 12 14 15 16	30	37.5	40.5	15	14	29	— — 4 x 1.8 4 x 1.8 5 x 2.3 5 x 2.3 5 x 2.3
<b>SUS1.5-28</b> ● <b>SUS1.5-28J10</b> ● <b>SUS1.5-28J12</b> ● <b>SUS1.5-28J14</b> ● <b>SUS1.5-28J15</b> ● <b>SUS1.5-28J16</b> ● <b>SUS1.5-28J18</b> ● <b>SUS1.5-28J19</b> ● <b>SUS1.5-28J20</b>		28	S1 S1K S1K S1K S1K S1K S1K S1K S1K	10 10 12 14 15 16 18 19 20	36	42	45	15	14	29	— 4 x 1.8 4 x 1.8 5 x 2.3 5 x 2.3 5 x 2.3 6 x 2.8 6 x 2.8 6 x 2.8
<b>SUS1.5-30</b> ● <b>SUS1.5-30J10</b> ● <b>SUS1.5-30J12</b> ● <b>SUS1.5-30J14</b> ● <b>SUS1.5-30J15</b> ● <b>SUS1.5-30J16</b> ● <b>SUS1.5-30J18</b> ● <b>SUS1.5-30J19</b> ● <b>SUS1.5-30J20</b> ● <b>SUS1.5-30J22</b>		30	S1 S1K S1K S1K S1K S1K S1K S1K S1K S1K	10 10 12 14 15 16 18 19 20 22	38	45	48	15	14	29	— 4 x 1.8 4 x 1.8 5 x 2.3 5 x 2.3 5 x 2.3 6 x 2.8 6 x 2.8 6 x 2.8 6 x 2.8
<b>SUS1.5-32</b> ● <b>SUS1.5-32J10</b> ● <b>SUS1.5-32J12</b> ● <b>SUS1.5-32J14</b> ● <b>SUS1.5-32J15</b> ● <b>SUS1.5-32J16</b> ● <b>SUS1.5-32J18</b> ● <b>SUS1.5-32J19</b> ● <b>SUS1.5-32J20</b> ● <b>SUS1.5-32J22</b>		32	S1 S1K S1K S1K S1K S1K S1K S1K S1K S1K	10 10 12 14 15 16 18 19 20 22	40	48	51	15	14	29	— 4 x 1.8 4 x 1.8 5 x 2.3 5 x 2.3 5 x 2.3 6 x 2.8 6 x 2.8 6 x 2.8 6 x 2.8 6 x 2.8

[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.



Stainless Steel Spur Gears

Newly added



Set Screw		Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
— M5	— 7	6.89	0.43	0.70	0.044	0.10~0.22	0.063 0.062	<b>SUS1.5-15</b> ● <b>SUS1.5-15J8</b>
— M5	— 7	7.63	0.50	0.78	0.051	0.10~0.22	0.076 0.075	<b>SUS1.5-16</b> ● <b>SUS1.5-16J8</b>
— M5 M4	— 7 7	9.16	0.65	0.93	0.066	0.10~0.22	0.097 0.096 0.088	<b>SUS1.5-18</b> ● <b>SUS1.5-18J8</b> ● <b>SUS1.5-18J10</b>
— M5 M4 M4	— 7 7 7	10.7	0.82	1.09	0.084	0.10~0.22	0.12 0.12 0.11 0.10	<b>SUS1.5-20</b> ● <b>SUS1.5-20J8</b> ● <b>SUS1.5-20J10</b> ● <b>SUS1.5-20J12</b>
— M5 M4 M4 M4	— 7 7 7 7	12.3	1.01	1.26	0.10	0.12~0.26	0.15 0.15 0.14 0.13 0.12	<b>SUS1.5-22</b> ● <b>SUS1.5-22J8</b> ● <b>SUS1.5-22J10</b> ● <b>SUS1.5-22J12</b> ● <b>SUS1.5-22J14</b>
— M5 M4 M4 M4 M4 M4	— 7 7 7 7 7 7	13.9	1.23	1.42	0.13	0.12~0.26	0.17 0.17 0.17 0.16 0.15 0.14 0.14	<b>SUS1.5-24</b> ● <b>SUS1.5-24J8</b> ● <b>SUS1.5-24J10</b> ● <b>SUS1.5-24J12</b> ● <b>SUS1.5-24J14</b> ● <b>SUS1.5-24J15</b> ● <b>SUS1.5-24J16</b>
— M5 M4 M4 M4 M4 M4	— 7 7 7 7 7 7	14.8	1.35	1.50	0.14	0.12~0.26	0.20 0.19 0.19 0.18 0.17 0.16 0.16	<b>SUS1.5-25</b> ● <b>SUS1.5-25J8</b> ● <b>SUS1.5-25J10</b> ● <b>SUS1.5-25J12</b> ● <b>SUS1.5-25J14</b> ● <b>SUS1.5-25J15</b> ● <b>SUS1.5-25J16</b>
— M4 M4 M4 M4 M4 M4 M5 M5 M5	— 7 7 7 7 7 7 7 7 7	17.2	1.71	1.76	0.17	0.12~0.26	0.26 0.25 0.24 0.23 0.23 0.23 0.22 0.21 0.20 0.20	<b>SUS1.5-28</b> ● <b>SUS1.5-28J10</b> ● <b>SUS1.5-28J12</b> ● <b>SUS1.5-28J14</b> ● <b>SUS1.5-28J15</b> ● <b>SUS1.5-28J16</b> ● <b>SUS1.5-28J18</b> ● <b>SUS1.5-28J19</b> ● <b>SUS1.5-28J20</b>
— M4 M4 M4 M4 M4 M4 M5 M5 M5	— 7 7 7 7 7 7 7 7 7	18.9	1.98	1.93	0.20	0.12~0.26	0.29 0.29 0.28 0.27 0.27 0.27 0.26 0.25 0.25 0.24 0.23 0.22	<b>SUS1.5-30</b> ● <b>SUS1.5-30J10</b> ● <b>SUS1.5-30J12</b> ● <b>SUS1.5-30J14</b> ● <b>SUS1.5-30J15</b> ● <b>SUS1.5-30J16</b> ● <b>SUS1.5-30J18</b> ● <b>SUS1.5-30J19</b> ● <b>SUS1.5-30J20</b> ● <b>SUS1.5-30J22</b>
— M4* M4 M4 M4 M4 M4 M5 M5 M5 M5	— 7 7 7 7 7 7 7 7 7 7	20.6	2.27	2.10	0.23	0.12~0.26	0.33 0.33 0.32 0.31 0.30 0.30 0.30 0.28 0.28 0.27 0.26	<b>SUS1.5-32</b> ● <b>SUS1.5-32J10</b> ● <b>SUS1.5-32J12</b> ● <b>SUS1.5-32J14</b> ● <b>SUS1.5-32J15</b> ● <b>SUS1.5-32J16</b> ● <b>SUS1.5-32J18</b> ● <b>SUS1.5-32J19</b> ● <b>SUS1.5-32J20</b> ● <b>SUS1.5-32J22</b>

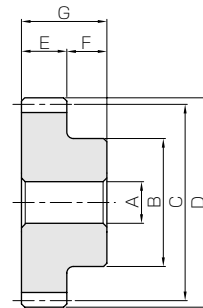
[Caution on J series]

- ① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).
- ⑤ For products having a tapped hole, a set screw is included.



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	SUS303
Heat treatment	—
Tooth hardness	less than 187HB

\* The precision grade of J Series products is equivalent to the value shown in the table.



S1

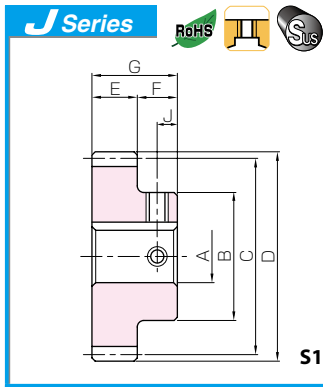
Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway									
				A <sub>H7</sub>	B	C	D	E	F	G	Width×Depth									
<b>SUS1.5-35</b> ●SUS1.5-35J10 ●SUS1.5-35J12 ●SUS1.5-35J14 ●SUS1.5-35J15 ●SUS1.5-35J16 ●SUS1.5-35J18 ●SUS1.5-35J19 ●SUS1.5-35J20 ●SUS1.5-35J22 ●SUS1.5-35J25	m1.5	35	S1	10	42	52.5	55.5	15	14	29	—									
			S1K	10							4 × 1.8									
			S1K	12							4 × 1.8									
			S1K	14							5 × 2.3									
			S1K	15							5 × 2.3									
			S1K	16							5 × 2.3									
			S1K	18							6 × 2.8									
			S1K	19							6 × 2.8									
			S1K	20							6 × 2.8									
			S1K	22							6 × 2.8									
			S1K	22							6 × 2.8									
			S1K	25							8 × 3.3									
			<b>SUS1.5-36</b> ●SUS1.5-36J10 ●SUS1.5-36J12 ●SUS1.5-36J14 ●SUS1.5-36J15 ●SUS1.5-36J16 ●SUS1.5-36J18 ●SUS1.5-36J19 ●SUS1.5-36J20 ●SUS1.5-36J22 ●SUS1.5-36J25	m1.5							36	S1	10	45	54	57	15	14	29	—
S1K	10	4 × 1.8																		
S1K	12	4 × 1.8																		
S1K	14	5 × 2.3																		
S1K	15	5 × 2.3																		
S1K	16	5 × 2.3																		
S1K	18	6 × 2.8																		
S1K	19	6 × 2.8																		
S1K	20	6 × 2.8																		
S1K	22	6 × 2.8																		
S1K	22	6 × 2.8																		
S1K	25	8 × 3.3																		
<b>SUS1.5-40</b> ●SUS1.5-40J12 ●SUS1.5-40J14 ●SUS1.5-40J15 ●SUS1.5-40J16 ●SUS1.5-40J18 ●SUS1.5-40J19 ●SUS1.5-40J20 ●SUS1.5-40J22 ●SUS1.5-40J25	m1.5	40			S1	12	45	60	63	15		14	29							—
			S1K	12	4 × 1.8															
			S1K	14	5 × 2.3															
			S1K	15	5 × 2.3															
			S1K	16	5 × 2.3															
			S1K	18	6 × 2.8															
			S1K	19	6 × 2.8															
			S1K	20	6 × 2.8															
			S1K	22	6 × 2.8															
			S1K	22	6 × 2.8															
			S1K	25	8 × 3.3															
			<b>SUS1.5-42</b> ●SUS1.5-42J12 ●SUS1.5-42J14 ●SUS1.5-42J15 ●SUS1.5-42J16 ●SUS1.5-42J18 ●SUS1.5-42J19 ●SUS1.5-42J20 ●SUS1.5-42J22 ●SUS1.5-42J25	m1.5	42	S1					12			45	63	66	15	14	29	—
						S1K					12									4 × 1.8
S1K	14	5 × 2.3																		
S1K	15	5 × 2.3																		
S1K	16	5 × 2.3																		
S1K	18	6 × 2.8																		
S1K	19	6 × 2.8																		
S1K	20	6 × 2.8																		
S1K	22	6 × 2.8																		
S1K	22	6 × 2.8																		
S1K	25	8 × 3.3																		
<b>SUS1.5-45</b> ●SUS1.5-45J12 ●SUS1.5-45J14 ●SUS1.5-45J15 ●SUS1.5-45J16 ●SUS1.5-45J18 ●SUS1.5-45J19 ●SUS1.5-45J20 ●SUS1.5-45J22 ●SUS1.5-45J25	m1.5	45				S1	12	45	67.5	70.5	15	14	29							—
						S1K	12													4 × 1.8
			S1K	14	5 × 2.3															
			S1K	15	5 × 2.3															
			S1K	16	5 × 2.3															
			S1K	18	6 × 2.8															
			S1K	19	6 × 2.8															
			S1K	20	6 × 2.8															
			S1K	22	6 × 2.8															
			S1K	22	6 × 2.8															
			S1K	25	8 × 3.3															
			<b>SUS1.5-48</b> ●SUS1.5-48J12 ●SUS1.5-48J14 ●SUS1.5-48J15 ●SUS1.5-48J16 ●SUS1.5-48J18 ●SUS1.5-48J19 ●SUS1.5-48J20 ●SUS1.5-48J22 ●SUS1.5-48J25	m1.5	48	S1	12							45	72	75	15	14	29	—
						S1K	12													4 × 1.8
S1K	14	5 × 2.3																		
S1K	15	5 × 2.3																		
S1K	16	5 × 2.3																		
S1K	18	6 × 2.8																		
S1K	19	6 × 2.8																		
S1K	20	6 × 2.8																		
S1K	22	6 × 2.8																		
S1K	22	6 × 2.8																		
S1K	25	8 × 3.3																		

[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.



Stainless Steel Spur Gears

Newly added



Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

Bevel Gearboxes

Other Products

Set Screw		Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—	23.2	2.74	2.36	0.28	0.12~0.26	0.39	<b>SUS1.5-35</b>
M4*	7							●SUS1.5-35J10
M4*	7							●SUS1.5-35J12
M4	7							●SUS1.5-35J14
M4	7							●SUS1.5-35J15
M4	7							●SUS1.5-35J16
M5	7							●SUS1.5-35J18
M5	7							●SUS1.5-35J19
M5	7							●SUS1.5-35J20
M5	7							●SUS1.5-35J22
M6	7	●SUS1.5-35J25						
—	—	24.0	2.91	2.45	0.30	0.12~0.26	0.42	<b>SUS1.5-36</b>
M4*	7							●SUS1.5-36J10
M4*	7							●SUS1.5-36J12
M4*	7							●SUS1.5-36J14
M4*	7							●SUS1.5-36J15
M4*	7							●SUS1.5-36J16
M5	7							●SUS1.5-36J18
M5	7							●SUS1.5-36J19
M5	7							●SUS1.5-36J20
M5	7							●SUS1.5-36J22
M6	7	●SUS1.5-36J25						
—	—	27.5	3.62	2.80	0.37	0.12~0.26	0.48	<b>SUS1.5-40</b>
M4*	7							●SUS1.5-40J12
M4*	7							●SUS1.5-40J14
M4*	7							●SUS1.5-40J15
M4*	7							●SUS1.5-40J16
M5	7							●SUS1.5-40J18
M5	7							●SUS1.5-40J19
M5	7							●SUS1.5-40J20
M5	7							●SUS1.5-40J22
M6	7							●SUS1.5-40J25
—	—	29.2	4.01	2.98	0.41	0.14~0.32	0.51	<b>SUS1.5-42</b>
M4*	7							●SUS1.5-42J12
M4*	7							●SUS1.5-42J14
M4*	7							●SUS1.5-42J15
M4*	7							●SUS1.5-42J16
M5	7							●SUS1.5-42J18
M5	7							●SUS1.5-42J19
M5	7							●SUS1.5-42J20
M5	7							●SUS1.5-42J22
M6	7							●SUS1.5-42J25
—	—	31.9	4.64	3.25	0.47	0.14~0.32	0.57	<b>SUS1.5-45</b>
M4*	7							●SUS1.5-45J12
M4*	7							●SUS1.5-45J14
M4*	7							●SUS1.5-45J15
M4*	7							●SUS1.5-45J16
M5	7							●SUS1.5-45J18
M5	7							●SUS1.5-45J19
M5	7							●SUS1.5-45J20
M5	7							●SUS1.5-45J22
M6	7							●SUS1.5-45J25
—	—	34.5	5.31	3.52	0.54	0.14~0.32	0.62	<b>SUS1.5-48</b>
M4*	7							●SUS1.5-48J12
M4*	7							●SUS1.5-48J14
M4*	7							●SUS1.5-48J15
M4*	7							●SUS1.5-48J16
M5	7							●SUS1.5-48J18
M5	7							●SUS1.5-48J19
M5	7							●SUS1.5-48J20
M5	7							●SUS1.5-48J22
M6	7							●SUS1.5-48J25

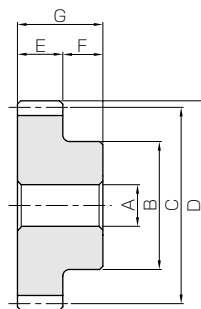
[Caution on J series]

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- ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).
- ⑤ For products having a tapped hole, a set screw is included.



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	SUS303
Heat treatment	—
Tooth hardness	less than 187HB

\* The precision grade of J Series products is equivalent to the value shown in the table.



S1

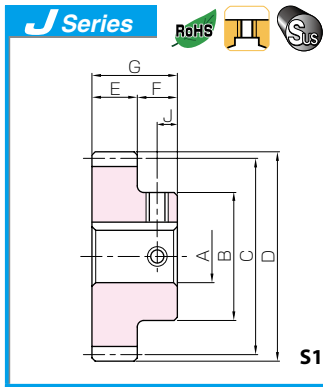
Catalog No. ●: J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	Width×Depth
<b>SUS1.5-50</b> ●SUS1.5-50J12 ●SUS1.5-50J14 ●SUS1.5-50J15 ●SUS1.5-50J16 ●SUS1.5-50J18 ●SUS1.5-50J19 ●SUS1.5-50J20 ●SUS1.5-50J22 ●SUS1.5-50J25 ●SUS1.5-50J28 ●SUS1.5-50J30	m1.5	50	S1	12	50	75	78	15	14	29	—
			S1K	12							4 × 1.8
			S1K	14							5 × 2.3
			S1K	15							5 × 2.3
			S1K	16							5 × 2.3
			S1K	18							6 × 2.8
			S1K	19							6 × 2.8
			S1K	20							6 × 2.8
			S1K	22							6 × 2.8
			S1K	25							8 × 3.3
			S1K	28							8 × 3.3
			S1K	30							8 × 3.3
			<b>SUS1.5-55</b> ●SUS1.5-55J12 ●SUS1.5-55J14 ●SUS1.5-55J15 ●SUS1.5-55J16 ●SUS1.5-55J18 ●SUS1.5-55J19 ●SUS1.5-55J20 ●SUS1.5-55J22 ●SUS1.5-55J25 ●SUS1.5-55J28 ●SUS1.5-55J30 ●SUS1.5-55J32	m1.5							55
S1K	12	4 × 1.8									
S1K	14	5 × 2.3									
S1K	15	5 × 2.3									
S1K	16	5 × 2.3									
S1K	18	6 × 2.8									
S1K	19	6 × 2.8									
S1K	20	6 × 2.8									
S1K	22	6 × 2.8									
S1K	25	8 × 3.3									
S1K	28	8 × 3.3									
S1K	30	8 × 3.3									
S1K	32	10 × 3.3									
<b>SUS1.5-56</b> ●SUS1.5-56J12 ●SUS1.5-56J14 ●SUS1.5-56J15 ●SUS1.5-56J16 ●SUS1.5-56J18 ●SUS1.5-56J19 ●SUS1.5-56J20 ●SUS1.5-56J22 ●SUS1.5-56J25 ●SUS1.5-56J28 ●SUS1.5-56J30 ●SUS1.5-56J32	m1.5	56	S1	12	55	84	87	15	14	29	—
			S1K	12							4 × 1.8
			S1K	14							5 × 2.3
			S1K	15							5 × 2.3
			S1K	16							5 × 2.3
			S1K	18							6 × 2.8
			S1K	19							6 × 2.8
			S1K	20							6 × 2.8
			S1K	22							6 × 2.8
			S1K	25							8 × 3.3
			S1K	28							8 × 3.3
			S1K	30							8 × 3.3
			S1K	32							10 × 3.3
<b>SUS1.5-60</b> ●SUS1.5-60J15 ●SUS1.5-60J16 ●SUS1.5-60J18 ●SUS1.5-60J19 ●SUS1.5-60J20 ●SUS1.5-60J22 ●SUS1.5-60J25 ●SUS1.5-60J28 ●SUS1.5-60J30 ●SUS1.5-60J32 ●SUS1.5-60J35	m1.5	60	S1	15	60	90	93	15	14	29	—
			S1K	15							5 × 2.3
			S1K	16							5 × 2.3
			S1K	18							6 × 2.8
			S1K	19							6 × 2.8
			S1K	20							6 × 2.8
			S1K	22							6 × 2.8
			S1K	25							8 × 3.3
			S1K	28							8 × 3.3
			S1K	30							8 × 3.3
			S1K	32							10 × 3.3
			S1K	35							10 × 3.3
			<b>SUS1.5-64</b> ●SUS1.5-64J15 ●SUS1.5-64J16 ●SUS1.5-64J18 ●SUS1.5-64J19 ●SUS1.5-64J20 ●SUS1.5-64J22 ●SUS1.5-64J25 ●SUS1.5-64J28 ●SUS1.5-64J30 ●SUS1.5-64J32 ●SUS1.5-64J35	m1.5							64
S1K	15	5 × 2.3									
S1K	16	5 × 2.3									
S1K	18	6 × 2.8									
S1K	19	6 × 2.8									
S1K	20	6 × 2.8									
S1K	22	6 × 2.8									
S1K	25	8 × 3.3									
S1K	28	8 × 3.3									
S1K	30	8 × 3.3									
S1K	32	10 × 3.3									
S1K	35	10 × 3.3									

[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.



Stainless Steel Spur Gears

Newly added



Set Screw		Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—	36.3	5.79	3.70	0.59	0.14~0.32	0.71	<b>SUS1.5-50</b>
M4*	7							●SUS1.5-50J12
M4*	7							●SUS1.5-50J14
M4*	7							●SUS1.5-50J15
M4*	7							●SUS1.5-50J16
M5	7							●SUS1.5-50J18
M5	7							●SUS1.5-50J19
M5	7							●SUS1.5-50J20
M5	7							●SUS1.5-50J22
M6	7							●SUS1.5-50J25
M6	7							●SUS1.5-50J28
M6	7							●SUS1.5-50J30
—	—	40.7	7.08	4.15	0.72	0.14~0.32	0.86	<b>SUS1.5-55</b>
M4*	7							●SUS1.5-55J12
M4*	7							●SUS1.5-55J14
M4*	7							●SUS1.5-55J15
M4*	7							●SUS1.5-55J16
M5*	7							●SUS1.5-55J18
M5*	7							●SUS1.5-55J19
M5*	7							●SUS1.5-55J20
M5	7							●SUS1.5-55J22
M6	7							●SUS1.5-55J25
M6	7							●SUS1.5-55J28
M6	7							●SUS1.5-55J30
M8	7	●SUS1.5-55J32						
—	—	41.6	7.36	4.24	0.75	0.14~0.32	0.88	<b>SUS1.5-56</b>
M4*	7							●SUS1.5-56J12
M4*	7							●SUS1.5-56J14
M4*	7							●SUS1.5-56J15
M4*	7							●SUS1.5-56J16
M5*	7							●SUS1.5-56J18
M5*	7							●SUS1.5-56J19
M5*	7							●SUS1.5-56J20
M5	7							●SUS1.5-56J22
M6	7							●SUS1.5-56J25
M6	7							●SUS1.5-56J28
M6	7							●SUS1.5-56J30
M8	7	●SUS1.5-56J32						
—	—	45.2	8.51	4.61	0.87	0.14~0.32	1.01	<b>SUS1.5-60</b>
M4*	7							●SUS1.5-60J15
M4*	7							●SUS1.5-60J16
M5*	7							●SUS1.5-60J18
M5*	7							●SUS1.5-60J19
M5*	7							●SUS1.5-60J20
M5*	7							●SUS1.5-60J22
M6	7							●SUS1.5-60J25
M6	7							●SUS1.5-60J28
M6	7							●SUS1.5-60J30
M8	7							●SUS1.5-60J32
M8	7							●SUS1.5-60J35
—	—	48.8	9.75	4.97	0.99	0.14~0.32	1.12	<b>SUS1.5-64</b>
M4*	7							●SUS1.5-64J15
M4*	7							●SUS1.5-64J16
M5*	7							●SUS1.5-64J18
M5*	7							●SUS1.5-64J19
M5*	7							●SUS1.5-64J20
M5*	7							●SUS1.5-64J22
M6	7							●SUS1.5-64J25
M6	7							●SUS1.5-64J28
M6	7							●SUS1.5-64J30
M8	7							●SUS1.5-64J32
M8	7							●SUS1.5-64J35

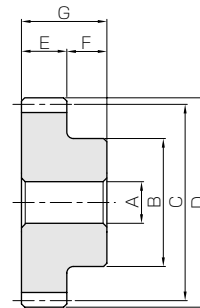
[Caution on J series]

- ① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).
- ⑤ For products having a tapped hole, a set screw is included.



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	SUS303
Heat treatment	—
Tooth hardness	less than 187HB

\* The precision grade of J Series products is equivalent to the value shown in the table.



S1

Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	Width×Depth
<b>SUS1.5-70</b> ● SUS1.5-70J15 ● SUS1.5-70J16 ● SUS1.5-70J18 ● SUS1.5-70J19 ● SUS1.5-70J20 ● SUS1.5-70J22 ● SUS1.5-70J25 ● SUS1.5-70J28 ● SUS1.5-70J30 ● SUS1.5-70J32 ● SUS1.5-70J35 ● SUS1.5-70J40	m1.5	70	S1	15	70	105	108	15	14	29	—
			S1K	15							5 x 2.3
			S1K	16							5 x 2.3
			S1K	18							6 x 2.8
			S1K	19							6 x 2.8
			S1K	20							6 x 2.8
			S1K	22							6 x 2.8
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
			S1K	30							8 x 3.3
			S1K	32							10 x 3.3
			S1K	35							10 x 3.3
			S1K	40							12 x 3.3
			<b>SUS1.5-75</b> ● SUS1.5-75J15 ● SUS1.5-75J16 ● SUS1.5-75J18 ● SUS1.5-75J19 ● SUS1.5-75J20 ● SUS1.5-75J22 ● SUS1.5-75J25 ● SUS1.5-75J28 ● SUS1.5-75J30 ● SUS1.5-75J32 ● SUS1.5-75J35 ● SUS1.5-75J40	m1.5							75
S1K	15	5 x 2.3									
S1K	16	5 x 2.3									
S1K	18	6 x 2.8									
S1K	19	6 x 2.8									
S1K	20	6 x 2.8									
S1K	22	6 x 2.8									
S1K	25	8 x 3.3									
S1K	28	8 x 3.3									
S1K	30	8 x 3.3									
S1K	32	10 x 3.3									
S1K	35	10 x 3.3									
S1K	40	12 x 3.3									
<b>SUS1.5-80</b> ● SUS1.5-80J15 ● SUS1.5-80J16 ● SUS1.5-80J18 ● SUS1.5-80J19 ● SUS1.5-80J20 ● SUS1.5-80J22 ● SUS1.5-80J25 ● SUS1.5-80J28 ● SUS1.5-80J30 ● SUS1.5-80J32 ● SUS1.5-80J35 ● SUS1.5-80J40 ● SUS1.5-80J45	m1.5	80			S1	15	80	120	123	15	
			S1K	15	5 x 2.3						
			S1K	16	5 x 2.3						
			S1K	18	6 x 2.8						
			S1K	19	6 x 2.8						
			S1K	20	6 x 2.8						
			S1K	22	6 x 2.8						
			S1K	25	8 x 3.3						
			S1K	28	8 x 3.3						
			S1K	30	8 x 3.3						
			S1K	32	10 x 3.3						
			S1K	35	10 x 3.3						
			S1K	40	12 x 3.3						
			S1K	45	14 x 3.8						
<b>SUS1.5-90</b> ● SUS1.5-90J15 ● SUS1.5-90J16 ● SUS1.5-90J18 ● SUS1.5-90J19 ● SUS1.5-90J20 ● SUS1.5-90J22 ● SUS1.5-90J25 ● SUS1.5-90J28 ● SUS1.5-90J30 ● SUS1.5-90J32 ● SUS1.5-90J35 ● SUS1.5-90J40 ● SUS1.5-90J45	m1.5	90	S1	15	80	135	138	15	14	29	—
			S1K	15							5 x 2.3
			S1K	16							5 x 2.3
			S1K	18							6 x 2.8
			S1K	19							6 x 2.8
			S1K	20							6 x 2.8
			S1K	22							6 x 2.8
			S1K	25							8 x 3.3
			S1K	28							8 x 3.3
			S1K	30							8 x 3.3
			S1K	32							10 x 3.3
			S1K	35							10 x 3.3
			S1K	40							12 x 3.3
			S1K	45							14 x 3.8

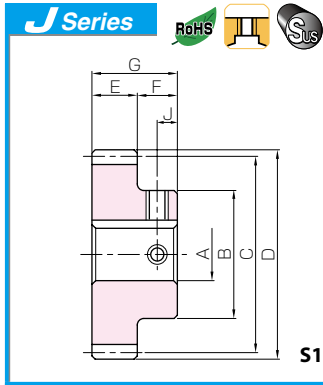
[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.





Stainless Steel Spur Gears

Newly added



Set Screw		Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—	54.2	11.8	5.52	1.20	0.14~0.32	1.39	<b>SUS1.5-70</b>
M4*	7							●SUS1.5-70J15
M4*	7							●SUS1.5-70J16
M5*	7							●SUS1.5-70J18
M5*	7							●SUS1.5-70J19
M5*	7							●SUS1.5-70J20
M5*	7							●SUS1.5-70J22
M6*	7							●SUS1.5-70J25
M6*	7							●SUS1.5-70J28
M6*	7							●SUS1.5-70J30
M8	7							●SUS1.5-70J32
M8	7							●SUS1.5-70J35
M8	7	●SUS1.5-70J40						
—	—	58.7	13.6	5.99	1.39	0.14~0.32	1.54	<b>SUS1.5-75</b>
M4*	7							●SUS1.5-75J15
M4*	7							●SUS1.5-75J16
M5*	7							●SUS1.5-75J18
M5*	7							●SUS1.5-75J19
M5*	7							●SUS1.5-75J20
M5*	7							●SUS1.5-75J22
M6*	7							●SUS1.5-75J25
M6*	7							●SUS1.5-75J28
M6*	7							●SUS1.5-75J30
M8	7							●SUS1.5-75J32
M8	7							●SUS1.5-75J35
M8	7	●SUS1.5-75J40						
—	—	63.2	15.6	6.45	1.59	0.14~0.32	1.83	<b>SUS1.5-80</b>
M4*	7							●SUS1.5-80J15
M4*	7							●SUS1.5-80J16
M5*	7							●SUS1.5-80J18
M5*	7							●SUS1.5-80J19
M5*	7							●SUS1.5-80J20
M5*	7							●SUS1.5-80J22
M6*	7							●SUS1.5-80J25
M6*	7							●SUS1.5-80J28
M6*	7							●SUS1.5-80J30
M8	7							●SUS1.5-80J32
M8	7							●SUS1.5-80J35
M8	7	●SUS1.5-80J40						
M10	7	●SUS1.5-80J45						
—	—	72.3	20.1	7.37	2.05	0.18~0.38	2.18	<b>SUS1.5-90</b>
M4*	7							●SUS1.5-90J15
M4*	7							●SUS1.5-90J16
M5*	7							●SUS1.5-90J18
M5*	7							●SUS1.5-90J19
M5*	7							●SUS1.5-90J20
M5*	7							●SUS1.5-90J22
M6*	7							●SUS1.5-90J25
M6*	7							●SUS1.5-90J28
M6*	7							●SUS1.5-90J30
M8	7							●SUS1.5-90J32
M8	7							●SUS1.5-90J35
M8	7	●SUS1.5-90J40						
M10	7	●SUS1.5-90J45						

[Caution on J series]

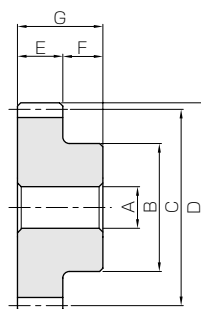
- ① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).
- ⑤ For products having a tapped hole, a set screw is included.

Spur Gears  
Helical Gears  
Internal Gears  
Racks  
CP Racks & Pinions  
Miter Gears  
Bevel Gears  
Screw Gears  
Worm Gear Pair  
Bevel Gearboxes  
Other Products



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	SUS303
Heat treatment	—
Tooth hardness	less than 187HB

\* The precision grade of J Series products is equivalent to the value shown in the table.



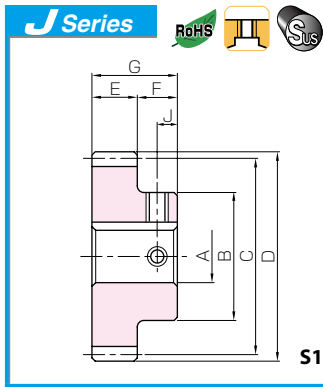
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Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	Width×Depth
<b>SUS1.5-100</b>	<b>m1.5</b>	100	S1	15	80	150	153	15	14	29	—
● <b>SUS1.5-100J15</b>			S1K	15							5 x 2.3
● <b>SUS1.5-100J16</b>			S1K	16							5 x 2.3
● <b>SUS1.5-100J18</b>			S1K	18							6 x 2.8
● <b>SUS1.5-100J19</b>			S1K	19							6 x 2.8
● <b>SUS1.5-100J20</b>			S1K	20							6 x 2.8
● <b>SUS1.5-100J22</b>			S1K	22							6 x 2.8
● <b>SUS1.5-100J25</b>			S1K	25							8 x 3.3
● <b>SUS1.5-100J28</b>			S1K	28							8 x 3.3
● <b>SUS1.5-100J30</b>			S1K	30							8 x 3.3
● <b>SUS1.5-100J32</b>			S1K	32							10 x 3.3
● <b>SUS1.5-100J35</b>			S1K	35							10 x 3.3
● <b>SUS1.5-100J40</b>			S1K	40							12 x 3.3
● <b>SUS1.5-100J45</b>			S1K	45							14 x 3.8

[Caution on Product Characteristics] ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.  
② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations] ① Please read “Caution on Performing Secondary Operations” (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK’s system for quick modification of KHK stock gears is also available.  
② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.

- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products



**Stainless Steel Spur Gears**

**Newly added**



Set Screw		Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—	81.4	25.2	8.30	2.57	0.18~0.38	2.58	<b>SUS1.5-100</b>
M4*	7						2.57	● <b>SUS1.5-100J15</b>
M4*	7						2.56	● <b>SUS1.5-100J16</b>
M5*	7						2.55	● <b>SUS1.5-100J18</b>
M5*	7						2.54	● <b>SUS1.5-100J19</b>
M5*	7						2.53	● <b>SUS1.5-100J20</b>
M5*	7						2.52	● <b>SUS1.5-100J22</b>
M6*	7						2.49	● <b>SUS1.5-100J25</b>
M6*	7						2.46	● <b>SUS1.5-100J28</b>
M6*	7						2.44	● <b>SUS1.5-100J30</b>
M8	7						2.41	● <b>SUS1.5-100J32</b>
M8	7						2.37	● <b>SUS1.5-100J35</b>
M8	7						2.31	● <b>SUS1.5-100J40</b>
M10	7						2.22	● <b>SUS1.5-100J45</b>

**[Caution on J series]**

- ① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).
- ⑤ For products having a tapped hole, a set screw is included.

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

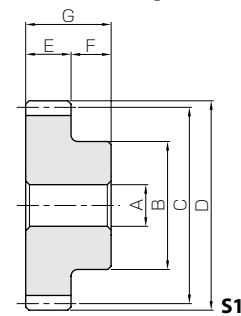
Bevel Gearboxes

Other Products



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	SUS303
Heat treatment	—
Tooth hardness	less than 187HB

\* The precision grade of J Series products is equivalent to the value shown in the table.



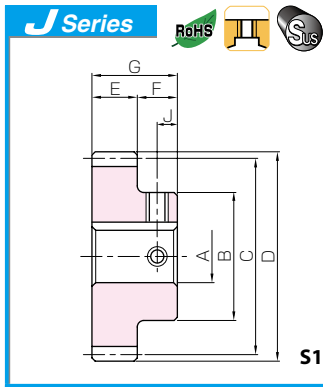
Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	Width×Depth
<b>SUS2-15</b> ● <b>SUS2-15J12</b>	m2	15	S1	12	24	30	34	20	16	36	—
S1K			12	4 x 1.8							
<b>SUS2-16</b> ● <b>SUS2-16J12</b>		16	S1	12	26	32	36	20	16	36	—
S1K			12	4 x 1.8							
<b>SUS2-18</b> ● <b>SUS2-18J12</b> ● <b>SUS2-18J14</b> ● <b>SUS2-18J15</b> ● <b>SUS2-18J16</b>		18	S1	12	30	36	40	20	16	36	—
S1K			12	4 x 1.8							
S1K			14	5 x 2.3							
S1K			15	5 x 2.3							
S1K			16	5 x 2.3							
<b>SUS2-20</b> ● <b>SUS2-20J12</b> ● <b>SUS2-20J14</b> ● <b>SUS2-20J15</b> ● <b>SUS2-20J16</b> ● <b>SUS2-20J18</b>		20	S1	12	32	40	44	20	16	36	—
S1K			12	4 x 1.8							
S1K			14	5 x 2.3							
S1K			15	5 x 2.3							
S1K			16	5 x 2.3							
S1K			18	6 x 2.8							
<b>SUS2-22</b> ● <b>SUS2-22J12</b> ● <b>SUS2-22J14</b> ● <b>SUS2-22J15</b> ● <b>SUS2-22J16</b> ● <b>SUS2-22J18</b> ● <b>SUS2-22J19</b> ● <b>SUS2-22J20</b>	22	S1	12	36	44	48	20	16	36	—	
S1K		12	4 x 1.8								
S1K		14	5 x 2.3								
S1K		15	5 x 2.3								
S1K		16	5 x 2.3								
S1K		18	6 x 2.8								
S1K		19	6 x 2.8								
S1K		20	6 x 2.8								
<b>SUS2-24</b> ● <b>SUS2-24J12</b> ● <b>SUS2-24J14</b> ● <b>SUS2-24J15</b> ● <b>SUS2-24J16</b> ● <b>SUS2-24J18</b> ● <b>SUS2-24J19</b> ● <b>SUS2-24J20</b> ● <b>SUS2-24J22</b>	24	S1	12	38	48	52	20	16	36	—	
S1K		12	4 x 1.8								
S1K		14	5 x 2.3								
S1K		15	5 x 2.3								
S1K		16	5 x 2.3								
S1K		18	6 x 2.8								
S1K		19	6 x 2.8								
S1K		20	6 x 2.8								
S1K		22	6 x 2.8								
<b>SUS2-25</b> ● <b>SUS2-25J12</b> ● <b>SUS2-25J14</b> ● <b>SUS2-25J15</b> ● <b>SUS2-25J16</b> ● <b>SUS2-25J18</b> ● <b>SUS2-25J19</b> ● <b>SUS2-25J20</b> ● <b>SUS2-25J22</b>		25	S1							12	40
S1K	12		4 x 1.8								
S1K	14		5 x 2.3								
S1K	15		5 x 2.3								
S1K	16		5 x 2.3								
S1K	18		6 x 2.8								
S1K	19		6 x 2.8								
S1K	22		6 x 2.8								
<b>SUS2-28</b> ● <b>SUS2-28J12</b> ● <b>SUS2-28J14</b> ● <b>SUS2-28J15</b> ● <b>SUS2-28J16</b> ● <b>SUS2-28J18</b> ● <b>SUS2-28J19</b> ● <b>SUS2-28J20</b> ● <b>SUS2-28J22</b> ● <b>SUS2-28J25</b>	28	S1	12	45	56	60	20	16	36	—	
S1K		12	4 x 1.8								
S1K		14	5 x 2.3								
S1K		15	5 x 2.3								
S1K		16	5 x 2.3								
S1K		18	6 x 2.8								
S1K		19	6 x 2.8								
S1K		20	6 x 2.8								
S1K		22	6 x 2.8								
S1K		25	8 x 3.3								
<b>SUS2-30</b> ● <b>SUS2-30J12</b> ● <b>SUS2-30J14</b> ● <b>SUS2-30J15</b> ● <b>SUS2-30J16</b> ● <b>SUS2-30J18</b> ● <b>SUS2-30J19</b> ● <b>SUS2-30J20</b> ● <b>SUS2-30J22</b> ● <b>SUS2-30J25</b> ● <b>SUS2-30J28</b> ● <b>SUS2-30J30</b>	30	S1	12	50	60	64	20	16	36	—	
S1K		12	4 x 1.8								
S1K		14	5 x 2.3								
S1K		15	5 x 2.3								
S1K		16	5 x 2.3								
S1K		18	6 x 2.8								
S1K		19	6 x 2.8								
S1K		20	6 x 2.8								
S1K		22	6 x 2.8								
S1K		25	8 x 3.3								
S1K		28	8 x 3.3								
S1K		30	8 x 3.3								

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- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

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Stainless Steel Spur Gears

Newly added



Set Screw		Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—	16.3	1.05	1.67	0.11	0.12~0.26	0.13 0.13	SUS2-15 ● SUS2-15J12
M4	8							SUS2-16 ● SUS2-16J12
—	—	18.1	1.22	1.85	0.12	0.12~0.26	0.16 0.16	SUS2-18 ● SUS2-18J12 ● SUS2-18J14 ● SUS2-18J15 ● SUS2-18J16
M4	8							SUS2-20 ● SUS2-20J12 ● SUS2-20J14 ● SUS2-20J15 ● SUS2-20J16 ● SUS2-20J18
—	—	21.7	1.59	2.21	0.16	0.12~0.26	0.22 0.21 0.20 0.19 0.19	SUS2-22 ● SUS2-22J12 ● SUS2-22J14 ● SUS2-22J15 ● SUS2-22J16 ● SUS2-22J18 ● SUS2-22J19 ● SUS2-22J20
M4	8							SUS2-24 ● SUS2-24J12 ● SUS2-24J14 ● SUS2-24J15 ● SUS2-24J16 ● SUS2-24J18 ● SUS2-24J19 ● SUS2-24J20 ● SUS2-24J22
M4	8							SUS2-25 ● SUS2-25J12 ● SUS2-25J14 ● SUS2-25J15 ● SUS2-25J16 ● SUS2-25J18 ● SUS2-25J19 ● SUS2-25J20 ● SUS2-25J22
M4	8							SUS2-28 ● SUS2-28J12 ● SUS2-28J14 ● SUS2-28J15 ● SUS2-28J16 ● SUS2-28J18 ● SUS2-28J19 ● SUS2-28J20 ● SUS2-28J22 ● SUS2-28J25
—	—	25.4	2.01	2.59	0.20	0.12~0.26	0.26 0.26 0.25 0.24 0.24 0.22	SUS2-30 ● SUS2-30J12 ● SUS2-30J14 ● SUS2-30J15 ● SUS2-30J16 ● SUS2-30J18 ● SUS2-30J19 ● SUS2-30J20 ● SUS2-30J22 ● SUS2-30J25 ● SUS2-30J28 ● SUS2-30J30
M4	8							SUS2-31 ● SUS2-31J12 ● SUS2-31J14 ● SUS2-31J15 ● SUS2-31J16 ● SUS2-31J18 ● SUS2-31J19 ● SUS2-31J20 ● SUS2-31J22 ● SUS2-31J25 ● SUS2-31J28 ● SUS2-31J30
M4	8							SUS2-32 ● SUS2-32J12 ● SUS2-32J14 ● SUS2-32J15 ● SUS2-32J16 ● SUS2-32J18 ● SUS2-32J19 ● SUS2-32J20 ● SUS2-32J22 ● SUS2-32J25 ● SUS2-32J28 ● SUS2-32J30
M4	8							SUS2-33 ● SUS2-33J12 ● SUS2-33J14 ● SUS2-33J15 ● SUS2-33J16 ● SUS2-33J18 ● SUS2-33J19 ● SUS2-33J20 ● SUS2-33J22 ● SUS2-33J25 ● SUS2-33J28 ● SUS2-33J30
—	—	29.2	2.48	2.98	0.25	0.14~0.30	0.33 0.33 0.32 0.31 0.30 0.29 0.28 0.27	SUS2-34 ● SUS2-34J12 ● SUS2-34J14 ● SUS2-34J15 ● SUS2-34J16 ● SUS2-34J18 ● SUS2-34J19 ● SUS2-34J20 ● SUS2-34J22
M4	8							SUS2-35 ● SUS2-35J12 ● SUS2-35J14 ● SUS2-35J15 ● SUS2-35J16 ● SUS2-35J18 ● SUS2-35J19 ● SUS2-35J20 ● SUS2-35J22
M4	8							SUS2-36 ● SUS2-36J12 ● SUS2-36J14 ● SUS2-36J15 ● SUS2-36J16 ● SUS2-36J18 ● SUS2-36J19 ● SUS2-36J20 ● SUS2-36J22
M4	8							SUS2-37 ● SUS2-37J12 ● SUS2-37J14 ● SUS2-37J15 ● SUS2-37J16 ● SUS2-37J18 ● SUS2-37J19 ● SUS2-37J20 ● SUS2-37J22
—	—	33.0	3.01	3.37	0.31	0.14~0.30	0.39 0.39 0.38 0.37 0.36 0.34 0.34 0.33 0.31	SUS2-38 ● SUS2-38J12 ● SUS2-38J14 ● SUS2-38J15 ● SUS2-38J16 ● SUS2-38J18 ● SUS2-38J19 ● SUS2-38J20 ● SUS2-38J22
M4	8							SUS2-39 ● SUS2-39J12 ● SUS2-39J14 ● SUS2-39J15 ● SUS2-39J16 ● SUS2-39J18 ● SUS2-39J19 ● SUS2-39J20 ● SUS2-39J22
M4	8							SUS2-40 ● SUS2-40J12 ● SUS2-40J14 ● SUS2-40J15 ● SUS2-40J16 ● SUS2-40J18 ● SUS2-40J19 ● SUS2-40J20 ● SUS2-40J22
M4	8							SUS2-41 ● SUS2-41J12 ● SUS2-41J14 ● SUS2-41J15 ● SUS2-41J16 ● SUS2-41J18 ● SUS2-41J19 ● SUS2-41J20 ● SUS2-41J22
—	—	35.0	3.30	3.57	0.34	0.14~0.30	0.43 0.43 0.41 0.41 0.40 0.38 0.38 0.37 0.35	SUS2-42 ● SUS2-42J12 ● SUS2-42J14 ● SUS2-42J15 ● SUS2-42J16 ● SUS2-42J18 ● SUS2-42J19 ● SUS2-42J20 ● SUS2-42J22
M4	8							SUS2-43 ● SUS2-43J12 ● SUS2-43J14 ● SUS2-43J15 ● SUS2-43J16 ● SUS2-43J18 ● SUS2-43J19 ● SUS2-43J20 ● SUS2-43J22
M4	8							SUS2-44 ● SUS2-44J12 ● SUS2-44J14 ● SUS2-44J15 ● SUS2-44J16 ● SUS2-44J18 ● SUS2-44J19 ● SUS2-44J20 ● SUS2-44J22
M4	8							SUS2-45 ● SUS2-45J12 ● SUS2-45J14 ● SUS2-45J15 ● SUS2-45J16 ● SUS2-45J18 ● SUS2-45J19 ● SUS2-45J20 ● SUS2-45J22
—	—	40.9	4.18	4.17	0.43	0.14~0.30	0.55 0.55 0.53 0.53 0.52 0.50 0.49 0.49 0.47 0.43	SUS2-46 ● SUS2-46J12 ● SUS2-46J14 ● SUS2-46J15 ● SUS2-46J16 ● SUS2-46J18 ● SUS2-46J19 ● SUS2-46J20 ● SUS2-46J22
M4*	8							SUS2-47 ● SUS2-47J12 ● SUS2-47J14 ● SUS2-47J15 ● SUS2-47J16 ● SUS2-47J18 ● SUS2-47J19 ● SUS2-47J20 ● SUS2-47J22
M4*	8							SUS2-48 ● SUS2-48J12 ● SUS2-48J14 ● SUS2-48J15 ● SUS2-48J16 ● SUS2-48J18 ● SUS2-48J19 ● SUS2-48J20 ● SUS2-48J22
M4*	8							SUS2-49 ● SUS2-49J12 ● SUS2-49J14 ● SUS2-49J15 ● SUS2-49J16 ● SUS2-49J18 ● SUS2-49J19 ● SUS2-49J20 ● SUS2-49J22
—	—	44.8	4.83	4.57	0.49	0.14~0.30	0.65 0.65 0.64 0.63 0.62 0.61 0.60 0.59 0.57 0.54 0.50 0.48	SUS2-50 ● SUS2-50J12 ● SUS2-50J14 ● SUS2-50J15 ● SUS2-50J16 ● SUS2-50J18 ● SUS2-50J19 ● SUS2-50J20 ● SUS2-50J22
M4*	8							SUS2-51 ● SUS2-51J12 ● SUS2-51J14 ● SUS2-51J15 ● SUS2-51J16 ● SUS2-51J18 ● SUS2-51J19 ● SUS2-51J20 ● SUS2-51J22
M4*	8							SUS2-52 ● SUS2-52J12 ● SUS2-52J14 ● SUS2-52J15 ● SUS2-52J16 ● SUS2-52J18 ● SUS2-52J19 ● SUS2-52J20 ● SUS2-52J22
M4*	8							SUS2-53 ● SUS2-53J12 ● SUS2-53J14 ● SUS2-53J15 ● SUS2-53J16 ● SUS2-53J18 ● SUS2-53J19 ● SUS2-53J20 ● SUS2-53J22

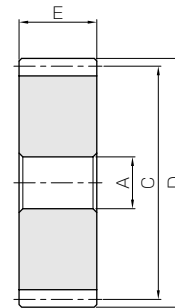
[Caution on J series]

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- ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ Certain products which would otherwise have a very long tapped hole are concentered to reduce the length of the tap. (Products marked with "\*" are tap size).
- ⑤ For products having a tapped hole, a set screw is included.



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	SUS303
Heat treatment	—
Tooth hardness	less than 187HB

\* The precision grade of J Series products is equivalent to the value shown in the table.



S5

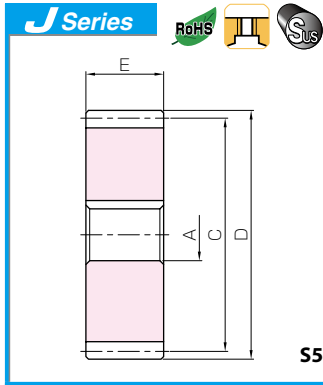
Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	WidthxDepth
<b>SUSA2-32</b> ● SUSA2-32J15 ● SUSA2-32J16 ● SUSA2-32J18 ● SUSA2-32J19 ● SUSA2-32J20 ● SUSA2-32J22 ● SUSA2-32J25 ● SUSA2-32J28 ● SUSA2-32J30	m2	32	S5	15	—	64	68	20	—	—	—
			S5K	15							5 x 2.3
			S5K	16							5 x 2.3
			S5K	18							6 x 2.8
			S5K	19							6 x 2.8
			S5K	20							6 x 2.8
			S5K	22							6 x 2.8
			S5K	25							8 x 3.3
			S5K	28							8 x 3.3
			S5K	30							8 x 3.3
<b>SUSA2-35</b> ● SUSA2-35J15 ● SUSA2-35J16 ● SUSA2-35J18 ● SUSA2-35J19 ● SUSA2-35J20 ● SUSA2-35J22 ● SUSA2-35J25 ● SUSA2-35J28 ● SUSA2-35J30 ● SUSA2-35J32	m2	35	S5	15	—	70	74	20	—	—	—
			S5K	15							5 x 2.3
			S5K	16							5 x 2.3
			S5K	18							6 x 2.8
			S5K	19							6 x 2.8
			S5K	20							6 x 2.8
			S5K	22							6 x 2.8
			S5K	25							8 x 3.3
			S5K	28							8 x 3.3
			S5K	30							8 x 3.3
S5K	32	10 x 3.3									
<b>SUSA2-36</b> ● SUSA2-36J15 ● SUSA2-36J16 ● SUSA2-36J18 ● SUSA2-36J19 ● SUSA2-36J20 ● SUSA2-36J22 ● SUSA2-36J25 ● SUSA2-36J28 ● SUSA2-36J30 ● SUSA2-36J32	m2	36	S5	15	—	72	76	20	—	—	—
			S5K	15							5 x 2.3
			S5K	16							5 x 2.3
			S5K	18							6 x 2.8
			S5K	19							6 x 2.8
			S5K	20							6 x 2.8
			S5K	22							6 x 2.8
			S5K	25							8 x 3.3
			S5K	28							8 x 3.3
			S5K	30							8 x 3.3
S5K	32	10 x 3.3									
<b>SUSA2-40</b> ● SUSA2-40J15 ● SUSA2-40J16 ● SUSA2-40J18 ● SUSA2-40J19 ● SUSA2-40J20 ● SUSA2-40J22 ● SUSA2-40J25 ● SUSA2-40J28 ● SUSA2-40J30 ● SUSA2-40J32 ● SUSA2-40J35	m2	40	S5	15	—	80	84	20	—	—	—
			S5K	15							5 x 2.3
			S5K	16							5 x 2.3
			S5K	18							6 x 2.8
			S5K	19							6 x 2.8
			S5K	20							6 x 2.8
			S5K	22							6 x 2.8
			S5K	25							8 x 3.3
			S5K	28							8 x 3.3
			S5K	30							8 x 3.3
S5K	32	10 x 3.3									
S5K	35	10 x 3.3									
<b>SUSA2-42</b> ● SUSA2-42J15 ● SUSA2-42J16 ● SUSA2-42J18 ● SUSA2-42J19 ● SUSA2-42J20 ● SUSA2-42J22 ● SUSA2-42J25 ● SUSA2-42J28 ● SUSA2-42J30 ● SUSA2-42J32 ● SUSA2-42J35	m2	42	S5	15	—	84	88	20	—	—	—
			S5K	15							5 x 2.3
			S5K	16							5 x 2.3
			S5K	18							6 x 2.8
			S5K	19							6 x 2.8
			S5K	20							6 x 2.8
			S5K	22							6 x 2.8
			S5K	25							8 x 3.3
			S5K	28							8 x 3.3
			S5K	30							8 x 3.3
S5K	32	10 x 3.3									
S5K	35	10 x 3.3									

[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.



Stainless Steel Spur Gears

Newly added



Set Screw		Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—	48.9	5.53	4.98	0.56	0.14~0.30	0.47 0.47 0.47 0.46 0.45 0.45 0.44 0.42 0.40 0.39	<b>SUSA2-32</b> ●SUSA2-32J15 ●SUSA2-32J16 ●SUSA2-32J18 ●SUSA2-32J19 ●SUSA2-32J20 ●SUSA2-32J22 ●SUSA2-32J25 ●SUSA2-32J28 ●SUSA2-32J30
—	—	54.9	6.67	5.60	0.68	0.14~0.30	0.57 0.57 0.57 0.56 0.55 0.55 0.54 0.52 0.50 0.49 0.47	<b>SUSA2-35</b> ●SUSA2-35J15 ●SUSA2-35J16 ●SUSA2-35J18 ●SUSA2-35J19 ●SUSA2-35J20 ●SUSA2-35J22 ●SUSA2-35J25 ●SUSA2-35J28 ●SUSA2-35J30 ●SUSA2-35J32
—	—	57.0	7.08	5.81	0.72	0.14~0.30	0.61 0.61 0.60 0.59 0.59 0.58 0.57 0.55 0.53 0.52 0.50	<b>SUSA2-36</b> ●SUSA2-36J15 ●SUSA2-36J16 ●SUSA2-36J18 ●SUSA2-36J19 ●SUSA2-36J20 ●SUSA2-36J22 ●SUSA2-36J25 ●SUSA2-36J28 ●SUSA2-36J30 ●SUSA2-36J32
—	—	65.2	8.85	6.65	0.90	0.14~0.30	0.76 0.75 0.75 0.74 0.74 0.73 0.72 0.70 0.68 0.67 0.65 0.63	<b>SUSA2-40</b> ●SUSA2-40J15 ●SUSA2-40J16 ●SUSA2-40J18 ●SUSA2-40J19 ●SUSA2-40J20 ●SUSA2-40J22 ●SUSA2-40J25 ●SUSA2-40J28 ●SUSA2-40J30 ●SUSA2-40J32 ●SUSA2-40J35
—	—	69.3	9.81	7.07	1.00	0.18~0.36	0.84 0.84 0.83 0.82 0.82 0.81 0.80 0.78 0.76 0.75 0.73 0.71	<b>SUSA2-42</b> ●SUSA2-42J15 ●SUSA2-42J16 ●SUSA2-42J18 ●SUSA2-42J19 ●SUSA2-42J20 ●SUSA2-42J22 ●SUSA2-42J25 ●SUSA2-42J28 ●SUSA2-42J30 ●SUSA2-42J32 ●SUSA2-42J35

[Caution on J series]

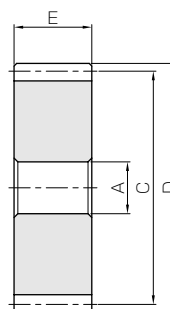
- ① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.

- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	SUS303
Heat treatment	—
Tooth hardness	less than 187HB

\* The precision grade of J Series products is equivalent to the value shown in the table.



S5

Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	Width×Depth
<b>SUSA2-45</b> ● SUSA2-45J15 ● SUSA2-45J16 ● SUSA2-45J18 ● SUSA2-45J19 ● SUSA2-45J20 ● SUSA2-45J22 ● SUSA2-45J25 ● SUSA2-45J28 ● SUSA2-45J30 ● SUSA2-45J32 ● SUSA2-45J35 ● SUSA2-45J40	m2	45	S5	15	—	90	94	20	—	—	—
			S5K	15							5 x 2.3
			S5K	16							5 x 2.3
			S5K	18							6 x 2.8
			S5K	19							6 x 2.8
			S5K	20							6 x 2.8
			S5K	22							6 x 2.8
			S5K	25							8 x 3.3
			S5K	28							8 x 3.3
			S5K	30							8 x 3.3
			S5K	32							10 x 3.3
			S5K	35							10 x 3.3
			S5K	40							12 x 3.3
			S5K	40							12 x 3.3
<b>SUSA2-48</b> ● SUSA2-48J15 ● SUSA2-48J16 ● SUSA2-48J18 ● SUSA2-48J19 ● SUSA2-48J20 ● SUSA2-48J22 ● SUSA2-48J25 ● SUSA2-48J28 ● SUSA2-48J30 ● SUSA2-48J32 ● SUSA2-48J35 ● SUSA2-48J40 ● SUSA2-48J45	m2	48	S5	15	—	96	100	20	—	—	—
			S5K	15							5 x 2.3
			S5K	16							5 x 2.3
			S5K	18							6 x 2.8
			S5K	19							6 x 2.8
			S5K	20							6 x 2.8
			S5K	22							6 x 2.8
			S5K	25							8 x 3.3
			S5K	28							8 x 3.3
			S5K	30							8 x 3.3
			S5K	32							10 x 3.3
			S5K	35							10 x 3.3
			S5K	40							12 x 3.3
			S5K	45							14 x 3.8
<b>SUSA2-50</b> ● SUSA2-50J15 ● SUSA2-50J16 ● SUSA2-50J18 ● SUSA2-50J19 ● SUSA2-50J20 ● SUSA2-50J22 ● SUSA2-50J25 ● SUSA2-50J28 ● SUSA2-50J30 ● SUSA2-50J32 ● SUSA2-50J35 ● SUSA2-50J40 ● SUSA2-50J45	m2	50	S5	15	—	100	104	20	—	—	—
			S5K	15							5 x 2.3
			S5K	16							5 x 2.3
			S5K	18							6 x 2.8
			S5K	19							6 x 2.8
			S5K	20							6 x 2.8
			S5K	22							6 x 2.8
			S5K	25							8 x 3.3
			S5K	28							8 x 3.3
			S5K	30							8 x 3.3
			S5K	32							10 x 3.3
			S5K	35							10 x 3.3
			S5K	40							12 x 3.3
			S5K	45							14 x 3.8
<b>SUSA2-55</b> ● SUSA2-55J15 ● SUSA2-55J16 ● SUSA2-55J18 ● SUSA2-55J19 ● SUSA2-55J20 ● SUSA2-55J22 ● SUSA2-55J25 ● SUSA2-55J28 ● SUSA2-55J30 ● SUSA2-55J32 ● SUSA2-55J35 ● SUSA2-55J40 ● SUSA2-55J45 ● SUSA2-55J50	m2	55	S5	15	—	110	114	20	—	—	—
			S5K	15							5 x 2.3
			S5K	16							5 x 2.3
			S5K	18							6 x 2.8
			S5K	19							6 x 2.8
			S5K	20							6 x 2.8
			S5K	22							6 x 2.8
			S5K	25							8 x 3.3
			S5K	28							8 x 3.3
			S5K	30							8 x 3.3
			S5K	32							10 x 3.3
			S5K	35							10 x 3.3
			S5K	40							12 x 3.3
			S5K	45							14 x 3.8
S5K	50	14 x 3.8									

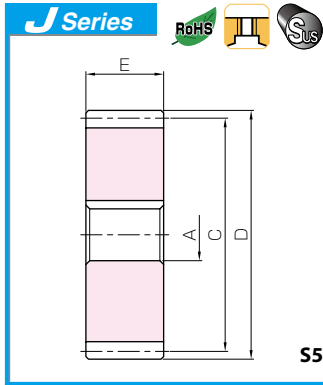
[Caution on Product Characteristics]

- The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations]

- Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.





Stainless Steel Spur Gears

Newly added



Set Screw		Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—	75.5	11.4	7.70	1.16	0.18~0.36	0.96 0.96 0.96 0.95 0.95 0.94 0.93 0.91 0.89 0.88 0.86 0.84 0.79	<b>SUSA2-45</b> ●SUSA2-45J15 ●SUSA2-45J16 ●SUSA2-45J18 ●SUSA2-45J19 ●SUSA2-45J20 ●SUSA2-45J22 ●SUSA2-45J25 ●SUSA2-45J28 ●SUSA2-45J30 ●SUSA2-45J32 ●SUSA2-45J35 ●SUSA2-45J40
—	—	81.8	13.0	8.34	1.33	0.18~0.36	1.10 1.10 1.10 1.09 1.08 1.08 1.07 1.05 1.03 1.01 1.00 0.97 0.93 0.87	<b>SUSA2-48</b> ●SUSA2-48J15 ●SUSA2-48J16 ●SUSA2-48J18 ●SUSA2-48J19 ●SUSA2-48J20 ●SUSA2-48J22 ●SUSA2-48J25 ●SUSA2-48J28 ●SUSA2-48J30 ●SUSA2-48J32 ●SUSA2-48J35 ●SUSA2-48J40 ●SUSA2-48J45
—	—	86.0	14.2	8.77	1.44	0.18~0.36	1.20 1.20 1.19 1.18 1.18 1.17 1.16 1.14 1.13 1.11 1.09 1.07 1.02 0.97	<b>SUSA2-50</b> ●SUSA2-50J15 ●SUSA2-50J16 ●SUSA2-50J18 ●SUSA2-50J19 ●SUSA2-50J20 ●SUSA2-50J22 ●SUSA2-50J25 ●SUSA2-50J28 ●SUSA2-50J30 ●SUSA2-50J32 ●SUSA2-50J35 ●SUSA2-50J40 ●SUSA2-50J45
—	—	96.5	17.3	9.84	1.77	0.18~0.36	1.45 1.45 1.45 1.44 1.44 1.43 1.42 1.40 1.38 1.37 1.35 1.33 1.28 1.23 1.17	<b>SUSA2-55</b> ●SUSA2-55J15 ●SUSA2-55J16 ●SUSA2-55J18 ●SUSA2-55J19 ●SUSA2-55J20 ●SUSA2-55J22 ●SUSA2-55J25 ●SUSA2-55J28 ●SUSA2-55J30 ●SUSA2-55J32 ●SUSA2-55J35 ●SUSA2-55J40 ●SUSA2-55J45 ●SUSA2-55J50

[Caution on J series]

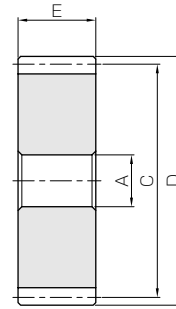
- ① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.

- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	SUS303
Heat treatment	—
Tooth hardness	less than 187HB

\* The precision grade of J Series products is equivalent to the value shown in the table.



S5

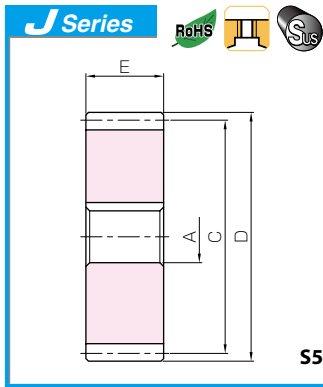
Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	Width×Depth
<b>SUSA2-56</b> ● SUSA2-56J15 ● SUSA2-56J16 ● SUSA2-56J18 ● SUSA2-56J19 ● SUSA2-56J20 ● SUSA2-56J22 ● SUSA2-56J25 ● SUSA2-56J28 ● SUSA2-56J30 ● SUSA2-56J32 ● SUSA2-56J35 ● SUSA2-56J40 ● SUSA2-56J45 ● SUSA2-56J50	m2	56	S5	15	—	112	116	20	—	—	—
			S5K	15							5 × 2.3
			S5K	16							5 × 2.3
			S5K	18							6 × 2.8
			S5K	19							6 × 2.8
			S5K	20							6 × 2.8
			S5K	22							6 × 2.8
			S5K	25							8 × 3.3
			S5K	28							8 × 3.3
			S5K	30							8 × 3.3
			S5K	32							10 × 3.3
			S5K	35							10 × 3.3
			S5K	40							12 × 3.3
			S5K	45							14 × 3.8
			S5K	50							14 × 3.8
<b>SUSA2-60</b> ● SUSA2-60J15 ● SUSA2-60J16 ● SUSA2-60J18 ● SUSA2-60J19 ● SUSA2-60J20 ● SUSA2-60J22 ● SUSA2-60J25 ● SUSA2-60J28 ● SUSA2-60J30 ● SUSA2-60J32 ● SUSA2-60J35 ● SUSA2-60J40 ● SUSA2-60J45 ● SUSA2-60J50	m2	60	S5	15	—	120	124	20	—	—	—
			S5K	15							5 × 2.3
			S5K	16							5 × 2.3
			S5K	18							6 × 2.8
			S5K	19							6 × 2.8
			S5K	20							6 × 2.8
			S5K	22							6 × 2.8
			S5K	25							8 × 3.3
			S5K	28							8 × 3.3
			S5K	30							8 × 3.3
			S5K	32							10 × 3.3
			S5K	35							10 × 3.3
			S5K	40							12 × 3.3
			S5K	45							14 × 3.8
			S5K	50							14 × 3.8
<b>SUSA2-64</b> ● SUSA2-64J15 ● SUSA2-64J16 ● SUSA2-64J18 ● SUSA2-64J19 ● SUSA2-64J20 ● SUSA2-64J22 ● SUSA2-64J25 ● SUSA2-64J28 ● SUSA2-64J30 ● SUSA2-64J32 ● SUSA2-64J35 ● SUSA2-64J40 ● SUSA2-64J45 ● SUSA2-64J50	m2	64	S5	15	—	128	132	20	—	—	—
			S5K	15							5 × 2.3
			S5K	16							5 × 2.3
			S5K	18							6 × 2.8
			S5K	19							6 × 2.8
			S5K	20							6 × 2.8
			S5K	22							6 × 2.8
			S5K	25							8 × 3.3
			S5K	28							8 × 3.3
			S5K	30							8 × 3.3
			S5K	32							10 × 3.3
			S5K	35							10 × 3.3
			S5K	40							12 × 3.3
			S5K	45							14 × 3.8
			S5K	50							14 × 3.8
<b>SUSA2-70</b> ● SUSA2-70J15 ● SUSA2-70J16 ● SUSA2-70J18 ● SUSA2-70J19 ● SUSA2-70J20 ● SUSA2-70J22 ● SUSA2-70J25 ● SUSA2-70J28 ● SUSA2-70J30 ● SUSA2-70J32 ● SUSA2-70J35 ● SUSA2-70J40 ● SUSA2-70J45 ● SUSA2-70J50	m2	70	S5	15	—	140	144	20	—	—	—
			S5K	15							5 × 2.3
			S5K	16							5 × 2.3
			S5K	18							6 × 2.8
			S5K	19							6 × 2.8
			S5K	20							6 × 2.8
			S5K	22							6 × 2.8
			S5K	25							8 × 3.3
			S5K	28							8 × 3.3
			S5K	30							8 × 3.3
			S5K	32							10 × 3.3
			S5K	35							10 × 3.3
			S5K	40							12 × 3.3
			S5K	45							14 × 3.8
			S5K	50							14 × 3.8

[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
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Stainless Steel Spur Gears

Newly added



Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

Bevel Gearboxes

Other Products

Set Screw		Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—	98.7	18.0	10.1	1.83	0.18~0.36	1.51 1.51 1.50 1.49 1.49 1.49 1.47 1.46 1.44 1.42 1.41 1.38 1.33 1.28 1.22	<b>SUSA2-56</b> ●SUSA2-56J15 ●SUSA2-56J16 ●SUSA2-56J18 ●SUSA2-56J19 ●SUSA2-56J20 ●SUSA2-56J22 ●SUSA2-56J25 ●SUSA2-56J28 ●SUSA2-56J30 ●SUSA2-56J32 ●SUSA2-56J35 ●SUSA2-56J40 ●SUSA2-56J45 ●SUSA2-56J50
—	—	107	20.8	10.9	2.13	0.18~0.36	1.74 1.73 1.73 1.72 1.72 1.71 1.70 1.68 1.66 1.65 1.63 1.61 1.56 1.51 1.45	<b>SUSA2-60</b> ●SUSA2-60J15 ●SUSA2-60J16 ●SUSA2-60J18 ●SUSA2-60J19 ●SUSA2-60J20 ●SUSA2-60J22 ●SUSA2-60J25 ●SUSA2-60J28 ●SUSA2-60J30 ●SUSA2-60J32 ●SUSA2-60J35 ●SUSA2-60J40 ●SUSA2-60J45 ●SUSA2-60J50
—	—	116	23.9	11.8	2.44	0.18~0.36	1.98 1.98 1.97 1.97 1.96 1.96 1.95 1.93 1.91 1.89 1.88 1.85 1.81 1.75 1.69	<b>SUSA2-64</b> ●SUSA2-64J15 ●SUSA2-64J16 ●SUSA2-64J18 ●SUSA2-64J19 ●SUSA2-64J20 ●SUSA2-64J22 ●SUSA2-64J25 ●SUSA2-64J28 ●SUSA2-64J30 ●SUSA2-64J32 ●SUSA2-64J35 ●SUSA2-64J40 ●SUSA2-64J45 ●SUSA2-64J50
—	—	128	29.0	13.1	2.96	0.18~0.36	2.37 2.37 2.37 2.36 2.35 2.35 2.34 2.32 2.30 2.29 2.27 2.25 2.20 2.15 2.09	<b>SUSA2-70</b> ●SUSA2-70J15 ●SUSA2-70J16 ●SUSA2-70J18 ●SUSA2-70J19 ●SUSA2-70J20 ●SUSA2-70J22 ●SUSA2-70J25 ●SUSA2-70J28 ●SUSA2-70J30 ●SUSA2-70J32 ●SUSA2-70J35 ●SUSA2-70J40 ●SUSA2-70J45 ●SUSA2-70J50

[Caution on J series] ① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.

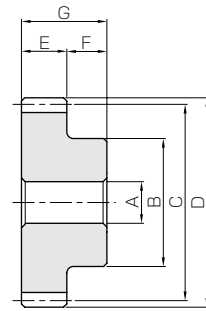
② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.

③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	SUS303
Heat treatment	—
Tooth hardness	less than 187HB

\* The precision grade of J Series products is equivalent to the value shown in the table.



S1

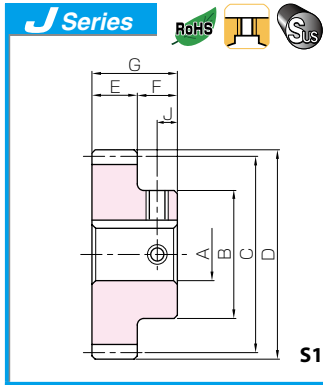
Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway	
				A <sub>H7</sub>	B	C	D	E	F	G	Width×Depth	
<b>SUS2.5-15</b> ● <b>SUS2.5-15J15</b> ● <b>SUS2.5-15J16</b>	m2.5	15	S1	15	30	37.5	42.5	25	18	43	—	
			S1K	15							5 × 2.3	
			S1K	16							5 × 2.3	
		<b>SUS2.5-16</b> ● <b>SUS2.5-16J15</b> ● <b>SUS2.5-16J16</b>	16	S1	15	32	40	45	25	18	43	—
				S1K	15							5 × 2.3
				S1K	16							5 × 2.3
		<b>SUS2.5-18</b> ● <b>SUS2.5-18J15</b> ● <b>SUS2.5-18J16</b> ● <b>SUS2.5-18J18</b> ● <b>SUS2.5-18J19</b> ● <b>SUS2.5-18J20</b> ● <b>SUS2.5-18J22</b>	18	S1	15	38	45	50	25	18	43	—
				S1K	15							5 × 2.3
				S1K	16							5 × 2.3
				S1K	18							6 × 2.8
				S1K	19							6 × 2.8
				S1K	20							6 × 2.8
<b>SUS2.5-20</b> ● <b>SUS2.5-20J15</b> ● <b>SUS2.5-20J16</b> ● <b>SUS2.5-20J18</b> ● <b>SUS2.5-20J19</b> ● <b>SUS2.5-20J20</b> ● <b>SUS2.5-20J22</b>	20	S1	15	40	50	55	25	18	43	—		
		S1K	15							5 × 2.3		
		S1K	16							5 × 2.3		
		S1K	18							6 × 2.8		
		S1K	19							6 × 2.8		
		S1K	20							6 × 2.8		
<b>SUS2.5-22</b> ● <b>SUS2.5-22J15</b> ● <b>SUS2.5-22J16</b> ● <b>SUS2.5-22J18</b> ● <b>SUS2.5-22J19</b> ● <b>SUS2.5-22J20</b> ● <b>SUS2.5-22J22</b> ● <b>SUS2.5-22J25</b>	22	S1	15	44	55	60	25	18	43	—		
		S1K	15							5 × 2.3		
		S1K	16							5 × 2.3		
		S1K	18							6 × 2.8		
		S1K	19							6 × 2.8		
		S1K	20							6 × 2.8		
<b>SUS2.5-24</b> ● <b>SUS2.5-24J15</b> ● <b>SUS2.5-24J16</b> ● <b>SUS2.5-24J18</b> ● <b>SUS2.5-24J19</b> ● <b>SUS2.5-24J20</b> ● <b>SUS2.5-24J22</b> ● <b>SUS2.5-24J25</b> ● <b>SUS2.5-24J28</b>	24	S1	15	48	60	65	25	18	43	—		
		S1K	15							5 × 2.3		
		S1K	16							5 × 2.3		
		S1K	18							6 × 2.8		
		S1K	19							6 × 2.8		
		S1K	20							6 × 2.8		
<b>SUS2.5-25</b> ● <b>SUS2.5-25J15</b> ● <b>SUS2.5-25J16</b> ● <b>SUS2.5-25J18</b> ● <b>SUS2.5-25J19</b> ● <b>SUS2.5-25J20</b> ● <b>SUS2.5-25J22</b> ● <b>SUS2.5-25J25</b> ● <b>SUS2.5-25J28</b> ● <b>SUS2.5-25J30</b>	25	S1	15	50	62.5	67.5	25	18	43	—		
		S1K	15							5 × 2.3		
		S1K	16							5 × 2.3		
		S1K	18							6 × 2.8		
		S1K	19							6 × 2.8		
		S1K	20							6 × 2.8		
<b>SUS2.5-28</b> ● <b>SUS2.5-28J15</b> ● <b>SUS2.5-28J16</b> ● <b>SUS2.5-28J18</b> ● <b>SUS2.5-28J19</b> ● <b>SUS2.5-28J20</b> ● <b>SUS2.5-28J22</b> ● <b>SUS2.5-28J25</b> ● <b>SUS2.5-28J28</b> ● <b>SUS2.5-28J30</b> ● <b>SUS2.5-28J32</b> ● <b>SUS2.5-28J35</b>	28	S1	15	60	70	75	25	18	43	—		
		S1K	15							5 × 2.3		
		S1K	16							5 × 2.3		
		S1K	18							6 × 2.8		
		S1K	19							6 × 2.8		
		S1K	20							6 × 2.8		
		S1K	22							6 × 2.8		
		S1K	25							8 × 3.3		
		S1K	28							8 × 3.3		
		S1K	30							8 × 3.3		
S1K	32	10 × 3.3										
S1K	35	10 × 3.3										

[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.



Stainless Steel Spur Gears

Newly added



Set Screw		Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—							<b>SUS2.5-15</b>
M4	9	31.9	2.11	3.25	0.21	0.14~0.28	0.26	● <b>SUS2.5-15J15</b>
M4	9						0.25	● <b>SUS2.5-15J16</b>
							0.24	
—	—							<b>SUS2.5-16</b>
M4	9	35.3	2.44	3.6	0.25	0.14~0.28	0.30	● <b>SUS2.5-16J15</b>
M4	9						0.29	● <b>SUS2.5-16J16</b>
							0.29	
—	—							<b>SUS2.5-18</b>
M4	9	42.4	3.18	4.32	0.32	0.14~0.28	0.41	● <b>SUS2.5-18J15</b>
M4	9						0.40	● <b>SUS2.5-18J16</b>
M4	9						0.40	● <b>SUS2.5-18J16</b>
M5	9						0.38	● <b>SUS2.5-18J18</b>
M5	9						0.37	● <b>SUS2.5-18J19</b>
M5	9						0.36	● <b>SUS2.5-18J20</b>
M5	9	0.33	● <b>SUS2.5-18J22</b>					
—	—							<b>SUS2.5-20</b>
M4	9	49.6	4.02	5.06	0.41	0.14~0.28	0.50	● <b>SUS2.5-20J15</b>
M4	9						0.49	● <b>SUS2.5-20J16</b>
M4	9						0.49	● <b>SUS2.5-20J16</b>
M5	9						0.46	● <b>SUS2.5-20J18</b>
M5	9						0.46	● <b>SUS2.5-20J19</b>
M5	9						0.45	● <b>SUS2.5-20J20</b>
M5	9	0.42	● <b>SUS2.5-20J22</b>					
—	—							<b>SUS2.5-22</b>
M4*	9	57.0	4.96	5.81	0.51	0.16~0.34	0.62	● <b>SUS2.5-22J15</b>
M4*	9						0.61	● <b>SUS2.5-22J16</b>
M4*	9						0.60	● <b>SUS2.5-22J16</b>
M5	9						0.58	● <b>SUS2.5-22J18</b>
M5	9						0.57	● <b>SUS2.5-22J19</b>
M5	9						0.56	● <b>SUS2.5-22J20</b>
M5	9	0.54	● <b>SUS2.5-22J22</b>					
M6	9	0.50	● <b>SUS2.5-22J25</b>					
—	—							<b>SUS2.5-24</b>
M4*	9	64.5	6.01	6.58	0.61	0.16~0.34	0.75	● <b>SUS2.5-24J15</b>
M4*	9						0.74	● <b>SUS2.5-24J16</b>
M4*	9						0.73	● <b>SUS2.5-24J16</b>
M5	9						0.71	● <b>SUS2.5-24J18</b>
M5	9						0.70	● <b>SUS2.5-24J19</b>
M5	9						0.69	● <b>SUS2.5-24J20</b>
M5	9	0.67	● <b>SUS2.5-24J22</b>					
M6	9	0.63	● <b>SUS2.5-24J25</b>					
M6	9	0.59	● <b>SUS2.5-24J28</b>					
—	—							<b>SUS2.5-25</b>
M4*	9	68.3	6.58	6.96	0.67	0.16~0.34	0.81	● <b>SUS2.5-25J15</b>
M4*	9						0.81	● <b>SUS2.5-25J15</b>
M4*	9						0.80	● <b>SUS2.5-25J16</b>
M5	9						0.78	● <b>SUS2.5-25J18</b>
M5	9						0.77	● <b>SUS2.5-25J19</b>
M5	9						0.76	● <b>SUS2.5-25J20</b>
M5	9	0.74	● <b>SUS2.5-25J22</b>					
M6	9	0.69	● <b>SUS2.5-25J25</b>					
M6	9	0.65	● <b>SUS2.5-25J28</b>					
M6	9	0.62	● <b>SUS2.5-25J30</b>					
—	—							<b>SUS2.5-28</b>
M4*	9	79.8	8.34	8.14	0.85	0.16~0.34	1.09	● <b>SUS2.5-28J15</b>
M4*	9						1.08	● <b>SUS2.5-28J15</b>
M4*	9						1.07	● <b>SUS2.5-28J16</b>
M5*	9						1.05	● <b>SUS2.5-28J18</b>
M5*	9						1.04	● <b>SUS2.5-28J19</b>
M5*	9						1.03	● <b>SUS2.5-28J20</b>
M5*	9	1.01	● <b>SUS2.5-28J22</b>					
M6	9	0.97	● <b>SUS2.5-28J25</b>					
M6	9	0.92	● <b>SUS2.5-28J28</b>					
M6	9	0.89	● <b>SUS2.5-28J30</b>					
M8	9	0.86	● <b>SUS2.5-28J32</b>					
M8	9	0.80	● <b>SUS2.5-28J35</b>					

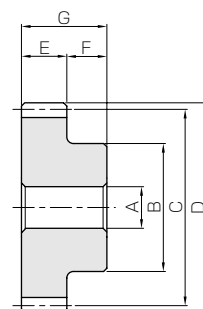
[Caution on J series]

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- ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).
- ⑤ For products having a tapped hole, a set screw is included.



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	SUS303
Heat treatment	—
Tooth hardness	less than 187HB

\* The precision grade of J Series products is equivalent to the value shown in the table.



S1

Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore		Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway
				A <sub>H7</sub>	B						C
<b>SUS2.5-30</b>	<b>m2.5</b>	30	S1	15	65	75	80	25	18	43	—
● <b>SUS2.5-30J15</b>			S1K	15							5 x 2.3
● <b>SUS2.5-30J16</b>			S1K	16							5 x 2.3
● <b>SUS2.5-30J18</b>			S1K	18							6 x 2.8
● <b>SUS2.5-30J19</b>			S1K	19							6 x 2.8
● <b>SUS2.5-30J20</b>			S1K	20							6 x 2.8
● <b>SUS2.5-30J22</b>			S1K	22							6 x 2.8
● <b>SUS2.5-30J25</b>			S1K	25							8 x 3.3
● <b>SUS2.5-30J28</b>			S1K	28							8 x 3.3
● <b>SUS2.5-30J30</b>			S1K	30							8 x 3.3
● <b>SUS2.5-30J32</b>			S1K	32							10 x 3.3
● <b>SUS2.5-30J35</b>			S1K	35							10 x 3.3

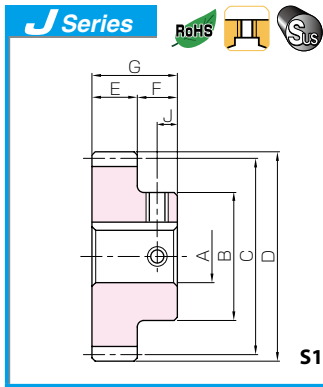
[Caution on Product Characteristics]

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- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
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- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products



**Stainless Steel Spur Gears**

**Newly added**



Set Screw		Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—	87.6	9.65	8.93	0.98	0.16~0.34	1.27	<b>SUS2.5-30</b>
M4*	9						1.26	● <b>SUS2.5-30J15</b>
M4*	9						1.25	● <b>SUS2.5-30J16</b>
M5*	9						1.23	● <b>SUS2.5-30J18</b>
M5*	9						1.22	● <b>SUS2.5-30J19</b>
M5*	9						1.21	● <b>SUS2.5-30J20</b>
M5*	9						1.19	● <b>SUS2.5-30J22</b>
M6	9						1.15	● <b>SUS2.5-30J25</b>
M6	9						1.10	● <b>SUS2.5-30J28</b>
M6	9						1.07	● <b>SUS2.5-30J30</b>
M8	9						1.03	● <b>SUS2.5-30J32</b>
M8	9	0.98	● <b>SUS2.5-30J35</b>					

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- ⑤ For products having a tapped hole, a set screw is included.

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

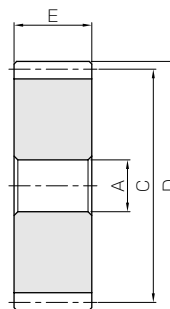
Bevel Gearboxes

Other Products



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	SUS303
Heat treatment	—
Tooth hardness	less than 187HB

\* The precision grade of J Series products is equivalent to the value shown in the table.



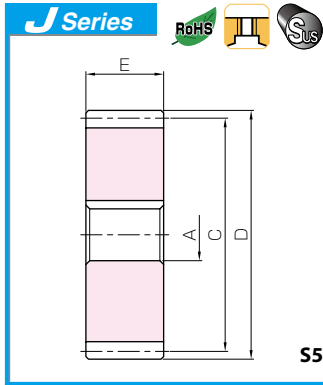
S5

Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore		Hub dia.		Pitch dia.		Outside dia.		Face width		Hub width		Total length		Keyway																				
				A <sub>H7</sub>	B	C	D	E	F	G	Width	Depth																										
<b>SUSA2.5-32</b> ● SUSA2.5-32J15 ● SUSA2.5-32J16 ● SUSA2.5-32J18 ● SUSA2.5-32J19 ● SUSA2.5-32J20 ● SUSA2.5-32J22 ● SUSA2.5-32J25 ● SUSA2.5-32J28 ● SUSA2.5-32J30 ● SUSA2.5-32J32 ● SUSA2.5-32J35	m2.5	32	S5	15	—	80	85	25	—	—	—	—	—	—	—	—	—	—	—																			
			S5K	15																5 x 2.3																		
			S5K	16																5 x 2.3																		
			S5K	18																6 x 2.8																		
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			S5K	20																6 x 2.8																		
			S5K	22																6 x 2.8																		
			S5K	25																8 x 3.3																		
			S5K	28																8 x 3.3																		
			S5K	30																8 x 3.3																		
			S5K	32																10 x 3.3																		
			S5K	35																10 x 3.3																		
			<b>SUSA2.5-35</b> ● SUSA2.5-35J15 ● SUSA2.5-35J16 ● SUSA2.5-35J18 ● SUSA2.5-35J19 ● SUSA2.5-35J20 ● SUSA2.5-35J22 ● SUSA2.5-35J25 ● SUSA2.5-35J28 ● SUSA2.5-35J30 ● SUSA2.5-35J32 ● SUSA2.5-35J35 ● SUSA2.5-35J40	m2.5																35	S5	15	—	87.5	92.5	25	—	—	—	—	—	—	—	—	—	—	—	
																					S5K	15																5 x 2.3
S5K	16	5 x 2.3																																				
S5K	18	6 x 2.8																																				
S5K	19	6 x 2.8																																				
S5K	20	6 x 2.8																																				
S5K	22	6 x 2.8																																				
S5K	25	8 x 3.3																																				
S5K	28	8 x 3.3																																				
S5K	30	8 x 3.3																																				
S5K	32	10 x 3.3																																				
S5K	35	10 x 3.3																																				
S5K	40	12 x 3.3																																				
<b>SUSA2.5-36</b> ● SUSA2.5-36J15 ● SUSA2.5-36J16 ● SUSA2.5-36J18 ● SUSA2.5-36J19 ● SUSA2.5-36J20 ● SUSA2.5-36J22 ● SUSA2.5-36J25 ● SUSA2.5-36J28 ● SUSA2.5-36J30 ● SUSA2.5-36J32 ● SUSA2.5-36J35 ● SUSA2.5-36J40	m2.5	36			S5	15	—	90	95	25	—	—	—	—	—	—	—	—	—		—	—																
			S5K	15	5 x 2.3																																	
			S5K	16	5 x 2.3																																	
			S5K	18	6 x 2.8																																	
			S5K	19	6 x 2.8																																	
			S5K	20	6 x 2.8																																	
			S5K	22	6 x 2.8																																	
			S5K	25	8 x 3.3																																	
			S5K	28	8 x 3.3																																	
			S5K	30	8 x 3.3																																	
			S5K	32	10 x 3.3																																	
			S5K	35	10 x 3.3																																	
			S5K	40	12 x 3.3																																	
			<b>SUSA2.5-40</b> ● SUSA2.5-40J20 ● SUSA2.5-40J22 ● SUSA2.5-40J25 ● SUSA2.5-40J28 ● SUSA2.5-40J30 ● SUSA2.5-40J32 ● SUSA2.5-40J35 ● SUSA2.5-40J40 ● SUSA2.5-40J45	m2.5	40	S5														20			—	100	105	25	—	—	—	—	—	—	—	—	—	—	—	
S5K	20	6 x 2.8																																				
S5K	22	6 x 2.8																																				
S5K	25	8 x 3.3																																				
S5K	28	8 x 3.3																																				
S5K	30	8 x 3.3																																				
S5K	32	10 x 3.3																																				
S5K	35	10 x 3.3																																				
S5K	40	12 x 3.3																																				
S5K	45	14 x 3.8																																				
<b>SUSA2.5-42</b> ● SUSA2.5-42J20 ● SUSA2.5-42J22 ● SUSA2.5-42J25 ● SUSA2.5-42J28 ● SUSA2.5-42J30 ● SUSA2.5-42J32 ● SUSA2.5-42J35 ● SUSA2.5-42J40 ● SUSA2.5-42J45	m2.5	42				S5	20	—	105	110	25	—	—	—	—	—	—	—	—	—	—	—																
						S5K	20																															6 x 2.8
						S5K	22																															6 x 2.8
						S5K	25																															8 x 3.3
			S5K	28	8 x 3.3																																	
			S5K	30	8 x 3.3																																	
			S5K	32	10 x 3.3																																	
			S5K	35	10 x 3.3																																	
			S5K	40	12 x 3.3																																	
			S5K	45	14 x 3.8																																	

(Caution on Product Characteristics) ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.  
② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

(Caution on Secondary Operations) ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.  
② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.





Stainless Steel Spur Gears

Newly added



Set Screw		Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—	95.4	11.1	9.73	1.13	0.16~0.34	0.95 0.94 0.94 0.93 0.92 0.92 0.90 0.88 0.85 0.84 0.82 0.79	<b>SUSA2.5-32</b> ●SUSA2.5-32J15 ●SUSA2.5-32J16 ●SUSA2.5-32J18 ●SUSA2.5-32J19 ●SUSA2.5-32J20 ●SUSA2.5-32J22 ●SUSA2.5-32J25 ●SUSA2.5-32J28 ●SUSA2.5-32J30 ●SUSA2.5-32J32 ●SUSA2.5-32J35
—	—	107	13.4	10.9	1.36	0.16~0.34	1.14 1.14 1.13 1.12 1.11 1.11 1.10 1.07 1.05 1.03 1.01 0.98 0.92	<b>SUSA2.5-35</b> ●SUSA2.5-35J15 ●SUSA2.5-35J16 ●SUSA2.5-35J18 ●SUSA2.5-35J19 ●SUSA2.5-35J20 ●SUSA2.5-35J22 ●SUSA2.5-35J25 ●SUSA2.5-35J28 ●SUSA2.5-35J30 ●SUSA2.5-35J32 ●SUSA2.5-35J35 ●SUSA2.5-35J40
—	—	111	14.2	11.3	1.45	0.16~0.34	1.21 1.20 1.20 1.19 1.18 1.18 1.16 1.14 1.12 1.10 1.08 1.05 0.99	<b>SUSA2.5-36</b> ●SUSA2.5-36J15 ●SUSA2.5-36J16 ●SUSA2.5-36J18 ●SUSA2.5-36J19 ●SUSA2.5-36J20 ●SUSA2.5-36J22 ●SUSA2.5-36J25 ●SUSA2.5-36J28 ●SUSA2.5-36J30 ●SUSA2.5-36J32 ●SUSA2.5-36J35 ●SUSA2.5-36J40
—	—	127	17.7	13.0	1.81	0.16~0.34	1.47 1.47 1.45 1.43 1.41 1.39 1.37 1.34 1.28 1.21	<b>SUSA2.5-40</b> ●SUSA2.5-40J20 ●SUSA2.5-40J22 ●SUSA2.5-40J25 ●SUSA2.5-40J28 ●SUSA2.5-40J30 ●SUSA2.5-40J32 ●SUSA2.5-40J35 ●SUSA2.5-40J40 ●SUSA2.5-40J45
—	—	135	19.6	13.8	2.00	0.18~0.40	1.63 1.62 1.61 1.59 1.56 1.55 1.53 1.49 1.44 1.37	<b>SUSA2.5-42</b> ●SUSA2.5-42J20 ●SUSA2.5-42J22 ●SUSA2.5-42J25 ●SUSA2.5-42J28 ●SUSA2.5-42J30 ●SUSA2.5-42J32 ●SUSA2.5-42J35 ●SUSA2.5-42J40 ●SUSA2.5-42J45

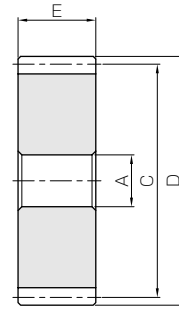
- [Caution on J series]
- ① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
  - ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
  - ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.

- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	SUS303
Heat treatment	—
Tooth hardness	less than 187HB

\* The precision grade of J Series products is equivalent to the value shown in the table.



S5

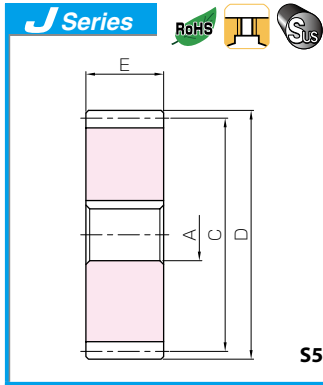
Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway									
				A <sub>H7</sub>	B	C	D	E	F	G	WidthxDepth									
<b>SUSA2.5-45</b> ● SUSA2.5-45J20 ● SUSA2.5-45J22 ● SUSA2.5-45J25 ● SUSA2.5-45J28 ● SUSA2.5-45J30 ● SUSA2.5-45J32 ● SUSA2.5-45J35 ● SUSA2.5-45J40 ● SUSA2.5-45J45 ● SUSA2.5-45J50	m2.5	45	S5	20	—	112.5	117.5	25	—	—	—									
			S5K	20							6 x 2.8									
			S5K	22							6 x 2.8									
			S5K	25							8 x 3.3									
			S5K	28							8 x 3.3									
			S5K	30							8 x 3.3									
			S5K	32							10 x 3.3									
			S5K	35							10 x 3.3									
			S5K	40							12 x 3.3									
			S5K	45							14 x 3.8									
			S5K	50							14 x 3.8									
			<b>SUSA2.5-48</b> ● SUSA2.5-48J20 ● SUSA2.5-48J22 ● SUSA2.5-48J25 ● SUSA2.5-48J28 ● SUSA2.5-48J30 ● SUSA2.5-48J32 ● SUSA2.5-48J35 ● SUSA2.5-48J40 ● SUSA2.5-48J45 ● SUSA2.5-48J50	m2.5							48	S5	20	—	120	125	25	—	—	—
												S5K	20							6 x 2.8
S5K	22	6 x 2.8																		
S5K	25	8 x 3.3																		
S5K	28	8 x 3.3																		
S5K	30	8 x 3.3																		
S5K	32	10 x 3.3																		
S5K	35	10 x 3.3																		
S5K	40	12 x 3.3																		
S5K	45	14 x 3.8																		
S5K	50	14 x 3.8																		
<b>SUSA2.5-50</b> ● SUSA2.5-50J20 ● SUSA2.5-50J22 ● SUSA2.5-50J25 ● SUSA2.5-50J28 ● SUSA2.5-50J30 ● SUSA2.5-50J32 ● SUSA2.5-50J35 ● SUSA2.5-50J40 ● SUSA2.5-50J45 ● SUSA2.5-50J50	m2.5	50			S5	20	—	125	130	25		—	—							—
					S5K	20														6 x 2.8
			S5K	22	6 x 2.8															
			S5K	25	8 x 3.3															
			S5K	28	8 x 3.3															
			S5K	30	8 x 3.3															
			S5K	32	10 x 3.3															
			S5K	35	10 x 3.3															
			S5K	40	12 x 3.3															
			S5K	45	14 x 3.8															
			S5K	50	14 x 3.8															
			<b>SUSA2.5-55</b> ● SUSA2.5-55J20 ● SUSA2.5-55J22 ● SUSA2.5-55J25 ● SUSA2.5-55J28 ● SUSA2.5-55J30 ● SUSA2.5-55J32 ● SUSA2.5-55J35 ● SUSA2.5-55J40 ● SUSA2.5-55J45 ● SUSA2.5-55J50	m2.5	55	S5					20			—	137.5	142.5	25	—	—	—
						S5K					20									6 x 2.8
S5K	22	6 x 2.8																		
S5K	25	8 x 3.3																		
S5K	28	8 x 3.3																		
S5K	30	8 x 3.3																		
S5K	32	10 x 3.3																		
S5K	35	10 x 3.3																		
S5K	40	12 x 3.3																		
S5K	45	14 x 3.8																		
S5K	50	14 x 3.8																		
<b>SUSA2.5-56</b> ● SUSA2.5-56J20 ● SUSA2.5-56J22 ● SUSA2.5-56J25 ● SUSA2.5-56J28 ● SUSA2.5-56J30 ● SUSA2.5-56J32 ● SUSA2.5-56J35 ● SUSA2.5-56J40 ● SUSA2.5-56J45 ● SUSA2.5-56J50	m2.5	56				S5	20	—	140	145	25	—	—							—
						S5K	20													6 x 2.8
			S5K	22	6 x 2.8															
			S5K	25	8 x 3.3															
			S5K	28	8 x 3.3															
			S5K	30	8 x 3.3															
			S5K	32	10 x 3.3															
			S5K	35	10 x 3.3															
			S5K	40	12 x 3.3															
			S5K	45	14 x 3.8															
			S5K	50	14 x 3.8															

[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations]

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- ② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.



Stainless Steel Spur Gears

Newly added



Set Screw		Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—	148	22.7	15.0	2.31	0.18~0.40	1.88 1.87 1.86 1.84 1.81 1.80 1.78 1.74 1.69 1.62 1.55	<b>SUSA2.5-45</b> ● SUSA2.5-45J20 ● SUSA2.5-45J22 ● SUSA2.5-45J25 ● SUSA2.5-45J28 ● SUSA2.5-45J30 ● SUSA2.5-45J32 ● SUSA2.5-45J35 ● SUSA2.5-45J40 ● SUSA2.5-45J45 ● SUSA2.5-45J50
—	—	160	26.1	16.3	2.66	0.18~0.40	2.14 2.14 2.13 2.10 2.08 2.06 2.04 2.01 1.95 1.88 1.81	<b>SUSA2.5-48</b> ● SUSA2.5-48J20 ● SUSA2.5-48J22 ● SUSA2.5-48J25 ● SUSA2.5-48J28 ● SUSA2.5-48J30 ● SUSA2.5-48J32 ● SUSA2.5-48J35 ● SUSA2.5-48J40 ● SUSA2.5-48J45 ● SUSA2.5-48J50
—	—	168	28.4	17.1	2.90	0.18~0.40	2.33 2.33 2.32 2.29 2.27 2.25 2.23 2.20 2.14 2.07 2.00	<b>SUSA2.5-50</b> ● SUSA2.5-50J20 ● SUSA2.5-50J22 ● SUSA2.5-50J25 ● SUSA2.5-50J28 ● SUSA2.5-50J30 ● SUSA2.5-50J32 ● SUSA2.5-50J35 ● SUSA2.5-50J40 ● SUSA2.5-50J45 ● SUSA2.5-50J50
—	—	189	34.9	19.2	3.56	0.18~0.40	2.83 2.83 2.82 2.79 2.77 2.75 2.73 2.70 2.64 2.58 2.50	<b>SUSA2.5-55</b> ● SUSA2.5-55J20 ● SUSA2.5-55J22 ● SUSA2.5-55J25 ● SUSA2.5-55J28 ● SUSA2.5-55J30 ● SUSA2.5-55J32 ● SUSA2.5-55J35 ● SUSA2.5-55J40 ● SUSA2.5-55J45 ● SUSA2.5-55J50
—	—	193	36.2	19.6	3.70	0.18~0.40	2.94 2.94 2.92 2.90 2.88 2.86 2.84 2.81 2.75 2.68 2.61	<b>SUSA2.5-56</b> ● SUSA2.5-56J20 ● SUSA2.5-56J22 ● SUSA2.5-56J25 ● SUSA2.5-56J28 ● SUSA2.5-56J30 ● SUSA2.5-56J32 ● SUSA2.5-56J35 ● SUSA2.5-56J40 ● SUSA2.5-56J45 ● SUSA2.5-56J50

[Caution on J series] ① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.

② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.

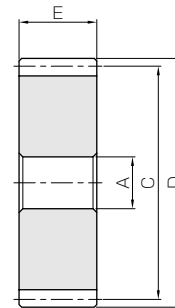
③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.

- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	SUS303
Heat treatment	—
Tooth hardness	less than 187HB

\* The precision grade of J Series products is equivalent to the value shown in the table.



S5

Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway							
				A <sub>H7</sub>	B	C	D	E	F	G	Width×Depth							
<b>SUSA2.5-60</b>	m2.5	60	S5	20	—	150	155	25	—	—	—							
● SUSA2.5-60J20			S5K	20							6 × 2.8							
● SUSA2.5-60J22			S5K	22							6 × 2.8							
● SUSA2.5-60J25			S5K	25							8 × 3.3							
● SUSA2.5-60J28			S5K	28							8 × 3.3							
● SUSA2.5-60J30			S5K	30							8 × 3.3							
● SUSA2.5-60J32			S5K	32							10 × 3.3							
● SUSA2.5-60J35			S5K	35							10 × 3.3							
● SUSA2.5-60J40			S5K	40							12 × 3.3							
● SUSA2.5-60J45			S5K	45							14 × 3.8							
● SUSA2.5-60J50			S5K	50							14 × 3.8							
<b>SUSA2.5-64</b>			64	S5							20	—	160	165	25	—	—	—
● SUSA2.5-64J20				S5K							20							6 × 2.8
● SUSA2.5-64J22				S5K							22							6 × 2.8
● SUSA2.5-64J25	S5K	25		8 × 3.3														
● SUSA2.5-64J28	S5K	28		8 × 3.3														
● SUSA2.5-64J30	S5K	30		8 × 3.3														
● SUSA2.5-64J32	S5K	32		10 × 3.3														
● SUSA2.5-64J35	S5K	35		10 × 3.3														
● SUSA2.5-64J40	S5K	40		12 × 3.3														
● SUSA2.5-64J45	S5K	45		14 × 3.8														
● SUSA2.5-64J50	S5K	50	14 × 3.8															

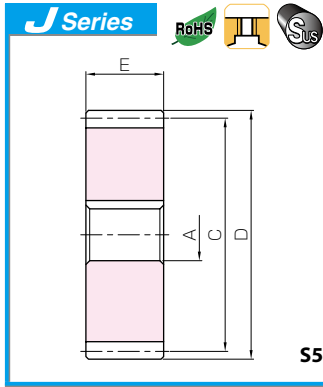
[Caution on Product Characteristics]

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- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

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Spur Gears  
Helical Gears  
Internal Gears  
Racks  
CP Racks & Pinions  
Miter Gears  
Bevel Gears  
Screw Gears  
Worm Gear Pair  
Bevel Gearboxes  
Other Products



Stainless Steel Spur Gears

Newly added



Set Screw		Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)							
Size	J	Bending strength	Surface durability	Bending strength	Surface durability										
—	—	209	42.0	21.3	4.28	0.18~0.40	3.38	<b>SUSA2.5-60</b>							
							3.38	● SUSA2.5-60J20							
							3.37	● SUSA2.5-60J22							
							3.35	● SUSA2.5-60J25							
							3.32	● SUSA2.5-60J28							
							3.30	● SUSA2.5-60J30							
							3.28	● SUSA2.5-60J32							
							3.25	● SUSA2.5-60J35							
							3.19	● SUSA2.5-60J40							
							3.13	● SUSA2.5-60J45							
							3.05	● SUSA2.5-60J50							
							—	—	226	48.2	23.0	4.91	0.18~0.40	3.86	<b>SUSA2.5-64</b>
														3.86	● SUSA2.5-64J20
3.84	● SUSA2.5-64J22														
3.82	● SUSA2.5-64J25														
3.80	● SUSA2.5-64J28														
3.78	● SUSA2.5-64J30														
3.76	● SUSA2.5-64J32														
3.73	● SUSA2.5-64J35														
3.67	● SUSA2.5-64J40														
3.60	● SUSA2.5-64J45														
3.53	● SUSA2.5-64J50														

[Caution on J series]

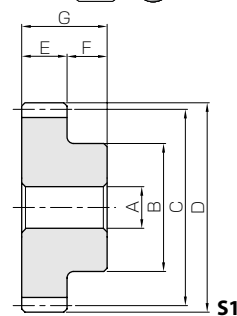
- ① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.

- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	SUS303
Heat treatment	—
Tooth hardness	less than 187HB

\* The precision grade of J Series products is equivalent to the value shown in the table.



Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks &amp; Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

Bevel Gearboxes

Other Products

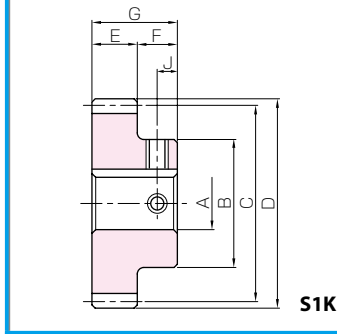
Catalog No. ●: J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	Width×Depth
<b>SUS3-15</b> ●SUS3-15J15 ●SUS3-15J16 ●SUS3-15J18 ●SUS3-15J19	m3	15	S1	15	36	45	51	30	20	50	—
			S1K	15							5 × 2.3
			S1K	16							5 × 2.3
			S1K	18							6 × 2.8
			S1K	19							6 × 2.8
<b>SUS3-16</b> ●SUS3-16J15 ●SUS3-16J16 ●SUS3-16J18 ●SUS3-16J19 ●SUS3-16J20 ●SUS3-16J22	m3	16	S1	15	38	48	54	30	20	50	—
			S1K	15							5 × 2.3
			S1K	16							5 × 2.3
			S1K	18							6 × 2.8
			S1K	19							6 × 2.8
			S1K	20							6 × 2.8
<b>SUS3-18</b> ●SUS3-18J15 ●SUS3-18J16 ●SUS3-18J18 ●SUS3-18J19 ●SUS3-18J20 ●SUS3-18J22	m3	18	S1	15	40	54	60	30	20	50	—
			S1K	15							5 × 2.3
			S1K	16							5 × 2.3
			S1K	18							6 × 2.8
			S1K	19							6 × 2.8
<b>SUS3-20</b> ●SUS3-20J15 ●SUS3-20J16 ●SUS3-20J18 ●SUS3-20J19 ●SUS3-20J20 ●SUS3-20J22 ●SUS3-20J25 ●SUS3-20J28 ●SUS3-20J30	m3	20	S1	15	50	60	66	30	20	50	—
			S1K	15							5 × 2.3
			S1K	16							5 × 2.3
			S1K	18							6 × 2.8
			S1K	19							6 × 2.8
			S1K	20							6 × 2.8
			S1K	22							6 × 2.8
S1K	25	8 × 3.3									
<b>SUS3-22</b> ●SUS3-22J15 ●SUS3-22J16 ●SUS3-22J18 ●SUS3-22J19 ●SUS3-22J20 ●SUS3-22J22 ●SUS3-22J25 ●SUS3-22J28 ●SUS3-22J30 ●SUS3-22J32	m3	22	S1	15	54	66	72	30	20	50	—
			S1K	15							5 × 2.3
			S1K	16							5 × 2.3
			S1K	18							6 × 2.8
			S1K	19							6 × 2.8
			S1K	20							6 × 2.8
			S1K	22							6 × 2.8
S1K	25	8 × 3.3									
<b>SUS3-24</b> ●SUS3-24J15 ●SUS3-24J16 ●SUS3-24J18 ●SUS3-24J19 ●SUS3-24J20 ●SUS3-24J22 ●SUS3-24J25 ●SUS3-24J28 ●SUS3-24J30 ●SUS3-24J32	m3	24	S1	15	58	72	78	30	20	50	—
			S1K	15							5 × 2.3
			S1K	16							5 × 2.3
			S1K	18							6 × 2.8
			S1K	19							6 × 2.8
			S1K	20							6 × 2.8
			S1K	22							6 × 2.8
S1K	25	8 × 3.3									
<b>SUS3-25</b> ●SUS3-25J20 ●SUS3-25J22 ●SUS3-25J25 ●SUS3-25J28 ●SUS3-25J30 ●SUS3-25J32 ●SUS3-25J35	m3	25	S1	20	60	75	81	30	20	50	—
			S1K	20							6 × 2.8
			S1K	22							6 × 2.8
			S1K	25							8 × 3.3
			S1K	28							8 × 3.3
			S1K	30							8 × 3.3
			S1K	32							10 × 3.3
S1K	35	10 × 3.3									

[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.



Set Screw		Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—						0.46	<b>SUS3-15</b>
M4	10	55.1	3.71	5.62	0.38	0.14~0.32	0.46	●SUS3-15J15
M4	10						0.45	●SUS3-15J16
M5	10						0.42	●SUS3-15J18
M5	10						0.41	●SUS3-15J19
M5	10						0.41	●SUS3-15J19
—	—						0.53	<b>SUS3-16</b>
M4	10	61.1	4.29	6.23	0.44	0.14~0.32	0.52	●SUS3-16J15
M4	10						0.52	●SUS3-16J16
M5	10						0.49	●SUS3-16J18
M5	10						0.48	●SUS3-16J19
M5	10						0.47	●SUS3-16J20
M5	10						0.44	●SUS3-16J22
M5	10						0.44	●SUS3-16J22
—	—						0.66	<b>SUS3-18</b>
M4	10	73.3	5.59	7.47	0.57	0.14~0.32	0.66	●SUS3-18J15
M4	10						0.65	●SUS3-18J16
M5	10						0.62	●SUS3-18J18
M5	10						0.61	●SUS3-18J19
M5	10						0.60	●SUS3-18J20
M5	10						0.57	●SUS3-18J22
M5	10						0.57	●SUS3-18J22
—	—						0.90	<b>SUS3-20</b>
M4*	10	85.8	7.07	8.74	0.72	0.14~0.32	0.89	●SUS3-20J15
M4*	10						0.88	●SUS3-20J16
M5	10						0.86	●SUS3-20J18
M5	10						0.85	●SUS3-20J19
M5	10						0.83	●SUS3-20J20
M5	10						0.81	●SUS3-20J22
M6	10						0.76	●SUS3-20J25
M6	10						0.71	●SUS3-20J28
M6	10						0.68	●SUS3-20J30
M6	10						0.68	●SUS3-20J30
—	—						1.09	<b>SUS3-22</b>
M4*	10	98.5	8.73	10.0	0.89	0.18~0.38	1.08	●SUS3-22J15
M4*	10						1.07	●SUS3-22J16
M5*	10						1.05	●SUS3-22J18
M5*	10						1.04	●SUS3-22J19
M5	10						1.02	●SUS3-22J20
M5	10						1.00	●SUS3-22J22
M6	10						0.95	●SUS3-22J25
M6	10						0.90	●SUS3-22J28
M6	10						0.87	●SUS3-22J30
M6	10						0.87	●SUS3-22J30
M8	10						0.82	●SUS3-22J32
—	—						1.30	<b>SUS3-24</b>
M4*	10	111	10.6	11.4	1.08	0.18~0.38	1.29	●SUS3-24J15
M4*	10						1.28	●SUS3-24J16
M5*	10						1.25	●SUS3-24J18
M5*	10						1.24	●SUS3-24J19
M5*	10						1.23	●SUS3-24J20
M5*	10						1.20	●SUS3-24J22
M6	10						1.16	●SUS3-24J25
M6	10						1.11	●SUS3-24J28
M6	10						1.07	●SUS3-24J30
M6	10						1.07	●SUS3-24J30
M8	10						1.03	●SUS3-24J32
—	—						1.35	<b>SUS3-25</b>
M5*	10	118	11.6	12.0	1.18	0.18~0.38	1.34	●SUS3-25J20
M5*	10						1.31	●SUS3-25J22
M6	10						1.27	●SUS3-25J25
M6	10						1.22	●SUS3-25J28
M6	10						1.18	●SUS3-25J30
M8	10						1.14	●SUS3-25J32
M8	10						1.14	●SUS3-25J32
M8	10						1.08	●SUS3-25J35

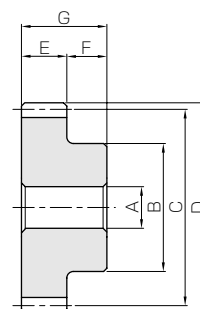
[Caution on J series]

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- ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).
- ⑤ For products having a tapped hole, a set screw is included.



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	SUS303
Heat treatment	—
Tooth hardness	less than 187HB

\* The precision grade of J Series products is equivalent to the value shown in the table.



S1

Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	Width×Depth
<b>SUS3-28</b> ● SUS3-28J20 ● SUS3-28J22 ● SUS3-28J25 ● SUS3-28J28 ● SUS3-28J30 ● SUS3-28J32 ● SUS3-28J35 ● SUS3-28J40	m3	28	S1	20	70	84	90	30	20	50	—
			S1K	20							6 × 2.8
			S1K	22							6 × 2.8
			S1K	25							8 × 3.3
			S1K	28							8 × 3.3
			S1K	30							8 × 3.3
			S1K	32							10 × 3.3
			S1K	35							10 × 3.3
			S1K	40							12 × 3.3
			<b>SUS3-30</b> ● SUS3-30J20 ● SUS3-30J22 ● SUS3-30J25 ● SUS3-30J28 ● SUS3-30J30 ● SUS3-30J32 ● SUS3-30J35 ● SUS3-30J40 ● SUS3-30J45	m3							30
S1K	20	6 × 2.8									
S1K	22	6 × 2.8									
S1K	25	8 × 3.3									
S1K	28	8 × 3.3									
S1K	30	8 × 3.3									
S1K	32	10 × 3.3									
S1K	35	10 × 3.3									
S1K	40	12 × 3.3									
S1K	45	14 × 3.8									

[Caution on Product Characteristics]

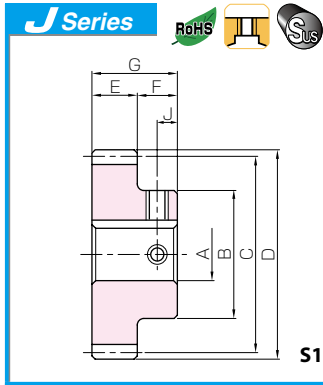
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- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations]

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- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products





**Stainless Steel Spur Gears**

**Newly added**



Set Screw		Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—	138	14.7	14.1	1.50	0.18~0.38	1.77 1.76 1.73 1.69 1.64 1.60 1.56 1.50 1.38	<b>SUS3-28</b>
M5*	10							●SUS3-28J20
M5*	10							●SUS3-28J22
M6*	10							●SUS3-28J25
M6*	10							●SUS3-28J28
M6	10							●SUS3-28J30
M8	10							●SUS3-28J32
M8	10							●SUS3-28J35
M8	10							●SUS3-28J40
—	—	151	17.0	15.4	1.74	0.18~0.38	2.06 2.04 2.01 1.97 1.92 1.88 1.83 1.77 1.66 1.52	<b>SUS3-30</b>
M5*	10							●SUS3-30J20
M5*	10							●SUS3-30J22
M6*	10							●SUS3-30J25
M6*	10							●SUS3-30J28
M6*	10							●SUS3-30J30
M8	10							●SUS3-30J32
M8	10							●SUS3-30J35
M8	10							●SUS3-30J40
M10	10							●SUS3-30J45

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Spur Gears

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Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

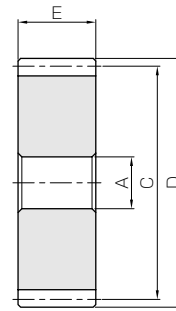
Bevel Gearboxes

Other Products



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	SUS303
Heat treatment	—
Tooth hardness	less than 187HB

\* The precision grade of J Series products is equivalent to the value shown in the table.



S5

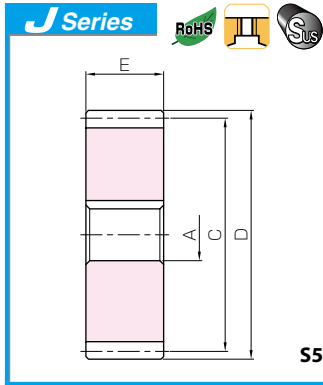
Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	WidthxDepth
<b>SUSA3-32</b> ● SUSA3-32J20 ● SUSA3-32J22 ● SUSA3-32J25 ● SUSA3-32J28 ● SUSA3-32J30 ● SUSA3-32J32 ● SUSA3-32J35 ● SUSA3-32J40 ● SUSA3-32J45	<b>m3</b>	32	S5	20	—	96	102	30	—	—	—
S5K			20	6 x 2.8							
S5K			22	6 x 2.8							
S5K			25	8 x 3.3							
S5K			28	8 x 3.3							
S5K			30	8 x 3.3							
S5K			32	10 x 3.3							
S5K			35	10 x 3.3							
S5K			40	12 x 3.3							
S5K		45	14 x 3.8								
<b>SUSA3-35</b> ● SUSA3-35J20 ● SUSA3-35J22 ● SUSA3-35J25 ● SUSA3-35J28 ● SUSA3-35J30 ● SUSA3-35J32 ● SUSA3-35J35 ● SUSA3-35J40 ● SUSA3-35J45		35	S5	20	—	105	111	30	—	—	—
S5K			20	6 x 2.8							
S5K			22	6 x 2.8							
S5K			25	8 x 3.3							
S5K			28	8 x 3.3							
S5K			30	8 x 3.3							
S5K			32	10 x 3.3							
S5K			35	10 x 3.3							
S5K			40	12 x 3.3							
S5K		45	14 x 3.8								
<b>SUSA3-36</b> ● SUSA3-36J20 ● SUSA3-36J22 ● SUSA3-36J25 ● SUSA3-36J28 ● SUSA3-36J30 ● SUSA3-36J32 ● SUSA3-36J35 ● SUSA3-36J40 ● SUSA3-36J45 ● SUSA3-36J50		36	S5	20	—	108	114	30	—	—	—
S5K			20	6 x 2.8							
S5K			22	6 x 2.8							
S5K			25	8 x 3.3							
S5K	28		8 x 3.3								
S5K	30		8 x 3.3								
S5K	32		10 x 3.3								
S5K	35		10 x 3.3								
S5K	40		12 x 3.3								
S5K	45	14 x 3.8									
S5K	50	14 x 3.8									
<b>SUSA3-40</b> ● SUSA3-40J25 ● SUSA3-40J28 ● SUSA3-40J30 ● SUSA3-40J32 ● SUSA3-40J35 ● SUSA3-40J40 ● SUSA3-40J45 ● SUSA3-40J50	40	S5	25	—	120	126	30	—	—	—	
S5K		25	8 x 3.3								
S5K		28	8 x 3.3								
S5K		30	8 x 3.3								
S5K		32	10 x 3.3								
S5K		35	10 x 3.3								
S5K		40	12 x 3.3								
S5K		45	14 x 3.8								
S5K		50	14 x 3.8								
<b>SUSA3-42</b> ● SUSA3-42J25 ● SUSA3-42J28 ● SUSA3-42J30 ● SUSA3-42J32 ● SUSA3-42J35 ● SUSA3-42J40 ● SUSA3-42J45 ● SUSA3-42J50	42	S5	25	—	126	132	30	—	—	—	
S5K		25	8 x 3.3								
S5K		28	8 x 3.3								
S5K		30	8 x 3.3								
S5K		32	10 x 3.3								
S5K		35	10 x 3.3								
S5K		40	12 x 3.3								
S5K		45	14 x 3.8								
S5K		50	14 x 3.8								
<b>SUSA3-45</b> ● SUSA3-45J25 ● SUSA3-45J28 ● SUSA3-45J30 ● SUSA3-45J32 ● SUSA3-45J35 ● SUSA3-45J40 ● SUSA3-45J45 ● SUSA3-45J50	45	S5	25	—	135	141	30	—	—	—	
S5K		25	8 x 3.3								
S5K		28	8 x 3.3								
S5K		30	8 x 3.3								
S5K		32	10 x 3.3								
S5K		35	10 x 3.3								
S5K		40	12 x 3.3								
S5K		45	14 x 3.8								
S5K		50	14 x 3.8								

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Bevel Gearboxes

Other Products

Set Screw		Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—	165	19.5	16.8	1.99	0.18~0.38	1.62 1.62 1.60 1.57 1.54 1.52 1.50 1.46 1.39 1.31	<b>SUSA3-32</b> ●SUSA3-32J20 ●SUSA3-32J22 ●SUSA3-32J25 ●SUSA3-32J28 ●SUSA3-32J30 ●SUSA3-32J32 ●SUSA3-32J35 ●SUSA3-32J40 ●SUSA3-32J45
—	—	185	23.6	18.9	2.40	0.18~0.38	1.95 1.95 1.93 1.91 1.88 1.85 1.83 1.79 1.72 1.64	<b>SUSA3-35</b> ●SUSA3-35J20 ●SUSA3-35J22 ●SUSA3-35J25 ●SUSA3-35J28 ●SUSA3-35J30 ●SUSA3-35J32 ●SUSA3-35J35 ●SUSA3-35J40 ●SUSA3-35J45
—	—	192	25.0	19.6	2.55	0.18~0.38	2.07 2.07 2.05 2.02 1.99 1.97 1.95 1.91 1.84 1.76 1.67	<b>SUSA3-36</b> ●SUSA3-36J20 ●SUSA3-36J22 ●SUSA3-36J25 ●SUSA3-36J28 ●SUSA3-36J30 ●SUSA3-36J32 ●SUSA3-36J35 ●SUSA3-36J40 ●SUSA3-36J45 ●SUSA3-36J50
—	—	220	31.3	22.4	3.19	0.18~0.38	2.53 2.53 2.50 2.47 2.45 2.41 2.34 2.26 2.17	<b>SUSA3-40</b> ●SUSA3-40J25 ●SUSA3-40J28 ●SUSA3-40J30 ●SUSA3-40J32 ●SUSA3-40J35 ●SUSA3-40J40 ●SUSA3-40J45 ●SUSA3-40J50
—	—	234	34.7	23.9	3.54	0.20~0.44	2.80 2.80 2.77 2.75 2.72 2.68 2.61 2.53 2.45	<b>SUSA3-42</b> ●SUSA3-42J25 ●SUSA3-42J28 ●SUSA3-42J30 ●SUSA3-42J32 ●SUSA3-42J35 ●SUSA3-42J40 ●SUSA3-42J45 ●SUSA3-42J50
—	—	255	40.2	26.0	4.10	0.20~0.44	3.23 3.23 3.20 3.18 3.15 3.12 3.05 2.96 2.88	<b>SUSA3-45</b> ●SUSA3-45J25 ●SUSA3-45J28 ●SUSA3-45J30 ●SUSA3-45J32 ●SUSA3-45J35 ●SUSA3-45J40 ●SUSA3-45J45 ●SUSA3-45J50

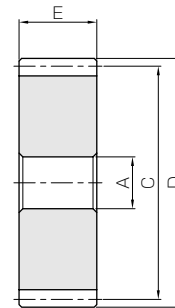
[Caution on J series]

- ① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	SUS303
Heat treatment	—
Tooth hardness	less than 187HB

\* The precision grade of J Series products is equivalent to the value shown in the table.

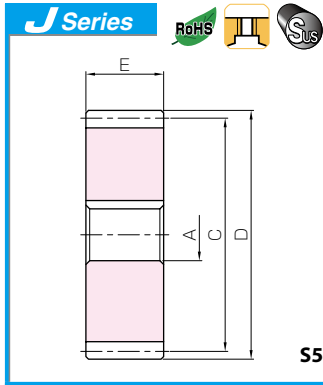


S5

Catalog No. ●: J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	WidthxDepth
<b>SUSA3-48</b> ● SUSA3-48J25 ● SUSA3-48J28 ● SUSA3-48J30 ● SUSA3-48J32 ● SUSA3-48J35 ● SUSA3-48J40 ● SUSA3-48J45 ● SUSA3-48J50	m3	48	S5	25	—	144	150	30	—	—	—
			S5K	25							8 x 3.3
			S5K	28							8 x 3.3
			S5K	30							8 x 3.3
			S5K	32							10 x 3.3
			S5K	35							10 x 3.3
			S5K	40							12 x 3.3
			S5K	45							14 x 3.8
			S5K	50							14 x 3.8
			<b>SUSA3-50</b> ● SUSA3-50J25 ● SUSA3-50J28 ● SUSA3-50J30 ● SUSA3-50J32 ● SUSA3-50J35 ● SUSA3-50J40 ● SUSA3-50J45 ● SUSA3-50J50	m3							50
S5K	25	8 x 3.3									
S5K	28	8 x 3.3									
S5K	30	8 x 3.3									
S5K	32	10 x 3.3									
S5K	35	10 x 3.3									
S5K	40	12 x 3.3									
S5K	45	14 x 3.8									
S5K	50	14 x 3.8									
<b>SUSA3-55</b> ● SUSA3-55J25 ● SUSA3-55J28 ● SUSA3-55J30 ● SUSA3-55J32 ● SUSA3-55J35 ● SUSA3-55J40 ● SUSA3-55J45 ● SUSA3-55J50	m3	55			S5	25	—	165	171	30	
			S5K	25	8 x 3.3						
			S5K	28	8 x 3.3						
			S5K	30	8 x 3.3						
			S5K	32	10 x 3.3						
			S5K	35	10 x 3.3						
			S5K	40	12 x 3.3						
			S5K	45	14 x 3.8						
			S5K	50	14 x 3.8						
			<b>SUSA3-56</b> ● SUSA3-56J25 ● SUSA3-56J28 ● SUSA3-56J30 ● SUSA3-56J32 ● SUSA3-56J35 ● SUSA3-56J40 ● SUSA3-56J45 ● SUSA3-56J50	m3	56	S5					25
S5K	25	8 x 3.3									
S5K	28	8 x 3.3									
S5K	30	8 x 3.3									
S5K	32	10 x 3.3									
S5K	35	10 x 3.3									
S5K	40	12 x 3.3									
S5K	45	14 x 3.8									
S5K	50	14 x 3.8									
<b>SUSA3-60</b> ● SUSA3-60J25 ● SUSA3-60J28 ● SUSA3-60J30 ● SUSA3-60J32 ● SUSA3-60J35 ● SUSA3-60J40 ● SUSA3-60J45 ● SUSA3-60J50	m3	60				S5	25	—	180	186	30
			S5K	25	8 x 3.3						
			S5K	28	8 x 3.3						
			S5K	30	8 x 3.3						
			S5K	32	10 x 3.3						
			S5K	35	10 x 3.3						
			S5K	40	12 x 3.3						
			S5K	45	14 x 3.8						
			S5K	50	14 x 3.8						

[Caution on Product Characteristics] ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.  
② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.  
② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.



**Stainless Steel Spur Gears**

**Newly added**



Set Screw		Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—	276	46.2	28.2	4.71	0.20~0.44	3.70 3.69 3.66 3.64 3.62 3.58 3.51 3.43 3.34	<b>SUSA3-48</b> ● <b>SUSA3-48J25</b> ● <b>SUSA3-48J28</b> ● <b>SUSA3-48J30</b> ● <b>SUSA3-48J32</b> ● <b>SUSA3-48J35</b> ● <b>SUSA3-48J40</b> ● <b>SUSA3-48J45</b> ● <b>SUSA3-48J50</b>
—	—	290	50.4	29.6	5.14	0.20~0.44	4.02 4.01 3.98 3.96 3.94 3.90 3.83 3.75 3.66	<b>SUSA3-50</b> ● <b>SUSA3-50J25</b> ● <b>SUSA3-50J28</b> ● <b>SUSA3-50J30</b> ● <b>SUSA3-50J32</b> ● <b>SUSA3-50J35</b> ● <b>SUSA3-50J40</b> ● <b>SUSA3-50J45</b> ● <b>SUSA3-50J50</b>
—	—	326	61.7	33.2	6.30	0.20~0.44	4.89 4.88 4.85 4.83 4.81 4.77 4.70 4.62 4.53	<b>SUSA3-55</b> ● <b>SUSA3-55J25</b> ● <b>SUSA3-55J28</b> ● <b>SUSA3-55J30</b> ● <b>SUSA3-55J32</b> ● <b>SUSA3-55J35</b> ● <b>SUSA3-55J40</b> ● <b>SUSA3-55J45</b> ● <b>SUSA3-55J50</b>
—	—	333	64.1	33.9	6.54	0.20~0.44	5.07 5.07 5.04 5.02 4.99 4.95 4.88 4.80 4.72	<b>SUSA3-56</b> ● <b>SUSA3-56J25</b> ● <b>SUSA3-56J28</b> ● <b>SUSA3-56J30</b> ● <b>SUSA3-56J32</b> ● <b>SUSA3-56J35</b> ● <b>SUSA3-56J40</b> ● <b>SUSA3-56J45</b> ● <b>SUSA3-56J50</b>
—	—	362	74.3	36.9	7.58	0.20~0.44	5.84 5.83 5.80 5.78 5.76 5.72 5.65 5.57 5.48	<b>SUSA3-60</b> ● <b>SUSA3-60J25</b> ● <b>SUSA3-60J28</b> ● <b>SUSA3-60J30</b> ● <b>SUSA3-60J32</b> ● <b>SUSA3-60J35</b> ● <b>SUSA3-60J40</b> ● <b>SUSA3-60J45</b> ● <b>SUSA3-60J50</b>

**[Caution on J series]** ① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order.

Please allow additional shipping time to get to your local distributor.

② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.

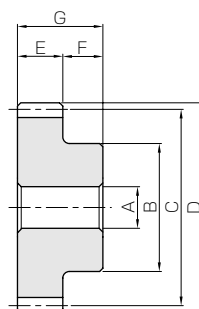
③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.

- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	SUS303
Heat treatment	—
Tooth hardness	less than 187HB

\* The precision grade of J Series products is equivalent to the value shown in the table.

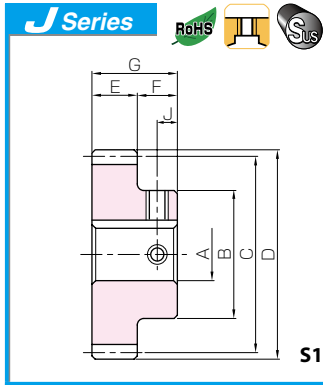


S1

Catalog No. ●: J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	Width×Depth
<b>SUS4-15</b> ●SUS4-15J20 ●SUS4-15J22 ●SUS4-15J25	m4	15	S1	20	45	60	68	40	25	65	—
			S1K	20							6 × 2.8
			S1K	22							6 × 2.8
			S1K	25							8 × 3.3
<b>SUS4-20</b> ●SUS4-20J20 ●SUS4-20J22 ●SUS4-20J25 ●SUS4-20J28 ●SUS4-20J30 ●SUS4-20J32 ●SUS4-20J35	m4	20	S1	20	65	80	88	40	25	65	—
			S1K	20							6 × 2.8
			S1K	22							6 × 2.8
			S1K	25							8 × 3.3
			S1K	28							8 × 3.3
			S1K	30							8 × 3.3
			S1K	32							10 × 3.3
			S1K	35							10 × 3.3
<b>SUS4-25</b> ●SUS4-25J20 ●SUS4-25J22 ●SUS4-25J25 ●SUS4-25J28 ●SUS4-25J30 ●SUS4-25J32 ●SUS4-25J35 ●SUS4-25J40 ●SUS4-25J45 ●SUS4-25J50	m4	25	S1	20	84	100	108	40	25	65	—
			S1K	20							6 × 2.8
			S1K	22							6 × 2.8
			S1K	25							8 × 3.3
			S1K	28							8 × 3.3
			S1K	30							8 × 3.3
			S1K	32							10 × 3.3
			S1K	35							10 × 3.3
			S1K	40							12 × 3.3
			S1K	45							14 × 3.8
S1K	50	14 × 3.8									
<b>SUS4-30</b> ●SUS4-30J20 ●SUS4-30J22 ●SUS4-30J25 ●SUS4-30J28 ●SUS4-30J30 ●SUS4-30J32 ●SUS4-30J35 ●SUS4-30J40 ●SUS4-30J45 ●SUS4-30J50	m4	30	S1	20	100	120	128	40	25	65	—
			S1K	20							6 × 2.8
			S1K	22							6 × 2.8
			S1K	25							8 × 3.3
			S1K	28							8 × 3.3
			S1K	30							8 × 3.3
			S1K	32							10 × 3.3
			S1K	35							10 × 3.3
			S1K	40							12 × 3.3
			S1K	45							14 × 3.8
S1K	50	14 × 3.8									

[Caution on Product Characteristics] ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.  
② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations] ① Please read “Caution on Performing Secondary Operations” (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK’s system for quick modification of KHK stock gears is also available.  
② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.



Stainless Steel Spur Gears

Newly added



Set Screw		Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—	131	9.06	13.3	0.92	0.18~0.38	1.03 1.02 0.99 0.93	<b>SUS4-15</b>
M5	12.5							● <b>SUS4-15J20</b>
M5	12.5							● <b>SUS4-15J22</b>
M6	12.5							● <b>SUS4-15J25</b>
—	—	203	17.3	20.7	1.76	0.18~0.38	2.06 2.04 2.01 1.94 1.88 1.84 1.78 1.70	<b>SUS4-20</b>
M5*	12.5							● <b>SUS4-20J20</b>
M5*	12.5							● <b>SUS4-20J22</b>
M6	12.5							● <b>SUS4-20J25</b>
M6	12.5							● <b>SUS4-20J28</b>
M6	12.5							● <b>SUS4-20J30</b>
M8	12.5							● <b>SUS4-20J32</b>
M8	12.5							● <b>SUS4-20J35</b>
—	—	280	28.3	28.5	2.89	0.20~0.44	3.37 3.35 3.32 3.26 3.19 3.15 3.09 3.01 2.86 2.67 2.49	<b>SUS4-25</b>
M5*	12.5							● <b>SUS4-25J20</b>
M5*	12.5							● <b>SUS4-25J22</b>
M6*	12.5							● <b>SUS4-25J25</b>
M6*	12.5							● <b>SUS4-25J28</b>
M6*	12.5							● <b>SUS4-25J30</b>
M8	12.5							● <b>SUS4-25J32</b>
M8	12.5							● <b>SUS4-25J35</b>
M8	12.5							● <b>SUS4-25J40</b>
M10	12.5							● <b>SUS4-25J45</b>
M10	12.5	● <b>SUS4-25J50</b>						
—	—	359	41.7	36.6	4.25	0.20~0.44	4.90 4.88 4.85 4.78 4.72 4.67 4.61 4.53 4.38 4.19 4.01	<b>SUS4-30</b>
M5*	12.5							● <b>SUS4-30J20</b>
M5*	12.5							● <b>SUS4-30J22</b>
M6*	12.5							● <b>SUS4-30J25</b>
M6*	12.5							● <b>SUS4-30J28</b>
M6*	12.5							● <b>SUS4-30J30</b>
M8*	12.5							● <b>SUS4-30J32</b>
M8*	12.5							● <b>SUS4-30J35</b>
M8*	12.5							● <b>SUS4-30J40</b>
M10	12.5							● <b>SUS4-30J45</b>
M10	12.5	● <b>SUS4-30J50</b>						

[Caution on J series]

- ① As available-on-request products, requires a lead-time for shipping (from the factory) **5 working-days after placing an order**. Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is **1 to 20 units**. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).
- ⑤ For products having a tapped hole, a set screw is included.

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

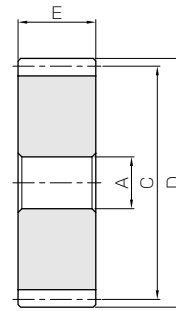
Bevel Gearboxes

Other Products



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	SUS303
Heat treatment	—
Tooth hardness	less than 187HB

\* The precision grade of J Series products is equivalent to the value shown in the table.



S5

Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	Width×Depth
<b>SUSA4-40</b> ● SUSA4-40J30 ● SUSA4-40J32 ● SUSA4-40J35 ● SUSA4-40J40 ● SUSA4-40J45 ● SUSA4-40J50	m4	40	S5	30	—	160	168	40	—	—	—
			S5K	30							8 x 3.3
			S5K	32							10 x 3.3
			S5K	35							10 x 3.3
			S5K	40							12 x 3.3
			S5K	45							14 x 3.8
			S5K	50							14 x 3.8
<b>SUSA4-50</b> ● SUSA4-50J30 ● SUSA4-50J32 ● SUSA4-50J35 ● SUSA4-50J40 ● SUSA4-50J45 ● SUSA4-50J50	m4	50	S5	30	—	200	208	40	—	—	—
			S5K	30							8 x 3.3
			S5K	32							10 x 3.3
			S5K	35							10 x 3.3
			S5K	40							12 x 3.3
			S5K	45							14 x 3.8
			S5K	50							14 x 3.8

[Caution on Product Characteristics]

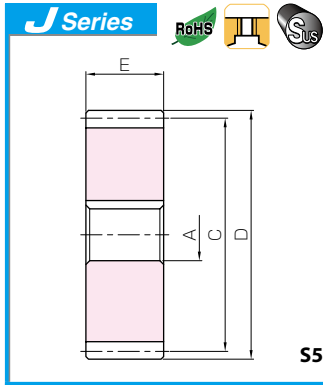
- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations]

- ① Please read “Caution on Performing Secondary Operations” (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
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- Helical Gears
- Internal Gears
- Racks
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- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products





**Stainless Steel Spur Gears**

**Newly added**



Set Screw		Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
Size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—	521	77.1	53.2	7.86	0.20~0.44	6.05 6.04 6.01 5.96 5.87 5.76 5.64	<b>SUSA4-40</b> ● <b>SUSA4-40J30</b> ● <b>SUSA4-40J32</b> ● <b>SUSA4-40J35</b> ● <b>SUSA4-40J40</b> ● <b>SUSA4-40J45</b> ● <b>SUSA4-40J50</b>
—	—	573	103	58.5	10.5	0.24~0.52	9.58 9.57 9.54 9.49 9.40 9.29 9.17	<b>SUSA4-50</b> ● <b>SUSA4-50J30</b> ● <b>SUSA4-50J32</b> ● <b>SUSA4-50J35</b> ● <b>SUSA4-50J40</b> ● <b>SUSA4-50J45</b> ● <b>SUSA4-50J50</b>

- [Caution on J series]**
- ① As available-on-request products, requires a lead-time for shipping within **3 working-days (excludes the day ordered)**, after placing an order. Please allow additional shipping time to get to your local distributor.
  - ② Number of products we can process for one order is **1 to 20 units**. For quantities of 21 or more pieces, we need to quote price and lead time.
  - ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.

- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products



Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks &amp; Pinions

Miter Gears

Bevel Gears

Screw Gears

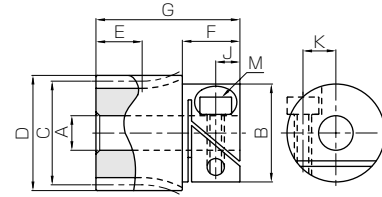
Worm Gear Pair

Bevel Gearboxes

Other Products



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	SUS303
Heat treatment	—
Tooth hardness	less than 187HB



\* The gear grade listed is the value before clamping. The precision grade of products with a module of less than 0.8 is equivalent to the value shown in the table.

S3

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Cap screw dimensions		
				A <sub>H7</sub>	B	C	D	E	F	G	M	J	K
SUSL0.5-16	m0.5	16	S3	4	14	8	9	7	8	22	M2.5	3.3	4.4
SUSL0.5-18		18	S3	4	14	9	10	7	8	22	M2.5	3.3	4.4
SUSL0.5-20		20	S3	4	14	10	11	7	8	22	M2.5	3.3	4.4
SUSL0.5-24		24	S3	5	14	12	13	7	8	22	M2.5	3.3	4.4
SUSL0.5-25		25	S3	5	14	12.5	13.5	7	8	22	M2.5	3.3	4.4
SUSL0.5-28		28	S3	5	14	14	15	7	8	22	M2.5	3.3	4.4
SUSL0.5-30		30	S3	5	14	15	16	7	8	22	M2.5	3.3	4.4
SUSL0.5-32		32	S3	6	17	16	17	5	10	15	M3	4.5	5.3
SUSL0.5-36		36	S3	6	17	18	19	5	10	15	M3	4.5	5.3
SUSL0.5-40		40	S1	6	17	20	21	5	10	15	M3	4.5	5.3
SUSL0.5-45		45	S1	6	17	22.5	23.5	5	10	15	M3	4.5	5.3
SUSL0.5-48		48	S1	6	17	24	25	5	10	15	M3	4.5	5.3
SUSL0.5-50		50	S1	6	17	25	26	5	10	15	M3	4.5	5.3
SUSL0.5-54		54	S1	6	17	27	28	5	10	15	M3	4.5	5.3
SUSL0.5-56		56	S1	6	17	28	29	5	10	15	M3	4.5	5.3
SUSL0.5-60		60	S1	8	17	30	31	5	10	15	M3	4.5	6
SUSL0.5-64		64	S1	8	17	32	33	5	10	15	M3	4.5	6
SUSL0.5-70		70	S1	8	17	35	36	5	10	15	M3	4.5	6
SUSL0.5-72		72	S1	8	17	36	37	5	10	15	M3	4.5	6
SUSL0.5-75		75	S1	8	17	37.5	38.5	5	10	15	M3	4.5	6
SUSL0.5-80	80	S1	10	24	40	41	5	14	19	M4	5.3	7.7	
SUSL0.5-90	90	S1	10	24	45	46	5	14	19	M4	5.3	7.7	
SUSL0.5-96	96	S1	10	24	48	49	5	14	19	M4	4.9	8	
SUSL0.5-100	100	S1	10	24	50	51	5	14	19	M4	4.9	8	
SUSL0.5-112	112	S1	10	24	56	57	5	14	19	M4	4.9	8	
SUSL0.5-120	120	S1	10	24	60	61	5	14	19	M4	4.9	8	
SUSL0.8-14	m0.8	14	S3	4	14	11.2	12.8	7	8	22	M2.5	3.3	4.4
SUSL0.8-15		15	S3	4	14	12	13.6	7	8	22	M2.5	3.3	4.4
SUSL0.8-16		16	S3	4	14	12.8	14.4	7	8	22	M2.5	3.3	4.4
SUSL0.8-18		18	S3	4	14	14.4	16	7	8	22	M2.5	3.3	4.4
SUSL0.8-20		20	S1	4	14	16	17.6	5	8	13	M2.5	3.3	4.4
SUSL0.8-22		22	S1	4	14	17.6	19.2	5	8	13	M2.5	3.3	4.4
SUSL0.8-24		24	S1	5	14	19.2	20.8	5	8	13	M2.5	3.3	4.4
SUSL0.8-25		25	S1	5	14	20	21.6	5	8	13	M2.5	3.3	4.4
SUSL0.8-28		28	S1	5	14	22.4	24	5	8	13	M2.5	3.3	4.4
SUSL0.8-30		30	S1	5	14	24	25.6	5	8	13	M2.5	3.3	4.4

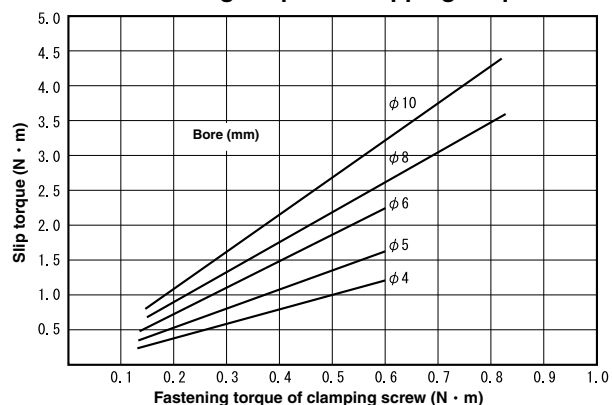
[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.
- ③ Fairloc Hub Gears are attached to the shaft by friction. Slipping torque should be considered when making a selection.
- ④ Do not tighten the clamping screw without inserting a shaft, or the bore will be permanently deformed and will not accept a shaft
- ⑤ The hub configurations are slightly different from the drawings shown above. But there is no difference in functionality.

### Fastening torque vs. Slipping torque

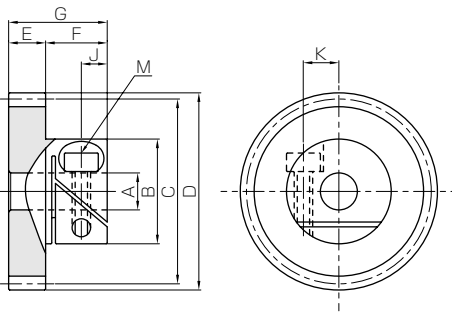
The slipping torque which is dependent on the fastening torque can sometimes be less than the gear strength. Please use caution in selecting. The chart on the right shows the relationship between the slipping torque and the fastening torque.

### Fastening torque vs. Slipping torque



※ Data supplied by Designtronics Inc.

## Stainless Steel Fairloc Hub Spur Gears



S1

Allowable torque (N-m)		Allowable torque (kgf-m)		Recommended fastening torque		Backlash (mm)	Weight (kg)	Catalog No.
Bending strength	Surface durability	Bending strength	Surface durability	(N-m)	(kgf-m)			
0.40	0.023	0.04	0.0023	0.60	0.061	0~0.10	0.012	SUSL0.5-16
0.47	0.03	0.048	0.0031	0.60	0.061	0~0.10	0.013	SUSL0.5-18
0.56	0.038	0.057	0.0039	0.60	0.061	0~0.10	0.015	SUSL0.5-20
0.72	0.056	0.074	0.0057	0.60	0.061	0~0.10	0.018	SUSL0.5-24
0.76	0.061	0.078	0.0062	0.60	0.061	0~0.10	0.019	SUSL0.5-25
0.89	0.079	0.091	0.0080	0.60	0.061	0~0.10	0.022	SUSL0.5-28
0.98	0.091	0.10	0.0093	0.60	0.061	0~0.10	0.025	SUSL0.5-30
0.76	0.076	0.078	0.0077	0.60	0.061	0~0.10	0.021	SUSL0.5-32
0.89	0.096	0.091	0.0098	0.60	0.061	0~0.10	0.023	SUSL0.5-36
1.02	0.12	0.10	0.012	0.60	0.061	0~0.10	0.025	SUSL0.5-40
1.18	0.15	0.12	0.016	0.60	0.061	0~0.10	0.029	SUSL0.5-45
1.28	0.17	0.13	0.018	0.60	0.061	0~0.10	0.031	SUSL0.5-48
1.34	0.19	0.14	0.019	0.60	0.061	0~0.10	0.032	SUSL0.5-50
1.48	0.22	0.15	0.023	0.60	0.061	0~0.10	0.035	SUSL0.5-54
1.54	0.24	0.16	0.025	0.60	0.061	0~0.10	0.037	SUSL0.5-56
1.67	0.28	0.17	0.029	0.80	0.082	0~0.10	0.038	SUSL0.5-60
1.81	0.32	0.18	0.033	0.80	0.082	0~0.10	0.042	SUSL0.5-64
2.01	0.39	0.20	0.04	0.80	0.082	0~0.10	0.048	SUSL0.5-70
2.07	0.41	0.21	0.042	0.80	0.082	0~0.10	0.050	SUSL0.5-72
2.17	0.45	0.22	0.046	0.80	0.082	0~0.10	0.054	SUSL0.5-75
2.34	0.51	0.24	0.053	0.80	0.082	0~0.10	0.084	SUSL0.5-80
2.68	0.66	0.27	0.067	0.80	0.082	0~0.10	0.097	SUSL0.5-90
2.88	0.76	0.29	0.077	0.80	0.082	0~0.10	0.11	SUSL0.5-96
3.02	0.82	0.31	0.084	0.80	0.082	0~0.10	0.11	SUSL0.5-100
3.42	1.05	0.35	0.11	0.80	0.082	0~0.10	0.13	SUSL0.5-112
3.69	1.21	0.38	0.12	0.80	0.082	0~0.10	0.15	SUSL0.5-120
0.82	0.048	0.083	0.0049	0.60	0.061	0~0.10	0.017	SUSL0.8-14
0.92	0.056	0.093	0.0057	0.60	0.061	0~0.10	0.019	SUSL0.8-15
1.01	0.065	0.10	0.0066	0.60	0.061	0~0.10	0.021	SUSL0.8-16
1.22	0.083	0.12	0.0085	0.60	0.061	0~0.10	0.024	SUSL0.8-18
1.02	0.076	0.10	0.0077	0.60	0.061	0~0.10	0.015	SUSL0.8-20
1.17	0.091	0.12	0.0093	0.60	0.061	0~0.10	0.017	SUSL0.8-22
1.32	0.11	0.13	0.011	0.60	0.061	0~0.10	0.018	SUSL0.8-24
1.40	0.12	0.14	0.012	0.60	0.061	0~0.10	0.019	SUSL0.8-25
1.63	0.15	0.17	0.015	0.60	0.061	0~0.10	0.022	SUSL0.8-28
1.79	0.17	0.18	0.018	0.60	0.061	0~0.10	0.024	SUSL0.8-30

[Caution on Secondary Operations]

- ① These are finished products, avoid performing secondary operations on the bore.
- ② Perform secondary operations carefully as to not distort the groove for clamping.

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks &amp; Pinions

Miter Gears

Bevel Gears

Screw Gears

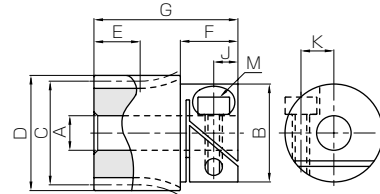
Worm Gear Pair

Bevel Gearboxes

Other Products



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	SUS303
Heat treatment	—
Tooth hardness	less than 187HB



\* The gear grade listed is the value before clamping. The precision grade of products with a module of less than 0.8 is equivalent to the value shown in the table.

S3

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Cap screw dimensions		
				AH7	B	C	D	E	F	G	M	J	K
SUSL0.8-32	m0.8	32	S1	5	14	25.6	27.2	5	8	13	M2.5	3.3	4.4
SUSL0.8-36		36	S1	6	17	28.8	30.4	5	10	15	M3	4.5	5.3
SUSL0.8-40		40	S1	6	17	32	33.6	5	10	15	M3	4.5	5.3
SUSL0.8-45		45	S1	6	17	36	37.6	5	10	15	M3	4.5	5.3
SUSL0.8-48		48	S1	6	17	38.4	40	5	10	15	M3	4.5	5.3
SUSL0.8-50		50	S1	6	17	40	41.6	5	10	15	M3	4.5	5.3
SUSL0.8-54		54	S1	6	17	43.2	44.8	5	10	15	M3	4.5	5.3
SUSL0.8-56		56	S1	6	17	44.8	46.4	5	10	15	M3	4.5	5.3
SUSL0.8-60		60	S1	8	17	48	49.6	5	10	15	M3	4.5	6
SUSL0.8-64		64	S1	8	17	51.2	52.8	5	10	15	M3	4.5	6
SUSL0.8-72	m1	72	S1	8	17	57.6	59.2	5	10	15	M3	4.5	6
SUSL0.8-80		80	S1	10	24	64	65.6	5	14	19	M4	4.9	8
SUSL0.8-90		90	S1	10	24	72	73.6	5	14	19	M4	4.9	8
SUSL0.8-100		100	S1	10	24	80	81.6	5	14	19	M4	4.9	8
SUSL1-14	m1	14	S3	6	17	14	16	8	10	25	M3	4.5	5.3
SUSL1-15		15	S3	6	17	15	17	8	10	25	M3	4.5	5.3
SUSL1-16		16	S3	6	17	16	18	8	10	25	M3	4.5	5.3
SUSL1-18		18	S3	6	17	18	20	8	10	25	M3	4.5	5.3
SUSL1-20		20	S1	6	17	20	22	6	10	16	M3	4.5	5.3
SUSL1-24		24	S1	6	17	24	26	6	10	16	M3	4.5	5.3
SUSL1-25		25	S1	6	17	25	27	6	10	16	M3	4.5	5.3
SUSL1-28		28	S1	6	17	28	30	6	10	16	M3	4.5	5.3
SUSL1-30		30	S1	8	17	30	32	6	10	16	M3	4.5	6
SUSL1-32		32	S1	8	17	32	34	6	10	16	M3	4.5	6
SUSL1-35	m1	35	S1	8	17	35	37	6	10	16	M3	4.5	6
SUSL1-36		36	S1	8	17	36	38	6	10	16	M3	4.5	6
SUSL1-40		40	S1	8	17	40	42	6	10	16	M3	4.5	6
SUSL1-45		45	S1	8	17	45	47	6	10	16	M3	4.5	6
SUSL1-48		48	S1	8	17	48	50	6	10	16	M3	4.5	6
SUSL1-50		50	S1	10	24	50	52	6	14	20	M4	4.9	8
SUSL1-56	56	S1	10	24	56	58	6	14	20	M4	4.9	8	
SUSL1-60	60	S1	10	24	60	62	6	14	20	M4	4.9	8	
SUSL1-64	64	S1	10	24	64	66	6	14	20	M4	4.9	8	
SUSL1-70	70	S1	10	24	70	72	6	14	20	M4	4.9	8	
SUSL1-72	m1	72	S1	10	24	72	74	6	14	20	M4	4.9	8
SUSL1-80		80	S1	10	24	80	82	6	14	20	M4	4.9	8
SUSL1-90		90	S1	10	24	90	92	6	14	20	M4	4.9	8
SUSL1-100		100	S1	10	24	100	102	6	14	20	M4	4.9	8

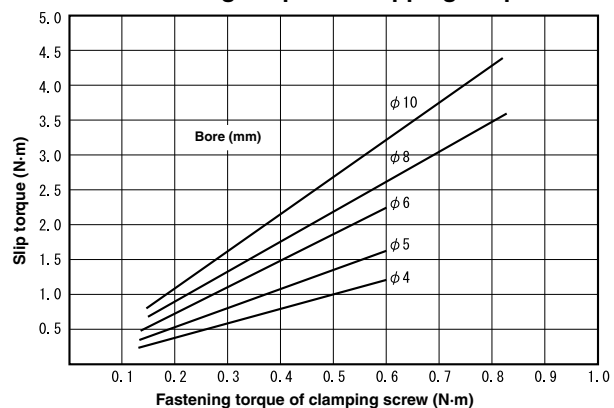
[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.
- ③ Fairloc Hub Gears are attached to the shaft by friction. Slipping torque should be considered when making a selection.
- ④ Do not tighten the clamping screw without inserting a shaft, or the bore will be permanently deformed and will not accept a shaft
- ⑤ The hub configurations are slightly different from the drawings shown above. But there is no difference in functionality.

### Fastening torque vs. Slipping torque

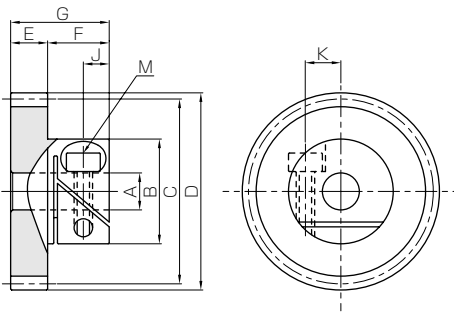
The slipping torque which is dependent on the fastening torque can sometimes be less than the gear strength. Please use caution in selecting. The chart on the right shows the relationship between the slipping torque and the fastening torque.

### Fastening torque vs. Slipping torque



※ Data supplied by Designatronics Inc.

## Stainless Steel Fairloc Hub Spur Gears



S1

Allowable torque (N-m)		Allowable torque (kgf-m)		Recommended fastening torque		Backlash (mm)	Weight (kg)	Catalog No.
Bending strength	Surface durability	Bending strength	Surface durability	(N-m)	(kgf-m)			
1.95	0.20	0.20	0.020	0.60	0.061	0~0.10	0.027	SUSL0.8-32
2.28	0.26	0.23	0.026	0.60	0.061	0~0.10	0.038	SUSL0.8-36
2.61	0.32	0.27	0.033	0.60	0.061	0~0.10	0.044	SUSL0.8-40
3.02	0.41	0.31	0.042	0.60	0.061	0~0.10	0.053	SUSL0.8-45
3.27	0.47	0.33	0.048	0.60	0.061	0~0.10	0.058	SUSL0.8-48
3.44	0.51	0.35	0.053	0.60	0.061	0~0.10	0.062	SUSL0.8-50
3.78	0.61	0.39	0.062	0.60	0.061	0~0.10	0.070	SUSL0.8-54
3.95	0.65	0.40	0.067	0.60	0.061	0~0.10	0.075	SUSL0.8-56
4.28	0.76	0.44	0.077	0.80	0.082	0~0.10	0.081	SUSL0.8-60
4.63	0.87	0.47	0.088	0.80	0.082	0~0.10	0.091	SUSL0.8-64
5.31	1.11	0.54	0.11	0.80	0.082	0~0.10	0.11	SUSL0.8-72
6.00	1.38	0.61	0.14	0.80	0.082	0~0.10	0.16	SUSL0.8-80
6.86	1.77	0.70	0.18	0.80	0.082	0~0.10	0.19	SUSL0.8-90
7.72	2.21	0.79	0.23	0.80	0.082	0~0.10	0.23	SUSL0.8-100
1.46	0.088	0.15	0.0090	0.60	0.061	0~0.10	0.029	SUSL1-14
1.63	0.10	0.17	0.010	0.60	0.061	0~0.10	0.032	SUSL1-15
1.81	0.12	0.18	0.012	0.60	0.061	0~0.10	0.034	SUSL1-16
2.17	0.15	0.22	0.016	0.60	0.061	0~0.10	0.041	SUSL1-18
1.91	0.14	0.19	0.015	0.60	0.061	0~0.10	0.028	SUSL1-20
2.48	0.21	0.25	0.021	0.60	0.061	0~0.10	0.034	SUSL1-24
2.62	0.23	0.27	0.023	0.60	0.061	0~0.10	0.036	SUSL1-25
3.06	0.29	0.31	0.030	0.60	0.061	0~0.10	0.042	SUSL1-28
3.36	0.34	0.34	0.034	0.80	0.082	0~0.10	0.043	SUSL1-30
3.66	0.39	0.37	0.039	0.80	0.082	0~0.10	0.048	SUSL1-32
4.12	0.47	0.42	0.048	0.80	0.082	0~0.10	0.055	SUSL1-35
4.27	0.49	0.44	0.050	0.80	0.082	0~0.10	0.058	SUSL1-36
4.89	0.62	0.50	0.063	0.80	0.082	0~0.10	0.069	SUSL1-40
5.67	0.79	0.58	0.081	0.80	0.082	0~0.10	0.085	SUSL1-45
6.14	0.91	0.63	0.093	0.80	0.082	0~0.10	0.095	SUSL1-48
6.45	0.99	0.66	0.10	0.80	0.082	0~0.10	0.13	SUSL1-50
7.40	1.25	0.75	0.13	0.80	0.082	0~0.10	0.15	SUSL1-56
8.03	1.45	0.82	0.15	0.80	0.082	0~0.10	0.17	SUSL1-60
8.67	1.66	0.88	0.17	0.80	0.082	0~0.10	0.19	SUSL1-64
9.63	2.00	0.98	0.20	0.80	0.082	0~0.10	0.21	SUSL1-70
9.95	2.12	1.02	0.22	0.80	0.082	0~0.10	0.23	SUSL1-72
11.2	2.65	1.15	0.27	0.80	0.082	0~0.10	0.27	SUSL1-80
12.9	3.40	1.31	0.35	0.80	0.082	0~0.10	0.33	SUSL1-90
14.5	4.25	1.48	0.43	0.80	0.082	0~0.10	0.40	SUSL1-100

[Caution on Secondary Operations]

- ① These are finished products, avoid performing secondary operations on the bore.  
 ② Perform secondary operations carefully as to not distort the groove for clamping.

Spur  
GearsHelical  
GearsInternal  
Gears

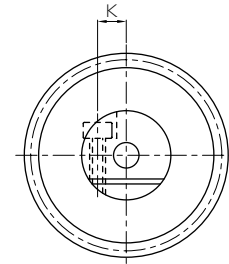
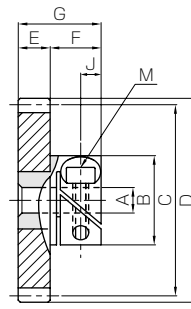
Racks

CP Racks  
& PinionsMiter  
GearsBevel  
GearsScrew  
GearsWorm  
Gear PairBevel  
GearboxesOther  
Products



Specifications	
Precision grade	JIS grade N10 (JIS B1702-1: 1998) * JIS grade 6 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	Acetal with SUS303 core
Heat treatment	—
Tooth hardness	110 ~ 120HRR

\* The gear grade listed is the value before clamping. The precision grade of products with a module of less than 0.8 is equivalent to the value shown in the table.



S1

Catalog No.	Module	No. of teeth	Shape	Bore										Cap screw dimensions		
				AH7	B	C	D	E	F	G	M	J	K			
DSL0.5-28	m0.5	28	S1	5	14	14	15	5	8.5	13.5	M2.5	3.3	4.4			
DSL0.5-30		30	S1	5	14	15	16	5	8.5	13.5	M2.5	3.3	4.4			
DSL0.5-32		32	S1	5	14	16	17	5	8.5	13.5	M2.5	3.3	4.4			
DSL0.5-36		36	S1	5	14	18	19	5	8.5	13.5	M2.5	3.3	4.4			
DSL0.5-40		40	S1	5	14	20	21	5	8.5	13.5	M2.5	3.3	4.4			
DSL0.5-45		45	S1	5	14	22.5	23.5	5	8.5	13.5	M2.5	3.3	4.4			
DSL0.5-48		48	S1	5	14	24	25	5	8.5	13.5	M2.5	3.3	4.4			
DSL0.5-50		50	S1	5	14	25	26	5	8.5	13.5	M2.5	3.3	4.4			
DSL0.5-56		56	S1	5	14	28	29	5	8.5	13.5	M2.5	3.3	4.4			
DSL0.5-60		60	S1	5	14	30	31	5	8.5	13.5	M2.5	3.3	4.4			
DSL0.5-64		64	S1	5	14	32	33	5	8.5	13.5	M2.5	3.3	4.4			
DSL0.5-70		70	S1	5	14	35	36	5	8.5	13.5	M2.5	3.3	4.4			
DSL0.5-72		72	S1	5	14	36	37	5	8.5	13.5	M2.5	3.3	4.4			
DSL0.5-75		75	S1	5	14	37.5	38.5	5	8.5	13.5	M2.5	3.3	4.4			
DSL0.5-80		80	S1	5	14	40	41	5	8.5	13.5	M2.5	3.3	4.4			
DSL0.5-90		90	S1	8	17	45	46	5	9.8	14.8	M3	4.3	5.9			
DSL0.5-96		96	S1	8	17	48	49	5	9.8	14.8	M3	4.3	5.9			
DSL0.5-100		100	S1	8	17	50	51	5	9.8	14.8	M3	4.3	5.9			
DSL0.5-120		120	S1	8	17	60	61	5	9.8	14.8	M3	4.3	5.9			
DSL0.8-20		m0.8	20	S1	5	14	16	17.6	5	8.5	13.5	M2.5	3.3	4.4		
DSL0.8-24	24		S1	5	14	19.2	20.8	5	8.5	13.5	M2.5	3.3	4.4			
DSL0.8-25	25		S1	5	14	20	21.6	5	8.5	13.5	M2.5	3.3	4.4			
DSL0.8-28	28		S1	5	14	22.4	24	5	8.5	13.5	M2.5	3.3	4.4			
DSL0.8-30	30		S1	5	14	24	25.6	5	8.5	13.5	M2.5	3.3	4.4			
DSL0.8-32	32		S1	5	14	25.6	27.2	5	8.5	13.5	M2.5	3.3	4.4			
DSL0.8-36	36		S1	5	14	28.8	30.4	5	8.5	13.5	M2.5	3.3	4.4			
DSL0.8-40	40		S1	5	14	32	33.6	5	8.5	13.5	M2.5	3.3	4.4			
DSL0.8-45	45		S1	5	14	36	37.6	5	8.5	13.5	M2.5	3.3	4.4			
DSL0.8-48	48		S1	5	14	38.4	40	5	8.5	13.5	M2.5	3.3	4.4			
DSL0.8-50	50		S1	5	14	40	41.6	5	8.5	13.5	M2.5	3.3	4.4			
DSL0.8-56	56		S1	5	14	44.8	46.4	5	8.5	13.5	M2.5	3.3	4.4			
DSL0.8-60	60		S1	8	17	48	49.6	5	9.8	14.8	M3	4.3	5.9			
DSL0.8-72	72		S1	8	17	57.6	59.2	5	9.8	14.8	M3	4.3	5.9			
DSL0.8-80	80		S1	8	17	64	65.6	5	9.8	14.8	M3	4.3	5.9			
DSL0.8-90	90		S1	8	17	72	73.6	5	9.8	14.8	M3	4.3	5.9			
DSL0.8-100	100		S1	8	17	80	81.6	5	9.8	14.8	M3	4.3	5.9			

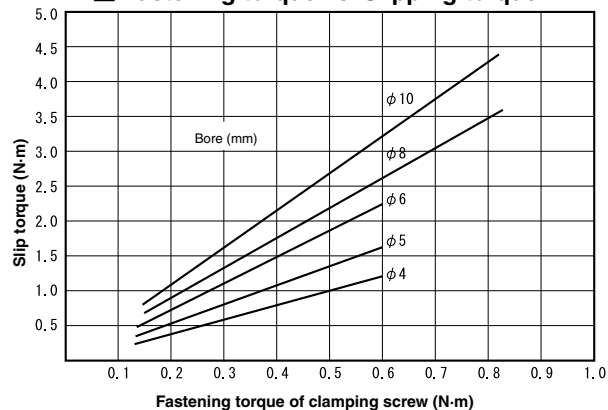
[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.
- ③ Fairloc Hub Gears are attached to the shaft by friction. Slipping torque should be considered when making a selection.
- ④ Do not tighten the clamping screw without inserting a shaft, or the bore will be permanently deformed and will not accept a shaft.

## Fastening torque vs. Slipping torque

The slipping torque which is dependent on the fastening torque can sometimes be less than the gear strength. Please use caution in selecting. The chart on the right shows the relationship between the slipping torque and the fastening torque.

## Fastening torque vs. Slipping torque



※ Data supplied by Designatronics Inc.

## Acetal Fairloc Hub Spur Gears

Allowable torque (N·m)		Allowable torque (kgf·m)		Recommended fastening torque		Backlash (mm)	Weight (kg)	Catalog No.
Bending strength	Surface durability	Bending strength	Surface durability	(N·m)	(kgf·m)			
0.39	—	0.04	—	0.60	0.061	0~0.10	10.8	<b>DSL0.5-28</b>
0.43	—	0.044	—	0.60	0.061	0~0.10	11.0	<b>DSL0.5-30</b>
0.46	—	0.047	—	0.60	0.061	0~0.10	11.2	<b>DSL0.5-32</b>
0.54	—	0.055	—	0.60	0.061	0~0.10	11.5	<b>DSL0.5-36</b>
0.62	—	0.063	—	0.60	0.061	0~0.10	12.0	<b>DSL0.5-40</b>
0.71	—	0.073	—	0.60	0.061	0~0.10	12.5	<b>DSL0.5-45</b>
0.78	—	0.079	—	0.60	0.061	0~0.10	12.9	<b>DSL0.5-48</b>
0.82	—	0.083	—	0.60	0.061	0~0.10	13.2	<b>DSL0.5-50</b>
0.93	—	0.095	—	0.60	0.061	0~0.10	14.1	<b>DSL0.5-56</b>
1.01	—	0.10	—	0.80	0.082	0~0.10	14.7	<b>DSL0.5-60</b>
1.08	—	0.11	—	0.80	0.082	0~0.10	15.4	<b>DSL0.5-64</b>
1.20	—	0.12	—	0.80	0.082	0~0.10	16.5	<b>DSL0.5-70</b>
1.24	—	0.13	—	0.80	0.082	0~0.10	16.9	<b>DSL0.5-72</b>
1.29	—	0.13	—	0.80	0.082	0~0.10	17.5	<b>DSL0.5-75</b>
1.39	—	0.14	—	0.80	0.082	0~0.10	18.6	<b>DSL0.5-80</b>
1.58	—	0.16	—	0.80	0.082	0~0.10	23.9	<b>DSL0.5-90</b>
1.70	—	0.17	—	0.80	0.082	0~0.10	25.5	<b>DSL0.5-96</b>
1.78	—	0.18	—	0.80	0.082	0~0.10	26.6	<b>DSL0.5-100</b>
2.15	—	0.22	—	0.80	0.082	0~0.10	32.6	<b>DSL0.5-120</b>
0.58	—	0.059	—	0.60	0.061	0~0.10	11.2	<b>DSL0.8-20</b>
0.73	—	0.075	—	0.60	0.061	0~0.10	11.8	<b>DSL0.8-24</b>
0.78	—	0.079	—	0.60	0.061	0~0.10	12.0	<b>DSL0.8-25</b>
0.89	—	0.091	—	0.60	0.061	0~0.10	12.5	<b>DSL0.8-28</b>
0.97	—	0.099	—	0.60	0.061	0~0.10	12.9	<b>DSL0.8-30</b>
1.06	—	0.11	—	0.60	0.061	0~0.10	13.4	<b>DSL0.8-32</b>
1.23	—	0.13	—	0.60	0.061	0~0.10	14.3	<b>DSL0.8-36</b>
1.41	—	0.14	—	0.60	0.061	0~0.10	15.4	<b>DSL0.8-40</b>
1.62	—	0.17	—	0.60	0.061	0~0.10	16.9	<b>DSL0.8-45</b>
1.76	—	0.18	—	0.60	0.061	0~0.10	17.9	<b>DSL0.8-48</b>
1.85	—	0.19	—	0.60	0.061	0~0.10	18.6	<b>DSL0.8-50</b>
2.11	—	0.22	—	0.60	0.061	0~0.10	20.8	<b>DSL0.8-56</b>
2.28	—	0.23	—	0.80	0.082	0~0.10	25.5	<b>DSL0.8-60</b>
2.8	—	0.29	—	0.80	0.082	0~0.10	31.1	<b>DSL0.8-72</b>
3.15	—	0.32	—	0.80	0.082	0~0.10	35.4	<b>DSL0.8-80</b>
3.58	—	0.37	—	0.80	0.082	0~0.10	41.4	<b>DSL0.8-90</b>
4.03	—	0.41	—	0.80	0.082	0~0.10	48.1	<b>DSL0.8-100</b>

[Caution on Secondary Operations]

- ① These are finished products, avoid performing secondary operations on the bore.  
 ② Perform secondary operations carefully as to not distort the groove for clamping.

Spur  
GearsHelical  
GearsInternal  
Gears

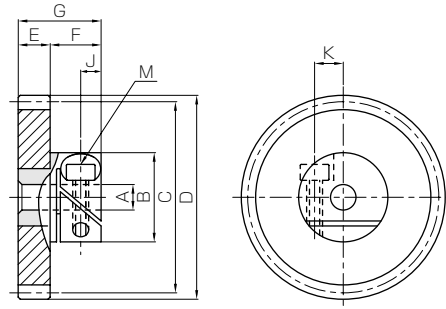
Racks

CP Racks  
& PinionsMiter  
GearsBevel  
GearsScrew  
GearsWorm  
Gear PairBevel  
GearboxesOther  
Products



Specifications	
Precision grade	JIS grade N10 (JIS B1702-1: 1998) * JIS grade 6 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	Acetal with SUS303 core
Heat treatment	—
Tooth hardness	110 ~ 120HRR

\* The gear grade listed is the value before clamping. The precision grade of products with a module of less than 0.8 is equivalent to the value shown in the table.



S1

Catalog No.	Module	No. of teeth	Shape	Bore										Cap screw dimensions		
				AH7	B	C	D	E	F	G	M	J	K			
<b>DSL1-15</b>	m1	15	S1	5	14	15	17	5	8.5	13.5	M2.5	3.3	4.4			
<b>DSL1-16</b>		16	S1	5	14	16	18	5	8.5	13.5	M2.5	3.3	4.4			
<b>DSL1-18</b>		18	S1	5	14	18	20	5	8.5	13.5	M2.5	3.3	4.4			
<b>DSL1-20</b>		20	S1	5	14	20	22	5	8.5	13.5	M2.5	3.3	4.4			
<b>DSL1-24</b>		24	S1	5	14	24	26	5	8.5	13.5	M2.5	3.3	4.4			
<b>DSL1-25</b>		25	S1	5	14	25	27	5	8.5	13.5	M2.5	3.3	4.4			
<b>DSL1-28</b>		28	S1	5	14	28	30	5	8.5	13.5	M2.5	3.3	4.4			
<b>DSL1-30</b>		30	S1	8	17	30	32	5	9.8	14.8	M3	4.3	5.9			
<b>DSL1-32</b>		32	S1	8	17	32	34	5	9.8	14.8	M3	4.3	5.9			
<b>DSL1-35</b>		35	S1	8	17	35	37	5	9.8	14.8	M3	4.3	5.9			
<b>DSL1-36</b>		36	S1	8	17	36	38	5	9.8	14.8	M3	4.3	5.9			
<b>DSL1-40</b>		40	S1	8	17	40	42	5	9.8	14.8	M3	4.3	5.9			
<b>DSL1-45</b>		45	S1	8	17	45	47	5	9.8	14.8	M3	4.3	5.9			
<b>DSL1-48</b>		48	S1	8	17	48	50	5	9.8	14.8	M3	4.3	5.9			
<b>DSL1-50</b>		50	S1	8	17	50	52	5	9.8	14.8	M3	4.3	5.9			
<b>DSL1-56</b>		56	S1	8	17	56	58	5	9.8	14.8	M3	4.3	5.9			
<b>DSL1-60</b>		60	S1	8	17	60	62	5	9.8	14.8	M3	4.3	5.9			
<b>DSL1-64</b>		64	S1	8	17	64	66	5	9.8	14.8	M3	4.3	5.9			
<b>DSL1-70</b>		70	S1	8	17	70	72	5	9.8	14.8	M3	4.3	5.9			
<b>DSL1-72</b>		72	S1	8	17	72	74	5	9.8	14.8	M3	4.3	5.9			
<b>DSL1-80</b>	80	S1	8	17	80	82	5	9.8	14.8	M3	4.3	5.9				
<b>DSL1-90</b>	90	S1	8	17	90	92	5	9.8	14.8	M3	4.3	5.9				
<b>DSL1-100</b>	100	S1	8	17	100	102	5	9.8	14.8	M3	4.3	5.9				

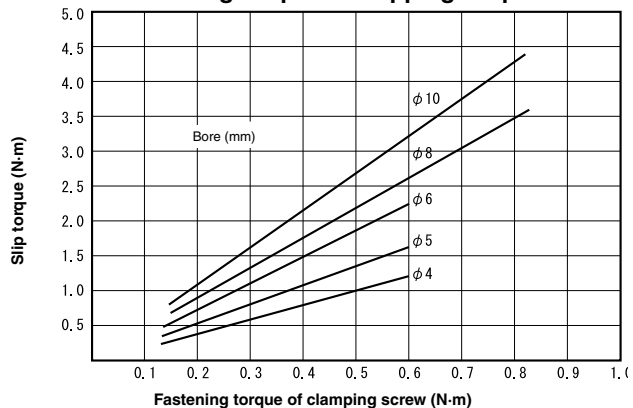
[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.
- ③ Fairloc Hub Gears are attached to the shaft by friction. Slipping torque should be considered when making a selection.
- ④ Do not tighten the clamping screw without inserting a shaft, or the bore will be permanently deformed and will not accept a shaft.

### Fastening torque vs. Slipping torque

The slipping torque which is dependent on the fastening torque can sometimes be less than the gear strength. Please use caution in selecting. The chart on the right shows the relationship between the slipping torque and the fastening torque.

### Fastening torque vs. Slipping torque



※ Data supplied by Designatronics Inc.



## Acetal Fairloc Hub Spur Gears

Allowable torque (N·m)		Allowable torque (kgf·m)		Recommended fastening torque		Backlash (mm)	Weight (kg)	Catalog No.
Bending strength	Surface durability	Bending strength	Surface durability	(N·m)	(kgf·m)			
0.53	—	0.054	—	0.60	0.061	0~0.10	11.0	<b>DSL1-15</b>
0.59	—	0.06	—	0.60	0.061	0~0.10	11.2	<b>DSL1-16</b>
0.69	—	0.07	—	0.60	0.061	0~0.10	11.5	<b>DSL1-18</b>
0.80	—	0.081	—	0.60	0.061	0~0.10	12.0	<b>DSL1-20</b>
1.00	—	0.10	—	0.60	0.061	0~0.10	12.9	<b>DSL1-24</b>
1.06	—	0.11	—	0.60	0.061	0~0.10	13.2	<b>DSL1-25</b>
1.22	—	0.12	—	0.60	0.061	0~0.10	14.1	<b>DSL1-28</b>
1.33	—	0.14	—	0.80	0.082	0~0.10	17.7	<b>DSL1-30</b>
1.44	—	0.15	—	0.80	0.082	0~0.10	18.4	<b>DSL1-32</b>
1.62	—	0.17	—	0.80	0.082	0~0.10	19.5	<b>DSL1-35</b>
1.68	—	0.17	—	0.80	0.082	0~0.10	19.9	<b>DSL1-36</b>
1.92	—	0.20	—	0.80	0.082	0~0.10	21.6	<b>DSL1-40</b>
2.22	—	0.23	—	0.80	0.082	0~0.10	23.9	<b>DSL1-45</b>
2.41	—	0.25	—	0.80	0.082	0~0.10	25.5	<b>DSL1-48</b>
2.53	—	0.26	—	0.80	0.082	0~0.10	26.6	<b>DSL1-50</b>
2.88	—	0.29	—	0.80	0.082	0~0.10	30.1	<b>DSL1-56</b>
3.12	—	0.32	—	0.80	0.082	0~0.10	32.6	<b>DSL1-60</b>
3.35	—	0.34	—	0.80	0.082	0~0.10	35.4	<b>DSL1-64</b>
3.71	—	0.38	—	0.80	0.082	0~0.10	39.8	<b>DSL1-70</b>
3.83	—	0.39	—	0.80	0.082	0~0.10	41.4	<b>DSL1-72</b>
4.30	—	0.44	—	0.80	0.082	0~0.10	48.1	<b>DSL1-80</b>
4.89	—	0.50	—	0.80	0.082	0~0.10	57.6	<b>DSL1-90</b>
5.49	—	0.56	—	0.80	0.082	0~0.10	68.1	<b>DSL1-100</b>

[Caution on Secondary Operations]

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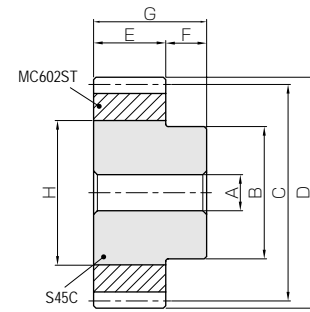
Spur  
GearsHelical  
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Gears

Racks

CP Racks  
& PinionsMiter  
GearsBevel  
GearsScrew  
GearsWorm  
Gear PairBevel  
GearboxesOther  
Products



Specifications	
Precision grade	JIS grade N9 (JIS B1702-1: 1998) JIS grade 5 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	MC602ST with S45C core
Heat treatment	—
Tooth hardness	115 ~ 120HRR



S1

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Metal core dia.
				A <sub>H7</sub>	B	C	D	E	F	G	H
<b>NSU1-30</b>	<b>m1</b>	30	S1	8	20	30	32	10	10	20	20
<b>NSU1-32</b>		32	S1	8	22	32	34	10	10	20	22
<b>NSU1-34</b>		34	S1	8	25	34	36	10	10	20	25
<b>NSU1-35</b>		35	S1	8	25	35	37	10	10	20	25
<b>NSU1-36</b>		36	S1	8	25	36	38	10	10	20	25
<b>NSU1-40</b>		40	S1	10	25	40	42	10	10	20	28
<b>NSU1-45</b>		45	S1	10	30	45	47	10	10	20	34
<b>NSU1-48</b>		48	S1	10	30	48	50	10	10	20	34
<b>NSU1-50</b>		50	S1	10	30	50	52	10	10	20	34
<b>NSU1-60</b>		60	S1	10	40	60	62	10	10	20	45
<b>NSU1-70</b>	<b>m1.5</b>	70	S1	10	40	70	72	10	10	20	45
<b>NSU1-80</b>		80	S1	10	40	80	82	10	10	20	45
<b>NSU1-90</b>		90	S1	10	40	90	92	10	10	20	55
<b>NSU1-100</b>		100	S1	10	40	100	102	10	10	20	65
<b>NSU1.5-28</b>		28	S1	10	30	42	45	15	12	27	30
<b>NSU1.5-30</b>		30	S1	10	30	45	48	15	12	27	30
<b>NSU1.5-32</b>		32	S1	10	33	48	51	15	12	27	33
<b>NSU1.5-34</b>		34	S1	10	33	51	54	15	12	27	33
<b>NSU1.5-35</b>		35	S1	10	33	52.5	55.5	15	12	27	36
<b>NSU1.5-36</b>		36	S1	10	33	54	57	15	12	27	36
<b>NSU1.5-40</b>	40	S1	10	40	60	63	15	12	27	45	
<b>NSU1.5-45</b>	45	S1	10	40	67.5	70.5	15	12	27	45	
<b>NSU1.5-48</b>	48	S1	10	40	72	75	15	12	27	45	
<b>NSU1.5-50</b>	50	S1	12	40	75	78	15	12	27	45	
<b>NSU1.5-56</b>	56	S1	12	50	84	87	15	12	27	55	
<b>NSU1.5-60</b>	60	S1	12	50	90	93	15	12	27	55	
<b>NSU1.5-68</b>	68	S1	12	50	102	105	15	12	27	67	
<b>NSU1.5-70</b>	70	S1	12	50	105	108	15	12	27	70	
<b>NSU1.5-80</b>	80	S1	12	60	120	123	15	12	27	85	
<b>NSU1.5-90</b>	90	S1	12	60	135	138	15	12	27	100	

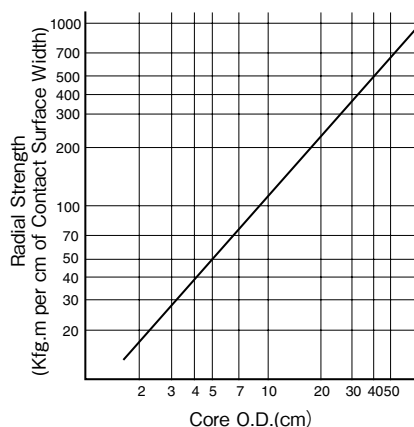
[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② When the core O.D. is the same as the hub diameter, you may see some serration on the hub. There is no effect on the strength of the gear.
- ③ Without lubrication, using plastic gears in pairs may generate heat and dilation. It is recommended to mate with steel gears.
- ④ The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

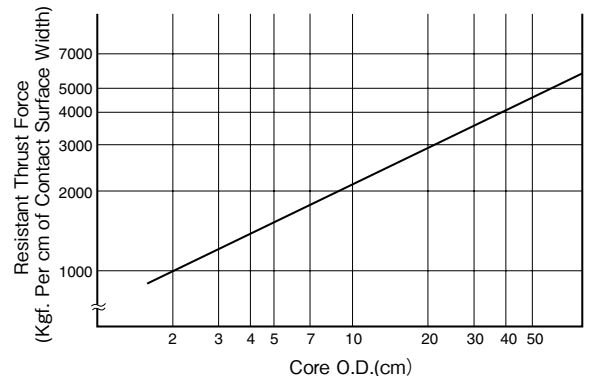
### Definition of Holding Strength and Safety Factor

① The holding strength between the metal core and the molded material is a function of the contact area. The relationship between the core outside diameter and the radial strength (torque) is shown on the left, while the relationship between the core diameter and the resistant thrust force is shown on the right.

Relationship between radial strength and core diameter



Relationship between resistant thrust force and core diameter

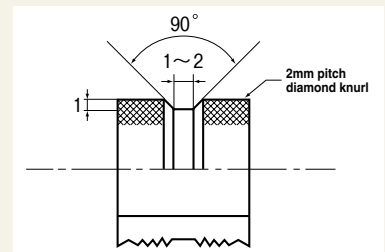


Allowable torque (N·m)	Allowable torque (kgf·m)	Backlash (mm)	Weight (kg)	Catalog No.
Bending strength	Bending strength			
1.23	0.13	0~0.34	0.046	<b>NSU1-30</b>
1.34	0.14	0~0.34	0.057	<b>NSU1-32</b>
1.44	0.15	0~0.34	0.074	<b>NSU1-34</b>
1.50	0.15	0~0.34	0.075	<b>NSU1-35</b>
1.56	0.16	0~0.34	0.076	<b>NSU1-36</b>
1.78	0.18	0~0.34	0.082	<b>NSU1-40</b>
2.06	0.21	0~0.34	0.12	<b>NSU1-45</b>
2.23	0.23	0~0.34	0.13	<b>NSU1-48</b>
2.35	0.24	0~0.34	0.13	<b>NSU1-50</b>
2.93	0.30	0~0.36	0.23	<b>NSU1-60</b>
3.46	0.35	0~0.36	0.24	<b>NSU1-70</b>
4.00	0.41	0~0.36	0.25	<b>NSU1-80</b>
4.56	0.46	0~0.36	0.32	<b>NSU1-90</b>
5.12	0.52	0~0.36	0.40	<b>NSU1-100</b>
3.82	0.39	0~0.38	0.15	<b>NSU1.5-28</b>
4.15	0.42	0~0.38	0.15	<b>NSU1.5-30</b>
4.51	0.46	0~0.38	0.18	<b>NSU1.5-32</b>
4.88	0.50	0~0.40	0.19	<b>NSU1.5-34</b>
5.07	0.52	0~0.40	0.20	<b>NSU1.5-35</b>
5.26	0.54	0~0.40	0.21	<b>NSU1.5-36</b>
6.00	0.61	0~0.40	0.31	<b>NSU1.5-40</b>
6.94	0.71	0~0.40	0.33	<b>NSU1.5-45</b>
7.53	0.77	0~0.40	0.33	<b>NSU1.5-48</b>
7.92	0.81	0~0.40	0.33	<b>NSU1.5-50</b>
9.09	0.93	0~0.40	0.50	<b>NSU1.5-56</b>
9.89	1.01	0~0.40	0.51	<b>NSU1.5-60</b>
11.3	1.15	0~0.40	0.66	<b>NSU1.5-68</b>
11.7	1.19	0~0.42	0.70	<b>NSU1.5-70</b>
13.5	1.38	0~0.42	1.01	<b>NSU1.5-80</b>
15.4	1.57	0~0.42	1.29	<b>NSU1.5-90</b>

How is MC nylon fused to the metal core

This method is superior to other conventional methods such as bolting, shrink fitting and bonding.

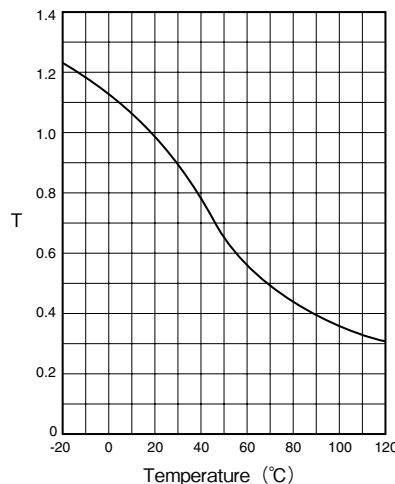
① Outline of the procedure  
The surface of the core material is rolled with a 2mm pitch diamond knurl. Then one or more grooves (1 to 2mm wide and 1mm deep) are cut as shown below. The metal surface is treated prior to casting nylon in a mold.



② Advantage of MC nylon with metal core  
1. Wide temperature range.  
There are examples of wheel use in furnaces at 130 to 140° C.  
2. Good dimensional stability  
Since nylon is fused to the whole outer surface of the metal hub, dimensional change is very small even under temperature variations.  
3. Good appearance  
Elimination of bolts and nuts provides a cleaner physical appearance.

- [Caution on Secondary Operations]
- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
  - ② Even though the holding strength at the material interface is designed to be stronger than the teeth, a secondary operation may weaken the holding strength.
  - ③ Plastic gears are susceptible to the effects of temperature and moisture. Dimensional changes may occur while performing secondary operations and during post-machining operations.

Ambient temperature compensation factor T



② When the ambient temperature rises, obtain the temperature compensation factor, T, from the chart on the right. Also, use a safety factor of 4 to 5 in the calculation.

$$T_{al} = T_{max} \times \frac{1}{\text{Safety Factor}} \times T$$

Where

$T_{al}$  : Allowable Holding Strength at the contact surface

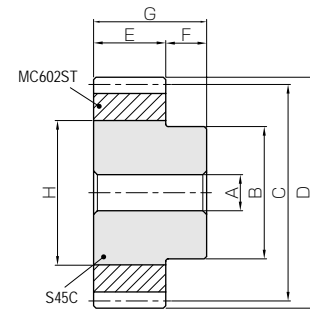
$T_{max}$  : Maximum Holding Strength - Find from the charts on the left.

$T$  : Temperature Compensation Factor

\* Data supplied by Japan Polypenco Limited.



Specifications	
Precision grade	JIS grade N9 (JIS B1702-1: 1998) JIS grade 5 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	MC602ST with S45C core
Heat treatment	—
Tooth hardness	115 ~ 120HRR



S1

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Metal core dia.
				A <sub>H7</sub>	B	C	D	E	F	G	H
<b>NSU2-20</b>	m2	20	S1	10	22	40	44	20	14	34	22
<b>NSU2-22</b>		22	S1	10	30	44	48	20	14	34	30
<b>NSU2-24</b>		24	S1	10	30	48	52	20	14	34	30
<b>NSU2-25</b>		25	S1	10	30	50	54	20	14	34	30
<b>NSU2-28</b>		28	S1	10	35	56	60	20	14	34	35
<b>NSU2-30</b>		30	S1	10	35	60	64	20	14	34	35
<b>NSU2-32</b>		32	S1	12	40	64	68	20	14	34	40
<b>NSU2-34</b>		34	S1	12	40	68	72	20	14	34	45
<b>NSU2-35</b>		35	S1	12	40	70	74	20	14	34	45
<b>NSU2-36</b>		36	S1	12	40	72	76	20	14	34	45
<b>NSU2-40</b>		40	S1	15	55	80	84	20	14	34	60
<b>NSU2-44</b>		44	S1	15	55	88	92	20	14	34	60
<b>NSU2-45</b>		45	S1	15	55	90	94	20	14	34	60
<b>NSU2-48</b>		48	S1	15	60	96	100	20	14	34	65
<b>NSU2-50</b>		50	S1	15	60	100	104	20	14	34	65
<b>NSU2-56</b>		56	S1	15	60	112	116	20	14	34	65
<b>NSU2-60</b>	60	S1	15	60	120	124	20	14	34	85	
<b>NSU2-68</b>	68	S1	15	60	136	140	20	14	34	100	
<b>NSU2-70</b>	70	S1	15	60	140	144	20	14	34	105	
<b>NSU2-80</b>	80	S1	15	60	160	164	20	14	34	125	
<b>NSU2.5-18</b>	m2.5	18	S1	12	25	45	50	25	15	40	25
<b>NSU2.5-20</b>		20	S1	12	28	50	55	25	15	40	28
<b>NSU2.5-22</b>		22	S1	12	35	55	60	25	15	40	35
<b>NSU2.5-24</b>		24	S1	12	35	60	65	25	15	40	35
<b>NSU2.5-25</b>		25	S1	12	35	62.5	67.5	25	15	40	35
<b>NSU2.5-28</b>		28	S1	12	40	70	75	25	15	40	40
<b>NSU2.5-30</b>		30	S1	12	45	75	80	25	15	40	50
<b>NSU2.5-32</b>		32	S1	12	45	80	85	25	15	40	50
<b>NSU2.5-34</b>		34	S1	12	50	85	90	25	15	40	55
<b>NSU2.5-35</b>		35	S1	12	55	87.5	92.5	25	15	40	60

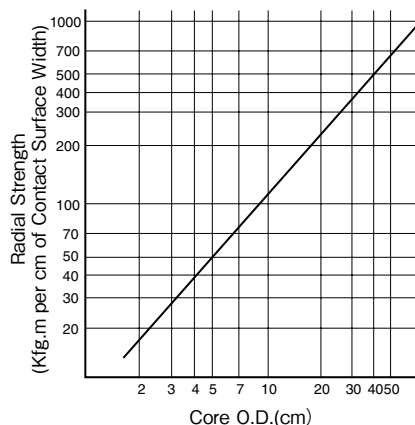
[Caution on Product Characteristics]

- The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- When the core O.D. is the same as the hub diameter, you may see some serration on the hub. There is no effect on the strength of the gear.
- Without lubrication, using plastic gears in pairs may generate heat and dilation. It is recommended to mate with steel gears.
- The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

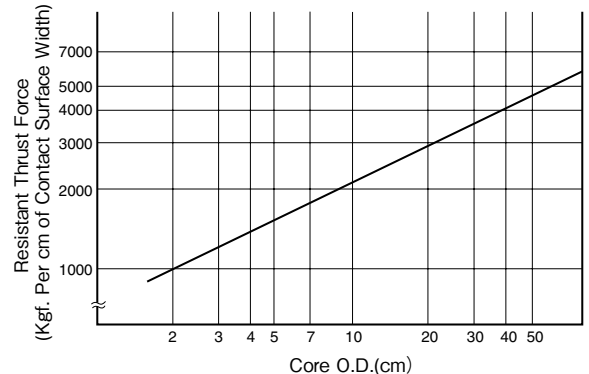
### Definition of Holding Strength and Safety Factor

① The holding strength between the metal core and the molded material is a function of the contact area. The relationship between the core outside diameter and the radial strength (torque) is shown on the left, while the relationship between the core diameter and the resistant thrust force is shown on the right.

Relationship between radial strength and core diameter



Relationship between resistant thrust force and core diameter

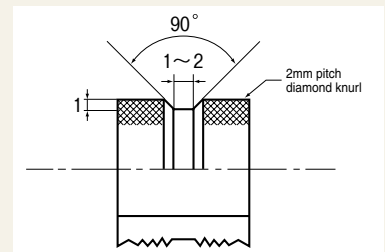


Allowable torque (N·m)	Allowable torque (kgf·m)	Backlash (mm)	Weight (kg)	Catalog No.
Bending strength	Bending strength			
5.89	0.60	0~0.42	0.10	<b>NSU2-20</b>
6.66	0.68	0~0.42	0.19	<b>NSU2-22</b>
7.43	0.76	0~0.42	0.19	<b>NSU2-24</b>
7.85	0.80	0~0.42	0.20	<b>NSU2-25</b>
9.05	0.92	0~0.44	0.27	<b>NSU2-28</b>
9.84	1.00	0~0.44	0.28	<b>NSU2-30</b>
10.7	1.09	0~0.44	0.35	<b>NSU2-32</b>
11.6	1.18	0~0.44	0.41	<b>NSU2-34</b>
12.0	1.22	0~0.44	0.41	<b>NSU2-35</b>
12.5	1.27	0~0.44	0.42	<b>NSU2-36</b>
14.2	1.45	0~0.44	0.71	<b>NSU2-40</b>
16.0	1.63	0~0.44	0.74	<b>NSU2-44</b>
16.5	1.68	0~0.44	0.74	<b>NSU2-45</b>
17.8	1.82	0~0.44	0.88	<b>NSU2-48</b>
18.8	1.92	0~0.44	0.90	<b>NSU2-50</b>
21.5	2.20	0~0.46	0.95	<b>NSU2-56</b>
23.5	2.39	0~0.46	1.29	<b>NSU2-60</b>
26.8	2.74	0~0.46	1.66	<b>NSU2-68</b>
27.7	2.82	0~0.46	1.79	<b>NSU2-70</b>
32.0	3.27	0~0.46	2.38	<b>NSU2-80</b>
9.93	1.01	0~0.44	0.15	<b>NSU2.5-18</b>
11.5	1.17	0~0.44	0.20	<b>NSU2.5-20</b>
13.0	1.33	0~0.46	0.31	<b>NSU2.5-22</b>
14.5	1.48	0~0.46	0.32	<b>NSU2.5-24</b>
15.3	1.56	0~0.46	0.33	<b>NSU2.5-25</b>
17.7	1.80	0~0.46	0.44	<b>NSU2.5-28</b>
19.2	1.96	0~0.46	0.61	<b>NSU2.5-30</b>
20.9	2.13	0~0.46	0.63	<b>NSU2.5-32</b>
22.6	2.30	0~0.46	0.76	<b>NSU2.5-34</b>
23.5	2.39	0~0.46	0.90	<b>NSU2.5-35</b>

■ How is MC nylon fused to the metal core

This method is superior to other conventional methods such as bolting, shrink fitting and bonding.

① Outline of the procedure  
The surface of the core material is rolled with a 2mm pitch diamond knurl. Then one or more grooves (1 to 2mm wide and 1mm deep) are cut as shown below. The metal surface is treated prior to casting nylon in a mold.

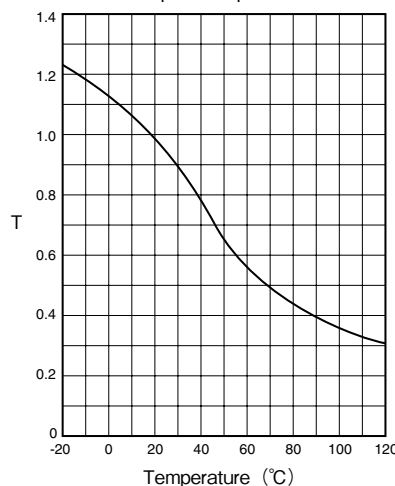


② Advantage of MC nylon with metal core

1. Wide temperature range.  
There are examples of wheel use in furnaces at 130 to 140° C.
2. Good dimensional stability  
Since nylon is fused to the whole outer surface of the metal hub, dimensional change is very small even under temperature variations.
3. Good appearance  
Elimination of bolts and nuts provides a cleaner physical appearance.

- [Caution on Secondary Operations]
- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
  - ② Even though the holding strength at the material interface is designed to be stronger than the teeth, a secondary operation may weaken the holding strength.
  - ③ Plastic gears are susceptible to the effects of temperature and moisture. Dimensional changes may occur while performing secondary operations and during post-machining operations.

■ Ambient temperature compensation factor T



- ② When the ambient temperature rises, obtain the temperature compensation factor, T, from the chart on the right. Also, use a safety factor of 4 to 5 in the calculation.

$$T_{al} = T_{max} \times \frac{1}{\text{Safety Factor}} \times T$$

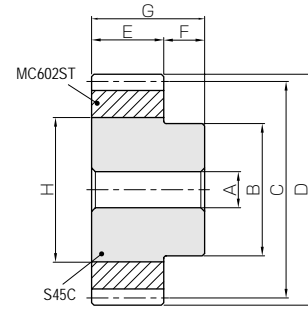
Where

- $T_{al}$  : Allowable Holding Strength at the contact surface
- $T_{max}$  : Maximum Holding Strength - Find from the charts on the left.
- $T$  : Temperature Compensation Factor

\* Data supplied by Japan Polypenco Limited.



Specifications	
Precision grade	JIS grade N9 (JIS B1702-1: 1998) JIS grade 5 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	MC602ST with S45C core
Heat treatment	—
Tooth hardness	115 ~ 120HRR



S1

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Metal core dia.
				A <sub>H7</sub>	B	C	D	E	F	G	H
<b>NSU2.5-36</b>	<b>m2.5</b>	36	S1	12	55	90	95	25	15	40	60
<b>NSU2.5-40</b>		40	S1	15	65	100	105	25	15	40	70
<b>NSU2.5-44</b>		44	S1	15	65	110	115	25	15	40	75
<b>NSU2.5-45</b>		45	S1	15	65	112.5	117.5	25	15	40	75
<b>NSU2.5-48</b>		48	S1	15	65	120	125	25	15	40	85
<b>NSU2.5-50</b>		50	S1	15	65	125	130	25	15	40	95
<b>NSU2.5-56</b>	56	S1	15	65	140	145	25	15	40	105	
<b>NSU2.5-60</b>	60	S1	20	70	150	155	25	15	40	115	
<b>NSU2.5-68</b>	68	S1	20	70	170	175	25	15	40	135	
<b>NSU2.5-70</b>	70	S1	20	70	175	180	25	15	40	140	
<b>NSU3-16</b>	<b>m3</b>	16	S1	12	24	48	54	30	17	47	24
<b>NSU3-18</b>		18	S1	12	30	54	60	30	17	47	30
<b>NSU3-20</b>		20	S1	12	33	60	66	30	17	47	33
<b>NSU3-22</b>		22	S1	12	38	66	72	30	17	47	38
<b>NSU3-24</b>		24	S1	12	43	72	78	30	17	47	43
<b>NSU3-25</b>		25	S1	12	45	75	81	30	17	47	45
<b>NSU3-28</b>	28	S1	15	50	84	90	30	17	47	50	
<b>NSU3-30</b>	30	S1	15	55	90	96	30	17	47	60	
<b>NSU3-32</b>	32	S1	15	60	96	102	30	17	47	65	
<b>NSU3-34</b>	34	S1	15	60	102	108	30	17	47	65	
<b>NSU3-35</b>	35	S1	15	60	105	111	30	17	47	75	
<b>NSU3-36</b>	36	S1	15	60	108	114	30	17	47	80	
<b>NSU3-40</b>	40	S1	20	70	120	126	30	17	47	85	
<b>NSU3-44</b>	44	S1	20	70	132	138	30	17	47	95	
<b>NSU3-45</b>	45	S1	20	70	135	141	30	17	47	105	
<b>NSU3-48</b>	48	S1	20	70	144	150	30	17	47	105	
<b>NSU3-50</b>	50	S1	20	70	150	156	30	17	47	105	
<b>NSU3-56</b>	56	S1	20	70	168	174	30	17	47	130	
<b>NSU3-60</b>	60	S1	20	70	180	186	30	17	47	145	
<b>NSU3-68</b>	68	S1	20	70	204	210	30	17	47	165	
<b>NSU3-70</b>	70	S1	20	70	210	216	30	17	47	175	

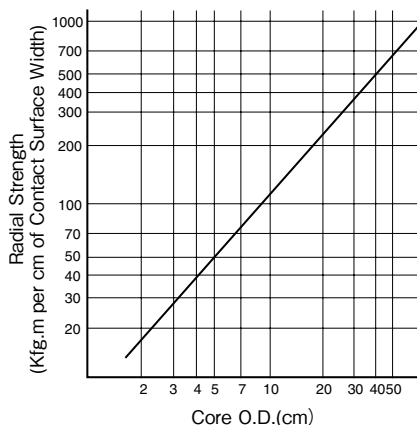
[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② When the core O.D. is the same as the hub diameter, you may see some serration on the hub. There is no effect on the strength of the gear.
- ③ Without lubrication, using plastic gears in pairs may generate heat and dilation. It is recommended to mate with steel gears.
- ④ The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

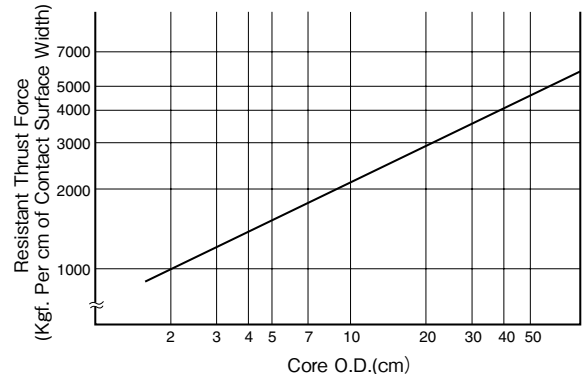
### Definition of Holding Strength and Safety Factor

① The holding strength between the metal core and the molded material is a function of the contact area. The relationship between the core outside diameter and the radial strength (torque) is shown on the left, while the relationship between the core diameter and the resistant thrust force is shown on the right.

Relationship between radial strength and core diameter



Relationship between resistant thrust force and core diameter



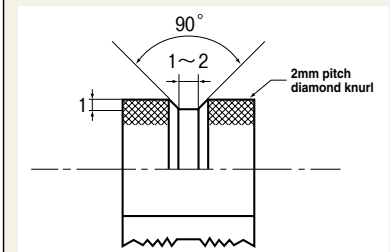
Allowable torque (N·m)	Allowable torque (kgf·m)	Backlash (mm)	Weight (kg)	Catalog No.
Bending strength	Bending strength			
24.3	2.48	0~0.46	0.91	<b>NSU2.5-36</b>
27.8	2.83	0~0.46	1.21	<b>NSU2.5-40</b>
31.3	3.19	0~0.48	1.36	<b>NSU2.5-44</b>
32.1	3.28	0~0.48	1.37	<b>NSU2.5-45</b>
34.8	3.55	0~0.48	1.62	<b>NSU2.5-48</b>
36.7	3.74	0~0.48	1.89	<b>NSU2.5-50</b>
42.1	4.29	0~0.48	2.24	<b>NSU2.5-56</b>
45.8	4.67	0~0.48	2.62	<b>NSU2.5-60</b>
52.4	5.34	0~0.48	3.42	<b>NSU2.5-68</b>
54.1	5.51	0~0.48	3.64	<b>NSU2.5-70</b>
14.7	1.50	0~0.52	0.18	<b>NSU3-16</b>
17.2	1.75	0~0.54	0.28	<b>NSU3-18</b>
19.9	2.03	0~0.54	0.35	<b>NSU3-20</b>
22.5	2.29	0~0.54	0.46	<b>NSU3-22</b>
25.1	2.56	0~0.54	0.59	<b>NSU3-24</b>
26.5	2.70	0~0.54	0.65	<b>NSU3-25</b>
30.5	3.11	0~0.54	0.79	<b>NSU3-28</b>
33.2	3.39	0~0.54	1.05	<b>NSU3-30</b>
36.1	3.68	0~0.54	1.24	<b>NSU3-32</b>
39.0	3.98	0~0.56	1.27	<b>NSU3-34</b>
40.5	4.13	0~0.56	1.51	<b>NSU3-35</b>
42.1	4.29	0~0.56	1.65	<b>NSU3-36</b>
48.0	4.90	0~0.56	1.94	<b>NSU3-40</b>
54.0	5.51	0~0.56	2.31	<b>NSU3-44</b>
55.5	5.66	0~0.56	2.65	<b>NSU3-45</b>
60.2	6.14	0~0.56	2.72	<b>NSU3-48</b>
63.4	6.46	0~0.56	2.77	<b>NSU3-50</b>
72.7	7.42	0~0.56	3.85	<b>NSU3-56</b>
79.1	8.07	0~0.56	4.62	<b>NSU3-60</b>
90.6	9.23	0~0.56	5.85	<b>NSU3-68</b>
93.4	9.53	0~0.56	6.45	<b>NSU3-70</b>

How is MC nylon fused to the metal core

This method is superior to other conventional methods such as bolting, shrink fitting and bonding.

① Outline of the procedure

The surface of the core material is rolled with a 2mm pitch diamond knurl. Then one or more grooves (1 to 2mm wide and 1mm deep) are cut as shown below. The metal surface is treated prior to casting nylon in a mold.



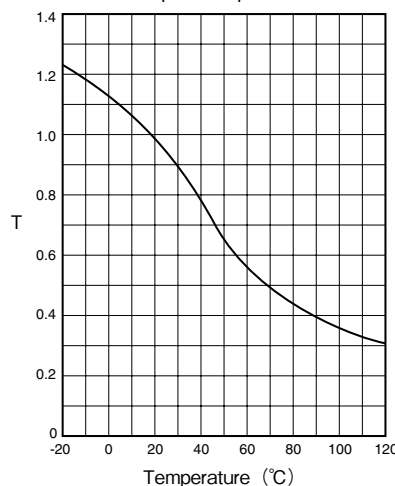
② Advantage of MC nylon with metal core

- Wide temperature range. There are examples of wheel use in furnaces at 130 to 140° C.
- Good dimensional stability. Since nylon is fused to the whole outer surface of the metal hub, dimensional change is very small even under temperature variations.
- Good appearance. Elimination of bolts and nuts provides a cleaner physical appearance.

[Caution on Secondary Operations]

- Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- Even though the holding strength at the material interface is designed to be stronger than the teeth, a secondary operation may weaken the holding strength.
- Plastic gears are susceptible to the effects of temperature and moisture. Dimensional changes may occur while performing secondary operations and during post-machining operations.

Ambient temperature compensation factor T



- When the ambient temperature rises, obtain the temperature compensation factor, T, from the chart on the right. Also, use a safety factor of 4 to 5 in the calculation.

$$T_{al} = T_{max} \times \frac{1}{\text{Safety Factor}} \times T$$

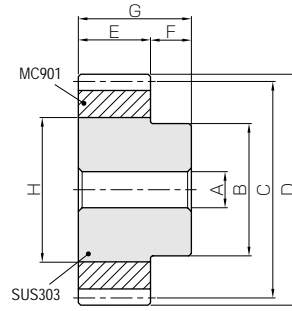
Where

- T<sub>al</sub> : Allowable Holding Strength at the contact surface
- T<sub>max</sub> : Maximum Holding Strength - Find from the charts on the left.
- T : Temperature Compensation Factor

\* Data supplied by Japan Polypenco Limited.



Specifications	
Precision grade	JIS grade N9 (JIS B1702-1: 1998) JIS grade 5 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	MC901 with SUS303 core
Heat treatment	—
Tooth hardness	115 ~ 120HRR



S1

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Metal core dia.
				A <sub>H7</sub>	B	C	D	E	F	G	H
<b>PU1-30</b>	<b>m1</b>	30	S1	8	20	30	32	10	10	20	20
<b>PU1-35</b>		35	S1	8	25	35	37	10	10	20	25
<b>PU1-40</b>		40	S1	10	25	40	42	10	10	20	28
<b>PU1-50</b>		50	S1	10	30	50	52	10	10	20	34
<b>PU1-60</b>		60	S1	10	40	60	62	10	10	20	45
<b>PU1-80</b>		80	S1	10	40	80	82	10	10	20	45
<b>PU1.5-30</b>	<b>m1.5</b>	30	S1	10	30	45	48	15	12	27	30
<b>PU1.5-35</b>		35	S1	10	33	52.5	55.5	15	12	27	36
<b>PU1.5-40</b>		40	S1	10	40	60	63	15	12	27	45
<b>PU1.5-50</b>		50	S1	12	40	75	78	15	12	27	45
<b>PU1.5-60</b>		60	S1	12	50	90	93	15	12	27	55
<b>PU1.5-80</b>		80	S1	12	60	120	123	15	12	27	85
<b>PU2-20</b>	<b>m2</b>	20	S1	10	22	40	44	20	14	34	22
<b>PU2-25</b>		25	S1	10	30	50	54	20	14	34	30
<b>PU2-30</b>		30	S1	10	35	60	64	20	14	34	35
<b>PU2-35</b>		35	S1	12	40	70	74	20	14	34	45
<b>PU2-40</b>		40	S1	15	55	80	84	20	14	34	60
<b>PU2-50</b>		50	S1	15	60	100	104	20	14	34	65
<b>PU2-60</b>	60	S1	15	60	120	124	20	14	34	85	

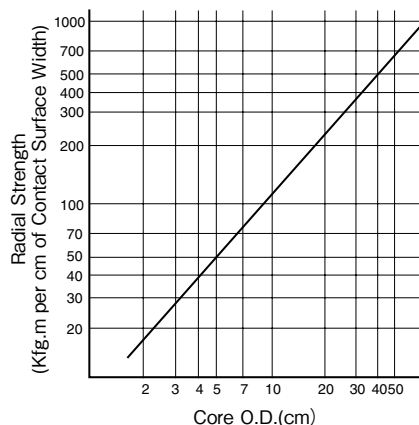
[Caution on Product Characteristics]

- ① Significant variations in temperature or humidity can cause dimensional changes in plastic gears (MC Nylon gears), including bore size (H8 when produced), tooth diameter, and backlash. Please see the section "Design of Plastic Gears" in the technical reference (Page 597).
- ② The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ③ When the core O.D. is the same as the hub diameter, you may see some serration on the hub. There is no effect on the strength of the gear.
- ④ Without lubrication, using plastic gears in pairs may generate heat and dilation. It is recommended to mate with steel gears.
- ⑤ The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

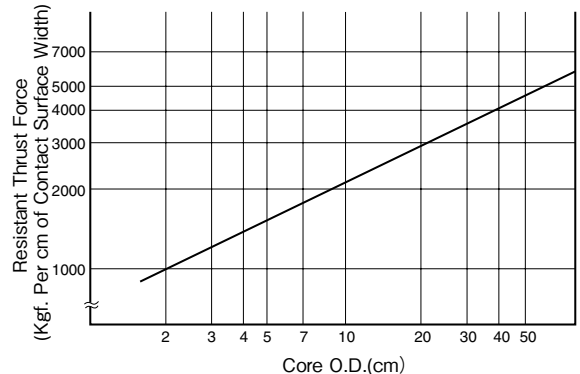
### Definition of Holding Strength and Safety Factor

① The holding strength between the metal core and the molded plastic material is a function of the contact area. The relationship between the core outside diameter and the radial strength (torque) is shown on the left, while the relationship between the core diameter and the resistant thrust force is shown on the right.

Relationship between radial strength and core diameter



Relationship between resistant thrust force and core diameter





Allowable torque (N·m)	Allowable torque (kgf·m)	Backlash (mm)	Weight (kg)	Catalog No.
Bending strength	Bending strength			
1.03	0.10	0~0.34	0.046	<b>PU1-30</b> <b>PU1-35</b> <b>PU1-40</b> <b>PU1-50</b> <b>PU1-60</b> <b>PU1-80</b>
1.25	0.13	0~0.34	0.074	
1.48	0.15	0~0.34	0.081	
1.96	0.20	0~0.34	0.13	
2.41	0.25	0~0.36	0.22	
3.34	0.34	0~0.36	0.25	
3.46	0.35	0~0.38	0.15	<b>PU1.5-30</b> <b>PU1.5-35</b> <b>PU1.5-40</b> <b>PU1.5-50</b> <b>PU1.5-60</b> <b>PU1.5-80</b>
4.22	0.43	0~0.40	0.20	
5.00	0.51	0~0.40	0.31	
6.60	0.67	0~0.40	0.33	
8.14	0.83	0~0.40	0.51	
11.26	1.15	0~0.42	1.00	
4.91	0.50	0~0.42	0.10	<b>PU2-20</b> <b>PU2-25</b> <b>PU2-30</b> <b>PU2-35</b> <b>PU2-40</b> <b>PU2-50</b> <b>PU2-60</b>
6.54	0.67	0~0.42	0.20	
8.20	0.84	0~0.44	0.28	
10.0	1.02	0~0.44	0.41	
11.9	1.21	0~0.44	0.70	
15.7	1.60	0~0.44	0.88	
19.3	1.97	0~0.46	1.28	

[Caution on Secondary Operations]

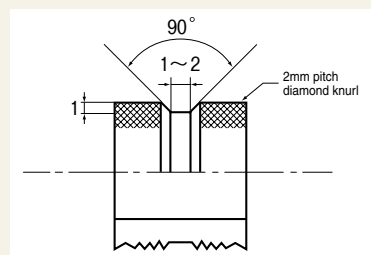
- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Even though the holding strength at the material interface is designed to be stronger than the teeth, a secondary operation may weaken the holding strength.
- ③ Plastic gears are susceptible to the effects of temperature and moisture. Dimensional changes may occur while performing secondary operations and during post-machining operations.

■ How is MC nylon fused to the metal core

This method is superior to other conventional methods such as bolting, shrink fitting and bonding.

① Outline of the procedure

The surface of the core material is rolled with a 2mm pitch diamond knurl. Then one or more grooves (1 to 2mm wide and 1mm deep) are cut as shown below. The metal surface is treated prior to casting nylon in a mold.



② Advantage of MC nylon with metal core

1. Wide temperature range.  
There are examples of wheel use in furnaces at 130 to 140° C.
2. Good dimensional stability  
Since nylon is fused to the whole outer surface of the metal hub, dimensional change is very small even under temperature variations.
3. Good appearance  
Elimination of bolts and nuts provides a cleaner physical appearance.

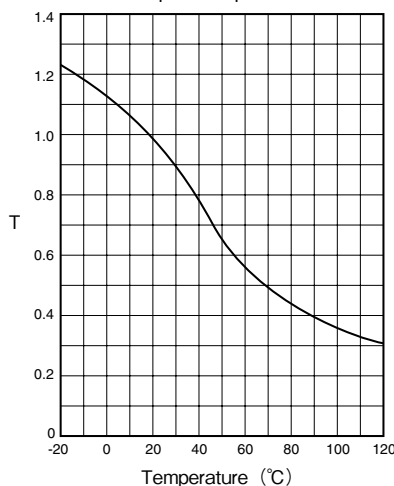
- ② When the ambient temperature rises, obtain the temperature compensation factor, T, from the chart on the right. Also, use a safety factor of 4 to 5 in the calculation.

$$T_{al} = T_{max} \times \frac{1}{\text{Safety Factor}} \times T$$

Where

- $T_{al}$  : Allowable Holding Strength at the contact surface
- $T_{max}$  : Maximum Holding Strength - Find from the charts on the left.
- $T$  : Temperature Compensation Factor

■ Ambient temperature compensation factor T

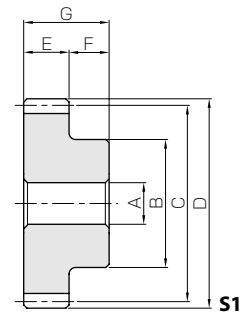


\* Data supplied by Japan Polypenco Limited.



Specifications	
Precision grade	JIS grade N9 (JIS B1702-1: 1998) * JIS grade 5 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	MC901
Heat treatment	—
Tooth hardness	115 ~ 120HRR

\* The precision grade of this product is equivalent to the value shown in the table.

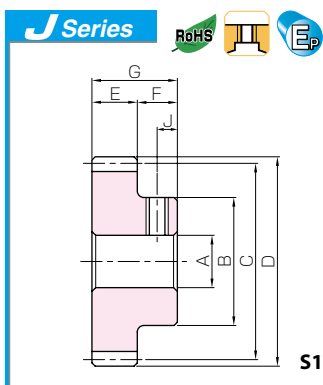


- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length
				A	B	C	D	E	F	G
<b>PS1-15</b> ● <b>PS1-15J6</b>	<b>m1</b>	15	S1 S1T	6 6	12	15	17	10	10	20
<b>PS1-16</b> ● <b>PS1-16J6</b>		16	S1 S1T	6 6	12	16	18	10	10	20
<b>PS1-18</b> ● <b>PS1-18J6</b>		18	S1 S1T	6 6	14	18	20	10	10	20
<b>PS1-20</b> ● <b>PS1-20J6</b>		20	S1 S1T	6 6	16	20	22	10	10	20
<b>PS1-22</b> ● <b>PS1-22J8</b>		22	S1 S1T	8 8	18	22	24	10	10	20
<b>PS1-24</b> ● <b>PS1-24J8</b>		24	S1 S1T	8 8	20	24	26	10	10	20
<b>PS1-25</b> ● <b>PS1-25J8</b>		25	S1 S1T	8 8	20	25	27	10	10	20
<b>PS1-26</b> ● <b>PS1-26J8</b>		26	S1 S1T	8 8	20	26	28	10	10	20
<b>PS1-28</b> ● <b>PS1-28J8</b> ● <b>PS1-28J10</b>		28	S1 S1T S1K	8 8 10	22	28	30	10	10	20
<b>PS1-30</b> ● <b>PS1-30J8</b> ● <b>PS1-30J10</b> ● <b>PS1-30J12</b>		30	S1 S1T S1K S1K	8 8 10 12	25	30	32	10	10	20
<b>PS1-32</b> ● <b>PS1-32J8</b> ● <b>PS1-32J10</b> ● <b>PS1-32J12</b>		32	S1 S1T S1K S1K	8 8 10 12	26	32	34	10	10	20
<b>PS1-35</b> ● <b>PS1-35J8</b> ● <b>PS1-35J10</b> ● <b>PS1-35J12</b>		35	S1 S1T S1K S1K	8 8 10 12	26	35	37	10	10	20
<b>PS1-36</b> ● <b>PS1-36J8</b> ● <b>PS1-36J10</b> ● <b>PS1-36J12</b> ● <b>PS1-36J14</b> ● <b>PS1-36J15</b>		36	S1 S1T S1K S1K S1K S1K	8 8 10 12 14 15	28	36	38	10	10	20
<b>PS1-40</b> ● <b>PS1-40J10</b> ● <b>PS1-40J12</b> ● <b>PS1-40J14</b> ● <b>PS1-40J15</b> ● <b>PS1-40J16</b> ● <b>PS1-40J18</b> ● <b>PS1-40J19</b>		40	S1 S1K S1K S1K S1K S1K S1K S1K	10 10 12 14 15 16 18 19	35	40	42	10	10	20
<b>PS1-45</b> ● <b>PS1-45J10</b> ● <b>PS1-45J12</b> ● <b>PS1-45J14</b> ● <b>PS1-45J15</b> ● <b>PS1-45J16</b> ● <b>PS1-45J18</b> ● <b>PS1-45J19</b>		45	S1 S1K S1K S1K S1K S1K S1K S1K	10 10 12 14 15 16 18 19	35	45	47	10	10	20

- [Caution on Product Characteristics]
- ① Significant variations in temperature or humidity can cause dimensional changes in plastic gears (MC Nylon gears), including bore size (H8 when produced), tooth diameter, and backlash. Please see the section "Design of Plastic Gears" in the technical reference (Page 693).
  - ② The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
  - ③ Without lubrication, using plastic gears in pairs may generate heat and dilation. It is recommended to mate with steel gears.
  - ④ The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

- [Caution on Secondary Operations]
- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
  - ② Plastic gears are susceptible to the effects of temperature and moisture. Dimensional changes may occur while performing secondary operations and during post-machining operations.



## Plastic Spur Gears

Newly added



Keyway WidthxDepth	Set Screw		Allowable torque (N·m) Bending strength	Allowable torque (kgf·m) Bending strength	Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
	Size	J					
—	—	—	0.41	0.042	0~0.32	0.0027 0.0027	<b>PS1-15</b> ● <b>PS1-15J6</b>
—	M4**	5					
—	—	—	0.45	0.046	0~0.32	0.0030 0.0029	<b>PS1-16</b> ● <b>PS1-16J6</b>
—	M4**	5					
—	—	—	0.53	0.054	0~0.32	0.0041 0.0040	<b>PS1-18</b> ● <b>PS1-18J6</b>
—	M4**	5					
—	—	—	0.61	0.063	0~0.32	0.0053 0.0052	<b>PS1-20</b> ● <b>PS1-20J6</b>
—	M4	5					
—	—	—	0.69	0.071	0~0.34	0.0062 0.0061	<b>PS1-22</b> ● <b>PS1-22J8</b>
—	M5**	5					
—	—	—	0.77	0.079	0~0.34	0.0077 0.0076	<b>PS1-24</b> ● <b>PS1-24J8</b>
—	M5	5					
—	—	—	0.82	0.083	0~0.34	0.0082 0.0080	<b>PS1-25</b> ● <b>PS1-25J8</b>
—	M5	5					
—	—	—	0.86	0.088	0~0.34	0.0086 0.0085	<b>PS1-26</b> ● <b>PS1-26J8</b>
—	M5	5					
—	—	—	0.94	0.096	0~0.34	0.010 0.010 0.0094	<b>PS1-28</b> ● <b>PS1-28J8</b> ● <b>PS1-28J10</b>
4 x 1.8	M5 M4	5 5					
—	—	—	1.03	0.10	0~0.34	0.013 0.013 0.012 0.011	<b>PS1-30</b> ● <b>PS1-30J8</b> ● <b>PS1-30J10</b> ● <b>PS1-30J12</b>
4 x 1.8	M5	5					
4 x 1.8	M4	5					
—	—	—	1.11	0.11	0~0.34	0.014 0.014 0.013 0.012	<b>PS1-32</b> ● <b>PS1-32J8</b> ● <b>PS1-32J10</b> ● <b>PS1-32J12</b>
4 x 1.8	M5	5					
4 x 1.8	M4	5					
—	—	—	1.25	0.13	0~0.34	0.016 0.016 0.015 0.014	<b>PS1-35</b> ● <b>PS1-35J8</b> ● <b>PS1-35J10</b> ● <b>PS1-35J12</b>
4 x 1.8	M5	5					
4 x 1.8	M4	5					
—	—	—	1.30	0.13	0~0.34	0.018 0.018 0.017 0.016 0.015 0.014	<b>PS1-36</b> ● <b>PS1-36J8</b> ● <b>PS1-36J10</b> ● <b>PS1-36J12</b> ● <b>PS1-36J14</b> ● <b>PS1-36J15</b>
4 x 1.8	M5	5					
4 x 1.8	M4	5					
4 x 1.8	M4	5					
5 x 2.3	M4	5					
5 x 2.3	M4	5					
—	—	—	1.48	0.15	0~0.34	0.024 0.023 0.023 0.022 0.021 0.021 0.019 0.018	<b>PS1-40</b> ● <b>PS1-40J10</b> ● <b>PS1-40J12</b> ● <b>PS1-40J14</b> ● <b>PS1-40J15</b> ● <b>PS1-40J16</b> ● <b>PS1-40J18</b> ● <b>PS1-40J19</b>
4 x 1.8	M4	5					
4 x 1.8	M4	5					
5 x 2.3	M4	5					
5 x 2.3	M4	5					
5 x 2.3	M4	5					
6 x 2.8	M5	5					
6 x 2.8	M5	5					
—	—	—	1.71	0.17	0~0.34	0.028 0.027 0.026 0.025 0.025 0.024 0.023 0.022	<b>PS1-45</b> ● <b>PS1-45J10</b> ● <b>PS1-45J12</b> ● <b>PS1-45J14</b> ● <b>PS1-45J15</b> ● <b>PS1-45J16</b> ● <b>PS1-45J18</b> ● <b>PS1-45J19</b>
4 x 1.8	M4	5					
4 x 1.8	M4	5					
5 x 2.3	M4	5					
5 x 2.3	M4	5					
5 x 2.3	M4	5					
6 x 2.8	M5	5					
6 x 2.8	M5	5					

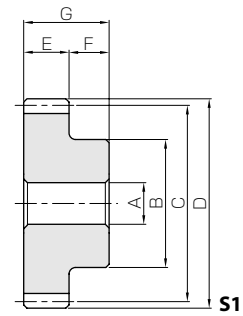
**[Caution on J series]**

- As available-on-request products, requires a lead-time for shipping within **3 working-days (excludes the day ordered)**, after placing an order. Please allow additional shipping time to get to your local distributor.
- Number of products we can process for one order is **1 to 20 units**. For quantities of 21 or more pieces, we need to quote price and lead time.
- Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).
- For products having a tapped hole, a set screw is included.
- Since tapped holes of plastic products are easily broken, avoid too much tightening when fastening screws. For products which have a short tapped hole (Products marked with "\*" are the tap size), fasten with torques less than 0.12N · m for M4, and 0.38N · m for M5.



Specifications	
Precision grade	JIS grade N9 (JIS B1702-1: 1998) * JIS grade 5 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	MC901
Heat treatment	—
Tooth hardness	115 ~ 120HRR

\* The precision grade of this product is equivalent to the value shown in the table.

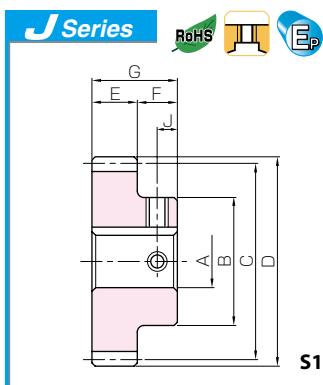


- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length
				A	B	C	D	E	F	G
<b>PS1-48</b> ● PS1-48J10 ● PS1-48J12 ● PS1-48J14 ● PS1-48J15 ● PS1-48J16 ● PS1-48J18 ● PS1-48J19	m1	48	S1	10	35	48	50	10	10	20
			S1K	10						
			S1K	12						
			S1K	14						
			S1K	15						
			S1K	16						
			S1K	18						
			S1K	19						
			<b>PS1-50</b> ● PS1-50J10 ● PS1-50J12 ● PS1-50J14 ● PS1-50J15 ● PS1-50J16 ● PS1-50J18 ● PS1-50J19	m1						
S1K	10									
S1K	12									
S1K	14									
S1K	15									
S1K	16									
S1K	18									
S1K	19									
<b>PS1-55</b> ● PS1-55J10 ● PS1-55J12 ● PS1-55J14 ● PS1-55J15 ● PS1-55J16 ● PS1-55J18 ● PS1-55J19	m1	55			S1	10	35	55	57	10
			S1K	10						
			S1K	12						
			S1K	14						
			S1K	15						
			S1K	16						
			S1K	18						
			S1K	19						
			<b>PS1-60</b> ● PS1-60J10 ● PS1-60J12 ● PS1-60J14 ● PS1-60J15 ● PS1-60J16 ● PS1-60J18 ● PS1-60J19	m1	60	S1				
S1K	10									
S1K	12									
S1K	14									
S1K	15									
S1K	16									
S1K	18									
S1K	19									
<b>PS1-65</b> ● PS1-65J10 ● PS1-65J12 ● PS1-65J14 ● PS1-65J15 ● PS1-65J16 ● PS1-65J18 ● PS1-65J19	m1	65				S1	10	35	65	67
			S1K	10						
			S1K	12						
			S1K	14						
			S1K	15						
			S1K	16						
			S1K	18						
			S1K	19						
			<b>PS1-70</b> ● PS1-70J10 ● PS1-70J12 ● PS1-70J14 ● PS1-70J15 ● PS1-70J16 ● PS1-70J18 ● PS1-70J19 ● PS1-70J20 ● PS1-70J22	m1	70	S1	10			
S1K	10									
S1K	12									
S1K	14									
S1K	15									
S1K	16									
S1K	18									
S1K	19									
S1K	20									
S1K	22									
<b>PS1-75</b> ● PS1-75J10 ● PS1-75J12 ● PS1-75J14 ● PS1-75J15 ● PS1-75J16 ● PS1-75J18 ● PS1-75J19 ● PS1-75J20 ● PS1-75J22	m1	75	S1	10	40	75	77	10	10	20
			S1K	10						
			S1K	12						
			S1K	14						
			S1K	15						
			S1K	16						
			S1K	18						
			S1K	19						
			S1K	20						
S1K	22									

- [Caution on Product Characteristics]
- Significant variations in temperature or humidity can cause dimensional changes in plastic gears (MC Nylon gears), including bore size (H8 when produced), tooth diameter, and backlash. Please see the section "Design of Plastic Gears" in the technical reference (Page 693).
  - The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
  - Without lubrication, using plastic gears in pairs may generate heat and dilation. It is recommended to mate with steel gears.
  - The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

- [Caution on Secondary Operations]
- Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
  - Plastic gears are susceptible to the effects of temperature and moisture. Dimensional changes may occur while performing secondary operations and during post-machining operations.



## Plastic Spur Gears

Newly added



Keyway WidthxDepth	Set Screw		Allowable torque (N-m) Bending strength	Allowable torque (kgf-m) Bending strength	Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
	Size	J					
—	—	—	1.86	0.19	0~0.34	0.030 0.030 0.029 0.028 0.027 0.027 0.025 0.025	<b>PS1-48</b> ● PS1-48J10 ● PS1-48J12 ● PS1-48J14 ● PS1-48J15 ● PS1-48J16 ● PS1-48J18 ● PS1-48J19
4 x 1.8	M4	5					
4 x 1.8	M4	5					
5 x 2.3	M4	5					
5 x 2.3	M4	5					
5 x 2.3	M4	5					
6 x 2.8	M5	5					
6 x 2.8	M5	5					
—	—	—	1.96	0.20	0~0.34	0.032 0.032 0.031 0.030 0.029 0.029 0.027 0.027	<b>PS1-50</b> ● PS1-50J10 ● PS1-50J12 ● PS1-50J14 ● PS1-50J15 ● PS1-50J16 ● PS1-50J18 ● PS1-50J19
4 x 1.8	M4	5					
4 x 1.8	M4	5					
5 x 2.3	M4	5					
5 x 2.3	M4	5					
5 x 2.3	M4	5					
6 x 2.8	M5	5					
6 x 2.8	M5	5					
—	—	—	2.18	0.22	0~0.36	0.037 0.036 0.036 0.035 0.034 0.034 0.032 0.031	<b>PS1-55</b> ● PS1-55J10 ● PS1-55J12 ● PS1-55J14 ● PS1-55J15 ● PS1-55J16 ● PS1-55J18 ● PS1-55J19
4 x 1.8	M4	5					
4 x 1.8	M4	5					
5 x 2.3	M4	5					
5 x 2.3	M4	5					
5 x 2.3	M4	5					
6 x 2.8	M5	5					
6 x 2.8	M5	5					
—	—	—	2.41	0.25	0~0.36	0.042 0.042 0.041 0.040 0.039 0.039 0.037 0.037	<b>PS1-60</b> ● PS1-60J10 ● PS1-60J12 ● PS1-60J14 ● PS1-60J15 ● PS1-60J16 ● PS1-60J18 ● PS1-60J19
4 x 1.8	M4	5					
4 x 1.8	M4	5					
5 x 2.3	M4	5					
5 x 2.3	M4	5					
5 x 2.3	M4	5					
6 x 2.8	M5	5					
6 x 2.8	M5	5					
—	—	—	2.64	0.27	0~0.36	0.048 0.047 0.047 0.046 0.045 0.044 0.043 0.042	<b>PS1-65</b> ● PS1-65J10 ● PS1-65J12 ● PS1-65J14 ● PS1-65J15 ● PS1-65J16 ● PS1-65J18 ● PS1-65J19
4 x 1.8	M4	5					
4 x 1.8	M4	5					
5 x 2.3	M4	5					
5 x 2.3	M4	5					
5 x 2.3	M4	5					
6 x 2.8	M5	5					
6 x 2.8	M5	5					
—	—	—	2.87	0.29	0~0.36	0.057 0.057 0.056 0.055 0.054 0.054 0.052 0.052 0.051 0.050	<b>PS1-70</b> ● PS1-70J10 ● PS1-70J12 ● PS1-70J14 ● PS1-70J15 ● PS1-70J16 ● PS1-70J18 ● PS1-70J19 ● PS1-70J20 ● PS1-70J22
4 x 1.8	M4*	5					
4 x 1.8	M4	5					
5 x 2.3	M4	5					
5 x 2.3	M4	5					
5 x 2.3	M4	5					
6 x 2.8	M5	5					
6 x 2.8	M5	5					
6 x 2.8	M5	5					
6 x 2.8	M5	5					
—	—	—	3.11	0.32	0~0.36	0.064 0.063 0.063 0.062 0.061 0.061 0.059 0.058 0.058 0.056	<b>PS1-75</b> ● PS1-75J10 ● PS1-75J12 ● PS1-75J14 ● PS1-75J15 ● PS1-75J16 ● PS1-75J18 ● PS1-75J19 ● PS1-75J20 ● PS1-75J22
4 x 1.8	M4*	5					
4 x 1.8	M4	5					
5 x 2.3	M4	5					
5 x 2.3	M4	5					
5 x 2.3	M4	5					
6 x 2.8	M5	5					
6 x 2.8	M5	5					
6 x 2.8	M5	5					

[Caution on J series] ① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order.

Please allow additional shipping time to get to your local distributor.

② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.

③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.

④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).

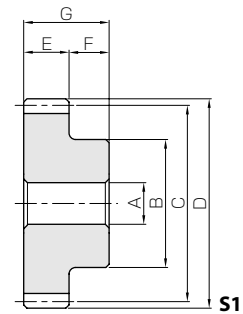
⑤ For products having a tapped hole, a set screw is included.

⑥ Since tapped holes of plastic products are easily broken, avoid too much tightening when fastening screws. For products which have a short tapped hole (Products marked with "\*" are the tap size), fasten with torques less than 0.12N · m for M4, and 0.38N · m for M5.



Specifications	
Precision grade	JIS grade N9 (JIS B1702-1: 1998) * JIS grade 5 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	MC901
Heat treatment	—
Tooth hardness	115 ~ 120HRR

\* The precision grade of this product is equivalent to the value shown in the table.



- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

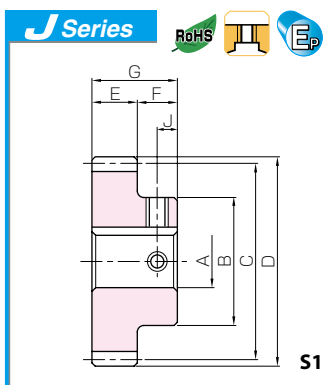
Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length
				A	B	C	D	E	F	G
<b>PS1-80</b> ● PS1-80J10 ● PS1-80J12 ● PS1-80J14 ● PS1-80J15 ● PS1-80J16 ● PS1-80J18 ● PS1-80J19 ● PS1-80J20 ● PS1-80J22	m1	80	S1	10	40	80	82	10	10	20
			S1K	10						
			S1K	12						
			S1K	14						
			S1K	15						
			S1K	16						
			S1K	18						
			S1K	19						
			S1K	20						
			S1K	22						
			<b>PS1-85</b> ● PS1-85J10 ● PS1-85J12 ● PS1-85J14 ● PS1-85J15 ● PS1-85J16 ● PS1-85J18 ● PS1-85J19 ● PS1-85J20 ● PS1-85J22	m1						
S1K	10									
S1K	12									
S1K	14									
S1K	15									
S1K	16									
S1K	18									
S1K	19									
S1K	20									
S1K	22									
<b>PS1-90</b> ● PS1-90J10 ● PS1-90J12 ● PS1-90J14 ● PS1-90J15 ● PS1-90J16 ● PS1-90J18 ● PS1-90J19 ● PS1-90J20 ● PS1-90J22	m1	90			S1	10	40	90	92	10
			S1K	10						
			S1K	12						
			S1K	14						
			S1K	15						
			S1K	16						
			S1K	18						
			S1K	19						
			S1K	20						
			S1K	22						
			<b>PS1-95</b> ● PS1-95J10 ● PS1-95J12 ● PS1-95J14 ● PS1-95J15 ● PS1-95J16 ● PS1-95J18 ● PS1-95J19 ● PS1-95J20 ● PS1-95J22	m1	95	S1				
S1K	10									
S1K	12									
S1K	14									
S1K	15									
S1K	16									
S1K	18									
S1K	19									
S1K	20									
S1K	22									
<b>PS1-100</b> ● PS1-100J10 ● PS1-100J12 ● PS1-100J14 ● PS1-100J15 ● PS1-100J16 ● PS1-100J18 ● PS1-100J19 ● PS1-100J20 ● PS1-100J22	m1	100				S1	10	40	100	102
			S1K	10						
			S1K	12						
			S1K	14						
			S1K	15						
			S1K	16						
			S1K	18						
			S1K	19						
			S1K	20						
			S1K	22						

[Caution on Product Characteristics]

- ① Significant variations in temperature or humidity can cause dimensional changes in plastic gears (MC Nylon gears), including bore size (H8 when produced), tooth diameter, and backlash. Please see the section "Design of Plastic Gears" in the technical reference (Page 693).
- ② The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ③ Without lubrication, using plastic gears in pairs may generate heat and dilation. It is recommended to mate with steel gears.
- ④ The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Plastic gears are susceptible to the effects of temperature and moisture. Dimensional changes may occur while performing secondary operations and during post-machining operations.



## Plastic Spur Gears

Newly added



Keyway Width×Depth	Set Screw		Allowable torque (N·m) Bending strength	Allowable torque (kgf·m) Bending strength	Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
	Size	J					
—	—	—	3.34	0.34	0~0.36	0.071 0.070 0.070 0.069 0.068 0.068 0.066 0.065 0.065 0.063	<b>PS1-80</b> ●PS1-80J10 ●PS1-80J12 ●PS1-80J14 ●PS1-80J15 ●PS1-80J16 ●PS1-80J18 ●PS1-80J19 ●PS1-80J20 ●PS1-80J22
4 × 1.8	M4*	5					
4 × 1.8	M4	5					
5 × 2.3	M4	5					
5 × 2.3	M4	5					
5 × 2.3	M4	5					
6 × 2.8	M5	5					
6 × 2.8	M5	5					
6 × 2.8	M5	5					
—	—	—	3.57	0.36	0~0.36	0.079 0.078 0.077 0.076 0.076 0.075 0.074 0.073 0.072 0.071	<b>PS1-85</b> ●PS1-85J10 ●PS1-85J12 ●PS1-85J14 ●PS1-85J15 ●PS1-85J16 ●PS1-85J18 ●PS1-85J19 ●PS1-85J20 ●PS1-85J22
4 × 1.8	M4*	5					
4 × 1.8	M4	5					
5 × 2.3	M4	5					
5 × 2.3	M4	5					
5 × 2.3	M4	5					
6 × 2.8	M5	5					
6 × 2.8	M5	5					
6 × 2.8	M5	5					
—	—	—	3.80	0.39	0~0.36	0.087 0.086 0.085 0.084 0.084 0.083 0.082 0.081 0.080 0.079	<b>PS1-90</b> ●PS1-90J10 ●PS1-90J12 ●PS1-90J14 ●PS1-90J15 ●PS1-90J16 ●PS1-90J18 ●PS1-90J19 ●PS1-90J20 ●PS1-90J22
4 × 1.8	M4*	5					
4 × 1.8	M4	5					
5 × 2.3	M4	5					
5 × 2.3	M4	5					
5 × 2.3	M4	5					
6 × 2.8	M5	5					
6 × 2.8	M5	5					
6 × 2.8	M5	5					
—	—	—	4.03	0.41	0~0.36	0.095 0.094 0.094 0.093 0.092 0.092 0.090 0.089 0.089 0.087	<b>PS1-95</b> ●PS1-95J10 ●PS1-95J12 ●PS1-95J14 ●PS1-95J15 ●PS1-95J16 ●PS1-95J18 ●PS1-95J19 ●PS1-95J20 ●PS1-95J22
4 × 1.8	M4*	5					
4 × 1.8	M4	5					
5 × 2.3	M4	5					
5 × 2.3	M4	5					
5 × 2.3	M4	5					
6 × 2.8	M5	5					
6 × 2.8	M5	5					
6 × 2.8	M5	5					
—	—	—	4.27	0.44	0~0.36	0.10 0.10 0.10 0.10 0.10 0.10 0.099 0.098 0.098 0.096	<b>PS1-100</b> ●PS1-100J10 ●PS1-100J12 ●PS1-100J14 ●PS1-100J15 ●PS1-100J16 ●PS1-100J18 ●PS1-100J19 ●PS1-100J20 ●PS1-100J22
4 × 1.8	M4*	5					
4 × 1.8	M4	5					
5 × 2.3	M4	5					
5 × 2.3	M4	5					
5 × 2.3	M4	5					
6 × 2.8	M5	5					
6 × 2.8	M5	5					
6 × 2.8	M5	5					

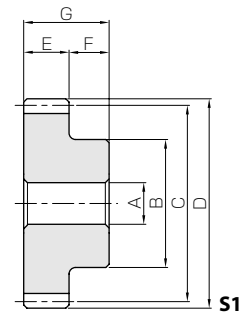
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Specifications	
Precision grade	JIS grade N9 (JIS B1702-1: 1998) * JIS grade 5 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	MC901
Heat treatment	—
Tooth hardness	115 ~ 120HRR

\* The precision grade of this product is equivalent to the value shown in the table.



- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	
				A	B	C	D	E	F	G	
<b>PS1.5-15</b> ● <b>PS1.5-15J8</b>	<b>m1.5</b>	15	S1	8	18	22.5	25.5	15	10	25	
			S1T	8							
		<b>PS1.5-16</b> ● <b>PS1.5-16J8</b>	16	S1	8	20	24	27	15	10	25
				S1T	8						
		<b>PS1.5-18</b> ● <b>PS1.5-18J8</b> ● <b>PS1.5-18J10</b>	18	S1	8	22	27	30	15	10	25
				S1T	8						
				S1K	10						
		<b>PS1.5-20</b> ● <b>PS1.5-20J8</b> ● <b>PS1.5-20J10</b> ● <b>PS1.5-20J12</b>	20	S1	8	24	30	33	15	10	25
				S1T	8						
				S1K	10						
				S1K	12						
		<b>PS1.5-22</b> ● <b>PS1.5-22J8</b> ● <b>PS1.5-22J10</b> ● <b>PS1.5-22J12</b>	22	S1	8	26	33	36	15	10	25
S1T	8										
S1K	10										
S1K	12										
<b>PS1.5-24</b> ● <b>PS1.5-24J8</b> ● <b>PS1.5-24J10</b> ● <b>PS1.5-24J12</b> ● <b>PS1.5-24J14</b> ● <b>PS1.5-24J15</b>	24	S1	8	28	36	39	15	10	25		
		S1T	8								
		S1K	10								
		S1K	12								
		S1K	14								
S1K	15										
<b>PS1.5-25</b> ● <b>PS1.5-25J8</b> ● <b>PS1.5-25J10</b> ● <b>PS1.5-25J12</b> ● <b>PS1.5-25J14</b> ● <b>PS1.5-25J15</b> ● <b>PS1.5-25J16</b>	25	S1	8	30	37.5	40.5	15	10	25		
		S1T	8								
		S1K	10								
		S1K	12								
		S1K	14								
S1K	15										
S1K	16										
<b>PS1.5-26</b> ● <b>PS1.5-26J8</b> ● <b>PS1.5-26J10</b> ● <b>PS1.5-26J12</b> ● <b>PS1.5-26J14</b> ● <b>PS1.5-26J15</b> ● <b>PS1.5-26J16</b>	26	S1	8	32	39	42	15	10	25		
		S1T	8								
		S1K	10								
		S1K	12								
		S1K	14								
		S1K	15								
S1K	16										
<b>PS1.5-28</b> ● <b>PS1.5-28J8</b> ● <b>PS1.5-28J10</b> ● <b>PS1.5-28J12</b> ● <b>PS1.5-28J14</b> ● <b>PS1.5-28J15</b> ● <b>PS1.5-28J16</b> ● <b>PS1.5-28J18</b> ● <b>PS1.5-28J19</b> ● <b>PS1.5-28J20</b>	28	S1	8	36	42	45	15	10	25		
		S1T	8								
		S1K	10								
		S1K	12								
		S1K	14								
		S1K	15								
		S1K	16								
		S1K	18								
		S1K	19								
		S1K	20								
<b>PS1.5-30</b> ● <b>PS1.5-30J8</b> ● <b>PS1.5-30J10</b> ● <b>PS1.5-30J12</b> ● <b>PS1.5-30J14</b> ● <b>PS1.5-30J15</b> ● <b>PS1.5-30J16</b> ● <b>PS1.5-30J18</b> ● <b>PS1.5-30J19</b> ● <b>PS1.5-30J20</b> ● <b>PS1.5-30J22</b>	30	S1	8	38	45	48	15	10	25		
		S1T	8								
		S1K	10								
		S1K	12								
		S1K	14								
		S1K	15								
		S1K	16								
		S1K	18								
		S1K	19								
		S1K	20								
		S1K	22								

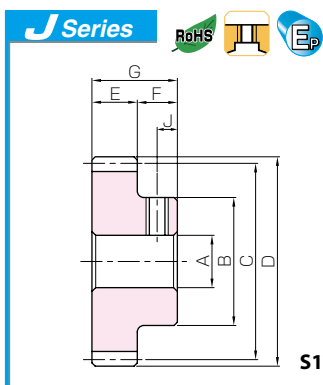
[Caution on Product Characteristics]

- ① Significant variations in temperature or humidity can cause dimensional changes in plastic gears (MC Nylon gears), including bore size (H8 when produced), tooth diameter, and backlash. Please see the section "Design of Plastic Gears" in the technical reference (Page 693).
- ② The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ③ Without lubrication, using plastic gears in pairs may generate heat and dilation. It is recommended to mate with steel gears.
- ④ The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Plastic gears are susceptible to the effects of temperature and moisture. Dimensional changes may occur while performing secondary operations and during post-machining operations.





## Plastic Spur Gears

Newly added



Keyway WidthxDepth	Set Screw		Allowable torque (N·m) Bending strength	Allowable torque (kgf·m) Bending strength	Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
	Size	J					
— —	— M5**	— 5	1.39	0.14	0~0.38	0.0084 0.0083	<b>PS1.5-15</b> ● <b>PS1.5-15J8</b>
— —	— M5	— 5	1.53	0.16	0~0.38	0.010 0.0099	<b>PS1.5-16</b> ● <b>PS1.5-16J8</b>
— —	— M5	— 5	1.79	0.18	0~0.38	0.013 0.013	<b>PS1.5-18</b> ● <b>PS1.5-18J8</b>
4 x 1.8	M4	5	1.79	0.18	0~0.38	0.012	● <b>PS1.5-18J10</b>
— —	— M5	— 5	2.07	0.21	0~0.38	0.016 0.016	<b>PS1.5-20</b> ● <b>PS1.5-20J8</b>
4 x 1.8	M4	5	2.07	0.21	0~0.38	0.015	● <b>PS1.5-20J10</b>
4 x 1.8	M4	5	2.07	0.21	0~0.38	0.014	● <b>PS1.5-20J12</b>
— —	— M5	— 5	2.34	0.24	0~0.38	0.020 0.019	<b>PS1.5-22</b> ● <b>PS1.5-22J8</b>
4 x 1.8	M4	5	2.34	0.24	0~0.38	0.018	● <b>PS1.5-22J10</b>
4 x 1.8	M4	5	2.34	0.24	0~0.38	0.017	● <b>PS1.5-22J12</b>
— —	— M5	— 5	2.61	0.27	0~0.38	0.023 0.023	<b>PS1.5-24</b> ● <b>PS1.5-24J8</b>
4 x 1.8	M4	5	2.61	0.27	0~0.38	0.022	● <b>PS1.5-24J10</b>
4 x 1.8	M4	5	2.61	0.27	0~0.38	0.021	● <b>PS1.5-24J12</b>
5 x 2.3	M4	5	2.61	0.27	0~0.38	0.020	● <b>PS1.5-24J14</b>
5 x 2.3	M4	5	2.61	0.27	0~0.38	0.019	● <b>PS1.5-24J15</b>
— —	— M5	— 5	2.76	0.28	0~0.38	0.026 0.026	<b>PS1.5-25</b> ● <b>PS1.5-25J8</b>
4 x 1.8	M4	5	2.76	0.28	0~0.38	0.025	● <b>PS1.5-25J10</b>
4 x 1.8	M4	5	2.76	0.28	0~0.38	0.024	● <b>PS1.5-25J12</b>
5 x 2.3	M4	5	2.76	0.28	0~0.38	0.022	● <b>PS1.5-25J14</b>
5 x 2.3	M4	5	2.76	0.28	0~0.38	0.022	● <b>PS1.5-25J15</b>
5 x 2.3	M4	5	2.76	0.28	0~0.38	0.021	● <b>PS1.5-25J16</b>
— —	— M5	— 5	2.91	0.3	0~0.38	0.029 0.028	<b>PS1.5-26</b> ● <b>PS1.5-26J8</b>
4 x 1.8	M4	5	2.91	0.3	0~0.38	0.027	● <b>PS1.5-26J10</b>
4 x 1.8	M4	5	2.91	0.3	0~0.38	0.026	● <b>PS1.5-26J12</b>
5 x 2.3	M4	5	2.91	0.3	0~0.38	0.025	● <b>PS1.5-26J14</b>
5 x 2.3	M4	5	2.91	0.3	0~0.38	0.024	● <b>PS1.5-26J15</b>
5 x 2.3	M4	5	2.91	0.3	0~0.38	0.024	● <b>PS1.5-26J16</b>
— —	— M5	— 5	3.18	0.32	0~0.38	0.034 0.034	<b>PS1.5-28</b> ● <b>PS1.5-28J8</b>
4 x 1.8	M4	5	3.18	0.32	0~0.38	0.033	● <b>PS1.5-28J10</b>
4 x 1.8	M4	5	3.18	0.32	0~0.38	0.032	● <b>PS1.5-28J12</b>
5 x 2.3	M4	5	3.18	0.32	0~0.38	0.031	● <b>PS1.5-28J14</b>
5 x 2.3	M4	5	3.18	0.32	0~0.38	0.030	● <b>PS1.5-28J15</b>
5 x 2.3	M4	5	3.18	0.32	0~0.38	0.029	● <b>PS1.5-28J16</b>
6 x 2.8	M5	5	3.18	0.32	0~0.38	0.028	● <b>PS1.5-28J18</b>
6 x 2.8	M5	5	3.18	0.32	0~0.38	0.027	● <b>PS1.5-28J19</b>
6 x 2.8	M5	5	3.18	0.32	0~0.38	0.026	● <b>PS1.5-28J20</b>
— —	— M5	— 5	3.46	0.35	0~0.38	0.039 0.039	<b>PS1.5-30</b> ● <b>PS1.5-30J8</b>
4 x 1.8	M4	5	3.46	0.35	0~0.38	0.038	● <b>PS1.5-30J10</b>
4 x 1.8	M4	5	3.46	0.35	0~0.38	0.037	● <b>PS1.5-30J12</b>
5 x 2.3	M4	5	3.46	0.35	0~0.38	0.036	● <b>PS1.5-30J14</b>
5 x 2.3	M4	5	3.46	0.35	0~0.38	0.035	● <b>PS1.5-30J15</b>
5 x 2.3	M4	5	3.46	0.35	0~0.38	0.034	● <b>PS1.5-30J16</b>
6 x 2.8	M5	5	3.46	0.35	0~0.38	0.033	● <b>PS1.5-30J18</b>
6 x 2.8	M5	5	3.46	0.35	0~0.38	0.032	● <b>PS1.5-30J19</b>
6 x 2.8	M5	5	3.46	0.35	0~0.38	0.031	● <b>PS1.5-30J20</b>
6 x 2.8	M5	5	3.46	0.35	0~0.38	0.029	● <b>PS1.5-30J22</b>

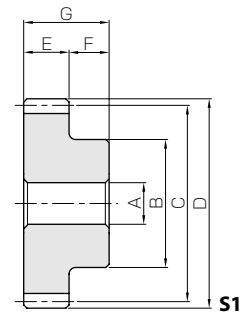
**[Caution on J series]**

- As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
- Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).
- For products having a tapped hole, a set screw is included.
- Since tapped holes of plastic products are easily broken, avoid too much tightening when fastening screws. For products which have a short tapped hole (Products marked with "\*" are the tap size), fasten with torques less than 0.12N · m for M4, and 0.38N · m for M5.



Specifications	
Precision grade	JIS grade N9 (JIS B1702-1: 1998) * JIS grade 5 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	MC901
Heat treatment	—
Tooth hardness	115 ~ 120HRR

\* The precision grade of this product is equivalent to the value shown in the table.



- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
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- Bevel Gearboxes
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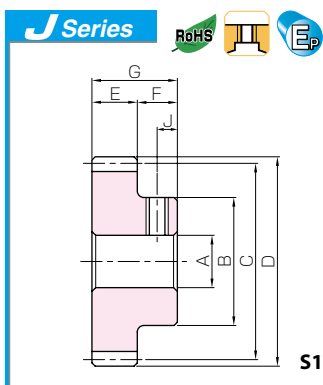
Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length									
				A	B	C	D	E	F	G									
<b>PS1.5-32</b> ●PS1.5-32J8 ●PS1.5-32J10 ●PS1.5-32J12 ●PS1.5-32J14 ●PS1.5-32J15 ●PS1.5-32J16 ●PS1.5-32J18 ●PS1.5-32J19 ●PS1.5-32J20 ●PS1.5-32J22	m1.5	32	S1	8	40	48	51	15	10	25									
			S1T	8															
			S1K	10															
			S1K	12															
			S1K	14															
			S1K	15															
			S1K	16															
			S1K	18															
			S1K	19															
			S1K	20															
			S1K	22															
			<b>PS1.5-35</b> ●PS1.5-35J8 ●PS1.5-35J10 ●PS1.5-35J12 ●PS1.5-35J14 ●PS1.5-35J15 ●PS1.5-35J16 ●PS1.5-35J18 ●PS1.5-35J19 ●PS1.5-35J20 ●PS1.5-35J22	m1.5							35	S1	8	42	52.5	55.5	15	10	25
												S1T	8						
S1K	10																		
S1K	12																		
S1K	14																		
S1K	15																		
S1K	16																		
S1K	18																		
S1K	19																		
S1K	20																		
<b>PS1.5-36</b> ●PS1.5-36J8 ●PS1.5-36J10 ●PS1.5-36J12 ●PS1.5-36J14 ●PS1.5-36J15 ●PS1.5-36J16 ●PS1.5-36J18 ●PS1.5-36J19 ●PS1.5-36J20 ●PS1.5-36J22 ●PS1.5-36J25	m1.5	36	S1	8	45	54	57	15	10	25									
			S1T	8															
			S1K	10															
			S1K	12															
			S1K	14															
			S1K	15															
			S1K	16															
			S1K	18															
			S1K	19															
			S1K	20															
			S1K	22															
			S1K	25															
<b>PS1.5-40</b> ●PS1.5-40J10 ●PS1.5-40J12 ●PS1.5-40J14 ●PS1.5-40J15 ●PS1.5-40J16 ●PS1.5-40J18 ●PS1.5-40J19 ●PS1.5-40J20 ●PS1.5-40J22 ●PS1.5-40J25	m1.5	40	S1	10	45	60	63	15	10	25									
			S1K	10															
			S1K	12															
			S1K	14															
			S1K	15															
			S1K	16															
			S1K	18															
			S1K	19															
			S1K	20															
			S1K	22															
			S1K	25															
<b>PS1.5-45</b> ●PS1.5-45J10 ●PS1.5-45J12 ●PS1.5-45J14 ●PS1.5-45J15 ●PS1.5-45J16 ●PS1.5-45J18 ●PS1.5-45J19 ●PS1.5-45J20 ●PS1.5-45J22 ●PS1.5-45J25	m1.5	45	S1	10	45	67.5	70.5	15	10	25									
			S1K	10															
			S1K	12															
			S1K	14															
			S1K	15															
			S1K	16															
			S1K	18															
			S1K	19															
			S1K	20															
			S1K	22															
			S1K	25															

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## Plastic Spur Gears

Newly added



Keyway WidthxDepth	Set Screw		Allowable torque (N-m) Bending strength	Allowable torque (kgf-m) Bending strength	Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
	Size	J					
—	—	—	3.76	0.38	0~0.38	0.045 0.044 0.043 0.042 0.041 0.040 0.040 0.038 0.037 0.036 0.034	<b>PS1.5-32</b> ●PS1.5-32J8 ●PS1.5-32J10 ●PS1.5-32J12 ●PS1.5-32J14 ●PS1.5-32J15 ●PS1.5-32J16 ●PS1.5-32J18 ●PS1.5-32J19 ●PS1.5-32J20 ●PS1.5-32J22
4 x 1.8	M5	5					
4 x 1.8	M4*	5					
4 x 1.8	M4	5					
5 x 2.3	M4	5					
5 x 2.3	M4	5					
5 x 2.3	M4	5					
6 x 2.8	M5	5					
6 x 2.8	M5	5					
6 x 2.8	M5	5					
—	—	—	4.22	0.43	0~0.40	0.052 0.052 0.051 0.050 0.049 0.048 0.047 0.045 0.045 0.044 0.042	<b>PS1.5-35</b> ●PS1.5-35J8 ●PS1.5-35J10 ●PS1.5-35J12 ●PS1.5-35J14 ●PS1.5-35J15 ●PS1.5-35J16 ●PS1.5-35J18 ●PS1.5-35J19 ●PS1.5-35J20 ●PS1.5-35J22
4 x 1.8	M5	5					
4 x 1.8	M4*	5					
4 x 1.8	M4	5					
5 x 2.3	M4	5					
5 x 2.3	M4	5					
5 x 2.3	M4	5					
6 x 2.8	M5	5					
6 x 2.8	M5	5					
6 x 2.8	M5	5					
—	—	—	4.38	0.45	0~0.40	0.057 0.056 0.055 0.054 0.053 0.052 0.052 0.050 0.049 0.048 0.046 0.043	<b>PS1.5-36</b> ●PS1.5-36J8 ●PS1.5-36J10 ●PS1.5-36J12 ●PS1.5-36J14 ●PS1.5-36J15 ●PS1.5-36J16 ●PS1.5-36J18 ●PS1.5-36J19 ●PS1.5-36J20 ●PS1.5-36J22 ●PS1.5-36J25
4 x 1.8	M5*	5					
4 x 1.8	M4*	5					
4 x 1.8	M4*	5					
5 x 2.3	M4*	5					
5 x 2.3	M4*	5					
5 x 2.3	M4*	5					
6 x 2.8	M5	5					
6 x 2.8	M5	5					
6 x 2.8	M5	5					
—	—	—	5.00	0.51	0~0.40	0.065 0.065 0.064 0.062 0.062 0.062 0.061 0.059 0.058 0.057 0.056 0.052	<b>PS1.5-40</b> ●PS1.5-40J10 ●PS1.5-40J12 ●PS1.5-40J14 ●PS1.5-40J15 ●PS1.5-40J16 ●PS1.5-40J18 ●PS1.5-40J19 ●PS1.5-40J20 ●PS1.5-40J22 ●PS1.5-40J25
4 x 1.8	M4*	5					
4 x 1.8	M4*	5					
5 x 2.3	M4*	5					
5 x 2.3	M4*	5					
5 x 2.3	M4*	5					
5 x 2.3	M4*	5					
6 x 2.8	M5	5					
6 x 2.8	M5	5					
6 x 2.8	M5	5					
—	—	—	5.79	0.59	0~0.40	0.078 0.078 0.077 0.075 0.075 0.075 0.074 0.072 0.071 0.071 0.069 0.065	<b>PS1.5-45</b> ●PS1.5-45J10 ●PS1.5-45J12 ●PS1.5-45J14 ●PS1.5-45J15 ●PS1.5-45J16 ●PS1.5-45J18 ●PS1.5-45J19 ●PS1.5-45J20 ●PS1.5-45J22 ●PS1.5-45J25
4 x 1.8	M4*	5					
4 x 1.8	M4*	5					
5 x 2.3	M4*	5					
5 x 2.3	M4*	5					
5 x 2.3	M4*	5					
5 x 2.3	M4*	5					
6 x 2.8	M5	5					
6 x 2.8	M5	5					
6 x 2.8	M5	5					

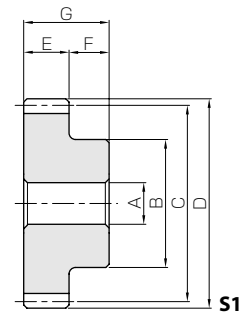
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- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).
- ⑤ For products having a tapped hole, a set screw is included.
- ⑥ Since tapped holes of plastic products are easily broken, avoid too much tightening when fastening screws. For products which have a short tapped hole (Products marked with "\*\*\*" are the tap size), fasten with torques less than  $0.12N \cdot m$  for M4, and  $0.38N \cdot m$  for M5.



Specifications	
Precision grade	JIS grade N9 (JIS B1702-1: 1998) * JIS grade 5 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	MC901
Heat treatment	—
Tooth hardness	115 ~ 120HRR

\* The precision grade of this product is equivalent to the value shown in the table.



- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
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- Worm Gear Pair
- Bevel Gearboxes
- Other Products

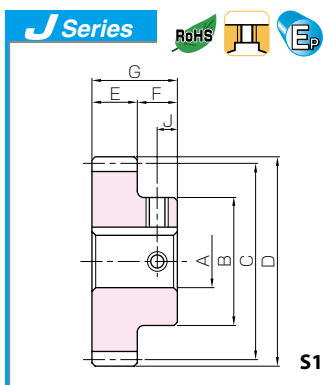
Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length									
				A	B	C	D	E	F	G									
<b>PS1.5-48</b> ●PS1.5-48J10 ●PS1.5-48J12 ●PS1.5-48J14 ●PS1.5-48J15 ●PS1.5-48J16 ●PS1.5-48J18 ●PS1.5-48J19 ●PS1.5-48J20 ●PS1.5-48J22 ●PS1.5-48J25	m1.5	48	S1	10	45	72	75	15	10	25									
			S1K	10															
			S1K	12															
			S1K	14															
			S1K	15															
			S1K	16															
			S1K	18															
			S1K	19															
			S1K	20															
			S1K	22															
			S1K	25															
			<b>PS1.5-50</b> ●PS1.5-50J10 ●PS1.5-50J12 ●PS1.5-50J14 ●PS1.5-50J15 ●PS1.5-50J16 ●PS1.5-50J18 ●PS1.5-50J19 ●PS1.5-50J20 ●PS1.5-50J22 ●PS1.5-50J25	m1.5							50	S1	10	45	75	78	15	10	25
												S1K	10						
S1K	12																		
S1K	14																		
S1K	15																		
S1K	16																		
S1K	18																		
S1K	19																		
S1K	20																		
S1K	22																		
S1K	25																		
<b>PS1.5-55</b> ●PS1.5-55J10 ●PS1.5-55J12 ●PS1.5-55J14 ●PS1.5-55J15 ●PS1.5-55J16 ●PS1.5-55J18 ●PS1.5-55J19 ●PS1.5-55J20 ●PS1.5-55J22 ●PS1.5-55J25	m1.5	55			S1	10	45	82.5	85.5	15		10	25						
					S1K	10													
			S1K	12															
			S1K	14															
			S1K	15															
			S1K	16															
			S1K	18															
			S1K	19															
			S1K	20															
			S1K	22															
			S1K	25															
			<b>PS1.5-60</b> ●PS1.5-60J10 ●PS1.5-60J12 ●PS1.5-60J14 ●PS1.5-60J15 ●PS1.5-60J16 ●PS1.5-60J18 ●PS1.5-60J19 ●PS1.5-60J20 ●PS1.5-60J22 ●PS1.5-60J25 ●PS1.5-60J28	m1.5	60	S1					10			50	90	93	15	10	25
						S1K					10								
S1K	12																		
S1K	14																		
S1K	15																		
S1K	16																		
S1K	18																		
S1K	19																		
S1K	20																		
S1K	22																		
S1K	25																		
S1K	28																		
<b>PS1.5-65</b> ●PS1.5-65J12 ●PS1.5-65J14 ●PS1.5-65J15 ●PS1.5-65J16 ●PS1.5-65J18 ●PS1.5-65J19 ●PS1.5-65J20 ●PS1.5-65J22 ●PS1.5-65J25 ●PS1.5-65J28	m1.5	65				S1	12	50	97.5	100.5	15	10	25						
			S1K	12															
			S1K	14															
			S1K	15															
			S1K	16															
			S1K	18															
			S1K	19															
			S1K	20															
			S1K	22															
			S1K	25															
			S1K	28															

[Caution on Product Characteristics]

- ① Significant variations in temperature or humidity can cause dimensional changes in plastic gears (MC Nylon gears), including bore size (H8 when produced), tooth diameter, and backlash. Please see the section "Design of Plastic Gears" in the technical reference (Page 693).
- ② The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ③ Without lubrication, using plastic gears in pairs may generate heat and dilation. It is recommended to mate with steel gears.
- ④ The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Plastic gears are susceptible to the effects of temperature and moisture. Dimensional changes may occur while performing secondary operations and during post-machining operations.



## Plastic Spur Gears

Newly added



Keyway WidthxDepth	Set Screw		Allowable torque (N-m) Bending strength	Allowable torque (kgf·m) Bending strength	Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
	Size	J					
—	—	—	6.27	0.64	0~0.40	0.087 0.086 0.085 0.084 0.083 0.083 0.081 0.080 0.079 0.077 0.074	<b>PS1.5-48</b> ●PS1.5-48J10 ●PS1.5-48J12 ●PS1.5-48J14 ●PS1.5-48J15 ●PS1.5-48J16 ●PS1.5-48J18 ●PS1.5-48J19 ●PS1.5-48J20 ●PS1.5-48J22 ●PS1.5-48J25
4 x 1.8	M4*	5					
4 x 1.8	M4*	5					
5 x 2.3	M4*	5					
5 x 2.3	M4*	5					
5 x 2.3	M4*	5					
6 x 2.8	M5	5					
6 x 2.8	M5	5					
6 x 2.8	M5	5					
6 x 2.8	M5	5					
8 x 3.3	M6	5					
—	—	—	6.60	0.67	0~0.40	0.093 0.092 0.091 0.090 0.089 0.089 0.087 0.086 0.085 0.083 0.080	<b>PS1.5-50</b> ●PS1.5-50J10 ●PS1.5-50J12 ●PS1.5-50J14 ●PS1.5-50J15 ●PS1.5-50J16 ●PS1.5-50J18 ●PS1.5-50J19 ●PS1.5-50J20 ●PS1.5-50J22 ●PS1.5-50J25
4 x 1.8	M4*	5					
4 x 1.8	M4*	5					
5 x 2.3	M4*	5					
5 x 2.3	M4*	5					
5 x 2.3	M4*	5					
6 x 2.8	M5	5					
6 x 2.8	M5	5					
6 x 2.8	M5	5					
6 x 2.8	M5	5					
8 x 3.3	M6	5					
—	—	—	7.36	0.75	0~0.40	0.11 0.11 0.11 0.11 0.11 0.10 0.10 0.10 0.10 0.099 0.096	<b>PS1.5-55</b> ●PS1.5-55J10 ●PS1.5-55J12 ●PS1.5-55J14 ●PS1.5-55J15 ●PS1.5-55J16 ●PS1.5-55J18 ●PS1.5-55J19 ●PS1.5-55J20 ●PS1.5-55J22 ●PS1.5-55J25
4 x 1.8	M4*	5					
4 x 1.8	M4*	5					
5 x 2.3	M4*	5					
5 x 2.3	M4*	5					
5 x 2.3	M4*	5					
6 x 2.8	M5	5					
6 x 2.8	M5	5					
6 x 2.8	M5	5					
6 x 2.8	M5	5					
8 x 3.3	M6	5					
—	—	—	8.14	0.83	0~0.40	0.13 0.13 0.13 0.13 0.13 0.13 0.12 0.12 0.12 0.12 0.12 0.11	<b>PS1.5-60</b> ●PS1.5-60J10 ●PS1.5-60J12 ●PS1.5-60J14 ●PS1.5-60J15 ●PS1.5-60J16 ●PS1.5-60J18 ●PS1.5-60J19 ●PS1.5-60J20 ●PS1.5-60J22 ●PS1.5-60J25 ●PS1.5-60J28
4 x 1.8	M4*	5					
4 x 1.8	M4*	5					
5 x 2.3	M4*	5					
5 x 2.3	M4*	5					
5 x 2.3	M4*	5					
6 x 2.8	M5	5					
6 x 2.8	M5	5					
6 x 2.8	M5	5					
6 x 2.8	M5	5					
8 x 3.3	M6	5					
—	—	—	8.91	0.91	0~0.40	0.15 0.15 0.15 0.15 0.15 0.14 0.14 0.14 0.14 0.14 0.14 0.13	<b>PS1.5-65</b> ●PS1.5-65J12 ●PS1.5-65J14 ●PS1.5-65J15 ●PS1.5-65J16 ●PS1.5-65J18 ●PS1.5-65J19 ●PS1.5-65J20 ●PS1.5-65J22 ●PS1.5-65J25 ●PS1.5-65J28
4 x 1.8	M4*	5					
5 x 2.3	M4*	5					
5 x 2.3	M4*	5					
5 x 2.3	M4*	5					
6 x 2.8	M5	5					
6 x 2.8	M5	5					
6 x 2.8	M5	5					
6 x 2.8	M5	5					
8 x 3.3	M6	5					
8 x 3.3	M6	5					

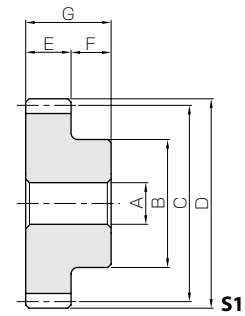
## [Caution on J series]

- As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order.  
Please allow additional shipping time to get to your local distributor.
- Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).
- For products having a tapped hole, a set screw is included.
- Since tapped holes of plastic products are easily broken, avoid too much tightening when fastening screws. For products which have a short tapped hole (Products marked with "\*" are the tap size), fasten with torques less than  $0.12N \cdot m$  for M4, and  $0.38N \cdot m$  for M5.



Specifications	
Precision grade	JIS grade N9 (JIS B1702-1: 1998) * JIS grade 5 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	MC901
Heat treatment	—
Tooth hardness	115 ~ 120HRR

\* The precision grade of this product is equivalent to the value shown in the table.



- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

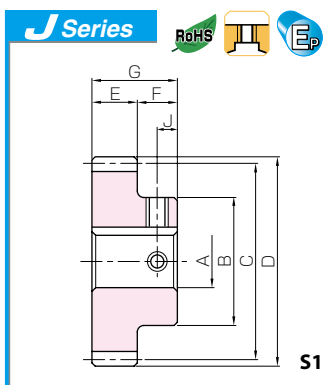
Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length									
				A	B	C	D	E	F	G									
<b>PS1.5-70</b> ● PS1.5-70J12 ● PS1.5-70J14 ● PS1.5-70J15 ● PS1.5-70J16 ● PS1.5-70J18 ● PS1.5-70J19 ● PS1.5-70J20 ● PS1.5-70J22 ● PS1.5-70J25 ● PS1.5-70J28	m1.5	70	S1	12	50	105	108	15	10	25									
			S1K	12															
			S1K	14															
			S1K	15															
			S1K	16															
			S1K	18															
			S1K	19															
			S1K	20															
			S1K	22															
			S1K	25															
			S1K	28															
			<b>PS1.5-75</b> ● PS1.5-75J12 ● PS1.5-75J14 ● PS1.5-75J15 ● PS1.5-75J16 ● PS1.5-75J18 ● PS1.5-75J19 ● PS1.5-75J20 ● PS1.5-75J22 ● PS1.5-75J25 ● PS1.5-75J28	m1.5							75	S1	12	50	112.5	115.5	15	10	25
												S1K	12						
S1K	14																		
S1K	15																		
S1K	16																		
S1K	18																		
S1K	19																		
S1K	20																		
S1K	22																		
S1K	25																		
S1K	28																		
<b>PS1.5-80</b> ● PS1.5-80J12 ● PS1.5-80J14 ● PS1.5-80J15 ● PS1.5-80J16 ● PS1.5-80J18 ● PS1.5-80J19 ● PS1.5-80J20 ● PS1.5-80J22 ● PS1.5-80J25 ● PS1.5-80J28 ● PS1.5-80J30	m1.5	80			S1	12	55	120	123	15		10	25						
					S1K	12													
			S1K	14															
			S1K	15															
			S1K	16															
			S1K	18															
			S1K	19															
			S1K	20															
			S1K	22															
			S1K	25															
			S1K	28															
			S1K	30															
			<b>PS1.5-85</b> ● PS1.5-85J12 ● PS1.5-85J14 ● PS1.5-85J15 ● PS1.5-85J16 ● PS1.5-85J18 ● PS1.5-85J19 ● PS1.5-85J20 ● PS1.5-85J22 ● PS1.5-85J25 ● PS1.5-85J28 ● PS1.5-85J30	m1.5	85	S1					12			55	127.5	130.5	15	10	25
S1K	12																		
S1K	14																		
S1K	15																		
S1K	16																		
S1K	18																		
S1K	19																		
S1K	20																		
S1K	22																		
S1K	25																		
S1K	28																		
S1K	30																		

[Caution on Product Characteristics]

- ① Significant variations in temperature or humidity can cause dimensional changes in plastic gears (MC Nylon gears), including bore size (H8 when produced), tooth diameter, and backlash. Please see the section "Design of Plastic Gears" in the technical reference (Page 693).
- ② The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ③ Without lubrication, using plastic gears in pairs may generate heat and dilation. It is recommended to mate with steel gears.
- ④ The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations]

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- ② Plastic gears are susceptible to the effects of temperature and moisture. Dimensional changes may occur while performing secondary operations and during post-machining operations.



## Plastic Spur Gears

Newly added



Keyway WidthxDepth	Set Screw		Allowable torque (N·m) Bending strength	Allowable torque (kgf·m) Bending strength	Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
	Size	J					
—	—	—	9.69	0.99	0~0.42	0.17	<b>PS1.5-70</b> ● PS1.5-70J12 ● PS1.5-70J14 ● PS1.5-70J15 ● PS1.5-70J16 ● PS1.5-70J18 ● PS1.5-70J19 ● PS1.5-70J20 ● PS1.5-70J22 ● PS1.5-70J25 ● PS1.5-70J28
4 x 1.8	M4*	5					
5 x 2.3	M4*	5					
5 x 2.3	M4*	5					
5 x 2.3	M4*	5					
6 x 2.8	M5	5					
6 x 2.8	M5	5					
6 x 2.8	M5	5					
6 x 2.8	M5	5					
8 x 3.3	M6	5					
8 x 3.3	M6	5					
—	—	—	10.5	1.07	0~0.42	0.19	<b>PS1.5-75</b> ● PS1.5-75J12 ● PS1.5-75J14 ● PS1.5-75J15 ● PS1.5-75J16 ● PS1.5-75J18 ● PS1.5-75J19 ● PS1.5-75J20 ● PS1.5-75J22 ● PS1.5-75J25 ● PS1.5-75J28
4 x 1.8	M4*	5					
5 x 2.3	M4*	5					
5 x 2.3	M4*	5					
5 x 2.3	M4*	5					
6 x 2.8	M5	5					
6 x 2.8	M5	5					
6 x 2.8	M5	5					
6 x 2.8	M5	5					
8 x 3.3	M6	5					
8 x 3.3	M6	5					
—	—	—	11.3	1.15	0~0.42	0.22	<b>PS1.5-80</b> ● PS1.5-80J12 ● PS1.5-80J14 ● PS1.5-80J15 ● PS1.5-80J16 ● PS1.5-80J18 ● PS1.5-80J19 ● PS1.5-80J20 ● PS1.5-80J22 ● PS1.5-80J25 ● PS1.5-80J28 ● PS1.5-80J30
4 x 1.8	M4*	5					
5 x 2.3	M4*	5					
5 x 2.3	M4*	5					
5 x 2.3	M4*	5					
6 x 2.8	M5*	5					
6 x 2.8	M5*	5					
6 x 2.8	M5*	5					
6 x 2.8	M5	5					
6 x 2.8	M5	5					
8 x 3.3	M6	5					
8 x 3.3	M6	5					
8 x 3.3	M6	5					
—	—	—	12.0	1.23	0~0.42	0.25	<b>PS1.5-85</b> ● PS1.5-85J12 ● PS1.5-85J14 ● PS1.5-85J15 ● PS1.5-85J16 ● PS1.5-85J18 ● PS1.5-85J19 ● PS1.5-85J20 ● PS1.5-85J22 ● PS1.5-85J25 ● PS1.5-85J28 ● PS1.5-85J30
4 x 1.8	M4*	5					
5 x 2.3	M4*	5					
5 x 2.3	M4*	5					
5 x 2.3	M4*	5					
6 x 2.8	M5*	5					
6 x 2.8	M5*	5					
6 x 2.8	M5*	5					
6 x 2.8	M5	5					
6 x 2.8	M5	5					
8 x 3.3	M6	5					
8 x 3.3	M6	5					
8 x 3.3	M6	5					

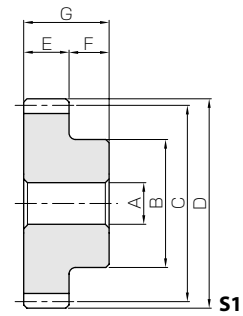
## [Caution on J series]

- ① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order.  
Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).
- ⑤ For products having a tapped hole, a set screw is included.
- ⑥ Since tapped holes of plastic products are easily broken, avoid too much tightening when fastening screws. For products which have a short tapped hole (Products marked with "\*" are the tap size), fasten with torques less than 0.12N · m for M4, and 0.38N · m for M5.



Specifications	
Precision grade	JIS grade N9 (JIS B1702-1: 1998) * JIS grade 5 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	MC901
Heat treatment	—
Tooth hardness	115 ~ 120HRR

\* The precision grade of this product is equivalent to the value shown in the table.



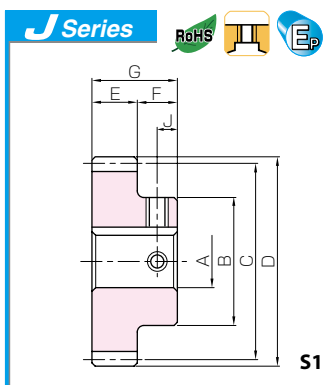
- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length
				A	B	C	D	E	F	G
<b>PS1.5-90</b> ● PS1.5-90J12 ● PS1.5-90J14 ● PS1.5-90J15 ● PS1.5-90J16 ● PS1.5-90J18 ● PS1.5-90J19 ● PS1.5-90J20 ● PS1.5-90J22 ● PS1.5-90J25 ● PS1.5-90J28 ● PS1.5-90J30	m1.5	90	S1	12	55	135	138	15	10	25
			S1K	12						
			S1K	14						
			S1K	15						
			S1K	16						
			S1K	18						
			S1K	19						
			S1K	20						
			S1K	22						
			S1K	25						
			S1K	28						
			S1K	30						
			<b>PS1.5-95</b> ● PS1.5-95J12 ● PS1.5-95J14 ● PS1.5-95J15 ● PS1.5-95J16 ● PS1.5-95J18 ● PS1.5-95J19 ● PS1.5-95J20 ● PS1.5-95J22 ● PS1.5-95J25 ● PS1.5-95J28 ● PS1.5-95J30	m1.5						
S1K	12									
S1K	14									
S1K	15									
S1K	16									
S1K	18									
S1K	19									
S1K	20									
S1K	22									
S1K	25									
S1K	28									
S1K	30									
<b>PS1.5-100</b> ● PS1.5-100J12 ● PS1.5-100J14 ● PS1.5-100J15 ● PS1.5-100J16 ● PS1.5-100J18 ● PS1.5-100J19 ● PS1.5-100J20 ● PS1.5-100J22 ● PS1.5-100J25 ● PS1.5-100J28 ● PS1.5-100J30	m1.5	100			S1	12	60	150	153	15
			S1K	12						
			S1K	14						
			S1K	15						
			S1K	16						
			S1K	18						
			S1K	19						
			S1K	20						
			S1K	22						
			S1K	25						
			S1K	28						
			S1K	30						

- [Caution on Product Characteristics]
- ① Significant variations in temperature or humidity can cause dimensional changes in plastic gears (MC Nylon gears), including bore size (H8 when produced), tooth diameter, and backlash. Please see the section "Design of Plastic Gears" in the technical reference (Page 693).
  - ② The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
  - ③ Without lubrication, using plastic gears in pairs may generate heat and dilation. It is recommended to mate with steel gears.
  - ④ The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

- [Caution on Secondary Operations]
- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
  - ② Plastic gears are susceptible to the effects of temperature and moisture. Dimensional changes may occur while performing secondary operations and during post-machining operations.





## Plastic Spur Gears

Newly added



Keyway WidthxDepth	Set Screw		Allowable torque (N-m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
	Size	J	Bending strength	Bending strength			
—	—	—	12.8	1.31	0~0.42	0.27 0.27 0.27 0.27 0.27 0.27 0.27 0.27 0.26 0.26 0.26 0.25	<b>PS1.5-90</b> ●PS1.5-90J12 ●PS1.5-90J14 ●PS1.5-90J15 ●PS1.5-90J16 ●PS1.5-90J18 ●PS1.5-90J19 ●PS1.5-90J20 ●PS1.5-90J22 ●PS1.5-90J25 ●PS1.5-90J28 ●PS1.5-90J30
4 x 1.8	M4*	5					
5 x 2.3	M4*	5					
5 x 2.3	M4*	5					
5 x 2.3	M4*	5					
6 x 2.8	M5*	5					
6 x 2.8	M5*	5					
6 x 2.8	M5*	5					
6 x 2.8	M5*	5					
8 x 3.3	M6	5					
8 x 3.3	M6	5					
8 x 3.3	M6	5					
—	—	—	13.6	1.39	0~0.42	0.31 0.31 0.30 0.30 0.30 0.30 0.30 0.30 0.30 0.29 0.29 0.29	<b>PS1.5-95</b> ●PS1.5-95J12 ●PS1.5-95J14 ●PS1.5-95J15 ●PS1.5-95J16 ●PS1.5-95J18 ●PS1.5-95J19 ●PS1.5-95J20 ●PS1.5-95J22 ●PS1.5-95J25 ●PS1.5-95J28 ●PS1.5-95J30
4 x 1.8	M4*	5					
5 x 2.3	M4*	5					
5 x 2.3	M4*	5					
5 x 2.3	M4*	5					
6 x 2.8	M5*	5					
6 x 2.8	M5*	5					
6 x 2.8	M5*	5					
6 x 2.8	M5*	5					
8 x 3.3	M6	5					
8 x 3.3	M6	5					
8 x 3.3	M6	5					
—	—	—	14.4	1.47	0~0.42	0.34 0.34 0.33 0.33 0.33 0.33 0.33 0.33 0.33 0.32 0.32 0.32	<b>PS1.5-100</b> ●PS1.5-100J12 ●PS1.5-100J14 ●PS1.5-100J15 ●PS1.5-100J16 ●PS1.5-100J18 ●PS1.5-100J19 ●PS1.5-100J20 ●PS1.5-100J22 ●PS1.5-100J25 ●PS1.5-100J28 ●PS1.5-100J30
4 x 1.8	M4*	5					
5 x 2.3	M4*	5					
5 x 2.3	M4*	5					
5 x 2.3	M4*	5					
6 x 2.8	M5*	5					
6 x 2.8	M5*	5					
6 x 2.8	M5*	5					
6 x 2.8	M5*	5					
8 x 3.3	M6	5					
8 x 3.3	M6	5					
8 x 3.3	M6	5					

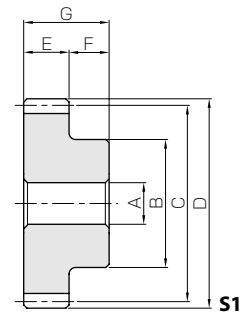
**[Caution on J series]**

- ① As available-on-request products, requires a lead-time for shipping within **3 working-days (excludes the day ordered)**, after placing an order.  
Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is **1 to 20 units**. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).
- ⑤ For products having a tapped hole, a set screw is included.
- ⑥ Since tapped holes of plastic products are easily broken, avoid too much tightening when fastening screws. For products which have a short tapped hole (Products marked with "\*\*" are the tap size), fasten with torques less than  $0.12N \cdot m$  for M4, and  $0.38N \cdot m$  for M5.



Specifications	
Precision grade	JIS grade N9 (JIS B1702-1: 1998) * JIS grade 5 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	MC901
Heat treatment	—
Tooth hardness	115 ~ 120HRR

\* The precision grade of this product is equivalent to the value shown in the table.

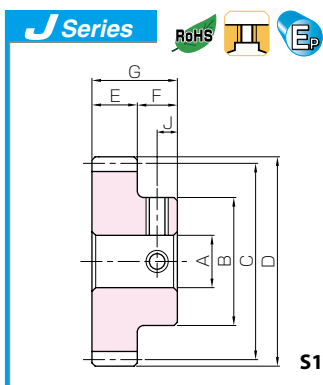


- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length
				A	B	C	D	E	F	G
<b>PS2-12</b> ● <b>PS2-12J10</b>	<b>m2</b>	12	S1 S1T2	10 10	18	24	28	20	10	30
<b>PS2-13</b> ● <b>PS2-13J10</b>		13	S1 S1T2	10 10	20	26	30	20	10	30
<b>PS2-14</b> ● <b>PS2-14J10</b>		14	S1 S1T2	10 10	20	28	32	20	10	30
<b>PS2-15</b> ● <b>PS2-15J10</b>		15	S1 S1K	10 10	24	30	34	20	10	30
<b>PS2-16</b> ● <b>PS2-16J10</b> ● <b>PS2-16J12</b>		16	S1 S1K S1K	10 10 12	26	32	36	20	10	30
<b>PS2-18</b> ● <b>PS2-18J10</b> ● <b>PS2-18J12</b> ● <b>PS2-18J14</b> ● <b>PS2-18J15</b> ● <b>PS2-18J16</b>		18	S1 S1K S1K S1K S1K S1K	10 10 12 14 15 16	30	36	40	20	10	30
<b>PS2-20</b> ● <b>PS2-20J10</b> ● <b>PS2-20J12</b> ● <b>PS2-20J14</b> ● <b>PS2-20J15</b> ● <b>PS2-20J16</b>		20	S1 S1K S1K S1K S1K S1K	10 10 12 14 15 16	32	40	44	20	10	30
<b>PS2-22</b> ● <b>PS2-22J10</b> ● <b>PS2-22J12</b> ● <b>PS2-22J14</b> ● <b>PS2-22J15</b> ● <b>PS2-22J16</b> ● <b>PS2-22J18</b> ● <b>PS2-22J19</b>		22	S1 S1K S1K S1K S1K S1K S1K	10 10 12 14 15 16 18 19	35	44	48	20	10	30
<b>PS2-24</b> ● <b>PS2-24J10</b> ● <b>PS2-24J12</b> ● <b>PS2-24J14</b> ● <b>PS2-24J15</b> ● <b>PS2-24J16</b> ● <b>PS2-24J18</b> ● <b>PS2-24J19</b> ● <b>PS2-24J20</b> ● <b>PS2-24J22</b>		24	S1 S1K S1K S1K S1K S1K S1K S1K S1K	10 10 12 14 15 16 18 19 20 22	38	48	52	20	10	30
<b>PS2-25</b> ● <b>PS2-25J10</b> ● <b>PS2-25J12</b> ● <b>PS2-25J14</b> ● <b>PS2-25J15</b> ● <b>PS2-25J16</b> ● <b>PS2-25J18</b> ● <b>PS2-25J19</b> ● <b>PS2-25J20</b> ● <b>PS2-25J22</b>		25	S1 S1K S1K S1K S1K S1K S1K S1K S1K S1K	10 10 12 14 15 16 18 19 20 22	40	50	54	20	10	30

- [Caution on Product Characteristics]
- ① Significant variations in temperature or humidity can cause dimensional changes in plastic gears (MC Nylon gears), including bore size (H8 when produced), tooth diameter, and backlash. Please see the section "Design of Plastic Gears" in the technical reference (Page 693).
  - ② The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
  - ③ Without lubrication, using plastic gears in pairs may generate heat and dilation. It is recommended to mate with steel gears.
  - ④ The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

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  - ② Plastic gears are susceptible to the effects of temperature and moisture. Dimensional changes may occur while performing secondary operations and during post-machining operations.



## Plastic Spur Gears

Newly added



Keyway WidthxDepth	Set Screw		Allowable torque (N·m) Bending strength	Allowable torque (kgf·m) Bending strength	Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
	Size	J					
—	—	—	2.25	0.23	0~0.42	0.011 0.011	PS2-12 ● PS2-12J10
—	M4**	5					
—	—	—	2.59	0.26	0~0.42	0.013 0.013	PS2-13 ● PS2-13J10
—	M4	5					
—	—	—	2.96	0.30	0~0.42	0.015 0.015	PS2-14 ● PS2-14J10
—	M4	5					
4 x 1.8	—	—	3.29	0.34	0~0.42	0.019 0.018	PS2-15 ● PS2-15J10
—	M4	5					
4 x 1.8 4 x 1.8	M4 M4	5 5	3.63	0.37	0~0.42	0.022 0.022 0.020	PS2-16 ● PS2-16J10 ● PS2-16J12
—	—	—					
4 x 1.8 4 x 1.8 5 x 2.3 5 x 2.3 5 x 2.3	M4 M4 M4 M4 M4	5 5 5 5 5	4.24	0.43	0~0.42	0.029 0.029 0.027 0.026 0.025 0.024	PS2-18 ● PS2-18J10 ● PS2-18J12 ● PS2-18J14 ● PS2-18J15 ● PS2-18J16
—	—	—					
4 x 1.8 4 x 1.8 5 x 2.3 5 x 2.3 5 x 2.3	M4 M4 M4 M4 M4	5 5 5 5 5	4.91	0.50	0~0.42	0.036 0.035 0.034 0.032 0.032 0.031	PS2-20 ● PS2-20J10 ● PS2-20J12 ● PS2-20J14 ● PS2-20J15 ● PS2-20J16
—	—	—					
4 x 1.8 4 x 1.8 5 x 2.3 5 x 2.3 5 x 2.3 6 x 2.8 6 x 2.8	M4 M4 M4 M4 M4 M5 M5	5 5 5 5 5 5 5	5.55	0.57	0~0.42	0.044 0.043 0.042 0.040 0.040 0.039 0.037 0.036	PS2-22 ● PS2-22J10 ● PS2-22J12 ● PS2-22J14 ● PS2-22J15 ● PS2-22J16 ● PS2-22J18 ● PS2-22J19
—	—	—					
4 x 1.8 4 x 1.8 5 x 2.3 5 x 2.3 5 x 2.3 6 x 2.8 6 x 2.8 6 x 2.8 6 x 2.8	M4 M4 M4 M4 M4 M5 M5 M5 M5	5 5 5 5 5 5 5 5 5	6.19	0.63	0~0.42	0.052 0.052 0.051 0.049 0.048 0.047 0.045 0.044 0.043 0.041	PS2-24 ● PS2-24J10 ● PS2-24J12 ● PS2-24J14 ● PS2-24J15 ● PS2-24J16 ● PS2-24J18 ● PS2-24J19 ● PS2-24J20 ● PS2-24J22
—	—	—					
4 x 1.8 4 x 1.8 5 x 2.3 5 x 2.3 5 x 2.3 6 x 2.8 6 x 2.8 6 x 2.8 6 x 2.8	M4* M4 M4 M4 M4 M5 M5 M5 M5	5 5 5 5 5 5 5 5 5	6.54	0.67	0~0.42	0.057 0.057 0.056 0.054 0.053 0.052 0.050 0.049 0.048 0.046	PS2-25 ● PS2-25J10 ● PS2-25J12 ● PS2-25J14 ● PS2-25J15 ● PS2-25J16 ● PS2-25J18 ● PS2-25J19 ● PS2-25J20 ● PS2-25J22

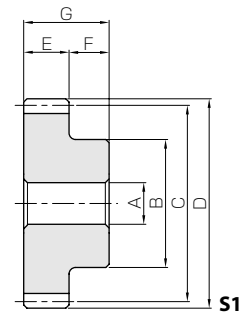
## [Caution on J series]

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Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).
- ⑤ For products having a tapped hole, a set screw is included.
- ⑥ Since tapped holes of plastic products are easily broken, avoid too much tightening when fastening screws. For products which have a short tapped hole (Products marked with "\*\*" are the tap size), fasten with torques less than 0.12N · m for M4, and 0.38N · m for M5.



Specifications	
Precision grade	JIS grade N9 (JIS B1702-1: 1998) * JIS grade 5 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	MC901
Heat treatment	—
Tooth hardness	115 ~ 120HRR

\* The precision grade of this product is equivalent to the value shown in the table.



- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

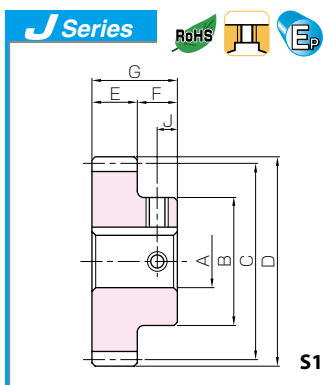
Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length
				A	B	C	D	E	F	G
<b>PS2-26</b> ● PS2-26J10 ● PS2-26J12 ● PS2-26J14 ● PS2-26J15 ● PS2-26J16 ● PS2-26J18 ● PS2-26J19 ● PS2-26J20 ● PS2-26J22	m2	26	S1	10	42	52	56	20	10	30
			S1K	10						
			S1K	12						
			S1K	14						
			S1K	15						
			S1K	16						
			S1K	18						
			S1K	19						
			S1K	20						
			S1K	22						
			<b>PS2-28</b> ● PS2-28J10 ● PS2-28J12 ● PS2-28J14 ● PS2-28J15 ● PS2-28J16 ● PS2-28J18 ● PS2-28J19 ● PS2-28J20 ● PS2-28J22 ● PS2-28J25	m2						
S1K	10									
S1K	12									
S1K	14									
S1K	15									
S1K	16									
S1K	18									
S1K	19									
S1K	20									
S1K	22									
S1K	25									
<b>PS2-30</b> ● PS2-30J10 ● PS2-30J12 ● PS2-30J14 ● PS2-30J15 ● PS2-30J16 ● PS2-30J18 ● PS2-30J19 ● PS2-30J20 ● PS2-30J22 ● PS2-30J25 ● PS2-30J28	m2	30	S1	10	50	60	64	20	10	30
			S1K	10						
			S1K	12						
			S1K	14						
			S1K	15						
			S1K	16						
			S1K	18						
			S1K	19						
			S1K	20						
			S1K	22						
			S1K	25						
S1K	28									

[Caution on Product Characteristics]

- ① Significant variations in temperature or humidity can cause dimensional changes in plastic gears (MC Nylon gears), including bore size (H8 when produced), tooth diameter, and backlash. Please see the section "Design of Plastic Gears" in the technical reference (Page 693).
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## Plastic Spur Gears

Newly added



Keyway WidthxDepth	Set Screw		Allowable torque (N·m) Bending strength	Allowable torque (kgf·m) Bending strength	Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
	Size	J					
—	—	—	6.90	0.70	0~0.44	0.063 0.062 0.061 0.059 0.058 0.058 0.055 0.054 0.053 0.051	<b>PS2-26</b> ● PS2-26J10 ● PS2-26J12 ● PS2-26J14 ● PS2-26J15 ● PS2-26J16 ● PS2-26J18 ● PS2-26J19 ● PS2-26J20 ● PS2-26J22
4 x 1.8	M4*	5					
4 x 1.8	M4*	5					
5 x 2.3	M4	5					
5 x 2.3	M4	5					
5 x 2.3	M4	5					
6 x 2.8	M5	5					
6 x 2.8	M5	5					
6 x 2.8	M5	5					
6 x 2.8	M5	5					
—	—	—	7.54	0.77	0~0.44	0.073 0.072 0.071 0.069 0.069 0.068 0.066 0.065 0.064 0.061 0.057	<b>PS2-28</b> ● PS2-28J10 ● PS2-28J12 ● PS2-28J14 ● PS2-28J15 ● PS2-28J16 ● PS2-28J18 ● PS2-28J19 ● PS2-28J20 ● PS2-28J22 ● PS2-28J25
4 x 1.8	M4*	5					
4 x 1.8	M4*	5					
5 x 2.3	M4*	5					
5 x 2.3	M4*	5					
5 x 2.3	M4*	5					
6 x 2.8	M5	5					
6 x 2.8	M5	5					
6 x 2.8	M5	5					
8 x 3.3	M6	5					
—	—	—	8.20	0.84	0~0.44	0.086 0.085 0.084 0.082 0.081 0.080 0.078 0.077 0.076 0.074 0.070 0.065	<b>PS2-30</b> ● PS2-30J10 ● PS2-30J12 ● PS2-30J14 ● PS2-30J15 ● PS2-30J16 ● PS2-30J18 ● PS2-30J19 ● PS2-30J20 ● PS2-30J22 ● PS2-30J25 ● PS2-30J28
4 x 1.8	M4*	5					
4 x 1.8	M4*	5					
5 x 2.3	M4*	5					
5 x 2.3	M4*	5					
5 x 2.3	M4*	5					
6 x 2.8	M5	5					
6 x 2.8	M5	5					
6 x 2.8	M5	5					
6 x 2.8	M5	5					
8 x 3.3	M6	5					
8 x 3.3	M6	5					

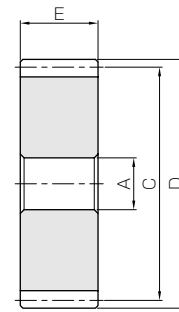
## [Caution on J series]

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Specifications	
Precision grade	JIS grade N9 (JIS B1702-1: 1998) * JIS grade 5 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	MC901
Heat treatment	—
Tooth hardness	115 ~ 120HRR

\* Precision grade of this product corresponds to 'equivalent'.



S5

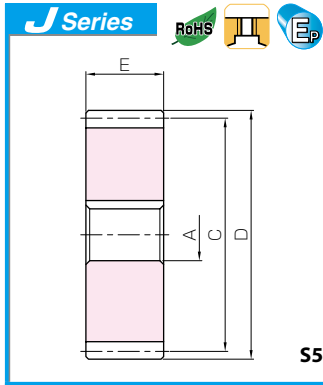
Catalog No. ● J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Pitch dia.	Outside dia.	Face width	Keyway
				A	C	D	E	WidthxDepth
<b>PSA2-32</b> ● PSA2-32 J12 ● PSA2-32 J14 ● PSA2-32 J15 ● PSA2-32 J16 ● PSA2-32 J18 ● PSA2-32 J19 ● PSA2-32 J20 ● PSA2-32 J22 ● PSA2-32 J25 ● PSA2-32 J28	m2	32	S5	12	64	68	20	—
			S5K	12				4 x 1.8
			S5K	14				5 x 2.3
			S5K	15				5 x 2.3
			S5K	16				5 x 2.3
			S5K	18				6 x 2.8
			S5K	19				6 x 2.8
			S5K	20				6 x 2.8
			S5K	22				6 x 2.8
			S5K	25				8 x 3.3
			S5K	28				8 x 3.3
			S5K	28				8 x 3.3
			<b>PSA2-35</b> ● PSA2-35 J12 ● PSA2-35 J14 ● PSA2-35 J15 ● PSA2-35 J16 ● PSA2-35 J18 ● PSA2-35 J19 ● PSA2-35 J20 ● PSA2-35 J22 ● PSA2-35 J25 ● PSA2-35 J28 ● PSA2-35 J30 ● PSA2-35 J32	m2				35
S5K	12	4 x 1.8						
S5K	14	5 x 2.3						
S5K	15	5 x 2.3						
S5K	16	5 x 2.3						
S5K	18	6 x 2.8						
S5K	19	6 x 2.8						
S5K	20	6 x 2.8						
S5K	22	6 x 2.8						
S5K	25	8 x 3.3						
S5K	28	8 x 3.3						
S5K	30	8 x 3.3						
S5K	32	10 x 3.3						
<b>PSA2-36</b> ● PSA2-36 J12 ● PSA2-36 J14 ● PSA2-36 J15 ● PSA2-36 J16 ● PSA2-36 J18 ● PSA2-36 J19 ● PSA2-36 J20 ● PSA2-36 J22 ● PSA2-36 J25 ● PSA2-36 J28 ● PSA2-36 J30 ● PSA2-36 J32	m2	36	S5	12	72	76	20	—
			S5K	12				4 x 1.8
			S5K	14				5 x 2.3
			S5K	15				5 x 2.3
			S5K	16				5 x 2.3
			S5K	18				6 x 2.8
			S5K	19				6 x 2.8
			S5K	20				6 x 2.8
			S5K	22				6 x 2.8
			S5K	25				8 x 3.3
			S5K	28				8 x 3.3
			S5K	30				8 x 3.3
			S5K	32				10 x 3.3
<b>PSA2-40</b> ● PSA2-40 J12 ● PSA2-40 J14 ● PSA2-40 J15 ● PSA2-40 J16 ● PSA2-40 J18 ● PSA2-40 J19 ● PSA2-40 J20 ● PSA2-40 J22 ● PSA2-40 J25 ● PSA2-40 J28 ● PSA2-40 J30 ● PSA2-40 J32 ● PSA2-40 J35	m2	40	S5	12	80	84	20	—
			S5K	12				4 x 1.8
			S5K	14				5 x 2.3
			S5K	15				5 x 2.3
			S5K	16				5 x 2.3
			S5K	18				6 x 2.8
			S5K	19				6 x 2.8
			S5K	20				6 x 2.8
			S5K	22				6 x 2.8
			S5K	25				8 x 3.3
			S5K	28				8 x 3.3
			S5K	30				8 x 3.3
			S5K	32				10 x 3.3
S5K	35	10 x 3.3						

[Caution on Product Characteristics]

- ① Significant variations in temperature or humidity can cause dimensional changes in plastic gears (MC Nylon gears), including bore size (H8 when produced), tooth diameter, and backlash. Please see the section "Design of Plastic Gears" in the technical reference (Page 693).
- ② The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ③ Without lubrication, using plastic gears in pairs may generate heat and dilation. It is recommended to mate with steel gears.
- ④ The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Plastic gears are susceptible to the effects of temperature and moisture. Dimensional changes may occur while performing secondary operations and during post-machining operations.



Plastic Spur Gears

Newly added



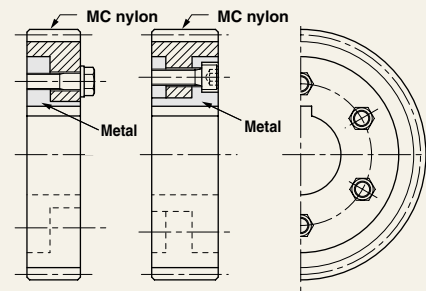
Allowable torque (N·m) Bending strength	Allowable torque (kgf·m) Bending strength	Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
8.91	0.91	0~0.44	0.075	<b>PSA2-32</b> ● PSA2-32 J12 ● PSA2-32 J14 ● PSA2-32 J15 ● PSA2-32 J16 ● PSA2-32 J18 ● PSA2-32 J19 ● PSA2-32 J20 ● PSA2-32 J22 ● PSA2-32 J25 ● PSA2-32 J28
			0.074	
			0.073	
			0.072	
			0.071	
			0.070	
			0.070	
			0.068	
			0.065	
			0.062	
			10.0	
0.089				
0.088				
0.088				
0.087				
0.086				
0.085				
0.084				
0.083				
0.080				
0.077				
10.4	1.06	0~0.44	0.094	<b>PSA2-36</b> ● PSA2-36 J12 ● PSA2-36 J14 ● PSA2-36 J15 ● PSA2-36 J16 ● PSA2-36 J18 ● PSA2-36 J19 ● PSA2-36 J20 ● PSA2-36 J22 ● PSA2-36 J25 ● PSA2-36 J28 ● PSA2-36 J30 ● PSA2-36 J32
			0.094	
			0.093	
			0.093	
			0.092	
			0.091	
			0.090	
			0.089	
			0.088	
			0.085	
			0.082	
11.9	1.21	0~0.44	0.12	<b>PSA2-40</b> ● PSA2-40 J12 ● PSA2-40 J14 ● PSA2-40 J15 ● PSA2-40 J16 ● PSA2-40 J18 ● PSA2-40 J19 ● PSA2-40 J20 ● PSA2-40 J22 ● PSA2-40 J25 ● PSA2-40 J28 ● PSA2-40 J30 ● PSA2-40 J32 ● PSA2-40 J35
			0.12	
			0.12	
			0.11	
			0.11	
			0.11	
			0.11	
			0.11	
			0.11	
			0.11	
			0.11	
0.10				
0.10				
0.10				
0.10				

How to attach gears to shafts

To attach gears to shafts, in case of light loads, methods include using keys, taper pins, spring pins, and press fitting after mounting the setscrews. While looseness tends to occur in the conditions below, plastic gears are fastened by applying a steel hub.

1. When the circumferential temperature is high
2. For large diameter gears
3. If forward-reverse motion impacts keys

For fastening steel hubs into plastic gears with bolts, see below for various methods. For gears, which cannot be fasten with bolts due to their shape; it is recommended to use the method of fusion bonding with metal cores.



Fastening with a steel hub bolt

Stainless Steel Hubs for PSA are now available!

Standardized sectional stainless steel hubs. It enhances a secure fastening to the shaft.



Sectional Parts

For details, please see Page 334.

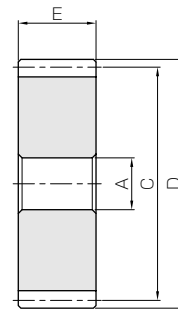
[Caution on J series]

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- ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.



Specifications	
Precision grade	JIS grade N9 (JIS B1702-1: 1998) * JIS grade 5 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	MC901
Heat treatment	—
Tooth hardness	115 ~ 120HRR

\* Precision grade of this product corresponds to 'equivalent'.



S5

Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Pitch dia.	Outside dia.	Face width	Keyway
				A	C	D	E	WidthxDepth
<b>PSA2-45</b> ● PSA2-45 J12 ● PSA2-45 J14 ● PSA2-45 J15 ● PSA2-45 J16 ● PSA2-45 J18 ● PSA2-45 J19 ● PSA2-45 J20 ● PSA2-45 J22 ● PSA2-45 J25 ● PSA2-45 J28 ● PSA2-45 J30 ● PSA2-45 J32 ● PSA2-45 J35 ● PSA2-45 J40	<b>m2</b>	45	S5	12	90	94	20	—
S5K			12	4 x 1.8				
S5K			14	5 x 2.3				
S5K			15	5 x 2.3				
S5K			16	5 x 2.3				
S5K			18	6 x 2.8				
S5K			19	6 x 2.8				
S5K			20	6 x 2.8				
S5K			22	6 x 2.8				
S5K			25	8 x 3.3				
S5K			28	8 x 3.3				
S5K			30	8 x 3.3				
S5K		32	10 x 3.3					
S5K		35	10 x 3.3					
S5K		40	12 x 3.3					
<b>PSA2-48</b> ● PSA2-48 J12 ● PSA2-48 J14 ● PSA2-48 J15 ● PSA2-48 J16 ● PSA2-48 J18 ● PSA2-48 J19 ● PSA2-48 J20 ● PSA2-48 J22 ● PSA2-48 J25 ● PSA2-48 J28 ● PSA2-48 J30 ● PSA2-48 J32 ● PSA2-48 J35 ● PSA2-48 J40 ● PSA2-48 J45		48	S5	12	96	100	20	—
S5K			12	4 x 1.8				
S5K			14	5 x 2.3				
S5K			15	5 x 2.3				
S5K			16	5 x 2.3				
S5K			18	6 x 2.8				
S5K			19	6 x 2.8				
S5K			20	6 x 2.8				
S5K			22	6 x 2.8				
S5K	25		8 x 3.3					
S5K	28		8 x 3.3					
S5K	30		8 x 3.3					
S5K	32	10 x 3.3						
S5K	35	10 x 3.3						
S5K	40	12 x 3.3						
S5K	45	14 x 3.8						
<b>PSA2-50</b> ● PSA2-50 J12 ● PSA2-50 J14 ● PSA2-50 J15 ● PSA2-50 J16 ● PSA2-50 J18 ● PSA2-50 J19 ● PSA2-50 J20 ● PSA2-50 J22 ● PSA2-50 J25 ● PSA2-50 J28 ● PSA2-50 J30 ● PSA2-50 J32 ● PSA2-50 J35 ● PSA2-50 J40 ● PSA2-50 J45	50	50	S5	12	100	104	20	—
S5K			12	4 x 1.8				
S5K			14	5 x 2.3				
S5K			15	5 x 2.3				
S5K			16	5 x 2.3				
S5K			18	6 x 2.8				
S5K			19	6 x 2.8				
S5K			20	6 x 2.8				
S5K			22	6 x 2.8				
S5K			25	8 x 3.3				
S5K			28	8 x 3.3				
S5K			30	8 x 3.3				
S5K	32	10 x 3.3						
S5K	35	10 x 3.3						
S5K	40	12 x 3.3						
S5K	45	14 x 3.8						

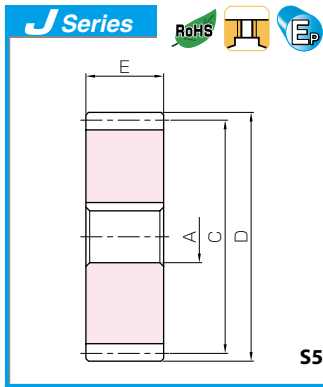
[Caution on Product Characteristics]

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Plastic Spur Gears

Newly added



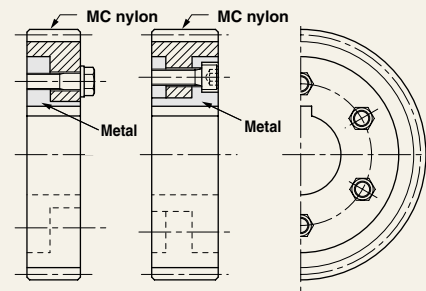
Allowable torque (N·m) Bending strength	Allowable torque (kgf·m) Bending strength	Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
13.7	1.40	0~0.44	0.15	<b>PSA2-45</b>
			0.15	● PSA2-45 J12
			0.15	● PSA2-45 J14
			0.15	● PSA2-45 J15
			0.15	● PSA2-45 J16
			0.14	● PSA2-45 J18
			0.14	● PSA2-45 J19
			0.14	● PSA2-45 J20
			0.14	● PSA2-45 J22
			0.14	● PSA2-45 J25
			0.14	● PSA2-45 J28
			0.13	● PSA2-45 J30
			0.13	● PSA2-45 J32
			0.13	● PSA2-45 J35
0.12	● PSA2-45 J40			
14.9	1.52	0~0.44	0.17	<b>PSA2-48</b>
			0.17	● PSA2-48 J12
			0.17	● PSA2-48 J14
			0.17	● PSA2-48 J15
			0.17	● PSA2-48 J16
			0.16	● PSA2-48 J18
			0.16	● PSA2-48 J19
			0.16	● PSA2-48 J20
			0.16	● PSA2-48 J22
			0.16	● PSA2-48 J25
			0.16	● PSA2-48 J28
			0.15	● PSA2-48 J30
			0.15	● PSA2-48 J32
			0.15	● PSA2-48 J35
0.14	● PSA2-48 J40			
0.13	● PSA2-48 J45			
15.7	1.60	0~0.44	0.18	<b>PSA2-50</b>
			0.18	● PSA2-50 J12
			0.18	● PSA2-50 J14
			0.18	● PSA2-50 J15
			0.18	● PSA2-50 J16
			0.18	● PSA2-50 J18
			0.18	● PSA2-50 J19
			0.18	● PSA2-50 J20
			0.18	● PSA2-50 J22
			0.17	● PSA2-50 J25
			0.17	● PSA2-50 J28
			0.17	● PSA2-50 J30
			0.17	● PSA2-50 J32
			0.16	● PSA2-50 J35
0.15	● PSA2-50 J40			
0.15	● PSA2-50 J45			

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3. If forward-reverse motion impacts keys

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Fastening with a steel hub bolt

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Sectional Parts

For details, please see Page 334.

[Caution on J series]

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- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

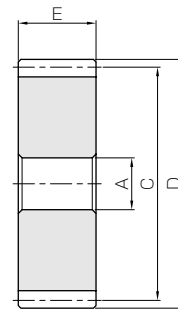
Bevel Gearboxes

Other Products



Specifications	
Precision grade	JIS grade N9 (JIS B1702-1: 1998) * JIS grade 5 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	MC901
Heat treatment	—
Tooth hardness	115 ~ 120HRR

\* Precision grade of this product corresponds to 'equivalent'.



S5

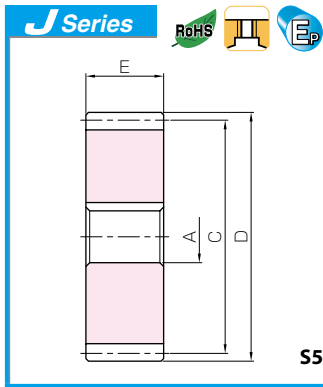
Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Pitch dia.	Outside dia.	Face width	Keyway
				A	C	D	E	WidthxDepth
<b>PSA2-55</b> ● PSA2-55 J12 ● PSA2-55 J14 ● PSA2-55 J15 ● PSA2-55 J16 ● PSA2-55 J18 ● PSA2-55 J19 ● PSA2-55 J20 ● PSA2-55 J22 ● PSA2-55 J25 ● PSA2-55 J28 ● PSA2-55 J30 ● PSA2-55 J32 ● PSA2-55 J35 ● PSA2-55 J40 ● PSA2-55 J45 ● PSA2-55 J50	<b>m2</b>	55	S5	12	110	114	20	—
S5K			12	4 x 1.8				
S5K			14	5 x 2.3				
S5K			15	5 x 2.3				
S5K			16	5 x 2.3				
S5K			18	6 x 2.8				
S5K			19	6 x 2.8				
S5K			20	6 x 2.8				
S5K			22	6 x 2.8				
S5K			25	8 x 3.3				
S5K			28	8 x 3.3				
S5K			30	8 x 3.3				
S5K			32	10 x 3.3				
S5K			35	10 x 3.3				
S5K			40	12 x 3.3				
S5K		45	14 x 3.8					
S5K		50	14 x 3.8					
<b>PSA2-60</b> ● PSA2-60 J12 ● PSA2-60 J14 ● PSA2-60 J15 ● PSA2-60 J16 ● PSA2-60 J18 ● PSA2-60 J19 ● PSA2-60 J20 ● PSA2-60 J22 ● PSA2-60 J25 ● PSA2-60 J28 ● PSA2-60 J30 ● PSA2-60 J32 ● PSA2-60 J35 ● PSA2-60 J40 ● PSA2-60 J45 ● PSA2-60 J50		60	S5	12	120	124	20	—
S5K			12	4 x 1.8				
S5K			14	5 x 2.3				
S5K			15	5 x 2.3				
S5K			16	5 x 2.3				
S5K			18	6 x 2.8				
S5K			19	6 x 2.8				
S5K			20	6 x 2.8				
S5K			22	6 x 2.8				
S5K			25	8 x 3.3				
S5K			28	8 x 3.3				
S5K			30	8 x 3.3				
S5K			32	10 x 3.3				
S5K	35		10 x 3.3					
S5K	40		12 x 3.3					
S5K	45	14 x 3.8						
S5K	50	14 x 3.8						
<b>PSA2-65</b> ● PSA2-65 J15 ● PSA2-65 J16 ● PSA2-65 J18 ● PSA2-65 J19 ● PSA2-65 J20 ● PSA2-65 J22 ● PSA2-65 J25 ● PSA2-65 J28 ● PSA2-65 J30 ● PSA2-65 J32 ● PSA2-65 J35 ● PSA2-65 J40 ● PSA2-65 J45 ● PSA2-65 J50	65	S5	15	130	134	20	—	
S5K		15	5 x 2.3					
S5K		16	5 x 2.3					
S5K		18	6 x 2.8					
S5K		19	6 x 2.8					
S5K		20	6 x 2.8					
S5K		22	6 x 2.8					
S5K		25	8 x 3.3					
S5K		28	8 x 3.3					
S5K		30	8 x 3.3					
S5K		32	10 x 3.3					
S5K		35	10 x 3.3					
S5K		40	12 x 3.3					
S5K		45	14 x 3.8					
S5K		50	14 x 3.8					

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Plastic Spur Gears

Newly added



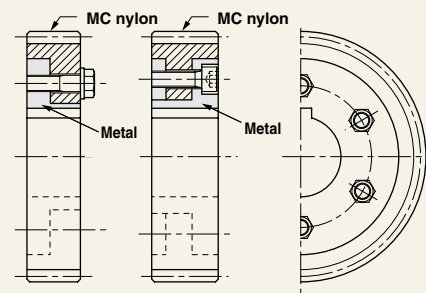
Allowable torque (N·m) Bending strength	Allowable torque (kgf·m) Bending strength	Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
17.5	1.78	0~0.46	0.22	<b>PSA2-55</b>
			0.22	● PSA2-55 J12
			0.22	● PSA2-55 J14
			0.22	● PSA2-55 J15
			0.22	● PSA2-55 J16
			0.22	● PSA2-55 J18
			0.22	● PSA2-55 J19
			0.22	● PSA2-55 J20
			0.21	● PSA2-55 J22
			0.21	● PSA2-55 J25
			0.21	● PSA2-55 J28
			0.21	● PSA2-55 J30
			0.20	● PSA2-55 J32
			0.20	● PSA2-55 J35
			0.19	● PSA2-55 J40
0.18	● PSA2-55 J45			
0.18	● PSA2-55 J50			
19.3	1.97	0~0.46	0.26	<b>PSA2-60</b>
			0.26	● PSA2-60 J12
			0.26	● PSA2-60 J14
			0.26	● PSA2-60 J15
			0.26	● PSA2-60 J16
			0.26	● PSA2-60 J18
			0.26	● PSA2-60 J19
			0.26	● PSA2-60 J20
			0.26	● PSA2-60 J22
			0.25	● PSA2-60 J25
			0.25	● PSA2-60 J28
			0.25	● PSA2-60 J30
			0.25	● PSA2-60 J32
			0.24	● PSA2-60 J35
			0.23	● PSA2-60 J40
0.23	● PSA2-60 J45			
0.22	● PSA2-60 J50			
21.1	2.15	0~0.46	0.31	<b>PSA2-65</b>
			0.31	● PSA2-65 J15
			0.31	● PSA2-65 J16
			0.31	● PSA2-65 J18
			0.31	● PSA2-65 J19
			0.30	● PSA2-65 J20
			0.30	● PSA2-65 J22
			0.30	● PSA2-65 J25
			0.30	● PSA2-65 J28
			0.30	● PSA2-65 J30
			0.29	● PSA2-65 J32
			0.29	● PSA2-65 J35
			0.28	● PSA2-65 J40
			0.27	● PSA2-65 J45
			0.27	● PSA2-65 J50

How to attach gears to shafts

To attach gears to shafts, in case of light loads, methods include using keys, taper pins, spring pins, and press fitting after mounting the setscrews. While looseness tends to occur in the conditions below, plastic gears are fastened by applying a steel hub.

1. When the circumferential temperature is high
2. For large diameter gears
3. If forward-reverse motion impacts keys

For fastening steel hubs into plastic gears with bolts, see below for various methods. For gears, which cannot be fastened with bolts due to their shape; it is recommended to use the method of fusion bonding with metal cores.



Fastening with a steel hub bolt

Stainless Steel Hubs for PSA are now available!

Standardized sectional stainless steel hubs. It enhances a secure fastening to the shaft.



Sectional Parts

For details, please see Page 334.

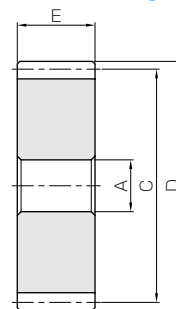
[Caution on J series]

- ① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keys are made according to JIS B1301 standards, Js 9 tolerance.



Specifications	
Precision grade	JIS grade N9 (JIS B1702-1: 1998) * JIS grade 5 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	MC901
Heat treatment	—
Tooth hardness	115 ~ 120HRR

\* Precision grade of this product corresponds to 'equivalent'.



S5

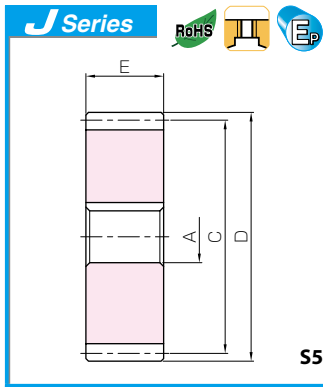
Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Pitch dia.	Outside dia.	Face width	Keyway
				A	C	D	E	WidthxDepth
<b>PSA2-70</b> ● PSA2-70 J15 ● PSA2-70 J16 ● PSA2-70 J18 ● PSA2-70 J19 ● PSA2-70 J20 ● PSA2-70 J22 ● PSA2-70 J25 ● PSA2-70 J28 ● PSA2-70 J30 ● PSA2-70 J32 ● PSA2-70 J35 ● PSA2-70 J40 ● PSA2-70 J45 ● PSA2-70 J50	m2	70	S5	15	140	144	20	—
			S5K	15				5 x 2.3
			S5K	16				5 x 2.3
			S5K	18				6 x 2.8
			S5K	19				6 x 2.8
			S5K	20				6 x 2.8
			S5K	22				6 x 2.8
			S5K	25				8 x 3.3
			S5K	28				8 x 3.3
			S5K	30				8 x 3.3
			S5K	32				10 x 3.3
			S5K	35				10 x 3.3
			S5K	40				12 x 3.3
			S5K	45				14 x 3.8
			S5K	50				14 x 3.8
<b>PSA2-75</b> ● PSA2-75 J15 ● PSA2-75 J16 ● PSA2-75 J18 ● PSA2-75 J19 ● PSA2-75 J20 ● PSA2-75 J22 ● PSA2-75 J25 ● PSA2-75 J28 ● PSA2-75 J30 ● PSA2-75 J32 ● PSA2-75 J35 ● PSA2-75 J40 ● PSA2-75 J45 ● PSA2-75 J50	m2	75	S5	15	150	154	20	—
			S5K	15				5 x 2.3
			S5K	16				5 x 2.3
			S5K	18				6 x 2.8
			S5K	19				6 x 2.8
			S5K	20				6 x 2.8
			S5K	22				6 x 2.8
			S5K	25				8 x 3.3
			S5K	28				8 x 3.3
			S5K	30				8 x 3.3
			S5K	32				10 x 3.3
			S5K	35				10 x 3.3
			S5K	40				12 x 3.3
			S5K	45				14 x 3.8
			S5K	50				14 x 3.8
<b>PSA2-80</b> ● PSA2-80 J15 ● PSA2-80 J16 ● PSA2-80 J18 ● PSA2-80 J19 ● PSA2-80 J20 ● PSA2-80 J22 ● PSA2-80 J25 ● PSA2-80 J28 ● PSA2-80 J30 ● PSA2-80 J32 ● PSA2-80 J35 ● PSA2-80 J40 ● PSA2-80 J45 ● PSA2-80 J50	m2	80	S5	15	160	164	20	—
			S5K	15				5 x 2.3
			S5K	16				5 x 2.3
			S5K	18				6 x 2.8
			S5K	19				6 x 2.8
			S5K	20				6 x 2.8
			S5K	22				6 x 2.8
			S5K	25				8 x 3.3
			S5K	28				8 x 3.3
			S5K	30				8 x 3.3
			S5K	32				10 x 3.3
			S5K	35				10 x 3.3
			S5K	40				12 x 3.3
			S5K	45				14 x 3.8
			S5K	50				14 x 3.8
<b>PSA2-85</b> ● PSA2-85 J15 ● PSA2-85 J16 ● PSA2-85 J18 ● PSA2-85 J19 ● PSA2-85 J20 ● PSA2-85 J22 ● PSA2-85 J25 ● PSA2-85 J28 ● PSA2-85 J30 ● PSA2-85 J32 ● PSA2-85 J35 ● PSA2-85 J40 ● PSA2-85 J45 ● PSA2-85 J50	m2	85	S5	15	170	174	20	—
			S5K	15				5 x 2.3
			S5K	16				5 x 2.3
			S5K	18				6 x 2.8
			S5K	19				6 x 2.8
			S5K	20				6 x 2.8
			S5K	22				6 x 2.8
			S5K	25				8 x 3.3
			S5K	28				8 x 3.3
			S5K	30				8 x 3.3
			S5K	32				10 x 3.3
			S5K	35				10 x 3.3
			S5K	40				12 x 3.3
			S5K	45				14 x 3.8
			S5K	50				14 x 3.8

[Caution on Product Characteristics]

- ① Significant variations in temperature or humidity can cause dimensional changes in plastic gears (MC Nylon gears), including bore size (H8 when produced), tooth diameter, and backlash. Please see the section "Design of Plastic Gears" in the technical reference (Page 693).
- ② The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ③ Without lubrication, using plastic gears in pairs may generate heat and dilation. It is recommended to mate with steel gears.
- ④ The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Plastic gears are susceptible to the effects of temperature and moisture. Dimensional changes may occur while performing secondary operations and during post-machining operations.



Plastic Spur Gears

Newly added



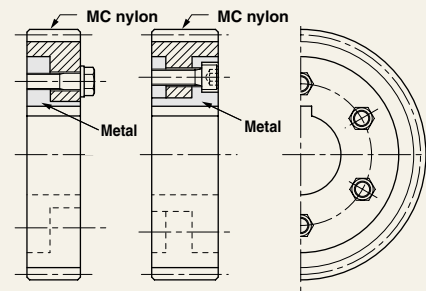
Allowable torque (N·m) Bending strength	Allowable torque (kgf·m) Bending strength	Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
23.0	2.34	0~0.46	0.36	<b>PSA2-70</b>
			0.36	● PSA2-70 J15
			0.36	● PSA2-70 J16
			0.35	● PSA2-70 J18
			0.35	● PSA2-70 J19
			0.35	● PSA2-70 J20
			0.35	● PSA2-70 J22
			0.35	● PSA2-70 J25
			0.35	● PSA2-70 J28
			0.34	● PSA2-70 J30
			0.34	● PSA2-70 J32
			0.34	● PSA2-70 J35
			0.33	● PSA2-70 J40
			0.32	● PSA2-70 J45
0.31	● PSA2-70 J50			
24.9	2.54	0~0.46	0.41	<b>PSA2-75</b>
			0.41	● PSA2-75 J15
			0.41	● PSA2-75 J16
			0.41	● PSA2-75 J18
			0.41	● PSA2-75 J19
			0.41	● PSA2-75 J20
			0.40	● PSA2-75 J22
			0.40	● PSA2-75 J25
			0.40	● PSA2-75 J28
			0.40	● PSA2-75 J30
			0.40	● PSA2-75 J32
			0.39	● PSA2-75 J35
			0.38	● PSA2-75 J40
			0.38	● PSA2-75 J45
0.37	● PSA2-75 J50			
26.7	2.72	0~0.46	0.47	<b>PSA2-80</b>
			0.47	● PSA2-80 J15
			0.47	● PSA2-80 J16
			0.46	● PSA2-80 J18
			0.46	● PSA2-80 J19
			0.46	● PSA2-80 J20
			0.46	● PSA2-80 J22
			0.46	● PSA2-80 J25
			0.46	● PSA2-80 J28
			0.45	● PSA2-80 J30
			0.45	● PSA2-80 J32
			0.45	● PSA2-80 J35
			0.44	● PSA2-80 J40
			0.43	● PSA2-80 J45
0.42	● PSA2-80 J50			
28.5	2.91	0~0.46	0.53	<b>PSA2-85</b>
			0.53	● PSA2-85 J15
			0.53	● PSA2-85 J16
			0.52	● PSA2-85 J18
			0.52	● PSA2-85 J19
			0.52	● PSA2-85 J20
			0.52	● PSA2-85 J22
			0.52	● PSA2-85 J25
			0.52	● PSA2-85 J28
			0.51	● PSA2-85 J30
			0.51	● PSA2-85 J32
			0.51	● PSA2-85 J35
			0.50	● PSA2-85 J40
			0.49	● PSA2-85 J45
0.48	● PSA2-85 J50			

How to attach gears to shafts

To attach gears to shafts, in case of light loads, methods include using keys, taper pins, spring pins, and press fitting after mounting the setscrews. While looseness tends to occur in the conditions below, plastic gears are fastened by applying a steel hub.

1. When the circumferential temperature is high
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For fastening steel hubs into plastic gears with bolts, see below for various methods. For gears, which cannot be fasten with bolts due to their shape; it is recommended to use the method of fusion bonding with metal cores.



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Sectional Parts

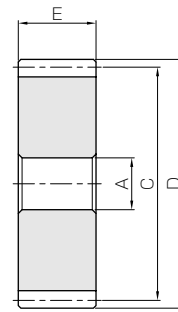
For details, please see Page 334.

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- ① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
  - ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
  - ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.



Specifications	
Precision grade	JIS grade N9 (JIS B1702-1: 1998) * JIS grade 5 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	MC901
Heat treatment	—
Tooth hardness	115 ~ 120HRR

\* Precision grade of this product corresponds to 'equivalent'.



S5

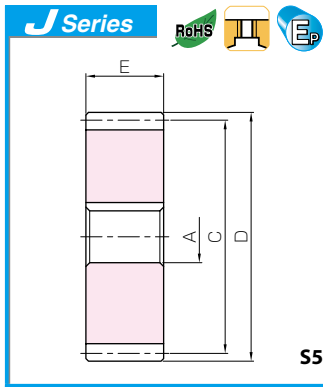
Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Pitch dia.	Outside dia.	Face width	Keyway
				A	C	D	E	WidthxDepth
<b>PSA2-90</b> ● PSA2-90 J15 ● PSA2-90 J16 ● PSA2-90 J18 ● PSA2-90 J19 ● PSA2-90 J20 ● PSA2-90 J22 ● PSA2-90 J25 ● PSA2-90 J28 ● PSA2-90 J30 ● PSA2-90 J32 ● PSA2-90 J35 ● PSA2-90 J40 ● PSA2-90 J45 ● PSA2-90 J50	m2	90	S5	15	180	184	20	—
			S5K	15				5 x 2.3
			S5K	16				5 x 2.3
			S5K	18				6 x 2.8
			S5K	19				6 x 2.8
			S5K	20				6 x 2.8
			S5K	22				6 x 2.8
			S5K	25				8 x 3.3
			S5K	28				8 x 3.3
			S5K	30				8 x 3.3
			S5K	32				10 x 3.3
			S5K	35				10 x 3.3
			S5K	40				12 x 3.3
			S5K	45				14 x 3.8
S5K	50	14 x 3.8						
<b>PSA2-95</b> ● PSA2-95 J15 ● PSA2-95 J16 ● PSA2-95 J18 ● PSA2-95 J19 ● PSA2-95 J20 ● PSA2-95 J22 ● PSA2-95 J25 ● PSA2-95 J28 ● PSA2-95 J30 ● PSA2-95 J32 ● PSA2-95 J35 ● PSA2-95 J40 ● PSA2-95 J45 ● PSA2-95 J50	m2	95	S5	15	190	194	20	—
			S5K	15				5 x 2.3
			S5K	16				5 x 2.3
			S5K	18				6 x 2.8
			S5K	19				6 x 2.8
			S5K	20				6 x 2.8
			S5K	22				6 x 2.8
			S5K	25				8 x 3.3
			S5K	28				8 x 3.3
			S5K	30				8 x 3.3
			S5K	32				10 x 3.3
			S5K	35				10 x 3.3
			S5K	40				12 x 3.3
			S5K	45				14 x 3.8
S5K	50	14 x 3.8						
<b>PSA2-100</b> ● PSA2-100 J15 ● PSA2-100 J16 ● PSA2-100 J18 ● PSA2-100 J19 ● PSA2-100 J20 ● PSA2-100 J22 ● PSA2-100 J25 ● PSA2-100 J28 ● PSA2-100 J30 ● PSA2-100 J32 ● PSA2-100 J35 ● PSA2-100 J40 ● PSA2-100 J45 ● PSA2-100 J50	m2	100	S5	15	200	204	20	—
			S5K	15				5 x 2.3
			S5K	16				5 x 2.3
			S5K	18				6 x 2.8
			S5K	19				6 x 2.8
			S5K	20				6 x 2.8
			S5K	22				6 x 2.8
			S5K	25				8 x 3.3
			S5K	28				8 x 3.3
			S5K	30				8 x 3.3
			S5K	32				10 x 3.3
			S5K	35				10 x 3.3
			S5K	40				12 x 3.3
			S5K	45				14 x 3.8
S5K	50	14 x 3.8						

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- ① Significant variations in temperature or humidity can cause dimensional changes in plastic gears (MC Nylon gears), including bore size (H8 when produced), tooth diameter, and backlash. Please see the section "Design of Plastic Gears" in the technical reference (Page 693).
- ② The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ③ Without lubrication, using plastic gears in pairs may generate heat and dilation. It is recommended to mate with steel gears.
- ④ The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

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Plastic Spur Gears

Newly added



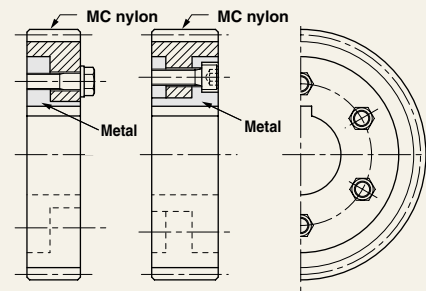
Allowable torque (N-m) Bending strength	Allowable torque (kgf-m) Bending strength	Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
30.4	3.10	0~0.46	0.59	<b>PSA2-90</b>
			0.59	● PSA2-90 J15
			0.59	● PSA2-90 J16
			0.59	● PSA2-90 J18
			0.59	● PSA2-90 J19
			0.59	● PSA2-90 J20
			0.59	● PSA2-90 J22
			0.58	● PSA2-90 J25
			0.58	● PSA2-90 J28
			0.58	● PSA2-90 J30
			0.58	● PSA2-90 J32
			0.57	● PSA2-90 J35
			0.56	● PSA2-90 J40
0.56	● PSA2-90 J45			
0.55	● PSA2-90 J50			
32.3	3.29	0~0.46	0.66	<b>PSA2-95</b>
			0.66	● PSA2-95 J15
			0.66	● PSA2-95 J16
			0.66	● PSA2-95 J18
			0.65	● PSA2-95 J19
			0.65	● PSA2-95 J20
			0.65	● PSA2-95 J22
			0.65	● PSA2-95 J25
			0.65	● PSA2-95 J28
			0.64	● PSA2-95 J30
			0.64	● PSA2-95 J32
			0.64	● PSA2-95 J35
			0.63	● PSA2-95 J40
0.62	● PSA2-95 J45			
0.62	● PSA2-95 J50			
34.2	3.48	0~0.46	0.73	<b>PSA2-100</b>
			0.73	● PSA2-100 J15
			0.73	● PSA2-100 J16
			0.73	● PSA2-100 J18
			0.73	● PSA2-100 J19
			0.73	● PSA2-100 J20
			0.72	● PSA2-100 J22
			0.72	● PSA2-100 J25
			0.72	● PSA2-100 J28
			0.72	● PSA2-100 J30
			0.71	● PSA2-100 J32
			0.71	● PSA2-100 J35
			0.70	● PSA2-100 J40
0.69	● PSA2-100 J45			
0.69	● PSA2-100 J50			

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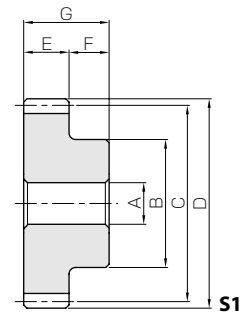
[Caution on J series]

- ① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
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- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.



Specifications	
Precision grade	JIS grade N9 (JIS B1702-1: 1998) * JIS grade 5 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	MC901
Heat treatment	—
Tooth hardness	115 ~ 120HRR

\* The precision grade of this product is equivalent to the value shown in the table.



- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	
				A	B	C	D	E	F	G	
<b>PS2.5-12</b> ● <b>PS2.5-12J10</b>	<b>m2.5</b>	12	S1	10	23	30	35	25	12	37	
			S1T2	10							
		<b>PS2.5-13</b> ● <b>PS2.5-13J10</b>	13	S1	10	25	32.5	37.5	25	12	37
				S1K	10						
		<b>PS2.5-14</b> ● <b>PS2.5-14J10</b> ● <b>PS2.5-14J12</b>	14	S1	10	25	35	40	25	12	37
				S1K	10						
				S1K	12						
		<b>PS2.5-15</b> ● <b>PS2.5-15J12</b> ● <b>PS2.5-15J14</b>	15	S1	12	30	37.5	42.5	25	12	37
				S1K	12						
				S1K	14						
		<b>PS2.5-16</b> ● <b>PS2.5-16J12</b> ● <b>PS2.5-16J14</b> ● <b>PS2.5-16J15</b> ● <b>PS2.5-16J16</b>	16	S1	12	32	40	45	25	12	37
				S1K	12						
S1K	14										
S1K	15										
S1K	16										
<b>PS2.5-18</b> ● <b>PS2.5-18J12</b> ● <b>PS2.5-18J14</b> ● <b>PS2.5-18J15</b> ● <b>PS2.5-18J16</b> ● <b>PS2.5-18J18</b> ● <b>PS2.5-18J19</b> ● <b>PS2.5-18J20</b>	18	S1	12	38	45	50	25	12	37		
		S1K	12								
		S1K	14								
		S1K	15								
		S1K	16								
		S1K	18								
S1K	19										
S1K	20										
<b>PS2.5-20</b> ● <b>PS2.5-20J12</b> ● <b>PS2.5-20J14</b> ● <b>PS2.5-20J15</b> ● <b>PS2.5-20J16</b> ● <b>PS2.5-20J18</b> ● <b>PS2.5-20J19</b> ● <b>PS2.5-20J20</b> ● <b>PS2.5-20J22</b>	20	S1	12	40	50	55	25	12	37		
		S1K	12								
		S1K	14								
		S1K	15								
		S1K	16								
		S1K	18								
		S1K	19								
		S1K	20								
		S1K	22								
		<b>PS2.5-22</b> ● <b>PS2.5-22J12</b> ● <b>PS2.5-22J14</b> ● <b>PS2.5-22J15</b> ● <b>PS2.5-22J16</b> ● <b>PS2.5-22J18</b> ● <b>PS2.5-22J19</b> ● <b>PS2.5-22J20</b> ● <b>PS2.5-22J22</b> ● <b>PS2.5-22J25</b>	22							S1	12
S1K	12										
S1K	14										
S1K	15										
S1K	16										
S1K	18										
S1K	19										
S1K	20										
S1K	22										
S1K	25										
<b>PS2.5-24</b> ● <b>PS2.5-24J12</b> ● <b>PS2.5-24J14</b> ● <b>PS2.5-24J15</b> ● <b>PS2.5-24J16</b> ● <b>PS2.5-24J18</b> ● <b>PS2.5-24J19</b> ● <b>PS2.5-24J20</b> ● <b>PS2.5-24J22</b> ● <b>PS2.5-24J25</b> ● <b>PS2.5-24J28</b>	24	S1	12	48	60	65	25	12	37		
		S1K	12								
		S1K	14								
		S1K	15								
		S1K	16								
		S1K	18								
		S1K	19								
		S1K	20								
		S1K	22								
		S1K	25								
		S1K	28								

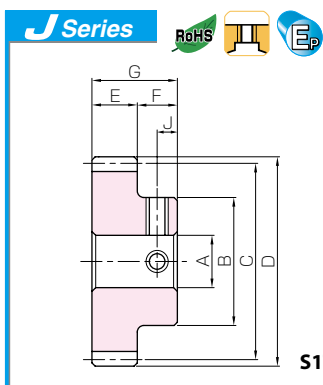
[Caution on Product Characteristics]

- ① Significant variations in temperature or humidity can cause dimensional changes in plastic gears (MC Nylon gears), including bore size (H8 when produced), tooth diameter, and backlash. Please see the section "Design of Plastic Gears" in the technical reference (Page 693).
- ② The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ③ Without lubrication, using plastic gears in pairs may generate heat and dilation. It is recommended to mate with steel gears.
- ④ The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Plastic gears are susceptible to the effects of temperature and moisture. Dimensional changes may occur while performing secondary operations and during post-machining operations.





## Plastic Spur Gears

Newly added



Keyway WidthxDepth	Set Screw		Allowable torque (N·m) Bending strength	Allowable torque (kgf·m) Bending strength	Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
	Size	J					
—	—	—	4.39	0.45	0~0.44	0.023 0.023	PS2.5-12 ● PS2.5-12J10
—	M4	6					
—	—	—	5.06	0.52	0~0.44	0.028 0.027	PS2.5-13 ● PS2.5-13J10
4 x 1.8	M4	6					
—	—	—	5.77	0.59	0~0.44	0.031 0.031 0.029	PS2.5-14 ● PS2.5-14J10 ● PS2.5-14J12
4 x 1.8	M4	6					
—	—	—	6.42	0.65	0~0.44	0.037 0.036 0.035	PS2.5-15 ● PS2.5-15J12 ● PS2.5-15J14
4 x 1.8	M4	6					
—	—	—	7.09	0.72	0~0.44	0.043 0.042 0.040 0.039 0.038	PS2.5-16 ● PS2.5-16J12 ● PS2.5-16J14 ● PS2.5-16J15 ● PS2.5-16J16
4 x 1.8	M4	6					
5 x 2.3	M4	6					
5 x 2.3	M4	6					
—	—	—	8.28	0.84	0~0.44	0.057 0.056 0.054 0.053 0.052 0.050 0.049 0.047	PS2.5-18 ● PS2.5-18J12 ● PS2.5-18J14 ● PS2.5-18J15 ● PS2.5-18J16 ● PS2.5-18J18 ● PS2.5-18J19 ● PS2.5-18J20
4 x 1.8	M4	6					
5 x 2.3	M4	6					
5 x 2.3	M4	6					
6 x 2.8	M5	6					
6 x 2.8	M5	6					
—	—	—	9.59	0.98	0~0.44	0.070 0.069 0.067 0.066 0.065 0.062 0.061 0.060 0.057	PS2.5-20 ● PS2.5-20J12 ● PS2.5-20J14 ● PS2.5-20J15 ● PS2.5-20J16 ● PS2.5-20J18 ● PS2.5-20J19 ● PS2.5-20J20 ● PS2.5-20J22
4 x 1.8	M4	6					
5 x 2.3	M4	6					
5 x 2.3	M4	6					
6 x 2.8	M5	6					
6 x 2.8	M5	6					
6 x 2.8	M5	6					
—	—	—	10.8	1.11	0~0.46	0.085 0.084 0.083 0.082 0.081 0.078 0.077 0.075 0.073 0.067	PS2.5-22 ● PS2.5-22J12 ● PS2.5-22J14 ● PS2.5-22J15 ● PS2.5-22J16 ● PS2.5-22J18 ● PS2.5-22J19 ● PS2.5-22J20 ● PS2.5-22J22 ● PS2.5-22J25
4 x 1.8	M4*	6					
5 x 2.3	M4*	6					
5 x 2.3	M4*	6					
6 x 2.8	M5	6					
6 x 2.8	M5	6					
6 x 2.8	M5	6					
8 x 3.3	M6	6					
—	—	—	12.1	1.23	0~0.46	0.10 0.10 0.100 0.099 0.098 0.095 0.094 0.092 0.090 0.084 0.079	PS2.5-24 ● PS2.5-24J12 ● PS2.5-24J14 ● PS2.5-24J15 ● PS2.5-24J16 ● PS2.5-24J18 ● PS2.5-24J19 ● PS2.5-24J20 ● PS2.5-24J22 ● PS2.5-24J25 ● PS2.5-24J28
4 x 1.8	M4*	6					
5 x 2.3	M4*	6					
5 x 2.3	M4*	6					
6 x 2.8	M5	6					
6 x 2.8	M5	6					
6 x 2.8	M5	6					
8 x 3.3	M6	6					
8 x 3.3	M6	6					

## [Caution on J series]

① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order.

Please allow additional shipping time to get to your local distributor.

② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.

③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.

④ Certain products which would otherwise have a very long tapped hole are conerbored to reduce the length of the tap. (Products marked with "\*" are tap size).

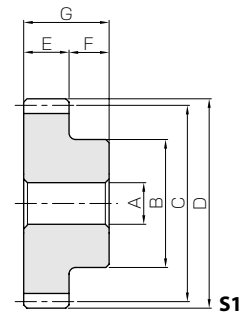
⑤ For products having a tapped hole, a set screw is included.

⑥ Since tapped holes of plastic products are easily broken, avoid too much tightening when fastening screws. For products which have a short tapped hole (Products marked with "\*" are the tap size), fasten with torques less than 0.12N · m for M4, and 0.38N · m for M5.



Specifications	
Precision grade	JIS grade N9 (JIS B1702-1: 1998) * JIS grade 5 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	MC901
Heat treatment	—
Tooth hardness	115 ~ 120HRR

\* The precision grade of this product is equivalent to the value shown in the table.



- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

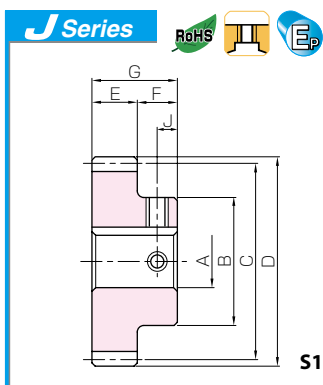
Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length									
				A	B	C	D	E	F	G									
<b>PS2.5-25</b> ● PS2.5-25J12 ● PS2.5-25J14 ● PS2.5-25J15 ● PS2.5-25J16 ● PS2.5-25J18 ● PS2.5-25J19 ● PS2.5-25J20 ● PS2.5-25J22 ● PS2.5-25J25 ● PS2.5-25J28	m2.5	25	S1	12	50	62.5	67.5	25	12	37									
			S1K	12															
			S1K	14															
			S1K	15															
			S1K	16															
			S1K	18															
			S1K	19															
			S1K	20															
			S1K	22															
			S1K	25															
			S1K	28															
			<b>PS2.5-26</b> ● PS2.5-26J12 ● PS2.5-26J14 ● PS2.5-26J15 ● PS2.5-26J16 ● PS2.5-26J18 ● PS2.5-26J19 ● PS2.5-26J20 ● PS2.5-26J22 ● PS2.5-26J25 ● PS2.5-26J28 ● PS2.5-26J30 ● PS2.5-26J32	m2.5							26	S1	12	55	65	70	25	12	37
												S1K	12						
												S1K	14						
S1K	15																		
S1K	16																		
S1K	18																		
S1K	19																		
S1K	20																		
S1K	22																		
S1K	25																		
S1K	28																		
S1K	30																		
S1K	32																		
<b>PS2.5-28</b> ● PS2.5-28J12 ● PS2.5-28J14 ● PS2.5-28J15 ● PS2.5-28J16 ● PS2.5-28J18 ● PS2.5-28J19 ● PS2.5-28J20 ● PS2.5-28J22 ● PS2.5-28J25 ● PS2.5-28J28 ● PS2.5-28J30 ● PS2.5-28J32 ● PS2.5-28J35	m2.5	28			S1	12	60	70	75	25		12	37						
			S1K	12															
			S1K	14															
			S1K	15															
			S1K	16															
			S1K	18															
			S1K	19															
			S1K	20															
			S1K	22															
			S1K	25															
			S1K	28															
			S1K	30															
			S1K	32															
			S1K	35															
<b>PS2.5-30</b> ● PS2.5-30J12 ● PS2.5-30J14 ● PS2.5-30J15 ● PS2.5-30J16 ● PS2.5-30J18 ● PS2.5-30J19 ● PS2.5-30J20 ● PS2.5-30J22 ● PS2.5-30J25 ● PS2.5-30J28 ● PS2.5-30J30 ● PS2.5-30J32 ● PS2.5-30J35	m2.5	30	S1	12	65	75	80	25	12	37									
			S1K	12															
			S1K	14															
			S1K	15															
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			S1K	28															
			S1K	30															
			S1K	32															
			S1K	35															

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- ① Significant variations in temperature or humidity can cause dimensional changes in plastic gears (MC Nylon gears), including bore size (H8 when produced), tooth diameter, and backlash. Please see the section "Design of Plastic Gears" in the technical reference (Page 693).
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## Plastic Spur Gears

Newly added



Keyway WidthxDepth	Set Screw		Allowable torque (N-m) Bending strength	Allowable torque (kgf·m) Bending strength	Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
	Size	J					
—	—	—	12.8	1.30	0~0.46	0.11 0.11 0.11 0.11 0.11 0.10 0.10 0.10 0.099 0.093 0.088	<b>PS2.5-25</b> ●PS2.5-25J12 ●PS2.5-25J14 ●PS2.5-25J15 ●PS2.5-25J16 ●PS2.5-25J18 ●PS2.5-25J19 ●PS2.5-25J20 ●PS2.5-25J22 ●PS2.5-25J25 ●PS2.5-25J28
4 x 1.8	M4*	6					
5 x 2.3	M4*	6					
5 x 2.3	M4*	6					
5 x 2.3	M4*	6					
6 x 2.8	M5	6					
6 x 2.8	M5	6					
6 x 2.8	M5	6					
6 x 2.8	M5	6					
8 x 3.3	M6	6					
8 x 3.3	M6	6					
—	—	—	13.5	1.37	0~0.46	0.12 0.12 0.12 0.12 0.12 0.12 0.11 0.11 0.10 0.097 0.092	<b>PS2.5-26</b> ●PS2.5-26J12 ●PS2.5-26J14 ●PS2.5-26J15 ●PS2.5-26J16 ●PS2.5-26J18 ●PS2.5-26J19 ●PS2.5-26J20 ●PS2.5-26J22 ●PS2.5-26J25 ●PS2.5-26J28 ●PS2.5-26J30 ●PS2.5-26J32
4 x 1.8	M4*	6					
5 x 2.3	M4*	6					
5 x 2.3	M4*	6					
5 x 2.3	M4*	6					
6 x 2.8	M5*	6					
6 x 2.8	M5*	6					
6 x 2.8	M5*	6					
6 x 2.8	M5	6					
8 x 3.3	M6	6					
8 x 3.3	M6	6					
8 x 3.3	M6	6					
10 x 3.3	M8	6					
—	—	—	14.7	1.50	0~0.46	0.15 0.15 0.14 0.14 0.14 0.14 0.14 0.14 0.13 0.13 0.12 0.12 0.11 0.11	<b>PS2.5-28</b> ●PS2.5-28J12 ●PS2.5-28J14 ●PS2.5-28J15 ●PS2.5-28J16 ●PS2.5-28J18 ●PS2.5-28J19 ●PS2.5-28J20 ●PS2.5-28J22 ●PS2.5-28J25 ●PS2.5-28J28 ●PS2.5-28J30 ●PS2.5-28J32 ●PS2.5-28J35
4 x 1.8	M4*	6					
5 x 2.3	M4*	6					
5 x 2.3	M4*	6					
5 x 2.3	M4*	6					
6 x 2.8	M5*	6					
6 x 2.8	M5*	6					
6 x 2.8	M5*	6					
6 x 2.8	M5*	6					
8 x 3.3	M6	6					
8 x 3.3	M6	6					
8 x 3.3	M6	6					
10 x 3.3	M8	6					
10 x 3.3	M8	6					
—	—	—	16.0	1.63	0~0.46	0.17 0.17 0.17 0.17 0.16 0.16 0.16 0.16 0.16 0.16 0.15 0.15 0.14 0.14 0.14	<b>PS2.5-30</b> ●PS2.5-30J12 ●PS2.5-30J14 ●PS2.5-30J15 ●PS2.5-30J16 ●PS2.5-30J18 ●PS2.5-30J19 ●PS2.5-30J20 ●PS2.5-30J22 ●PS2.5-30J25 ●PS2.5-30J28 ●PS2.5-30J30 ●PS2.5-30J32 ●PS2.5-30J35
4 x 1.8	M4*	6					
5 x 2.3	M4*	6					
5 x 2.3	M4*	6					
5 x 2.3	M4*	6					
6 x 2.8	M5*	6					
6 x 2.8	M5*	6					
6 x 2.8	M5*	6					
6 x 2.8	M5*	6					
8 x 3.3	M6	6					
8 x 3.3	M6	6					
8 x 3.3	M6	6					
10 x 3.3	M8	6					
10 x 3.3	M8	6					

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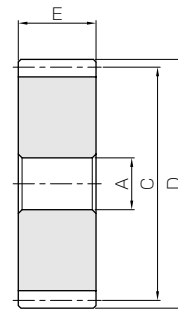
⑤ For products having a tapped hole, a set screw is included.

⑥ Since tapped holes of plastic products are easily broken, avoid too much tightening when fastening screws. For products which have a short tapped hole (Products marked with "\*" are the tap size), fasten with torques less than 0.12N · m for M4, and 0.38N · m for M5.



Specifications	
Precision grade	JIS grade N9 (JIS B1702-1: 1998) * JIS grade 5 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	MC901
Heat treatment	—
Tooth hardness	115 ~ 120HRR

\* Precision grade of this product corresponds to 'equivalent'.



S5

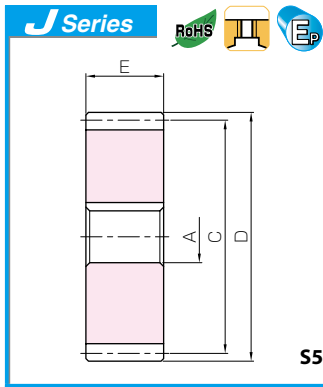
Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Pitch dia.	Outside dia.	Face width	Keyway
				A	C	D	E	WidthxDepth
<b>PSA2.5-32</b> ● PSA2.5-32 J15 ● PSA2.5-32 J16 ● PSA2.5-32 J18 ● PSA2.5-32 J19 ● PSA2.5-32 J20 ● PSA2.5-32 J22 ● PSA2.5-32 J25 ● PSA2.5-32 J28 ● PSA2.5-32 J30 ● PSA2.5-32 J32 ● PSA2.5-32 J35	<b>m2.5</b>	32	S5	15	80	85	25	—
S5K			15	5 x 2.3				
S5K			16	5 x 2.3				
S5K			18	6 x 2.8				
S5K			19	6 x 2.8				
S5K			20	6 x 2.8				
S5K			22	6 x 2.8				
S5K			25	8 x 3.3				
S5K			28	8 x 3.3				
S5K			30	8 x 3.3				
S5K			32	10 x 3.3				
S5K			35	10 x 3.3				
<b>PSA2.5-35</b> ● PSA2.5-35 J15 ● PSA2.5-35 J16 ● PSA2.5-35 J18 ● PSA2.5-35 J19 ● PSA2.5-35 J20 ● PSA2.5-35 J22 ● PSA2.5-35 J25 ● PSA2.5-35 J28 ● PSA2.5-35 J30 ● PSA2.5-35 J32 ● PSA2.5-35 J35 ● PSA2.5-35 J40	<b>m2.5</b>	35	S5	15	87.5	92.5	25	—
S5K			15	5 x 2.3				
S5K			16	5 x 2.3				
S5K			18	6 x 2.8				
S5K			19	6 x 2.8				
S5K			20	6 x 2.8				
S5K			22	6 x 2.8				
S5K			25	8 x 3.3				
S5K			28	8 x 3.3				
S5K			30	8 x 3.3				
S5K			32	10 x 3.3				
S5K			35	10 x 3.3				
S5K	40	12 x 3.3						
<b>PSA2.5-36</b> ● PSA2.5-36 J15 ● PSA2.5-36 J16 ● PSA2.5-36 J18 ● PSA2.5-36 J19 ● PSA2.5-36 J20 ● PSA2.5-36 J22 ● PSA2.5-36 J25 ● PSA2.5-36 J28 ● PSA2.5-36 J30 ● PSA2.5-36 J32 ● PSA2.5-36 J35 ● PSA2.5-36 J40	<b>m2.5</b>	36	S5	15	90	95	25	—
S5K			15	5 x 2.3				
S5K			16	5 x 2.3				
S5K			18	6 x 2.8				
S5K			19	6 x 2.8				
S5K			20	6 x 2.8				
S5K			22	6 x 2.8				
S5K			25	8 x 3.3				
S5K			28	8 x 3.3				
S5K			30	8 x 3.3				
S5K			32	10 x 3.3				
S5K			35	10 x 3.3				
S5K	40	12 x 3.3						
<b>PSA2.5-40</b> ● PSA2.5-40 J15 ● PSA2.5-40 J16 ● PSA2.5-40 J18 ● PSA2.5-40 J19 ● PSA2.5-40 J20 ● PSA2.5-40 J22 ● PSA2.5-40 J25 ● PSA2.5-40 J28 ● PSA2.5-40 J30 ● PSA2.5-40 J32 ● PSA2.5-40 J35 ● PSA2.5-40 J40 ● PSA2.5-40 J45	<b>m2.5</b>	40	S5	15	100	105	25	—
S5K			15	5 x 2.3				
S5K			16	5 x 2.3				
S5K			18	6 x 2.8				
S5K			19	6 x 2.8				
S5K			20	6 x 2.8				
S5K			22	6 x 2.8				
S5K			25	8 x 3.3				
S5K			28	8 x 3.3				
S5K			30	8 x 3.3				
S5K			32	10 x 3.3				
S5K			35	10 x 3.3				
S5K	40	12 x 3.3						
S5K	45	14 x 3.8						

[Caution on Product Characteristics]

- ① Significant variations in temperature or humidity can cause dimensional changes in plastic gears (MC Nylon gears), including bore size (H8 when produced), tooth diameter, and backlash. Please see the section "Design of Plastic Gears" in the technical reference (Page 693).
- ② The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ③ Without lubrication, using plastic gears in pairs may generate heat and dilation. It is recommended to mate with steel gears.
- ④ The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Plastic gears are susceptible to the effects of temperature and moisture. Dimensional changes may occur while performing secondary operations and during post-machining operations.



Plastic Spur Gears

Newly added



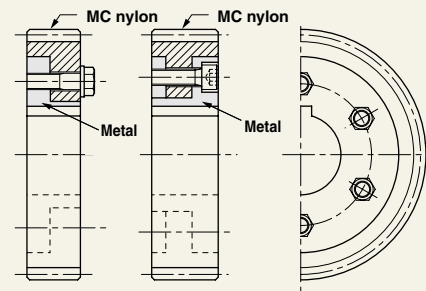
Allowable torque (N-m) Bending strength	Allowable torque (kgf-m) Bending strength	Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
17.4	1.77	0~0.46	0.15	<b>PSA2.5-32</b>
			0.15	● <b>PSA2.5-32 J15</b>
			0.14	● <b>PSA2.5-32 J16</b>
			0.14	● <b>PSA2.5-32 J18</b>
			0.14	● <b>PSA2.5-32 J19</b>
			0.14	● <b>PSA2.5-32 J20</b>
			0.14	● <b>PSA2.5-32 J22</b>
			0.14	● <b>PSA2.5-32 J25</b>
			0.13	● <b>PSA2.5-32 J28</b>
			0.13	● <b>PSA2.5-32 J30</b>
			0.13	● <b>PSA2.5-32 J32</b>
			0.12	● <b>PSA2.5-32 J35</b>
19.5	1.99	0~0.46	0.17	<b>PSA2.5-35</b>
			0.17	● <b>PSA2.5-35 J15</b>
			0.17	● <b>PSA2.5-35 J16</b>
			0.17	● <b>PSA2.5-35 J18</b>
			0.17	● <b>PSA2.5-35 J19</b>
			0.17	● <b>PSA2.5-35 J20</b>
			0.17	● <b>PSA2.5-35 J22</b>
			0.16	● <b>PSA2.5-35 J25</b>
			0.16	● <b>PSA2.5-35 J28</b>
			0.16	● <b>PSA2.5-35 J30</b>
			0.16	● <b>PSA2.5-35 J32</b>
			0.15	● <b>PSA2.5-35 J35</b>
0.14	● <b>PSA2.5-35 J40</b>			
20.3	2.07	0~0.46	0.18	<b>PSA2.5-36</b>
			0.18	● <b>PSA2.5-36 J15</b>
			0.18	● <b>PSA2.5-36 J16</b>
			0.18	● <b>PSA2.5-36 J18</b>
			0.18	● <b>PSA2.5-36 J19</b>
			0.18	● <b>PSA2.5-36 J20</b>
			0.18	● <b>PSA2.5-36 J22</b>
			0.17	● <b>PSA2.5-36 J25</b>
			0.17	● <b>PSA2.5-36 J28</b>
			0.17	● <b>PSA2.5-36 J30</b>
			0.17	● <b>PSA2.5-36 J32</b>
			0.16	● <b>PSA2.5-36 J35</b>
0.15	● <b>PSA2.5-36 J40</b>			
23.2	2.36	0~0.46	0.23	<b>PSA2.5-40</b>
			0.23	● <b>PSA2.5-40 J15</b>
			0.23	● <b>PSA2.5-40 J16</b>
			0.23	● <b>PSA2.5-40 J18</b>
			0.22	● <b>PSA2.5-40 J19</b>
			0.22	● <b>PSA2.5-40 J20</b>
			0.22	● <b>PSA2.5-40 J22</b>
			0.22	● <b>PSA2.5-40 J25</b>
			0.21	● <b>PSA2.5-40 J28</b>
			0.21	● <b>PSA2.5-40 J30</b>
			0.21	● <b>PSA2.5-40 J32</b>
			0.20	● <b>PSA2.5-40 J35</b>
0.20	● <b>PSA2.5-40 J40</b>			
0.19	● <b>PSA2.5-40 J45</b>			

How to attach gears to shafts

To attach gears to shafts, in case of light loads, methods include using keys, taper pins, spring pins, and press fitting after mounting the setscrews. While looseness tends to occur in the conditions below, plastic gears are fastened by applying a steel hub.

1. When the circumferential temperature is high
2. For large diameter gears
3. If forward-reverse motion impacts keys

For fastening steel hubs into plastic gears with bolts, see below for various methods. For gears, which cannot be fasten with bolts due to their shape; it is recommended to use the method of fusion bonding with metal cores.



Fastening with a steel hub bolt

Stainless Steel Hubs for PSA are now available!

Standardized sectional stainless steel hubs. It enhances a secure fastening to the shaft.



Sectional Parts

For details, please see Page 334.

- [Caution on J series]
- ① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order.  
Please allow additional shipping time to get to your local distributor.
  - ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
  - ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

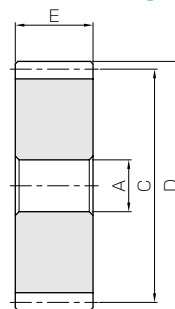
Bevel Gearboxes

Other Products



Specifications	
Precision grade	JIS grade N9 (JIS B1702-1: 1998) * JIS grade 5 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	MC901
Heat treatment	—
Tooth hardness	115 ~ 120HRR

\* Precision grade of this product corresponds to 'equivalent'.



S5

Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Pitch dia.	Outside dia.	Face width	Keyway					
				A	C	D	E	WidthxDepth					
<b>PSA2.5-45</b> ● PSA2.5-45 J15 ● PSA2.5-45 J16 ● PSA2.5-45 J18 ● PSA2.5-45 J19 ● PSA2.5-45 J20 ● PSA2.5-45 J22 ● PSA2.5-45 J25 ● PSA2.5-45 J28 ● PSA2.5-45 J30 ● PSA2.5-45 J32 ● PSA2.5-45 J35 ● PSA2.5-45 J40 ● PSA2.5-45 J45 ● PSA2.5-45 J50	<b>m2.5</b>	45	S5	15	112.5	117.5	25	—					
S5K			15	5 x 2.3									
S5K			16	5 x 2.3									
S5K			18	6 x 2.8									
S5K			19	6 x 2.8									
S5K			20	6 x 2.8									
S5K			22	6 x 2.8									
S5K			25	8 x 3.3									
S5K			28	8 x 3.3									
S5K			30	8 x 3.3									
S5K			32	10 x 3.3									
S5K			35	10 x 3.3									
S5K			40	12 x 3.3									
S5K			45	14 x 3.8									
S5K			50	14 x 3.8									
<b>PSA2.5-48</b> ● PSA2.5-48 J15 ● PSA2.5-48 J16 ● PSA2.5-48 J18 ● PSA2.5-48 J19 ● PSA2.5-48 J20 ● PSA2.5-48 J22 ● PSA2.5-48 J25 ● PSA2.5-48 J28 ● PSA2.5-48 J30 ● PSA2.5-48 J32 ● PSA2.5-48 J35 ● PSA2.5-48 J40 ● PSA2.5-48 J45 ● PSA2.5-48 J50			<b>m2.5</b>	48				S5	15	120	125	25	—
S5K								15	5 x 2.3				
S5K								16	5 x 2.3				
S5K	18	6 x 2.8											
S5K	19	6 x 2.8											
S5K	20	6 x 2.8											
S5K	22	6 x 2.8											
S5K	25	8 x 3.3											
S5K	28	8 x 3.3											
S5K	30	8 x 3.3											
S5K	32	10 x 3.3											
S5K	35	10 x 3.3											
S5K	40	12 x 3.3											
S5K	45	14 x 3.8											
S5K	50	14 x 3.8											
<b>PSA2.5-50</b> ● PSA2.5-50 J15 ● PSA2.5-50 J16 ● PSA2.5-50 J18 ● PSA2.5-50 J19 ● PSA2.5-50 J20 ● PSA2.5-50 J22 ● PSA2.5-50 J25 ● PSA2.5-50 J28 ● PSA2.5-50 J30 ● PSA2.5-50 J32 ● PSA2.5-50 J35 ● PSA2.5-50 J40 ● PSA2.5-50 J45 ● PSA2.5-50 J50	<b>m2.5</b>	50			S5	15	125	130	25				—
S5K					15	5 x 2.3							
S5K					16	5 x 2.3							
S5K			18	6 x 2.8									
S5K			19	6 x 2.8									
S5K			20	6 x 2.8									
S5K			22	6 x 2.8									
S5K			25	8 x 3.3									
S5K			28	8 x 3.3									
S5K			30	8 x 3.3									
S5K			32	10 x 3.3									
S5K			35	10 x 3.3									
S5K			40	12 x 3.3									
S5K			45	14 x 3.8									
S5K			50	14 x 3.8									

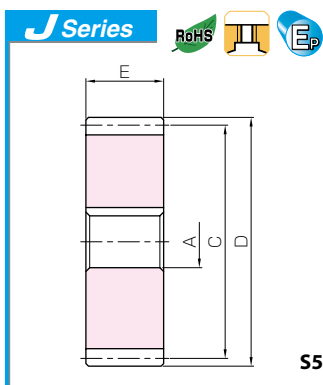
[Caution on Product Characteristics]

- ① Significant variations in temperature or humidity can cause dimensional changes in plastic gears (MC Nylon gears), including bore size (H8 when produced), tooth diameter, and backlash. Please see the section "Design of Plastic Gears" in the technical reference (Page 693).
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Spur Gears  
Helical Gears  
Internal Gears  
Racks  
CP Racks & Pinions  
Miter Gears  
Bevel Gears  
Screw Gears  
Worm Gear Pair  
Bevel Gearboxes  
Other Products



## Plastic Spur Gears

Newly added



Allowable torque (N-m)	Allowable torque (kgf-m)	Backlash (mm)	Weight (kg)	Catalog No.
Bending strength	Bending strength			● : J Series (Available-on-request)
26.8	2.73	0~0.48	0.29	<b>PSA2.5-45</b>
			0.29	● <b>PSA2.5-45 J15</b>
			0.29	● <b>PSA2.5-45 J16</b>
			0.29	● <b>PSA2.5-45 J18</b>
			0.28	● <b>PSA2.5-45 J19</b>
			0.28	● <b>PSA2.5-45 J20</b>
			0.28	● <b>PSA2.5-45 J22</b>
			0.28	● <b>PSA2.5-45 J25</b>
			0.27	● <b>PSA2.5-45 J28</b>
			0.27	● <b>PSA2.5-45 J30</b>
			0.27	● <b>PSA2.5-45 J32</b>
			0.26	● <b>PSA2.5-45 J35</b>
			0.26	● <b>PSA2.5-45 J40</b>
			0.25	● <b>PSA2.5-45 J45</b>
0.23	● <b>PSA2.5-45 J50</b>			
29.0	2.96	0~0.48	0.33	<b>PSA2.5-48</b>
			0.33	● <b>PSA2.5-48 J15</b>
			0.33	● <b>PSA2.5-48 J16</b>
			0.33	● <b>PSA2.5-48 J18</b>
			0.32	● <b>PSA2.5-48 J19</b>
			0.32	● <b>PSA2.5-48 J20</b>
			0.32	● <b>PSA2.5-48 J22</b>
			0.32	● <b>PSA2.5-48 J25</b>
			0.31	● <b>PSA2.5-48 J28</b>
			0.31	● <b>PSA2.5-48 J30</b>
			0.31	● <b>PSA2.5-48 J32</b>
			0.30	● <b>PSA2.5-48 J35</b>
			0.30	● <b>PSA2.5-48 J40</b>
			0.29	● <b>PSA2.5-48 J45</b>
0.27	● <b>PSA2.5-48 J50</b>			
30.6	3.12	0~0.48	0.36	<b>PSA2.5-50</b>
			0.36	● <b>PSA2.5-50 J15</b>
			0.35	● <b>PSA2.5-50 J16</b>
			0.35	● <b>PSA2.5-50 J18</b>
			0.35	● <b>PSA2.5-50 J19</b>
			0.35	● <b>PSA2.5-50 J20</b>
			0.35	● <b>PSA2.5-50 J22</b>
			0.35	● <b>PSA2.5-50 J25</b>
			0.34	● <b>PSA2.5-50 J28</b>
			0.34	● <b>PSA2.5-50 J30</b>
			0.34	● <b>PSA2.5-50 J32</b>
			0.33	● <b>PSA2.5-50 J35</b>
			0.32	● <b>PSA2.5-50 J40</b>
			0.31	● <b>PSA2.5-50 J45</b>
0.30	● <b>PSA2.5-50 J50</b>			

### [Caution on J series]

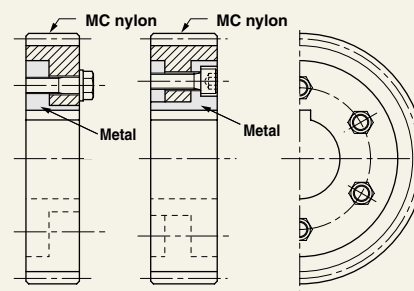
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- Number of products we can process for one order is **1 to 20 units**. For quantities of 21 or more pieces, we need to quote price and lead time.
- Keyways are made according to JIS B1301 standards, Js 9 tolerance.

### How to attach gears to shafts

To attach gears to shafts, in case of light loads, methods include using keys, taper pins, spring pins, and press fitting after mounting the setscrews. While looseness tends to occur in the conditions below, plastic gears are fastened by applying a steel hub.

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For fastening steel hubs into plastic gears with bolts, see below for various methods. For gears, which cannot be fastened with bolts due to their shape; it is recommended to use the method of fusion bonding with metal cores.



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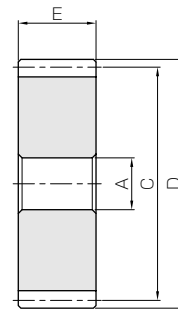
Sectional Parts

For details, please see Page 334.



Specifications	
Precision grade	JIS grade N9 (JIS B1702-1: 1998) * JIS grade 5 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	MC901
Heat treatment	—
Tooth hardness	115 ~ 120HRR

\* Precision grade of this product corresponds to 'equivalent'.



S5

Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Pitch dia.	Outside dia.	Face width	Keyway
				A	C	D	E	WidthxDepth
<b>PSA2.5-55</b>	<b>m2.5</b>	55	S5	15	137.5	142.5	25	—
● PSA2.5-55 J15			S5K	15				5 x 2.3
● PSA2.5-55 J16			S5K	16				5 x 2.3
● PSA2.5-55 J18			S5K	18				6 x 2.8
● PSA2.5-55 J19			S5K	19				6 x 2.8
● PSA2.5-55 J20			S5K	20				6 x 2.8
● PSA2.5-55 J22			S5K	22				6 x 2.8
● PSA2.5-55 J25			S5K	25				8 x 3.3
● PSA2.5-55 J28			S5K	28				8 x 3.3
● PSA2.5-55 J30			S5K	30				8 x 3.3
● PSA2.5-55 J32			S5K	32				10 x 3.3
● PSA2.5-55 J35			S5K	35				10 x 3.3
● PSA2.5-55 J40			S5K	40				12 x 3.3
● PSA2.5-55 J45			S5K	45				14 x 3.8
● PSA2.5-55 J50		S5K	50	14 x 3.8				
<b>PSA2.5-60</b>		60	S5	15	150	155	25	—
● PSA2.5-60 J15			S5K	15				5 x 2.3
● PSA2.5-60 J16			S5K	16				5 x 2.3
● PSA2.5-60 J18			S5K	18				6 x 2.8
● PSA2.5-60 J19			S5K	19				6 x 2.8
● PSA2.5-60 J20	S5K		20	6 x 2.8				
● PSA2.5-60 J22	S5K		22	6 x 2.8				
● PSA2.5-60 J25	S5K		25	8 x 3.3				
● PSA2.5-60 J28	S5K		28	8 x 3.3				
● PSA2.5-60 J30	S5K		30	8 x 3.3				
● PSA2.5-60 J32	S5K		32	10 x 3.3				
● PSA2.5-60 J35	S5K		35	10 x 3.3				
● PSA2.5-60 J40	S5K		40	12 x 3.3				
● PSA2.5-60 J45	S5K		45	14 x 3.8				
● PSA2.5-60 J50	S5K	50	14 x 3.8					

[Caution on Product Characteristics]

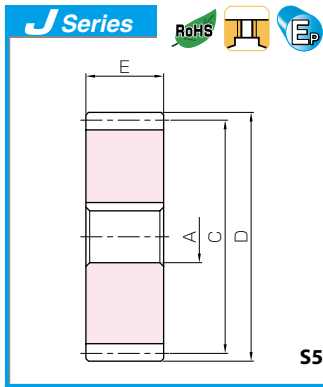
- ① Significant variations in temperature or humidity can cause dimensional changes in plastic gears (MC Nylon gears), including bore size (H8 when produced), tooth diameter, and backlash. Please see the section "Design of Plastic Gears" in the technical reference (Page 693).
- ② The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
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- Racks
- CP Racks & Pinions
- Miter Gears
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- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products





Plastic Spur Gears

Newly added



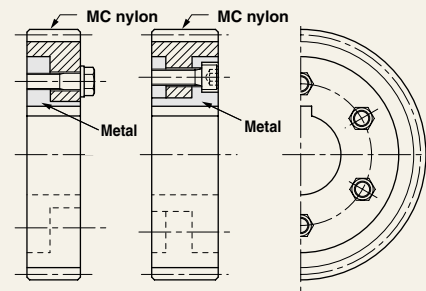
Allowable torque (N-m)	Allowable torque (kgf-m)	Backlash (mm)	Weight (kg)	Catalog No.
Bending strength	Bending strength			● : J Series (Available-on-request)
34.1	3.48	0~0.48	0.43	<b>PSA2.5-55</b>
			0.43	● <b>PSA2.5-55 J15</b>
			0.43	● <b>PSA2.5-55 J16</b>
			0.43	● <b>PSA2.5-55 J18</b>
			0.43	● <b>PSA2.5-55 J19</b>
			0.43	● <b>PSA2.5-55 J20</b>
			0.42	● <b>PSA2.5-55 J22</b>
			0.42	● <b>PSA2.5-55 J25</b>
			0.42	● <b>PSA2.5-55 J28</b>
			0.41	● <b>PSA2.5-55 J30</b>
			0.41	● <b>PSA2.5-55 J32</b>
			0.41	● <b>PSA2.5-55 J35</b>
			0.40	● <b>PSA2.5-55 J40</b>
			0.39	● <b>PSA2.5-55 J45</b>
0.38	● <b>PSA2.5-55 J50</b>			
37.7	3.84	0~0.48	0.51	<b>PSA2.5-60</b>
			0.51	● <b>PSA2.5-60 J15</b>
			0.51	● <b>PSA2.5-60 J16</b>
			0.51	● <b>PSA2.5-60 J18</b>
			0.51	● <b>PSA2.5-60 J19</b>
			0.51	● <b>PSA2.5-60 J20</b>
			0.51	● <b>PSA2.5-60 J22</b>
			0.50	● <b>PSA2.5-60 J25</b>
			0.50	● <b>PSA2.5-60 J28</b>
			0.50	● <b>PSA2.5-60 J30</b>
			0.49	● <b>PSA2.5-60 J32</b>
			0.49	● <b>PSA2.5-60 J35</b>
			0.48	● <b>PSA2.5-60 J40</b>
			0.47	● <b>PSA2.5-60 J45</b>
			0.46	● <b>PSA2.5-60 J50</b>

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[Caution on J series]

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- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.

Stainless Steel Hubs for PSA are now available!

Standardized sectional stainless steel hubs. It enhances a secure fastening to the shaft.



Sectional Parts

For details, please see Page 334.

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

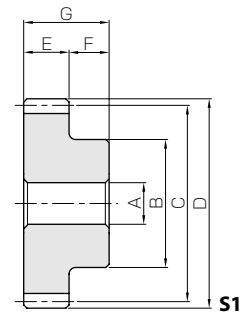
Bevel Gearboxes

Other Products



Specifications	
Precision grade	JIS grade N9 (JIS B1702-1: 1998) * JIS grade 5 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	MC901
Heat treatment	—
Tooth hardness	115 ~ 120HRR

\* The precision grade of this product is equivalent to the value shown in the table.



- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

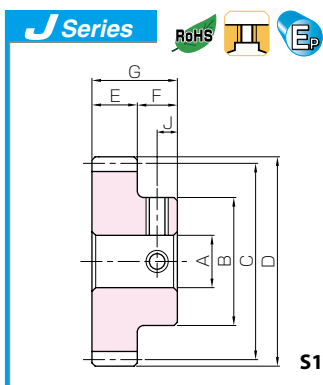
Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	
				A	B	C	D	E	F	G	
<b>PS3-12</b> ● <b>PS3-12J12</b>	<b>m3</b>	12	S1	12	28	36	42	30	15	45	
			S1T2	12							
		<b>PS3-13</b> ● <b>PS3-13J12</b>	13	S1	12	30	39	45	30	15	45
				S1K	12						
		<b>PS3-14</b> ● <b>PS3-14J12</b> ● <b>PS3-14J14</b>	14	S1	12	32	42	48	30	15	45
				S1K	12						
				S1K	14						
		<b>PS3-15</b> ● <b>PS3-15J14</b> ● <b>PS3-15J15</b> ● <b>PS3-15J16</b>	15	S1	14	36	45	51	30	15	45
				S1K	14						
				S1K	15						
S1K	16										
<b>PS3-16</b> ● <b>PS3-16J14</b> ● <b>PS3-16J15</b> ● <b>PS3-16J16</b> ● <b>PS3-16J18</b> ● <b>PS3-16J19</b>	16	S1	14	38	48	54	30	15	45		
		S1K	14								
		S1K	15								
		S1K	16								
		S1K	18								
		S1K	19								
<b>PS3-18</b> ● <b>PS3-18J14</b> ● <b>PS3-18J15</b> ● <b>PS3-18J16</b> ● <b>PS3-18J18</b> ● <b>PS3-18J19</b> ● <b>PS3-18J20</b> ● <b>PS3-18J22</b>	18	S1	14	40	54	60	30	15	45		
		S1K	14								
		S1K	15								
		S1K	16								
		S1K	18								
		S1K	19								
		S1K	20								
		S1K	22								
<b>PS3-20</b> ● <b>PS3-20J14</b> ● <b>PS3-20J15</b> ● <b>PS3-20J16</b> ● <b>PS3-20J18</b> ● <b>PS3-20J19</b> ● <b>PS3-20J20</b> ● <b>PS3-20J22</b> ● <b>PS3-20J25</b> ● <b>PS3-20J28</b>	20	S1	14	50	60	66	30	15	45		
		S1K	14								
		S1K	15								
		S1K	16								
		S1K	18								
		S1K	19								
		S1K	20								
		S1K	22								
<b>PS3-22</b> ● <b>PS3-22J14</b> ● <b>PS3-22J15</b> ● <b>PS3-22J16</b> ● <b>PS3-22J18</b> ● <b>PS3-22J19</b> ● <b>PS3-22J20</b> ● <b>PS3-22J22</b> ● <b>PS3-22J25</b> ● <b>PS3-22J28</b> ● <b>PS3-22J30</b>	22	S1	14	54	66	72	30	15	45		
		S1K	14								
		S1K	15								
		S1K	16								
		S1K	18								
		S1K	19								
		S1K	20								
		S1K	22								
		S1K	25								
		S1K	28								
S1K	30										

[Caution on Product Characteristics]

- ① Significant variations in temperature or humidity can cause dimensional changes in plastic gears (MC Nylon gears), including bore size (H8 when produced), tooth diameter, and backlash. Please see the section "Design of Plastic Gears" in the technical reference (Page 693).
- ② The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ③ Without lubrication, using plastic gears in pairs may generate heat and dilation. It is recommended to mate with steel gears.
- ④ The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Plastic gears are susceptible to the effects of temperature and moisture. Dimensional changes may occur while performing secondary operations and during post-machining operations.



## Plastic Spur Gears

Newly added



Keyway Width×Depth	Set Screw		Allowable torque (N·m) Bending strength	Allowable torque (kgf·m) Bending strength	Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
	Size	J					
—	—	—	7.58	0.77	0~0.52	0.040 0.040	PS3-12 ● PS3-12J12
—	M4	7.5					
—	—	—	8.74	0.89	0~0.52	0.048 0.047	PS3-13 ● PS3-13J12
4 x 1.8	M4	7.5					
—	—	—	9.97	1.02	0~0.52	0.056 0.056 0.053	PS3-14 ● PS3-14J12 ● PS3-14J14
4 x 1.8	M4	7.5					
5 x 2.3	M4	7.5					
—	—	—	11.1	1.13	0~0.52	0.065 0.064 0.063 0.062	PS3-15 ● PS3-15J14 ● PS3-15J15 ● PS3-15J16
5 x 2.3	M4	7.5					
5 x 2.3	M4	7.5					
5 x 2.3	M4	7.5					
—	—	—	12.3	1.25	0~0.52	0.075 0.074 0.073 0.071 0.068 0.067	PS3-16 ● PS3-16J14 ● PS3-16J15 ● PS3-16J16 ● PS3-16J18 ● PS3-16J19
5 x 2.3	M4	7.5					
5 x 2.3	M4	7.5					
5 x 2.3	M4	7.5					
6 x 2.8	M5	7.5					
6 x 2.8	M5	7.5					
—	—	—	14.3	1.46	0~0.54	0.094 0.093 0.091 0.090 0.087 0.085 0.084 0.080	PS3-18 ● PS3-18J14 ● PS3-18J15 ● PS3-18J16 ● PS3-18J18 ● PS3-18J19 ● PS3-18J20 ● PS3-18J22
5 x 2.3	M4	7.5					
5 x 2.3	M4	7.5					
5 x 2.3	M4	7.5					
6 x 2.8	M5	7.5					
6 x 2.8	M5	7.5					
6 x 2.8	M5	7.5					
6 x 2.8	M5	7.5					
—	—	—	16.6	1.69	0~0.54	0.12 0.12 0.12 0.12 0.12 0.12 0.11 0.11 0.10 0.098	PS3-20 ● PS3-20J14 ● PS3-20J15 ● PS3-20J16 ● PS3-20J18 ● PS3-20J19 ● PS3-20J20 ● PS3-20J22 ● PS3-20J25 ● PS3-20J28
5 x 2.3	M4*	7.5					
5 x 2.3	M4*	7.5					
5 x 2.3	M4*	7.5					
6 x 2.8	M5	7.5					
6 x 2.8	M5	7.5					
6 x 2.8	M5	7.5					
6 x 2.8	M5	7.5					
8 x 3.3	M6	7.5					
8 x 3.3	M6	7.5					
—	—	—	18.7	1.91	0~0.54	0.15 0.15 0.15 0.15 0.14 0.14 0.14 0.14 0.14 0.13 0.12 0.12	PS3-22 ● PS3-22J14 ● PS3-22J15 ● PS3-22J16 ● PS3-22J18 ● PS3-22J19 ● PS3-22J20 ● PS3-22J22 ● PS3-22J25 ● PS3-22J28 ● PS3-22J30
5 x 2.3	M4*	7.5					
5 x 2.3	M4*	7.5					
5 x 2.3	M4*	7.5					
6 x 2.8	M5*	7.5					
6 x 2.8	M5*	7.5					
6 x 2.8	M5	7.5					
6 x 2.8	M5	7.5					
8 x 3.3	M6	7.5					
8 x 3.3	M6	7.5					
8 x 3.3	M6	7.5					

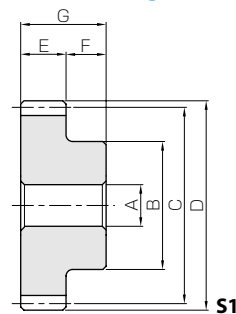
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- Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).
- For products having a tapped hole, a set screw is included.
- Since tapped holes of plastic products are easily broken, avoid too much tightening when fastening screws. For products which have a short tapped hole (Products marked with "\*" are the tap size), fasten with torques less than 0.12N · m for M4, and 0.38N · m for M5.



Specifications	
Precision grade	JIS grade N9 (JIS B1702-1: 1998) * JIS grade 5 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	MC901
Heat treatment	—
Tooth hardness	115 ~ 120HRR

\* The precision grade of this product is equivalent to the value shown in the table.



Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks &amp; Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

Bevel Gearboxes

Other Products

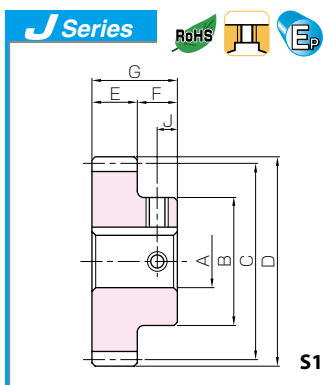
Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length
				A	B	C	D	E	F	G
<b>PS3-24</b> ● PS3-24J14 ● PS3-24J15 ● PS3-24J16 ● PS3-24J18 ● PS3-24J19 ● PS3-24J20 ● PS3-24J22 ● PS3-24J25 ● PS3-24J28 ● PS3-24J30 ● PS3-24J32	m3	24	S1	14	58	72	78	30	15	45
			S1K	14						
			S1K	15						
			S1K	16						
			S1K	18						
			S1K	19						
			S1K	20						
			S1K	22						
			S1K	25						
			S1K	28						
			S1K	30						
			S1K	32						
<b>PS3-25</b> ● PS3-25J14 ● PS3-25J15 ● PS3-25J16 ● PS3-25J18 ● PS3-25J19 ● PS3-25J20 ● PS3-25J22 ● PS3-25J25 ● PS3-25J28 ● PS3-25J30 ● PS3-25J32 ● PS3-25J35	m3	25	S1	14	60	75	81	30	15	45
			S1K	14						
			S1K	15						
			S1K	16						
			S1K	18						
			S1K	19						
			S1K	20						
			S1K	22						
			S1K	25						
			S1K	28						
			S1K	30						
			S1K	32						
S1K	35									
<b>PS3-26</b> ● PS3-26J14 ● PS3-26J15 ● PS3-26J16 ● PS3-26J18 ● PS3-26J19 ● PS3-26J20 ● PS3-26J22 ● PS3-26J25 ● PS3-26J28 ● PS3-26J30 ● PS3-26J32 ● PS3-26J35	m3	26	S1	14	65	78	84	30	15	45
			S1K	14						
			S1K	15						
			S1K	16						
			S1K	18						
			S1K	19						
			S1K	20						
			S1K	22						
			S1K	25						
			S1K	28						
			S1K	30						
			S1K	32						
S1K	35									
<b>PS3-28</b> ● PS3-28J14 ● PS3-28J15 ● PS3-28J16 ● PS3-28J18 ● PS3-28J19 ● PS3-28J20 ● PS3-28J22 ● PS3-28J25 ● PS3-28J28 ● PS3-28J30 ● PS3-28J32 ● PS3-28J35 ● PS3-28J40	m3	28	S1	14	70	84	90	30	15	45
			S1K	14						
			S1K	15						
			S1K	16						
			S1K	18						
			S1K	19						
			S1K	20						
			S1K	22						
			S1K	25						
			S1K	28						
			S1K	30						
			S1K	32						
S1K	35									
S1K	40									

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## Plastic Spur Gears

Newly added



Keyway WidthxDepth	Set Screw		Allowable torque (N·m) Bending strength	Allowable torque (kgf·m) Bending strength	Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
	Size	J					
—	—	—	20.9	2.13	0~0.54	0.18 0.18 0.18 0.18 0.17 0.17 0.17 0.17 0.16 0.15 0.15 0.14	<b>PS3-24</b> ●PS3-24J14 ●PS3-24J15 ●PS3-24J16 ●PS3-24J18 ●PS3-24J19 ●PS3-24J20 ●PS3-24J22 ●PS3-24J25 ●PS3-24J28 ●PS3-24J30 ●PS3-24J32
5 x 2.3	M4*	7.5					
5 x 2.3	M4*	7.5					
5 x 2.3	M4*	7.5					
6 x 2.8	M5*	7.5					
6 x 2.8	M5*	7.5					
6 x 2.8	M5*	7.5					
6 x 2.8	M5*	7.5					
8 x 3.3	M6	7.5					
8 x 3.3	M6	7.5					
10 x 3.3	M8	7.5					
—	—	—	22.1	2.25	0~0.54	0.19 0.19 0.19 0.19 0.19 0.18 0.18 0.17 0.17 0.16 0.16 0.15	<b>PS3-25</b> ●PS3-25J14 ●PS3-25J15 ●PS3-25J16 ●PS3-25J18 ●PS3-25J19 ●PS3-25J20 ●PS3-25J22 ●PS3-25J25 ●PS3-25J28 ●PS3-25J30 ●PS3-25J32 ●PS3-25J35
5 x 2.3	M4*	7.5					
5 x 2.3	M4*	7.5					
5 x 2.3	M4*	7.5					
6 x 2.8	M5*	7.5					
6 x 2.8	M5*	7.5					
6 x 2.8	M5*	7.5					
6 x 2.8	M5*	7.5					
8 x 3.3	M6	7.5					
8 x 3.3	M6	7.5					
10 x 3.3	M8	7.5					
—	—	—	23.3	2.37	0~0.54	0.22 0.21 0.21 0.21 0.21 0.21 0.21 0.20 0.20 0.19 0.18 0.18 0.17	<b>PS3-26</b> ●PS3-26J14 ●PS3-26J15 ●PS3-26J16 ●PS3-26J18 ●PS3-26J19 ●PS3-26J20 ●PS3-26J22 ●PS3-26J25 ●PS3-26J28 ●PS3-26J30 ●PS3-26J32 ●PS3-26J35
5 x 2.3	M4*	7.5					
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5 x 2.3	M4*	7.5					
6 x 2.8	M5*	7.5					
6 x 2.8	M5*	7.5					
6 x 2.8	M5*	7.5					
6 x 2.8	M5*	7.5					
8 x 3.3	M6	7.5					
8 x 3.3	M6	7.5					
10 x 3.3	M8	7.5					
—	—	—	25.5	2.60	0~0.54	0.25 0.25 0.25 0.25 0.24 0.24 0.24 0.24 0.23 0.22 0.22 0.21 0.21 0.19	<b>PS3-28</b> ●PS3-28J14 ●PS3-28J15 ●PS3-28J16 ●PS3-28J18 ●PS3-28J19 ●PS3-28J20 ●PS3-28J22 ●PS3-28J25 ●PS3-28J28 ●PS3-28J30 ●PS3-28J32 ●PS3-28J35 ●PS3-28J40
5 x 2.3	M4*	7.5					
5 x 2.3	M4*	7.5					
5 x 2.3	M4*	7.5					
6 x 2.8	M5*	7.5					
6 x 2.8	M5*	7.5					
6 x 2.8	M5*	7.5					
6 x 2.8	M5*	7.5					
8 x 3.3	M6*	7.5					
8 x 3.3	M6*	7.5					
10 x 3.3	M8	7.5					
10 x 3.3	M8	7.5					
12 x 3.3	M8	7.5					

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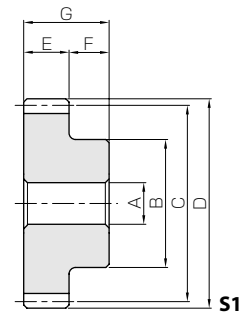
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Specifications	
Precision grade	JIS grade N9 (JIS B1702-1: 1998) * JIS grade 5 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	MC901
Heat treatment	—
Tooth hardness	115 ~ 120HRR

\* The precision grade of this product is equivalent to the value shown in the table.



Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length
				A	B	C	D	E	F	G
<b>PS3-30</b>	<b>m3</b>	30	S1	14	75	90	96	30	15	45
● PS3-30J14			S1K	14						
● PS3-30J15			S1K	15						
● PS3-30J16			S1K	16						
● PS3-30J18			S1K	18						
● PS3-30J19			S1K	19						
● PS3-30J20			S1K	20						
● PS3-30J22			S1K	22						
● PS3-30J25			S1K	25						
● PS3-30J28			S1K	28						
● PS3-30J30			S1K	30						
● PS3-30J32			S1K	32						
● PS3-30J35			S1K	35						
● PS3-30J40			S1K	40						

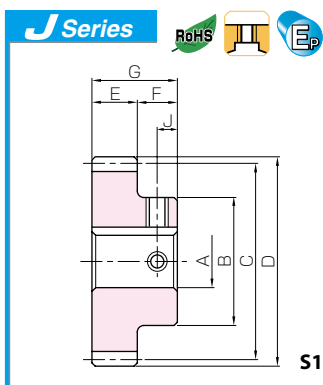
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Newly added



Keyway WidthxDepth	Set Screw		Allowable torque (N-m)		Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
	Size	J	Bending strength	Bending strength			
—	—	—	27.7	2.82	0~0.54	0.29	<b>PS3-30</b>
5 x 2.3	M4*	7.5					● PS3-30J14
5 x 2.3	M4*	7.5					● PS3-30J15
5 x 2.3	M4*	7.5					● PS3-30J16
6 x 2.8	M5*	7.5					● PS3-30J18
6 x 2.8	M5*	7.5					● PS3-30J19
6 x 2.8	M5*	7.5					● PS3-30J20
6 x 2.8	M5*	7.5					● PS3-30J22
8 x 3.3	M6*	7.5					● PS3-30J25
8 x 3.3	M6*	7.5					● PS3-30J28
8 x 3.3	M6*	7.5					● PS3-30J30
10 x 3.3	M8	7.5					● PS3-30J32
10 x 3.3	M8	7.5					● PS3-30J35
12 x 3.3	M8	7.5					● PS3-30J40

### [Caution on J series]

- ① As available-on-request products, requires a lead-time for shipping within **3 working-days (excludes the day ordered)**, after placing an order.  
Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is **1 to 20 units**. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ Certain products which would otherwise have a very long tapped hole are conterbored to reduce the length of the tap. (Products marked with "\*" are tap size).
- ⑤ For products having a tapped hole, a set screw is included.
- ⑥ Since tapped holes of plastic products are easily broken, avoid too much tightening when fastening screws. For products which have a short tapped hole (Products marked with "\*" are the tap size), fasten with torques less than  $0.12N \cdot m$  for M4, and  $0.38N \cdot m$  for M5.

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks &amp; Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

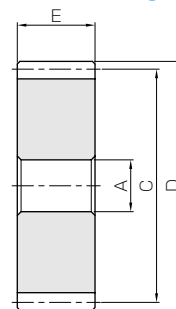
Bevel Gearboxes

Other Products



Specifications	
Precision grade	JIS grade N9 (JIS B1702-1: 1998) * JIS grade 5 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	MC901
Heat treatment	—
Tooth hardness	115 ~ 120HRR

\* Precision grade of this product corresponds to 'equivalent'.



S5

Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Pitch dia.	Outside dia.	Face width	Keyway					
				A	C	D	E	WidthxDepth					
<b>PSA3-32</b> ● PSA3-32 J18 ● PSA3-32 J19 ● PSA3-32 J20 ● PSA3-32 J22 ● PSA3-32 J25 ● PSA3-32 J28 ● PSA3-32 J30 ● PSA3-32 J32 ● PSA3-32 J35 ● PSA3-32 J40	m3	32	S5	18	96	102	30	—					
			S5K	18				6 x 2.8					
			S5K	19				6 x 2.8					
			S5K	20				6 x 2.8					
			S5K	22				6 x 2.8					
			S5K	25				8 x 3.3					
			S5K	28				8 x 3.3					
			S5K	30				8 x 3.3					
			S5K	32				10 x 3.3					
			S5K	35				10 x 3.3					
			S5K	40				12 x 3.3					
			<b>PSA3-35</b> ● PSA3-35 J18 ● PSA3-35 J19 ● PSA3-35 J20 ● PSA3-35 J22 ● PSA3-35 J25 ● PSA3-35 J28 ● PSA3-35 J30 ● PSA3-35 J32 ● PSA3-35 J35 ● PSA3-35 J40 ● PSA3-35 J45	35				S5	18	105	111	30	—
								S5K	18				6 x 2.8
S5K	19	6 x 2.8											
S5K	20	6 x 2.8											
S5K	22	6 x 2.8											
S5K	25	8 x 3.3											
S5K	28	8 x 3.3											
S5K	30	8 x 3.3											
S5K	32	10 x 3.3											
S5K	35	10 x 3.3											
S5K	40	12 x 3.3											
S5K	45	14 x 3.8											
<b>PSA3-36</b> ● PSA3-36 J18 ● PSA3-36 J19 ● PSA3-36 J20 ● PSA3-36 J22 ● PSA3-36 J25 ● PSA3-36 J28 ● PSA3-36 J30 ● PSA3-36 J32 ● PSA3-36 J35 ● PSA3-36 J40 ● PSA3-36 J45 ● PSA3-36 J50	36	S5			18	108	114	30	—				
		S5K	18	6 x 2.8									
		S5K	19	6 x 2.8									
		S5K	20	6 x 2.8									
		S5K	22	6 x 2.8									
		S5K	25	8 x 3.3									
		S5K	28	8 x 3.3									
		S5K	30	8 x 3.3									
		S5K	32	10 x 3.3									
		S5K	35	10 x 3.3									
		S5K	40	12 x 3.3									
		S5K	45	14 x 3.8									
		S5K	50	14 x 3.8									
<b>PSA3-40</b> ● PSA3-40 J18 ● PSA3-40 J19 ● PSA3-40 J20 ● PSA3-40 J22 ● PSA3-40 J25 ● PSA3-40 J28 ● PSA3-40 J30 ● PSA3-40 J32 ● PSA3-40 J35 ● PSA3-40 J40 ● PSA3-40 J45 ● PSA3-40 J50	40	S5	18	120	126	30	—						
		S5K	18				6 x 2.8						
		S5K	19				6 x 2.8						
		S5K	20				6 x 2.8						
		S5K	22				6 x 2.8						
		S5K	25				8 x 3.3						
		S5K	28				8 x 3.3						
		S5K	30				8 x 3.3						
		S5K	32				10 x 3.3						
		S5K	35				10 x 3.3						
		S5K	40				12 x 3.3						
		S5K	45				14 x 3.8						
		S5K	50				14 x 3.8						

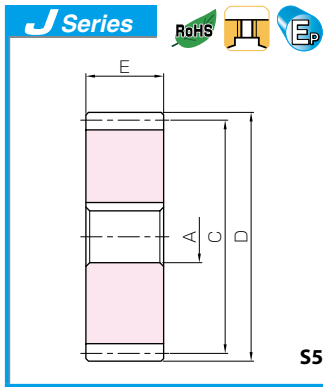
[Caution on Product Characteristics]

- ① Significant variations in temperature or humidity can cause dimensional changes in plastic gears (MC Nylon gears), including bore size (H8 when produced), tooth diameter, and backlash. Please see the section "Design of Plastic Gears" in the technical reference (Page 693).
- ② The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ③ Without lubrication, using plastic gears in pairs may generate heat and dilation. It is recommended to mate with steel gears.
- ④ The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Plastic gears are susceptible to the effects of temperature and moisture. Dimensional changes may occur while performing secondary operations and during post-machining operations.





Plastic Spur Gears

Newly added



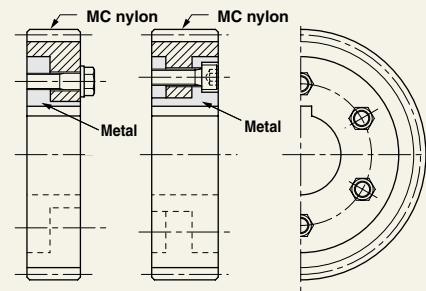
Allowable torque (N·m) Bending strength	Allowable torque (kgf·m) Bending strength	Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
30.1	3.07	0~0.54	0.25	<b>PSA3-32</b> ● PSA3-32 J18 ● PSA3-32 J19 ● PSA3-32 J20 ● PSA3-32 J22 ● PSA3-32 J25 ● PSA3-32 J28 ● PSA3-32 J30 ● PSA3-32 J32 ● PSA3-32 J35 ● PSA3-32 J40
			0.25	
			0.25	
			0.25	
			0.24	
			0.24	
			0.24	
			0.23	
			0.23	
			0.22	
33.8	3.44	0~0.56	0.30	<b>PSA3-35</b> ● PSA3-35 J18 ● PSA3-35 J19 ● PSA3-35 J20 ● PSA3-35 J22 ● PSA3-35 J25 ● PSA3-35 J28 ● PSA3-35 J30 ● PSA3-35 J32 ● PSA3-35 J35 ● PSA3-35 J40 ● PSA3-35 J45
			0.30	
			0.30	
			0.30	
			0.29	
			0.29	
			0.28	
			0.28	
			0.28	
			0.25	
35.1	3.57	0~0.56	0.32	<b>PSA3-36</b> ● PSA3-36 J18 ● PSA3-36 J19 ● PSA3-36 J20 ● PSA3-36 J22 ● PSA3-36 J25 ● PSA3-36 J28 ● PSA3-36 J30 ● PSA3-36 J32 ● PSA3-36 J35 ● PSA3-36 J40 ● PSA3-36 J45 ● PSA3-36 J50
			0.32	
			0.32	
			0.32	
			0.31	
			0.31	
			0.30	
			0.30	
			0.29	
			0.28	
40.0	4.08	0~0.56	0.39	<b>PSA3-40</b> ● PSA3-40 J18 ● PSA3-40 J19 ● PSA3-40 J20 ● PSA3-40 J22 ● PSA3-40 J25 ● PSA3-40 J28 ● PSA3-40 J30 ● PSA3-40 J32 ● PSA3-40 J35 ● PSA3-40 J40 ● PSA3-40 J45 ● PSA3-40 J50
			0.39	
			0.39	
			0.39	
			0.38	
			0.38	
			0.38	
			0.37	
			0.37	
			0.36	

How to attach gears to shafts

To attach gears to shafts, in case of light loads, methods include using keys, taper pins, spring pins, and press fitting after mounting the setscrews. While looseness tends to occur in the conditions below, plastic gears are fastened by applying a steel hub.

1. When the circumferential temperature is high
2. For large diameter gears
3. If forward-reverse motion impacts keys

For fastening steel hubs into plastic gears with bolts, see below for various methods. For gears, which cannot be fasten with bolts due to their shape; it is recommended to use the method of fusion bonding with metal cores.



Fastening with a steel hub bolt

Stainless Steel Hubs for PSA are now available!

Standardized sectional stainless steel hubs. It enhances a secure fastening to the shaft.



Sectional Parts

For details, please see Page 334.

- [Caution on J series]
- ① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
  - ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
  - ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

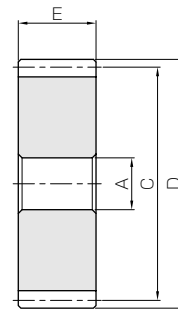
Bevel Gearboxes

Other Products



Specifications	
Precision grade	JIS grade N9 (JIS B1702-1: 1998) * JIS grade 5 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	MC901
Heat treatment	—
Tooth hardness	115 ~ 120HRR

\* Precision grade of this product corresponds to 'equivalent'.



S5

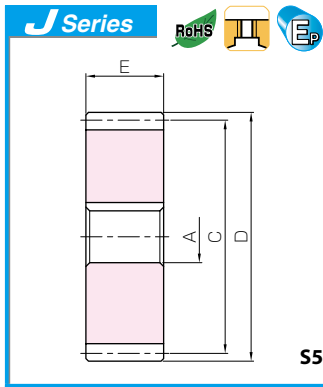
Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Pitch dia.	Outside dia.	Face width	Keyway
				A	C	D	E	WidthxDepth
<b>PSA3-45</b> ● PSA3-45 J18 ● PSA3-45 J19 ● PSA3-45 J20 ● PSA3-45 J22 ● PSA3-45 J25 ● PSA3-45 J28 ● PSA3-45 J30 ● PSA3-45 J32 ● PSA3-45 J35 ● PSA3-45 J40 ● PSA3-45 J45 ● PSA3-45 J50	m3	45	S5	18	135	141	30	—
S5K			18	6 x 2.8				
S5K			19	6 x 2.8				
S5K			20	6 x 2.8				
S5K			22	6 x 2.8				
S5K			25	8 x 3.3				
S5K			28	8 x 3.3				
S5K			30	8 x 3.3				
S5K			32	10 x 3.3				
S5K			35	10 x 3.3				
S5K			40	12 x 3.3				
S5K			45	14 x 3.8				
S5K	50	14 x 3.8						
<b>PSA3-48</b> ● PSA3-48 J18 ● PSA3-48 J19 ● PSA3-48 J20 ● PSA3-48 J22 ● PSA3-48 J25 ● PSA3-48 J28 ● PSA3-48 J30 ● PSA3-48 J32 ● PSA3-48 J35 ● PSA3-48 J40 ● PSA3-48 J45 ● PSA3-48 J50	m3	48	S5	18	144	150	30	—
S5K			18	6 x 2.8				
S5K			19	6 x 2.8				
S5K			20	6 x 2.8				
S5K			22	6 x 2.8				
S5K			25	8 x 3.3				
S5K			28	8 x 3.3				
S5K			30	8 x 3.3				
S5K			32	10 x 3.3				
S5K			35	10 x 3.3				
S5K			40	12 x 3.3				
S5K			45	14 x 3.8				
S5K	50	14 x 3.8						
<b>PSA3-50</b> ● PSA3-50 J18 ● PSA3-50 J19 ● PSA3-50 J20 ● PSA3-50 J22 ● PSA3-50 J25 ● PSA3-50 J28 ● PSA3-50 J30 ● PSA3-50 J32 ● PSA3-50 J35 ● PSA3-50 J40 ● PSA3-50 J45 ● PSA3-50 J50	m3	50	S5	18	150	156	30	—
S5K			18	6 x 2.8				
S5K			19	6 x 2.8				
S5K			20	6 x 2.8				
S5K			22	6 x 2.8				
S5K			25	8 x 3.3				
S5K			28	8 x 3.3				
S5K			30	8 x 3.3				
S5K			32	10 x 3.3				
S5K			35	10 x 3.3				
S5K			40	12 x 3.3				
S5K			45	14 x 3.8				
S5K	50	14 x 3.8						
<b>PSA3-55</b> ● PSA3-55 J18 ● PSA3-55 J19 ● PSA3-55 J20 ● PSA3-55 J22 ● PSA3-55 J25 ● PSA3-55 J28 ● PSA3-55 J30 ● PSA3-55 J32 ● PSA3-55 J35 ● PSA3-55 J40 ● PSA3-55 J45 ● PSA3-55 J50	m3	55	S5	18	165	171	30	—
S5K			18	6 x 2.8				
S5K			19	6 x 2.8				
S5K			20	6 x 2.8				
S5K			22	6 x 2.8				
S5K			25	8 x 3.3				
S5K			28	8 x 3.3				
S5K			30	8 x 3.3				
S5K			32	10 x 3.3				
S5K			35	10 x 3.3				
S5K			40	12 x 3.3				
S5K			45	14 x 3.8				
S5K	50	14 x 3.8						

[Caution on Product Characteristics]

- ① Significant variations in temperature or humidity can cause dimensional changes in plastic gears (MC Nylon gears), including bore size (H8 when produced), tooth diameter, and backlash. Please see the section "Design of Plastic Gears" in the technical reference (Page 693).
- ② The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ③ Without lubrication, using plastic gears in pairs may generate heat and dilation. It is recommended to mate with steel gears.
- ④ The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Plastic gears are susceptible to the effects of temperature and moisture. Dimensional changes may occur while performing secondary operations and during post-machining operations.



Plastic Spur Gears

Newly added



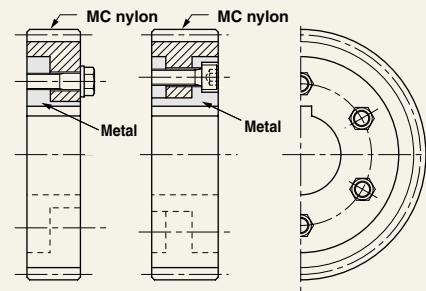
Allowable torque (N·m) Bending strength	Allowable torque (kgf·m) Bending strength	Backlash (mm)	Weight (kg)	Catalog No. ● : J Series (Available-on-request)
46.3	4.72	0~0.56	0.50	<b>PSA3-45</b>
			0.50	● PSA3-45 J18
			0.50	● PSA3-45 J19
			0.50	● PSA3-45 J20
			0.49	● PSA3-45 J22
			0.49	● PSA3-45 J25
			0.48	● PSA3-45 J28
			0.48	● PSA3-45 J30
			0.48	● PSA3-45 J32
			0.47	● PSA3-45 J35
			0.46	● PSA3-45 J40
			0.45	● PSA3-45 J45
0.44	● PSA3-45 J50			
50.2	5.12	0~0.56	0.57	<b>PSA3-48</b>
			0.57	● PSA3-48 J18
			0.57	● PSA3-48 J19
			0.56	● PSA3-48 J20
			0.56	● PSA3-48 J22
			0.56	● PSA3-48 J25
			0.55	● PSA3-48 J28
			0.55	● PSA3-48 J30
			0.55	● PSA3-48 J32
			0.54	● PSA3-48 J35
			0.53	● PSA3-48 J40
			0.52	● PSA3-48 J45
0.51	● PSA3-48 J50			
52.8	5.39	0~0.56	0.61	<b>PSA3-50</b>
			0.61	● PSA3-50 J18
			0.61	● PSA3-50 J19
			0.61	● PSA3-50 J20
			0.61	● PSA3-50 J22
			0.61	● PSA3-50 J25
			0.60	● PSA3-50 J28
			0.60	● PSA3-50 J30
			0.60	● PSA3-50 J32
			0.59	● PSA3-50 J35
			0.58	● PSA3-50 J40
			0.57	● PSA3-50 J45
0.55	● PSA3-50 J50			
58.9	6.01	0~0.56	0.74	<b>PSA3-55</b>
			0.74	● PSA3-55 J18
			0.74	● PSA3-55 J19
			0.74	● PSA3-55 J20
			0.74	● PSA3-55 J22
			0.73	● PSA3-55 J25
			0.73	● PSA3-55 J28
			0.73	● PSA3-55 J30
			0.72	● PSA3-55 J32
			0.72	● PSA3-55 J35
			0.71	● PSA3-55 J40
			0.70	● PSA3-55 J45
0.68	● PSA3-55 J50			

How to attach gears to shafts

To attach gears to shafts, in case of light loads, methods include using keys, taper pins, spring pins, and press fitting after mounting the setscrews. While looseness tends to occur in the conditions below, plastic gears are fastened by applying a steel hub.

1. When the circumferential temperature is high
2. For large diameter gears
3. If forward-reverse motion impacts keys

For fastening steel hubs into plastic gears with bolts, see below for various methods. For gears, which cannot be fasten with bolts due to their shape; it is recommended to use the method of fusion bonding with metal cores.



Fastening with a steel hub bolt

Stainless Steel Hubs for PSA are now available!

Standardized sectional stainless steel hubs. It enhances a secure fastening to the shaft.



Sectional Parts

For details, please see Page 334.

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Please allow additional shipping time to get to your local distributor.
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  - ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.

Spur Gears

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Racks

CP Racks & Pinions

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Screw Gears

Worm Gear Pair

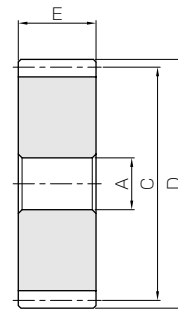
Bevel Gearboxes

Other Products



Specifications	
Precision grade	JIS grade N9 (JIS B1702-1: 1998) * JIS grade 5 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	MC901
Heat treatment	—
Tooth hardness	115 ~ 120HRR

\* Precision grade of this product corresponds to 'equivalent'.



S5

Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Bore	Pitch dia.	Outside dia.	Face width	Keyway
				A	C	D	E	WidthxDepth
<b>PSA3-60</b>	<b>m3</b>	60	S5	18	180	186	30	—
● PSA3-60 J18			S5K	18				6 x 2.8
● PSA3-60 J19			S5K	19				6 x 2.8
● PSA3-60 J20			S5K	20				6 x 2.8
● PSA3-60 J22			S5K	22				6 x 2.8
● PSA3-60 J25			S5K	25				8 x 3.3
● PSA3-60 J28			S5K	28				8 x 3.3
● PSA3-60 J30			S5K	30				8 x 3.3
● PSA3-60 J32			S5K	32				10 x 3.3
● PSA3-60 J35			S5K	35				10 x 3.3
● PSA3-60 J40			S5K	40				12 x 3.3
● PSA3-60 J45			S5K	45				14 x 3.8
● PSA3-60 J50			S5K	50				14 x 3.8

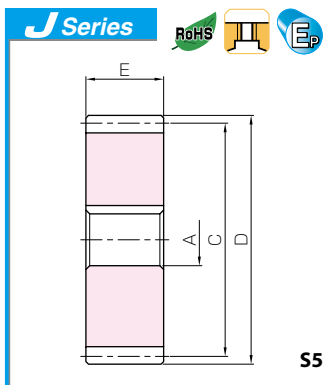
[Caution on Product Characteristics]

- ① Significant variations in temperature or humidity can cause dimensional changes in plastic gears (MC Nylon gears), including bore size (H8 when produced), tooth diameter, and backlash. Please see the section "Design of Plastic Gears" in the technical reference (Page 693).
- ② The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ③ Without lubrication, using plastic gears in pairs may generate heat and dilation. It is recommended to mate with steel gears.
- ④ The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

[Caution on Secondary Operations]

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- ② Plastic gears are susceptible to the effects of temperature and moisture. Dimensional changes may occur while performing secondary operations and during post-machining operations.

- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products



Plastic Spur Gears

Newly added



Allowable torque (N·m)	Allowable torque (kgf·m)	Backlash (mm)	Weight (kg)	Catalog No.
Bending strength	Bending strength			● : J Series (Available-on-request)
65.1	6.64	0~0.56	0.89	<b>PSA3-60</b>
			0.88	● <b>PSA3-60 J18</b>
			0.88	● <b>PSA3-60 J19</b>
			0.88	● <b>PSA3-60 J20</b>
			0.88	● <b>PSA3-60 J22</b>
			0.88	● <b>PSA3-60 J25</b>
			0.87	● <b>PSA3-60 J28</b>
			0.87	● <b>PSA3-60 J30</b>
			0.87	● <b>PSA3-60 J32</b>
			0.86	● <b>PSA3-60 J35</b>
			0.85	● <b>PSA3-60 J40</b>
			0.84	● <b>PSA3-60 J45</b>
			0.82	● <b>PSA3-60 J50</b>

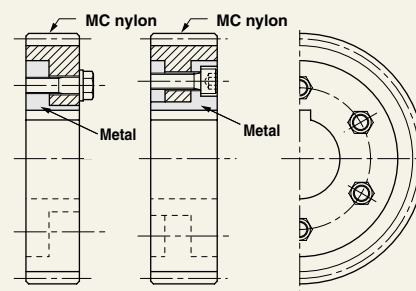
- [Caution on J series]**
- ① As available-on-request products, requires a lead-time for shipping within **3 working-days (excludes the day ordered)**, after placing an order. Please allow additional shipping time to get to your local distributor.
  - ② Number of products we can process for one order is **1 to 20 units**. For quantities of 21 or more pieces, we need to quote price and lead time.
  - ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.

How to attach gears to shafts

To attach gears to shafts, in case of light loads, methods include using keys, taper pins, spring pins, and press fitting after mounting the setscrews. While looseness tends to occur in the conditions below, plastic gears are fastened by applying a steel hub.

1. When the circumferential temperature is high
2. For large diameter gears
3. If forward-reverse motion impacts keys

For fastening steel hubs into plastic gears with bolts, see below for various methods. For gears, which cannot be fasten with bolts due to their shape; it is recommended to use the method of fusion bonding with metal cores.



Fastening with a steel hub bolt

Stainless Steel Hubs for PSA are now available!

Standardized sectional stainless steel hubs. It enhances a secure fastening to the shaft.



Sectional Parts

For details, please see Page 334.

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

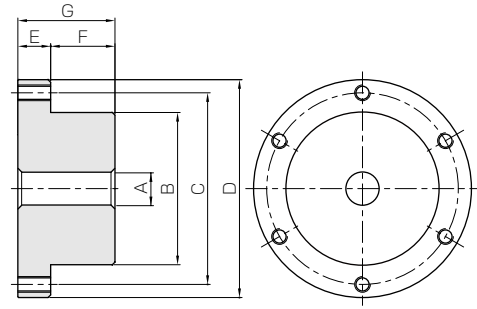
Bevel Gears

Screw Gears

Worm Gear Pair

Bevel Gearboxes

Other Products



T8

Material : SUS303

Catalog No. <small>Catalog No. in blue color : New Products</small>	Partner	Shape	Bore	Hub dia.	Socket head screw			Flange diameter	Flange length	Hub width	Total length
			A <sub>H7</sub>	B	No. of threaded hole	Size	C	D	E	F	G
SUKB20030 SUKB20046 SUKB20066	PSA2-32 or more PSA2-40 or more PSA2-50 or more	T8	10	30 46 66	6	M5	42 58 78	51 67 87	10	20	30
SUKB25038 SUKB25058 SUKB25083	PSA2.5-32 or more PSA2.5-40 or more PSA2.5-50 or more	T8	12	38 58 83	6	M6	53 73 98	63 83 108	12.5	24.5	37
SUKB30046 SUKB30070 SUKB30100	PSA3-32 or more PSA3-40 or more PSA3-50 or more	T8	15	46 70 100	6	M8	64 88 118	76 100 130	15	30	45

[Caution on Product Characteristics]

- ① The area where PSA Plastic Spur Gears are attached, with hub tolerance h7.
- ② The friction coupling torques shown in the table are reference values calculated according to these set values; friction factors and fastening torques of the tapping screw.
- ③ Please refer to the assembly example below, and then attach the hub to the gear with the accessories, plain washers, spring washers and hexagon socket head cap screws.
- ④ In accordance with the fastening torque values shown in the dimension table, use a torque wrench and fasten hexagon socket head cap screws firmly, to attach the hub.
- ⑤ If a fastened hexagon socket head cap screws come loose, friction tightening torque values shown in the table can not be maintained. It is recommended to check the fasteners regularly and retighten when required.
- ⑥ For secure positioning, it is recommended to use dowel pins.

## Features of Stainless Steel Hubs

- This is an attached stainless steel hub with excellent rust resistance.
- Perfectly matches with PSA Plastic Spur Gears, and suitable for food processing machinery.
- Efficient use of materials and superior cost performance for this product.

## Friction Coupling Torque for Stainless Steel Hubs

Friction coupling torque, for Stainless Steel Hubs, is calculated from the frictional force generated by the fastening torque at the contact face of the gear and the stainless steel hub.

Fastening Torque F(N) is calculated from the equation below.

$$F = \frac{n \cdot 1000 \cdot T}{K \cdot d}$$

$n$  : Number → No. of threaded holes shown in the dimension table.

$T$  : Tightening torque (N · m) → Fastening torque shown in the dimension table.

$K$  : Torque coefficient → Set the value at 0.164

$d$  : Nominal diameter (mm) → Socket head screw size shown in the dimension table (M5 = 5mm)

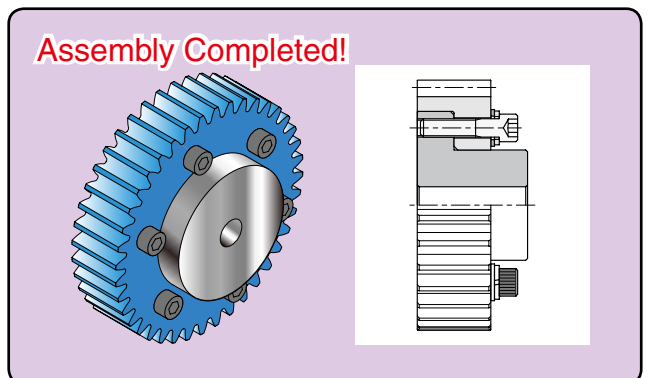
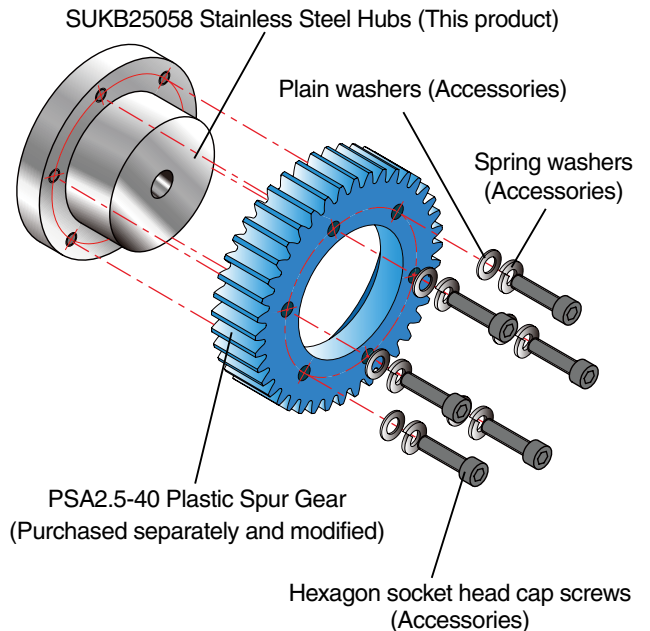
Friction Coupling Torque  $T_f$  (N · m) is calculated from the equation below.

$$T_f = \frac{F \cdot \mu \cdot d_w}{2000}$$

$F$  : Fastening torque (N) → The value obtained from the calculation above.

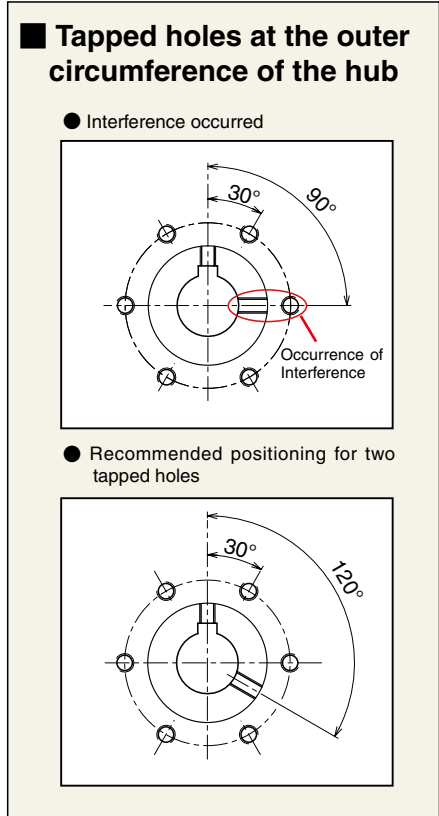
$\mu$  : Friction factor at the contact face of the gear and the stainless steel hub → Set the value at 0.18

$d_w$  : Pitch diameter of the threaded hole (mm) → Socket head screw size C shown in the dimension table

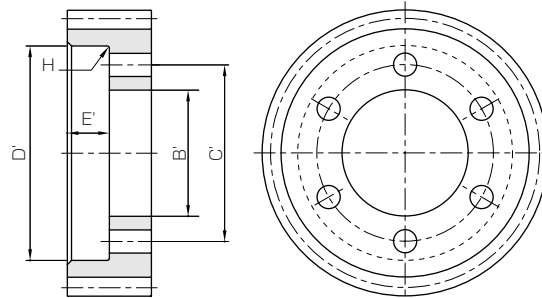


Recommended fastening torque		Friction coupling torque		Weight (kg)	Catalog No. <small>Catalog No. in blue color : New Products</small>
(N-m)	(kgf-m)	(N-m)	(kgf-m)		
0.9	0.092	24.9	2.54	0.24	<b>SUKB20030</b>
		34.4	3.51	0.51	<b>SUKB20046</b>
		46.2	4.71	0.97	<b>SUKB20066</b>
1.5	0.15	43.6	4.45	0.47	<b>SUKB25038</b>
		60.1	6.13	0.98	<b>SUKB25058</b>
		80.7	8.23	1.88	<b>SUKB25083</b>
3.7	0.38	97.5	9.94	0.82	<b>SUKB30046</b>
		134	13.7	1.72	<b>SUKB30070</b>
		180	18.3	3.29	<b>SUKB30100</b>

- [Caution on Secondary Operations]
- ① Please read "Cautions on Performing Secondary Operations" in Page 36 when performing modification and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
  - ② Datum plane for machining hubs is the outer circumference of the hub, where PSA Plastic Spur Gears are attached, and the flank of the flange is facing the hub.
  - ③ For modifying tapped holes at the outer circumference of the hub, apply machining with care and in consideration of the positions of the screw holes for the fastening screws, that attach the hub. (This position is where no interference occurs with the hexagon socket head cap screws).



### ■ Partner Products and Modifications



Stainless Steel Hubs Catalog No. <small>Catalog No. in blue color : New Products</small>	Partner Catalog No.	Bore	Drilled hole			Bore 2	Length of bore	Fillet radius
		B <sub>H8</sub>	No. of threaded hole	Size	C'	D'	E'±0.1	H
<b>SUKB20030</b>	<b>PSA2-32 or more</b>	30	6	φ5.5	42	51	10	R0.5 or less
<b>SUKB20046</b>	<b>PSA2-40 or more</b>	46			58	67		
<b>SUKB20066</b>	<b>PSA2-50 or more</b>	66			78	87		
<b>SUKB25038</b>	<b>PSA2.5-32 or more</b>	38	6	φ6.6	53	63	12.5	R0.5 or less
<b>SUKB25058</b>	<b>PSA2.5-40 or more</b>	58			73	83		
<b>SUKB25083</b>	<b>PSA2.5-50 or more</b>	83			98	108		
<b>SUKB30046</b>	<b>PSA3-32 or more</b>	46	6	φ9	64	76	15	R0.5 or less
<b>SUKB30070</b>	<b>PSA3-40 or more</b>	70			88	100		
<b>SUKB30100</b>	<b>PSA3-50 or more</b>	100			118	130		

**歯車工房**  
信頼の追加加工

**Modifications for bores, keyways and tapped holes done in 3 days!**

Please request modifications at [Haguruma Kobo](#).

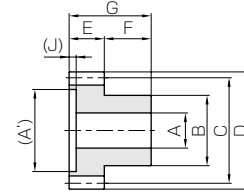
Modifications for SUKB Products (With fee)

Modifications for PSA Products (Purchased separately and modified with fee)



Specifications	
Precision grade	JIS grade N12 (JIS B1702-1: 1998) * JIS grade 8 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	Duracon acetal (M90-44)
Heat treatment	—
Tooth hardness	110 ~ 120HRR

\* The precision grade of this product is equivalent to the value shown in the table.



S8

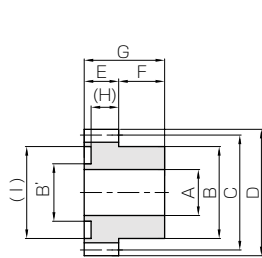
Catalog No.	Module	No. of teeth	Shape	Bore 1	Bore 2	Hub dia. 1	Hub dia. 2	Pitch dia.	Outside dia.	Face width	Hub width
				A	(A')	B	B'	C	D	E	F
<b>DS0.5-12</b>	<b>m0.5</b>	12	S8	2	(4)	4.5	—	6	7	3	4
<b>DS0.5-15</b>		15	S8	2	(5.5)	4.5	—	7.5	8.5	3	4
<b>DS0.5-16</b>		16	S8	3	(6)	6	—	8	9	3	4
<b>DS0.5-18</b>		18	S8	3	(7)	6	—	9	10	3	4
<b>DS0.5-20</b>		20	S8B	4	—	8	5	10	11	3	4
<b>DS0.5-24</b>		24	S9	4	—	8	5	12	13	3	4
<b>DS0.5-25</b>		25	S9	4	—	8	6	12.5	13.5	3	4
<b>DS0.5-28</b>		28	S9	4	—	8	6	14	15	3	4
<b>DS0.5-30</b>		30	S9	5	—	10	7	15	16	3	4
<b>DS0.5-32</b>		32	S9	5	—	10	7	16	17	3	4
<b>DS0.5-35</b>		35	S9	5	—	10	7	17.5	18.5	3	4
<b>DS0.5-36</b>		36	S9	5	—	10	7	18	19	3	4
<b>DS0.5-40</b>		40	S9	5	—	12	8	20	21	3	4
<b>DS0.5-45</b>		45	S9	5	—	12	8	22.5	23.5	3	4
<b>DS0.5-48</b>		48	S9	5	—	12	8	24	25	3	4
<b>DS0.5-50</b>		50	S9	5	—	12	8	25	26	3	4
<b>DS0.5-56</b>		56	S9	6	—	14	10	28	29	3	5
<b>DS0.5-60</b>		60	S9	6	—	14	10	30	31	3	5
<b>DS0.5-64</b>		64	S9	6	—	14	10	32	33	3	5
<b>DS0.5-70</b>		70	S9	6	—	14	10	35	36	3	5
<b>DS0.5-72</b>	72	S9	6	—	14	10	36	37	3	5	
<b>DS0.5-80</b>	80	S9	6	—	14	10	40	41	3	5	
<b>DS0.8-12</b>	<b>m0.8</b>	12	S9	3	—	6	4	9.6	11.2	4	5
<b>DS0.8-15</b>		15	S9	3	—	6	4.5	12	13.6	4	5
<b>DS0.8-16</b>		16	S9	4	—	8	6	12.8	14.4	4	5
<b>DS0.8-18</b>		18	S9	4	—	8	6	14.4	16	4	5
<b>DS0.8-20</b>		20	S9	5	—	10	8	16	17.6	4	5
<b>DS0.8-24</b>		24	S9	5	—	10	8	19.2	20.8	4	5
<b>DS0.8-25</b>		25	S9	5	—	10	8	20	21.6	4	5
<b>DS0.8-28</b>		28	S9	5	—	10	8	22.4	24	4	5
<b>DS0.8-30</b>		30	S9	6	—	12	10	24	25.6	4	5
<b>DS0.8-32</b>		32	S9	6	—	12	10	25.6	27.2	4	5
<b>DS0.8-35</b>		35	S9	6	—	12	10	28	29.6	4	5
<b>DS0.8-36</b>		36	S9	6	—	12	10	28.8	30.4	4	5
<b>DS0.8-40</b>		40	S9	6	—	12	10	32	33.6	4	5
<b>DS0.8-45</b>		45	S9	6	—	12	10	36	37.6	4	5
<b>DS0.8-48</b>		48	S9	6	—	14.5	11.7	38.4	40	4	6
<b>DS0.8-50</b>		50	S9	6	—	14.5	11.7	40	41.6	4	6
<b>DS0.8-56</b>		56	S9	6	—	14.5	11.7	44.8	46.4	4	6
<b>DS0.8-60</b>		60	S9	6	—	14.5	11.7	48	49.6	4	6
<b>DS0.8-64</b>		64	S9	6	—	15.5	11.7	51.2	52.8	4	6
<b>DS0.8-70</b>		70	S9	6	—	15.5	11.7	56	57.6	4	6
<b>DS0.8-72</b>	72	S9	6	—	15.5	11.7	57.6	59.2	4	6	
<b>DS0.8-80</b>	80	S9	6	—	15.5	11.7	64	65.6	4	6	

[Caution on Product Characteristics]

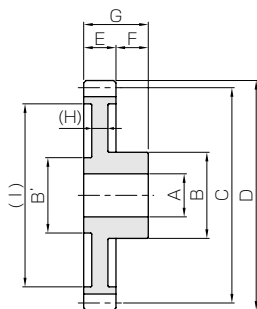
- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.
- ③ The bore tolerance is generally -0.05 to -0.30 but may be + value at the central portion of the hole.
- ④ To find dimensional precision, see the table "Tolerance of Injection Molded Products".



## Injection Molded Spur Gears



S8B



S9

Total length	Web thickness	Web O.D.	Depth of counterbore	Allowable torque (N-m)	Allowable torque (kgf-m)	Backlash (mm)	Weight (g)	Catalog No.
G	(H)	(I)	(J)	Bending strength	Bending strength			
7	—	—	(0.6)	0.063	0.0064	0~0.30	0.17	<b>DS0.5-12</b>
7	—	—	(0.6)	0.092	0.0094		0.23	<b>DS0.5-15</b>
7	—	—	(0.6)	0.10	0.010		0.28	<b>DS0.5-16</b>
7	—	—	(0.6)	0.12	0.012		0.33	<b>DS0.5-18</b>
7	(2.4)	(8)	—	0.14	0.014		0.47	<b>DS0.5-20</b>
7	(1.8)	(9.5)	—	0.17	0.018		0.58	<b>DS0.5-24</b>
7	(1.8)	(10)	—	0.18	0.019		0.61	<b>DS0.5-25</b>
7	(1.8)	(11.5)	—	0.21	0.022		0.69	<b>DS0.5-28</b>
7	(1.8)	(12)	—	0.23	0.023		0.90	<b>DS0.5-30</b>
7	(1.8)	(13)	—	0.25	0.025		0.97	<b>DS0.5-32</b>
7	(1.8)	(14.5)	—	0.28	0.029		1.09	<b>DS0.5-35</b>
7	(1.8)	(15)	—	0.29	0.030		1.13	<b>DS0.5-36</b>
7	(1.8)	(16.5)	—	0.33	0.034		1.53	<b>DS0.5-40</b>
7	(1.8)	(19)	—	0.38	0.039		1.78	<b>DS0.5-45</b>
7	(1.8)	(21)	—	0.42	0.043		1.91	<b>DS0.5-48</b>
7	(1.8)	(21.5)	—	0.44	0.045		2.02	<b>DS0.5-50</b>
8	(1.8)	(24.5)	—	0.50	0.051		2.77	<b>DS0.5-56</b>
8	(1.8)	(26.5)	—	0.54	0.055		3.02	<b>DS0.5-60</b>
8	(1.8)	(28.5)	—	0.58	0.059		3.29	<b>DS0.5-64</b>
8	(1.8)	(31.5)	—	0.64	0.066		3.71	<b>DS0.5-70</b>
8	(1.8)	(32)	—	0.67	0.068	3.86	<b>DS0.5-72</b>	
8	(1.8)	(36.5)	—	0.75	0.076	4.51	<b>DS0.5-80</b>	
9	(2)	(6.7)	—	0.22	0.022	0.48	<b>DS0.8-12</b>	
9	(2)	(8.8)	—	0.31	0.032	0.64	<b>DS0.8-15</b>	
9	(2)	(9.2)	—	0.35	0.035	0.84	<b>DS0.8-16</b>	
9	(2)	(10.7)	—	0.41	0.041	0.97	<b>DS0.8-18</b>	
9	(2)	(12.7)	—	0.47	0.048	1.26	<b>DS0.8-20</b>	
9	(2)	(15)	—	0.59	0.060	1.59	<b>DS0.8-24</b>	
9	(2)	(16.5)	—	0.63	0.064	1.73	<b>DS0.8-25</b>	
9	(2)	(18.5)	—	0.72	0.074	1.91	<b>DS0.8-28</b>	
9	(2)	(19.5)	—	0.79	0.080	2.37	<b>DS0.8-30</b>	
9	(2)	(21)	—	0.85	0.087	2.57	<b>DS0.8-32</b>	
9	(2)	(23.5)	—	0.96	0.098	2.91	<b>DS0.8-35</b>	
9	(2)	(24.5)	—	0.99	0.10	3.00	<b>DS0.8-36</b>	
9	(2)	(27.5)	—	1.13	0.12	3.47	<b>DS0.8-40</b>	
9	(2)	(31)	—	1.31	0.13	4.18	<b>DS0.8-45</b>	
10	(2)	(33.5)	—	1.42	0.15	5.31	<b>DS0.8-48</b>	
10	(2)	(35)	—	1.50	0.15	5.60	<b>DS0.8-50</b>	
10	(2)	(39.5)	—	1.70	0.17	6.55	<b>DS0.8-56</b>	
10	(2)	(42.5)	—	1.85	0.19	7.30	<b>DS0.8-60</b>	
10	(2)	(46)	—	1.98	0.20	8.64	<b>DS0.8-64</b>	
10	(2)	(50.5)	—	2.20	0.22	9.52	<b>DS0.8-70</b>	
10	(2)	(51.5)	—	2.27	0.23	9.85	<b>DS0.8-72</b>	
10	(2)	(55.5)	—	2.55	0.26	11.8	<b>DS0.8-80</b>	

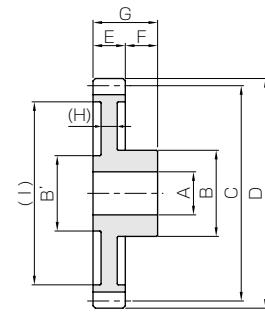
[Caution on Secondary Operations]

① Injection molded products may have air bubbles inside of the material; please avoid performing secondary operations.



Specifications	
Precision grade	JIS grade N12 (JIS B1702-1: 1998) * JIS grade 8 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	Duracon acetal (M90-44)
Heat treatment	—
Tooth hardness	110 ~ 120HRR

\* The precision grade of this product is equivalent to the value shown in the table.



S9

Catalog No.	Module	No. of teeth	Shape	Bore 1	Bore 2	Hub dia. 1	Hub dia. 2	Pitch dia.	Outside dia.	Face width	Hub width
				A	(A')	B	B'	C	D	E	F
<b>DS1-12</b>	m1	12	S9	4	—	8	6	12	14	6	6
<b>DS1-15</b>		15	S9	4	—	8	7	15	17	6	6
<b>DS1-16</b>		16	S9	5	—	10	8	16	18	6	6
<b>DS1-18</b>		18	S9	5	—	10	8	18	20	6	6
<b>DS1-20</b>		20	S9	5	—	11.7	9	20	22	6	6
<b>DS1-24</b>		24	S9	5	—	11.7	9	24	26	6	6
<b>DS1-25</b>		25	S9	5	—	11.7	9	25	27	6	6
<b>DS1-28</b>		28	S9	5	—	11.7	9	28	30	6	6
<b>DS1-30</b>		30	S9	6	—	14	12	30	32	6	6
<b>DS1-32</b>		32	S9	6	—	14	12	32	34	6	6
<b>DS1-35</b>		35	S9	6	—	14	12	35	37	6	6
<b>DS1-36</b>		36	S9	6	—	14	12	36	38	6	6
<b>DS1-40</b>		40	S9	8	—	16	14	40	42	6	6
<b>DS1-45</b>		45	S9	8	—	16	14	45	47	6	6
<b>DS1-48</b>		48	S9	8	—	16	14	48	50	6	8
<b>DS1-50</b>		50	S9	8	—	16	14	50	52	6	8
<b>DS1-56</b>		56	S9	8	—	18	15.6	56	58	6	8
<b>DS1-60</b>		60	S9	8	—	18	15.6	60	62	6	8
<b>DS1-64</b>		64	S9	8	—	18	15.6	64	66	6	8
<b>DS1-70</b>		70	S9	8	—	18	15.6	70	72	6	8
<b>DS1-72</b>	72	S9	8	—	18	15.6	72	74	6	8	
<b>DS1-80</b>	80	S9	8	—	18	15.6	80	82	6	8	

- [Caution on Product Characteristics]
- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
  - ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.
  - ③ The bore tolerance is generally -0.05 to -0.30 but may be + value at the central portion of the hole.
  - ④ To find dimensional precision, see the table "Tolerance of Injection Molded Products".



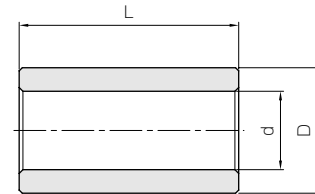
## BB Sintered Metal Bushings



### Sintered Metal Bushings



The table below shows a series of standard metal bushings that can be pressed into standard injection molded gears.



T8

Catalog No.	I.D. of bushing	O.D. of bushing	Length	Products that can use the bushing
	d <sup>+0.02</sup> <sub>0</sub>	D <sup>+0.02</sup> <sub>-0.01</sub>	L <sup>0</sup> <sub>-0.3</sub>	
<b>BB30507</b>	3	5	7	DS0.5
<b>BB30608</b>	3	6	8	DS0.5, DS0.8
<b>BB40609</b>	4	6	9	DS0.8
<b>BB40612</b>	4	6	12	DS1
<b>BB50812</b>	5	8	12	DS1
<b>BB50814</b>	5	8	14	DS1

Material : Oil impregnated sintered bronze



## Injection Molded Spur Gears

Total length	Web thickness	Web O.D.	Depth of counterbore	Allowable torque (N-m)	Allowable torque (kgf-m)	Backlash (mm)	Weight (g)	Catalog No.
G	(H)	(I)	(J)	Bending strength	Bending strength			
12	(3)	(8.5)	—	0.44	0.045	0~0.60	1.10	<b>DS1-12</b>
12	(3)	(11)	—	0.65	0.066		1.49	<b>DS1-15</b>
12	(3)	(11.5)	—	0.71	0.073		1.87	<b>DS1-16</b>
12	(3)	(13.5)	—	0.83	0.085		2.15	<b>DS1-18</b>
12	(3)	(15)	—	0.96	0.098		2.85	<b>DS1-20</b>
12	(3)	(17)	—	1.22	0.12		3.81	<b>DS1-24</b>
12	(3)	(20)	—	1.28	0.13		3.76	<b>DS1-25</b>
12	(3)	(23)	—	1.48	0.15		4.39	<b>DS1-28</b>
12	(3)	(24)	—	1.61	0.16		5.46	<b>DS1-30</b>
12	(3)	(26.5)	—	1.75	0.18		5.86	<b>DS1-32</b>
12	(3)	(29)	—	1.96	0.20		6.73	<b>DS1-35</b>
12	(3)	(30)	—	2.04	0.21		7.01	<b>DS1-36</b>
12	(3)	(34)	—	2.33	0.24		8.39	<b>DS1-40</b>
12	(3)	(39.5)	—	2.69	0.27		9.87	<b>DS1-45</b>
14	(3)	(40)	—	2.92	0.30		12.0	<b>DS1-48</b>
14	(3)	(42.5)	—	3.07	0.31		12.6	<b>DS1-50</b>
14	(3)	(48.5)	—	3.49	0.36		15.8	<b>DS1-56</b>
14	(3)	(52.5)	—	3.78	0.39		17.6	<b>DS1-60</b>
14	(3)	(56.5)	—	4.07	0.41		19.4	<b>DS1-64</b>
14	(3)	(62.5)	—	4.50	0.46		22.4	<b>DS1-70</b>
14	(3)	(64)	—	4.65	0.47	23.7	<b>DS1-72</b>	
14	(3)	(72.5)	—	5.23	0.53	27.9	<b>DS1-80</b>	

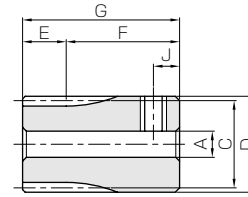
[Caution on Secondary Operations] ① Injection molded products may have air bubbles inside of the material; please avoid performing secondary operations.

■ Tolerance of Injection Molded Products. (Unit : mm)

Range	Tolerance
below 3 mm	± 0.20
3 up to 6 mm	± 0.25
6 up to 10 mm	± 0.30
10 up to 18 mm	± 0.35
18 up to 30 mm	± 0.40
30 mm up	± 0.50



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	Free cutting brass (C3604)
Heat treatment	—
Tooth hardness	more than 80HV



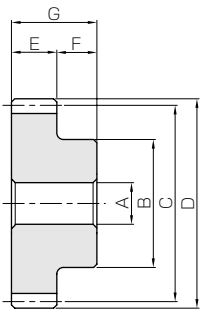
\* The precision grade of products with a module of less than 0.8 is equivalent to the value shown in the table.

S3T

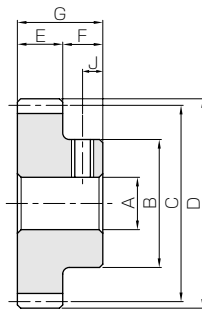
Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway	
				A <sub>H7</sub>	B	C	D	E	F	G	Width×Depth	
BSS0.5-15A	m0.5	15	S3T	3	8.5	7.5	8.5	3	11	14	—	
BSS0.5-16A		16	S3T	3	9	8	9	3	11	14	—	
BSS0.5-17A		17	S3T	3	9.5	8.5	9.5	3	11	14	—	
BSS0.5-18A		18	S3T	3	10	9	10	3	11	14	—	
BSS0.5-19A		19	S3T	3	10.5	9.5	10.5	3	11	14	—	
BSS0.5-20		20	S1	4	8.5					7	10	—
BSS0.5-20A			S3T	3	11	10	11	3	11	14	—	
BSS0.5-20B			S3T	4	11					11	14	—
BSS0.5-21A		21	S3T	3	11.5	10.5	11.5	3	11	14	—	
BSS0.5-22A		22	S1T	3	9	11	12	3	7	10	—	
BSS0.5-23A		23	S1T	3	9	11.5	12.5	3	7	10	—	
BSS0.5-24A		24	S1T	3	10	12	13	3	7	10	—	
BSS0.5-24B			S1T	4	10	12	13	3	7	10	—	
BSS0.5-25		25	S1	4	11							—
BSS0.5-25A			S1T	3	10	12.5	13.5	3	7	10	—	
BSS0.5-25B			S1T	4	10							—
BSS0.5-26A		26	S1T	3	10	13	14	3	7	10	—	
BSS0.5-27A		27	S1T	3	10	13.5	14.5	3	7	10	—	
BSS0.5-28A		28	S1T	3	12	14	15	3	7	10	—	
BSS0.5-29A		29	S1T	3	12	14.5	15.5	3	7	10	—	
BSS0.5-30		30	S1	4	13							—
BSS0.5-30A			S1T	3	12	15	16	3	7	10	—	
BSS0.5-30B			S1T	4	12							—
BSS0.5-30C			S1T	5	12							—
BSS0.5-32A		32	S1T	4	14	16	17	3	7	10	—	
BSS0.5-34A		34	S1T	4	15	17	18	3	7	10	—	
BSS0.5-35A		35	S1T	4	15	17.5	18.5	3	7	10	—	
BSS0.5-36A		36	S1T	4	16	18	19	3	7	10	—	
BSS0.5-38A		38	S1T	4	16	19	20	3	7	10	—	
BSS0.5-40		40	S1	4	17							—
BSS0.5-40A			S1T	4	18	20	21	3	7	10	—	
BSS0.5-40B			S1T	5	18							—
BSS0.5-50A	50	S1T	4	22	25	26	3	7	10	—		
BSS0.5-50B		S1T	5	22							—	
BSS0.5-60A	60	S1T	5	28	30	31	3	7	10	—		
BSS0.5-60B		S1T	6	28							—	
BSS0.5-70A	70	S1T	5	28	35	36	3	7	10	—		
BSS0.5-70B		S1T	6	28							—	
BSS0.5-80A	80	S1T	5	28	40	41	3	7	10	—		
BSS0.5-80B		S1T	6	28							—	

[Caution on Product Characteristics]

- ① For products with a tapped hole, a set screw is included.
- ② The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ③ The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.
- ④ If diameter is less than  $\phi 4$ , the diameter tolerance is H8. If diameter is  $\phi 5$  or  $\phi 6$ , and the hole length exceeds 3 times of the diameter, the tolerance is also H8.



S1



S1T

Set Screw		Allowable torque (N·m)		Backlash (mm)	Weight (kg)	Catalog No.
Size	J	Bending strength	Bending strength			
M3	2.5	0.058	0.0059	0 ~0.10	0.0054	<b>BSS0.5-15A</b>
M3	2.5	0.065	0.0066	0 ~0.10	0.0062	<b>BSS0.5-16A</b>
M3	2.5	0.071	0.0072	0 ~0.10	0.0070	<b>BSS0.5-17A</b>
M3	2.5	0.078	0.0079	0 ~0.10	0.0079	<b>BSS0.5-18A</b>
M3	2.5	0.084	0.0086	0 ~0.10	0.0088	<b>BSS0.5-19A</b>
—	—	0.091	0.0093	0 ~0.10	0.0043	<b>BSS0.5-20</b>
M3	2.5				0.0098	<b>BSS0.5-20A</b>
M3	2.5				0.0091	<b>BSS0.5-20B</b>
M3	2.5	0.10	0.0099	0 ~0.10	0.011	<b>BSS0.5-21A</b>
M3	3.5	0.10	0.011	0 ~0.10	0.0054	<b>BSS0.5-22A</b>
M3	3.5	0.11	0.011	0 ~0.10	0.0056	<b>BSS0.5-23A</b>
M3	3.5	0.12	0.012	0 ~0.10	0.0067	<b>BSS0.5-24A</b>
M3	3.5	0.12	0.012	0 ~0.10	0.0063	<b>BSS0.5-24B</b>
—	—	0.12	0.013	0 ~0.10	0.0077	<b>BSS0.5-25</b>
M3	3.5				0.0070	<b>BSS0.5-25A</b>
M3	3.5				0.0065	<b>BSS0.5-25B</b>
M3	3.5	0.13	0.013	0 ~0.10	0.0072	<b>BSS0.5-26A</b>
M3	3.5	0.14	0.014	0 ~0.10	0.0075	<b>BSS0.5-27A</b>
M3	3.5	0.15	0.015	0 ~0.10	0.0097	<b>BSS0.5-28A</b>
M3	3.5	0.15	0.016	0 ~0.10	0.010	<b>BSS0.5-29A</b>
—	—	0.16	0.016	0 ~0.10	0.011	<b>BSS0.5-30</b>
M3	3.5				0.010	<b>BSS0.5-30A</b>
M3	3.5				0.0099	<b>BSS0.5-30B</b>
M4	3.5				0.0092	<b>BSS0.5-30C</b>
M3	3.5	0.17	0.018	0 ~0.10	0.013	<b>BSS0.5-32A</b>
M3	3.5	0.19	0.019	0 ~0.10	0.015	<b>BSS0.5-34A</b>
M3	3.5	0.20	0.020	0 ~0.10	0.015	<b>BSS0.5-35A</b>
M3	3.5	0.20	0.021	0 ~0.10	0.017	<b>BSS0.5-36A</b>
M3	3.5	0.22	0.022	0 ~0.10	0.018	<b>BSS0.5-38A</b>
—	—	0.23	0.024	0 ~0.10	0.020	<b>BSS0.5-40</b>
M3	3.5				0.022	<b>BSS0.5-40A</b>
M4	3.5				0.021	<b>BSS0.5-40B</b>
M3	3.5	0.31	0.031	0 ~0.10	0.033	<b>BSS0.5-50A</b>
M4	3.5				0.032	<b>BSS0.5-50B</b>
M4	3.5	0.38	0.039	0 ~0.10	0.052	<b>BSS0.5-60A</b>
M4	3.5				0.051	<b>BSS0.5-60B</b>
M4	3.5	0.46	0.047	0 ~0.10	0.058	<b>BSS0.5-70A</b>
M4	3.5				0.057	<b>BSS0.5-70B</b>
M4	3.5	0.54	0.055	0 ~0.10	0.065	<b>BSS0.5-80A</b>
M4	3.5				0.065	<b>BSS0.5-80B</b>

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.
- ③ When performing secondary operations, be aware of deflection and distortion as the tooth is thin in width.

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks &amp; Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

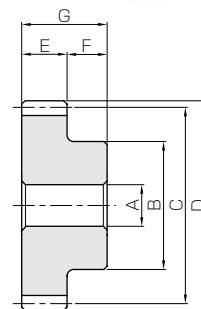
Bevel Gearboxes

Other Products



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	Free cutting brass (C3604)
Heat treatment	—
Tooth hardness	more than 80HV

\* The precision grade of products with a module of less than 0.8 is equivalent to the value shown in the table.

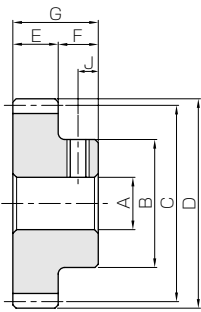


S1

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway	
				A <sub>H7</sub>	B	C	D	E	F	G	Width×Depth	
<b>BSS0.8-15A</b>	<b>m0.8</b>	15	S1T	4	9	12	13.6	4	8	12	—	
<b>BSS0.8-16A</b>		16	S1T	4	10	12.8	14.4	4	8	12	—	
<b>BSS0.8-17A</b>		17	S1T	4	10	13.6	15.2	4	8	12	—	
<b>BSS0.8-18A</b>		18	S1T	4	10	14.4	16	4	8	12	—	
<b>BSS0.8-19A</b>		19	S1T	4	12	15.2	16.8	4	8	12	—	
<b>BSS0.8-20</b>		20	S1	5	13.5							—
<b>BSS0.8-20A</b>			S1T	4	12	16	17.6	4	8	12	—	
<b>BSS0.8-20B</b>			S1T	5	12							—
<b>BSS0.8-21A</b>		21	S1T	5	14	16.8	18.4	4	8	12	—	
<b>BSS0.8-22A</b>		22	S1T	5	15	17.6	19.2	4	8	12	—	
<b>BSS0.8-23A</b>		23	S1T	5	15	18.4	20	4	8	12	—	
<b>BSS0.8-24A</b>		24	S1T	4	16	19.2	20.8	4	8	12	—	
<b>BSS0.8-24B</b>			S1T	5	16							—
<b>BSS0.8-25</b>		25	S1	5	17	20	21.6	4	8	12	—	
<b>BSS0.8-25A</b>			S1T	4	16							—
<b>BSS0.8-25B</b>			S1T	5	16							—
<b>BSS0.8-26A</b>		26	S1T	5	18	20.8	22.4	4	8	12	—	
<b>BSS0.8-27A</b>		27	S1T	5	18	21.6	23.2	4	8	12	—	
<b>BSS0.8-28A</b>		28	S1T	5	18	22.4	24	4	8	12	—	
<b>BSS0.8-29A</b>		29	S1T	5	20	23.2	24.8	4	8	12	—	
<b>BSS0.8-30</b>		30	S1	5	20							—
<b>BSS0.8-30A</b>			S1T	4	20	24	25.6	4	8	12	—	
<b>BSS0.8-30B</b>			S1T	5	20							—
<b>BSS0.8-30C</b>			S1T	6	20							—
<b>BSS0.8-32A</b>		32	S1T	5	22	25.6	27.2	4	8	12	—	
<b>BSS0.8-34A</b>		34	S1T	5	22	27.2	28.8	4	8	12	—	
<b>BSS0.8-35A</b>		35	S1T	5	25	28	29.6	4	8	12	—	
<b>BSS0.8-36A</b>		36	S1T	5	25	28.8	30.4	4	8	12	—	
<b>BSS0.8-38A</b>		38	S1T	5	25	30.4	32	4	8	12	—	
<b>BSS0.8-40</b>		40	S1	5	20	32	33.6	4	8	12	—	
<b>BSS0.8-40A</b>	S1T		5	28							—	
<b>BSS0.8-40B</b>	S1T		6	28							—	
<b>BSS0.8-50A</b>	50	S1T	5	28	40	41.6	4	8	12	—		
<b>BSS0.8-50B</b>		S1T	6	28							—	
<b>BSS0.8-60A</b>	60	S1T	5	28	48	49.6	4	8	12	—		
<b>BSS0.8-60B</b>		S1T	6	28							—	

[Caution on Product Characteristics]

- ① For products with a tapped hole, a set screw is included.
- ② The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ③ The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.
- ④ If diameter is less than  $\phi 4$ , the diameter tolerance is H8. If diameter is  $\phi 5$  or  $\phi 6$ , and the hole length exceeds 3 times of the diameter, the tolerance is also H8.



S1T

Set Screw		Allowable torque (N·m)		Backlash (mm)	Weight (kg)	Catalog No.
Size	J	Bending strength	Bending strength			
M3	4	0.20	0.020	0 ~0.10	0.0067	<b>BSS0.8-15A</b>
M3	4	0.22	0.022	0 ~0.10	0.0082	<b>BSS0.8-16A</b>
M3	4	0.24	0.025	0 ~0.10	0.0088	<b>BSS0.8-17A</b>
M3	4	0.26	0.027	0 ~0.10	0.0094	<b>BSS0.8-18A</b>
M3	4	0.29	0.029	0 ~0.10	0.012	<b>BSS0.8-19A</b>
—	—	0.31	0.032	0 ~0.10	0.014	<b>BSS0.8-20</b>
M3	4				0.013	<b>BSS0.8-20A</b>
M4	4				0.012	<b>BSS0.8-20B</b>
M4	4	0.33	0.034	0 ~0.10	0.015	<b>BSS0.8-21A</b>
M4	4	0.36	0.036	0 ~0.10	0.018	<b>BSS0.8-22A</b>
M4	4	0.38	0.039	0 ~0.10	0.018	<b>BSS0.8-23A</b>
M3	4	0.40	0.041	0 ~0.10	0.022	<b>BSS0.8-24A</b>
M4	4				0.021	<b>BSS0.8-24B</b>
—	—	0.43	0.043	0 ~0.10	0.024	<b>BSS0.8-25</b>
M3	4				0.023	<b>BSS0.8-25A</b>
M4	4				0.022	<b>BSS0.8-25B</b>
M4	4	0.45	0.046	0 ~0.10	0.026	<b>BSS0.8-26A</b>
M4	4	0.47	0.048	0 ~0.10	0.027	<b>BSS0.8-27A</b>
M4	4	0.50	0.051	0 ~0.10	0.028	<b>BSS0.8-28A</b>
M4	4	0.52	0.053	0 ~0.10	0.033	<b>BSS0.8-29A</b>
—	—	0.55	0.056	0 ~0.10	0.034	<b>BSS0.8-30</b>
M3	4				0.035	<b>BSS0.8-30A</b>
M4	4				0.034	<b>BSS0.8-30B</b>
M4	4				0.033	<b>BSS0.8-30C</b>
M4	4	0.60	0.061	0 ~0.10	0.040	<b>BSS0.8-32A</b>
M4	4	0.64	0.066	0 ~0.10	0.042	<b>BSS0.8-34A</b>
M4	4	0.67	0.068	0 ~0.10	0.051	<b>BSS0.8-35A</b>
M4	4	0.69	0.071	0 ~0.10	0.052	<b>BSS0.8-36A</b>
M4	4	0.74	0.076	0 ~0.10	0.055	<b>BSS0.8-38A</b>
—	—	0.79	0.081	0 ~0.10	0.046	<b>BSS0.8-40</b>
M4	4				0.066	<b>BSS0.8-40A</b>
M4	4				0.065	<b>BSS0.8-40B</b>
M4	4	1.05	0.11	0 ~0.10	0.081	<b>BSS0.8-50A</b>
M4	4				0.080	<b>BSS0.8-50B</b>
M4	4	1.31	0.13	0 ~0.10	0.10	<b>BSS0.8-60A</b>
M4	4				0.099	<b>BSS0.8-60B</b>

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.
- ③ When performing secondary operations, be aware of deflection and distortion as the tooth is thin in width.

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks &amp; Pinions

Miter Gears

Bevel Gears

Screw Gears

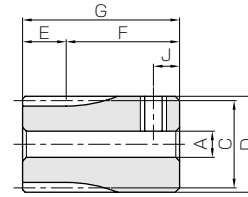
Worm Gear Pair

Bevel Gearboxes

Other Products



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	Free cutting brass (C3604)
Heat treatment	—
Tooth hardness	more than 80HV



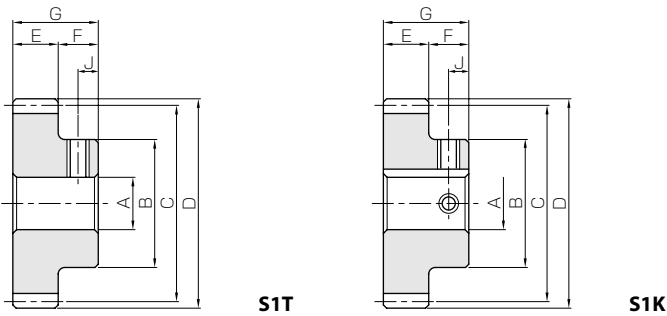
S3T

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	Width×Depth
<b>BSS1-15A</b> <b>BSS1-15B</b>	m1	15	S3T	4	17	15	17	6	15	21	—
S3T			5	17	15	17	6	15	21	—	
<b>BSS1-16A</b> <b>BSS1-16B</b>		16	S1T	4	12	16	18	6	8	14	—
S1T			5	12	16	18	6	8	14	—	
<b>BSS1-17A</b>		17	S1T	6	14	17	19	6	8	14	—
<b>BSS1-18A</b> <b>BSS1-18B</b>		18	S1T	5	15	18	20	6	8	14	—
S1T			6	15	18	20	6	8	14	—	
<b>BSS1-19A</b>		19	S1T	6	16	19	21	6	8	14	—
<b>BSS1-20A</b> <b>BSS1-20B</b> <b>BSS1-20C</b>		20	S1T	4	16	20	22	6	8	14	—
S1T			5	16	20	22	6	8	14	—	
S1T			6	16	20	22	6	8	14	—	
<b>BSS1-21A</b>		21	S1T	6	18	21	23	6	8	14	—
<b>BSS1-22A</b>		22	S1T	6	18	22	24	6	8	14	—
<b>BSS1-23A</b>		23	S1T	6	20	23	25	6	8	14	—
<b>BSS1-24A</b> <b>BSS1-24B</b> <b>BSS1-24C</b>		24	S1T	5	20	24	26	6	8	14	—
S1T			6	20	24	26	6	8	14	—	
S1T			8	20	24	26	6	8	14	—	
<b>BSS1-25A</b> <b>BSS1-25B</b> <b>BSS1-25C</b>		25	S1T	5	22	25	27	6	8	14	—
S1T			6	22	25	27	6	8	14	—	
S1T			8	22	25	27	6	8	14	—	
<b>BSS1-26A</b> <b>BSS1-26B</b>		26	S1T	6	22	26	28	6	8	14	—
S1T			8	22	26	28	6	8	14	—	
<b>BSS1-27A</b>		27	S1T	6	22	27	29	6	8	14	—
<b>BSS1-28A</b>		28	S1T	6	25	28	30	6	8	14	—
<b>BSS1-29A</b>		29	S1T	8	25	29	31	6	8	14	—
<b>BSS1-30A</b> <b>BSS1-30B</b> <b>BSS1-30C</b> <b>BSS1-30D</b>		30	S1T	5	25	30	32	6	8	14	—
S1T			6	25	30	32	6	8	14	—	
S1T			8	25	30	32	6	8	14	—	
S1K			10	25	30	32	6	8	14	4 x 1.8	
<b>BSS1-32A</b> <b>BSS1-32B</b> <b>BSS1-32C</b> <b>BSS1-32D</b>		32	S1T	5	28	32	34	6	8	14	—
S1T	6		28	32	34	6	8	14	—		
S1T	8		28	32	34	6	8	14	—		
S1K	10		28	32	34	6	8	14	4 x 1.8		
<b>BSS1-34A</b>	34	S1T	8	28	34	36	6	8	14	—	
<b>BSS1-35A</b> <b>BSS1-35B</b>	35	S1T	8	28	35	37	6	8	14	—	
S1K		10	28	35	37	6	8	14	4 x 1.8		
<b>BSS1-36A</b> <b>BSS1-36B</b>	36	S1T	8	28	36	38	6	8	14	—	
S1K		10	28	36	38	6	8	14	4 x 1.8		
<b>BSS1-38A</b>	38	S1T	8	28	38	40	6	8	14	—	
<b>BSS1-40A</b> <b>BSS1-40B</b> <b>BSS1-40C</b>	40	S1T	6	28	40	42	6	8	14	—	
S1T		8	28	40	42	6	8	14	—		
S1K		10	28	40	42	6	8	14	4 x 1.8		
<b>BSS1-50A</b> <b>BSS1-50B</b> <b>BSS1-50C</b>	50	S1T	6	28	50	52	6	8	14	—	
S1T		8	28	50	52	6	8	14	—		
S1K		10	28	50	52	6	8	14	4 x 1.8		

[Caution on Product Characteristics]

- ① For products with a tapped hole, a set screw is included.
- ② The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ③ The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.
- ④ If diameter is less than  $\phi 4$ , the diameter tolerance is H8. If diameter is  $\phi 5$  or  $\phi 6$ , and the hole length exceeds 3 times of the diameter, the tolerance is also H8.





S1T

S1K

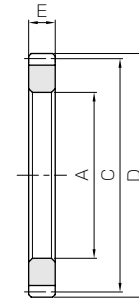
Set Screw		Allowable torque (N·m)		Backlash (mm)	Weight (kg)	Catalog No.
Size	J	Bending strength	Bending strength			
M3	4	0.47	0.048	0.08~0.18	0.035	<b>BSS1-15A</b>
M4	4			0.08~0.18	0.034	<b>BSS1-15B</b>
M3	4	0.52	0.053	0.08~0.18	0.016	<b>BSS1-16A</b>
M4	4			0.08~0.18	0.015	<b>BSS1-16B</b>
M4	4	0.57	0.058	0.08~0.18	0.018	<b>BSS1-17A</b>
M4	4	0.62	0.063	0.08~0.18	0.022	<b>BSS1-18A</b>
M4	4			0.08~0.18	0.021	<b>BSS1-18B</b>
M4	4	0.67	0.069	0.08~0.18	0.024	<b>BSS1-19A</b>
M3	4	0.73	0.074	0.08~0.18	0.028	<b>BSS1-20A</b>
M4	4			0.08~0.18	0.027	<b>BSS1-20B</b>
M4	4			0.08~0.18	0.026	<b>BSS1-20C</b>
M4	4	0.78	0.080	0.08~0.18	0.031	<b>BSS1-21A</b>
M4	4	0.83	0.085	0.08~0.18	0.033	<b>BSS1-22A</b>
M4	4	0.89	0.091	0.08~0.18	0.038	<b>BSS1-23A</b>
M4	4	0.94	0.10	0.08~0.18	0.041	<b>BSS1-24A</b>
M4	4			0.08~0.18	0.040	<b>BSS1-24B</b>
M5	4			0.08~0.18	0.037	<b>BSS1-24C</b>
M4	4	1.00	0.10	0.08~0.18	0.047	<b>BSS1-25A</b>
M4	4			0.08~0.18	0.046	<b>BSS1-25B</b>
M5	4			0.08~0.18	0.044	<b>BSS1-25C</b>
M4	4	1.05	0.11	0.08~0.18	0.048	<b>BSS1-26A</b>
M5	4			0.08~0.18	0.046	<b>BSS1-26B</b>
M4	4	1.11	0.11	0.08~0.18	0.051	<b>BSS1-27A</b>
M4	4	1.17	0.12	0.08~0.18	0.060	<b>BSS1-28A</b>
M5	4	1.22	0.12	0.08~0.18	0.059	<b>BSS1-29A</b>
M4	4	1.28	0.13	0.08~0.18	0.066	<b>BSS1-30A</b>
M4	4			0.08~0.18	0.065	<b>BSS1-30B</b>
M5	4			0.08~0.18	0.062	<b>BSS1-30C</b>
M4	4			0.08~0.18	0.058	<b>BSS1-30D</b>
M4	4	1.40	0.14	0.08~0.18	0.079	<b>BSS1-32A</b>
M4	4			0.08~0.18	0.078	<b>BSS1-32B</b>
M5	4			0.08~0.18	0.075	<b>BSS1-32C</b>
M4	4			0.08~0.18	0.071	<b>BSS1-32D</b>
M5	4	1.51	0.15	0.08~0.18	0.080	<b>BSS1-34A</b>
M5	4	1.57	0.16	0.08~0.18	0.083	<b>BSS1-35A</b>
M4	4			0.08~0.18	0.079	<b>BSS1-35B</b>
M5	4	1.63	0.17	0.08~0.18	0.086	<b>BSS1-36A</b>
M4	4			0.08~0.18	0.082	<b>BSS1-36B</b>
M5	4	1.74	0.18	0.08~0.18	0.092	<b>BSS1-38A</b>
M4	4	1.86	0.19	0.08~0.18	0.10	<b>BSS1-40A</b>
M5	4			0.08~0.18	0.098	<b>BSS1-40B</b>
M4	4			0.08~0.18	0.094	<b>BSS1-40C</b>
M4	4	2.46	0.25	0.08~0.18	0.14	<b>BSS1-50A</b>
M5	4			0.08~0.18	0.13	<b>BSS1-50B</b>
M4	4			0.08~0.18	0.13	<b>BSS1-50C</b>

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.
- ③ When performing secondary operations, be aware of deflection and distortion as the tooth is thin in width.



Specifications	
Precision grade	JIS grade N9 (JIS B1702-1: 1998) JIS grade 5 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB



S5

Catalog No.	Module	No. of teeth	Shape	Bore		Pitch dia.		Outside dia.		Face width		Allowable torque (N·m)		Allowable torque (kgf·m)	
				A <sub>H8</sub>	C	D	E	Bending strength	Surface durability	Bending strength	Surface durability				
<b>SSR2-120</b>	<b>m2</b>	120	S5	194	240	244	20	366	44.0	37.4	4.49				
<b>SSR2-200</b>		200	S5	354	400	404	20	630	84.2	64.3	8.59				
<b>SSR2.5-120</b>	<b>m2.5</b>	120	S5	245	300	305	25	715	88.5	72.9	9.02				
<b>SSR2.5-200</b>		200	S5	445	500	505	25	1230	169	126	17.2				
<b>SSR3-120</b>	<b>m3</b>	120	S5	296	360	366	30	1240	157	126	16.0				
<b>SSR3-160</b>		160	S5	416	480	486	30	1680	226	171	23.0				

Backlash (mm)	Weight (kg)	Catalog No.
0.17~0.37	2.46	<b>SSR2-120</b>
0.20~0.41	4.28	<b>SSR2-200</b>
0.19~0.41	4.62	<b>SSR2.5-120</b>
0.22~0.46	8.01	<b>SSR2.5-200</b>
0.22~0.45	7.77	<b>SSR3-120</b>
0.22~0.45	10.6	<b>SSR3-160</b>

[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② The backlash values shown in the table are the theoretical values for the normal direction for the ring gear in mesh with a 30 tooth SS type spur gear.
- ③ Although the inside diameter of these gears are made to H8 tolerance, since the ring shape is easily deformed, some error may occur beyond the stated tolerance.

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.

Spur Gears  
Helical Gears  
Internal Gears  
Racks  
CP Racks & Pinions  
Miter Gears  
Bevel Gears  
Screw Gears  
Worm Gear Pair  
Bevel Gearboxes  
Other Products

**KHG**  
Ground Helical Gears



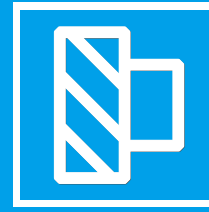
m1 ~ 3      Page 352



**SH**  
Steel Helical Gears



m2, 3      Page 362

# Helical Gears

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

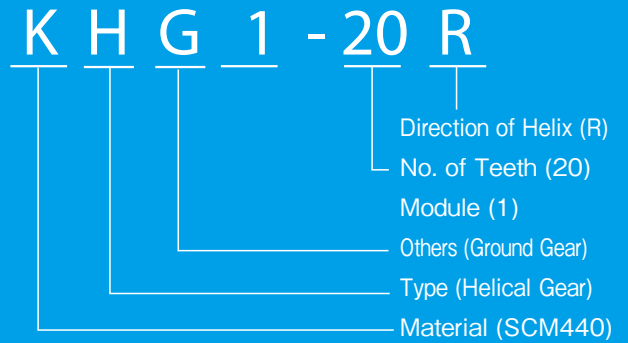
Bevel Gearboxes

Other Products

## Catalog Number of KHK Stock Gears

The Catalog Number for KHK stock gears is based on the simple formula listed below. Please order KHK gears by specifying the Catalog Numbers.

(Example) Helical Gears



### Material

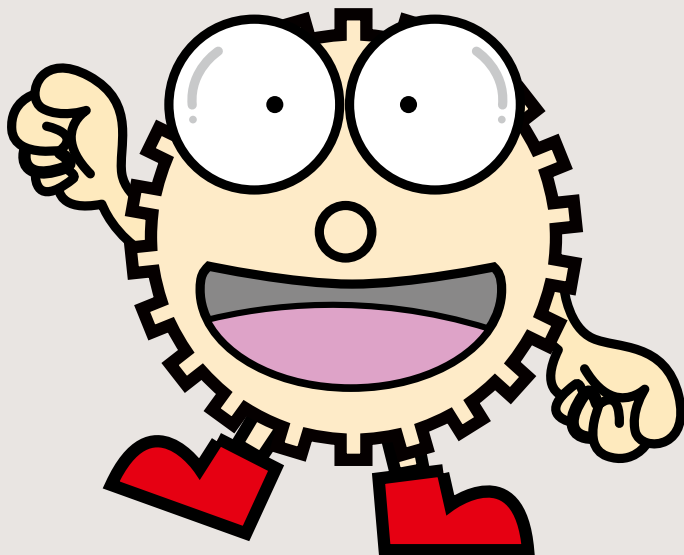
S S45C  
K SCM440

### Type

H Helical Gears

### Other Information

G Ground Gears



### Feature Icons

- |  |  |
|--|--|
|  RoHS Compliant Product |  Stainless Product          |
|  Re-machinable Product  |  Resin Product              |
|  Finished Product       |  Copper Alloy Product       |
|  Heat Treated Product   |  Injection Molded Product   |
|  Ground Gear            |  Black Oxide coated Product |



## Characteristics



KHK stock helical gears are quiet, compact and economical. They are suitable wherever you require high-speed rotation including in machine tools, speed reducers and other industrial machinery. The following table lists the main features.

Catalog No.	KHG	SH
Module	1 ~ 3	2 ~ 3
Material	SCM440	S45C
Heat Treatment	Thermal refined, Gear teeth induction hardened	—
Tooth Surface Finish	Ground	Cut
Precision JIS B 1702-1:1998	N6	N8
Secondary Operations	Possible except for tooth	Possible
Features	Have excellent strength and wear resistance which allow your designs to be more compact.	Having larger contact ratios compared to the SS spur gears, effective in reducing noise and vibration.

## Advanced grinding equipment allows for efficient production

The use of electro deposition grinding wheel produces consistent precision with shorter grinding usage, making products affordable.



Gleason Cylindrical Gear Grinding Machine (TAG400)

## Selection Hints



It is important to thoroughly understand the contents of the product tables as well as "CAUTION" notes before making the selection. You must specify the right or left hand by including the letter R or L in the catalog number when ordering.

### 1. Caution in Selecting the Mating Gears.

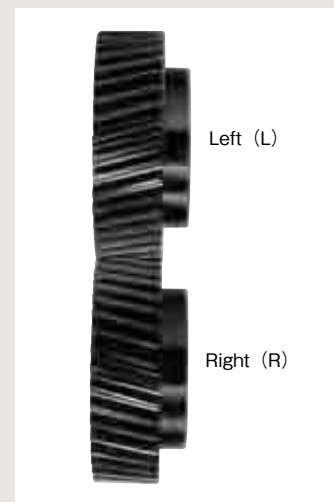
We have two different types of KHK helical gear products, one is a KHG gear type, and the other is a SH gear type. Each type of gear has different module systems, pressure angle designations and helix angles. Since the KHG Gears are of the transverse module style, and the SH gears are of normal module style, KHG and SH gears are not interchangeable. Please keep this in mind when making your selection.

Also, right hand and left hand helical mating gears are packaged as a set. See the photos below for reference and for help in making a proper selection. The table shows the possible combinations.

#### ■ Mating Helical Gear Selection Chart (○ Allowable × Not allowable)

Catalog No. & Helix Hand		KHG		SH		KRHG KRHGF		SRH	
		RH	LH	RH	LH	RH	LH	RH	LH
KHG	RH	×	○	×	×	×	○	×	×
	LH	○	×	×	×	○	×	×	×
SH	RH	×	×	×	○	×	×	×	○
	LH	×	×	○	×	×	×	○	×

#### ■ Helix Direction



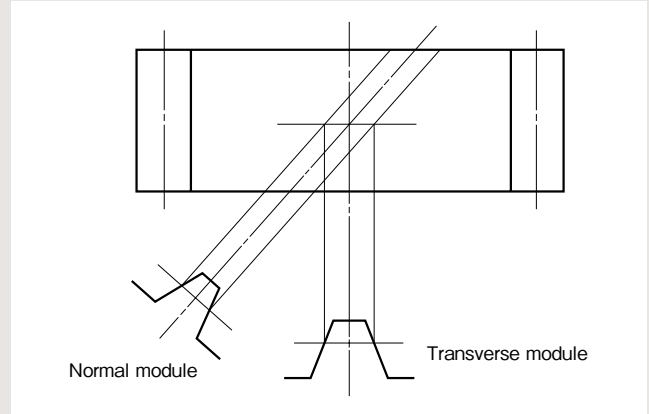
Pinion (L) & Rack (R)



Pinion (R) & Rack (L)

## ■ Transverse module and Normal module

The difference between transverse module and normal module is defined as the difference of basic tooth form. As shown on the right, the module of tooth datum orthogonal to the center axis of gear is called transverse module. The module of tooth datum orthogonal to the thread helix is called normal module. The characteristics of each are shown as below.



## ■ Characteristics of Transverse module and Normal module

Style	Advantages	Disadvantages
Transverse module (KHG)	Replaces spur gears having the same module, number of teeth, and center distance.	Special gear cutting or grinding machines are required for processing each helix angle.
Normal module (SH)	Modifications of spur gears are made by gear cutting or grinding machines, even if they have different helix angles.	Have a center distance value different from that of a spur gear, although they have the same module size and the same number of gear teeth. The center distance value is rarely an integral number.

**(CAUTION)** Above is for illustration purpose only and not a representation of the true tooth forms. For detailed technical information, please refer to the section of “4.3 Helical Gears” (Page 614).

## 2. Caution in Selecting Gears Based on Gear Strength

Allowable bending strength and surface durability values shown in product tables were computed by assuming a certain application environment. They should be used as reference only. We recommend that each user computes his own values by applying the actual usage conditions. To find more information on gear strength calculations, please refer to the technical reference, in the section “Bending Strength of Spur and Helical Gears” (Page 663) or “Surface Durability of Spur and Helical Gears” (Page 670).

## ■ Calculation assumptions for Bending Strength of Gears

Item \ Catalog No.	KHG	SH
Formula <small>NOTE 1</small>	Formula of spur and helical gears on bending strength (JGMA401-01)	
No. of teeth of Mating Gears	Same number of teeth	
Rotation	600rpm	100rpm
Durability	Over $10^7$ cycles	
Impact from motor	Uniform load	
Impact from load	Uniform load	
Direction of load	Bidirectional	
Allowable bending stress at root $\sigma_{Flim}$ (kgf/mm <sup>2</sup> ) <small>NOTE2</small>	30	19
Safety factor $S_F$	1.2	

## ■ Calculation assumptions for Surface Durability (Except where it is common with bending strength)

Item \ Catalog No.	KHG	SH
Formula <small>NOTE 1</small>	Formula of spur and helical gears on bending strength (JGMA402-01)	
Kinematic viscosity of lubricant	100cSt (50°C)	
Gear support	Symmetric support by bearings	
Allowable Hertz stress $\sigma_{Hlim}$ (kgf/mm <sup>2</sup> )	116	49
Safety factor $S_H$	1.15	

**(NOTE 1)** The formula for gear strength is based on JGMA Standard. The units for the rotational speed (rpm) and the load (kgf/mm<sup>2</sup>) were matched to the units needed in the equation.

**(NOTE 2)** Since the load is bidirectional, the allowable bending stress at root  $\sigma_{Flim}$  is set to 2/3 of the value.

## ■ Definition of Bending Strength by JGMA 401-01 (1974)

The allowable bending strength of a gear is defined as the allowable tangential force at the pitch circle based on the mutually allowable root stress of two meshing gears under load.



Example of the failure due to insufficient bending strength.

## ■ Definition of Surface Durability by JGMA 402-01 (1975)

The surface durability of a gear is defined as the allowable tangential force at the pitch circle, which permits the force to be transmitted safely without incurring surface failure.



Example of the defacement due to insufficient surface durability.



## Application Hints

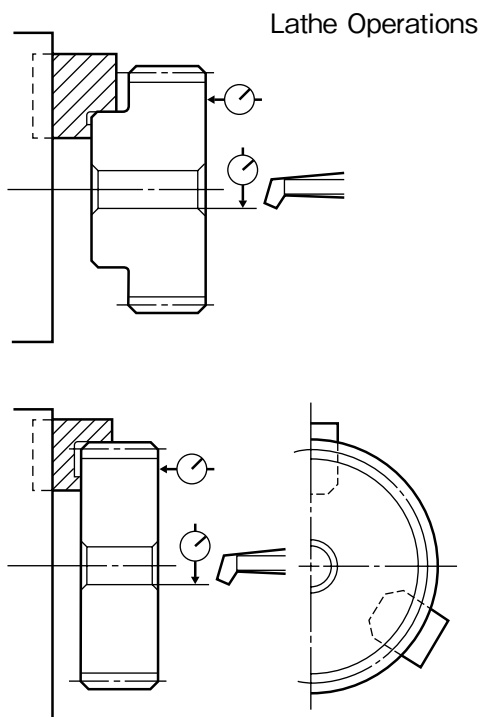


In order to use KHK stock gears safely, carefully read the Application Hints before proceeding. If there are questions or if you require clarifications, please contact our technical department or your nearest distributor.

KHK CO., LTD. TECHNICAL DEPARTMENT  
PHONE: 81-48-254-1744 FAX: 81-48-254-1765  
E-mail [export@khkgears.co.jp](mailto:export@khkgears.co.jp)

### 1. Caution on Performing Secondary Operations

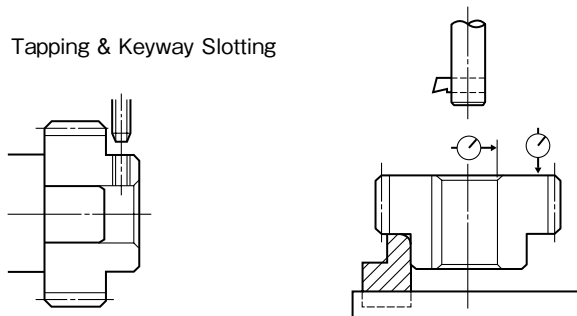
- ① If you are re boring, it is important to pay special attention to locating the center in order to avoid runout.
- ② The reference datum for gear cutting is the bore. Therefore, use the bore for locating the center. If it is too difficult to do for small bores, the alternative is to use one spot on the bore and the runout of the side surface.
- ③ If the rework requires using scroll chucks, we recommend the use of new or rebored jaws for improved precision. If chucking by the teeth, please apply the pressure carefully to avoid crushing the teeth which will lead to noisy gears.
- ④ The maximum bore size is dictated by the requirement



that the strength of the hub is to be higher than that of the gear teeth. The maximum bore size should be 60% to 70 % of the hub diameter (or tooth root diameter), and 50% to 60% for keyway applied modifications.

- ⑤ In order to avoid stress concentrations, leave radii on the keyway corners.

Tapping & Keyway Slotting



- ⑥ To avoid problems of reduced gear precision and other manufacturing difficulties, do not attempt to machine the gears to reduce face widths.
- ⑦ KHG Ground Helical Gears are already stress relieved. But if you subject them to a heavy turning operation such as removing the hubs, the residual stress may cause deformation.
- ⑧ When heat-treating SH Helical Gears, it is possible to get thermal stress cracks. It is best to subject them to penetrant inspection afterwards. If the tooth strength is not sufficient, it can be increased approximately four times by heat-treating. On the other hand, the precision of the gear will drop about one grade.

## Heat Treatment

If you apply induction hardening to the gear teeth of S45C products, you need to designate the hardness and where to apply the heat treatment. Below is an example of common specifications and KHK's specifications for hardening:

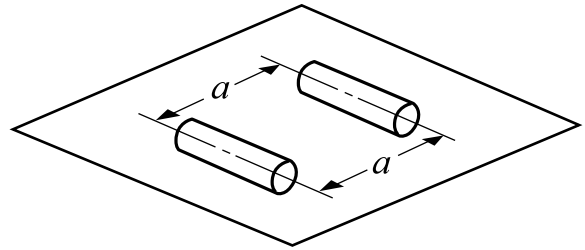
- Common Specifications for Heat Treatment
  - Area: Tooth surface, or, Tooth surface and Tooth root
  - Hardness: Within 10 HRC in the range from 45 to 60 HRC. (e.g. 48 - 58 HRC)
- KHK's Specifications for Heat Treatment
  - Area: Tooth surface, or, Tooth surface and Tooth root
  - Hardness: From 45 to 55 HRC.

\*Hardness and Depth of Gear-teeth Induction Hardening  
The hardening method and the state of hardened teeth area are varied depending on the size of gears. Since different hardening treatment is applied in accordance with the module and number of teeth, the hardness level you designate is referred to as the hardness of the pitch line. For some of our products, there may be a case that the hardness at tooth tip / root may not be equal to the hardness you designated.

As to the effective case depth for S45C, it is specified by JIS, as "The distance from the surface of the case to the area with hardness HV450". The case depth differs from area to area of a tooth.

## 2. Points of Caution in Assembling

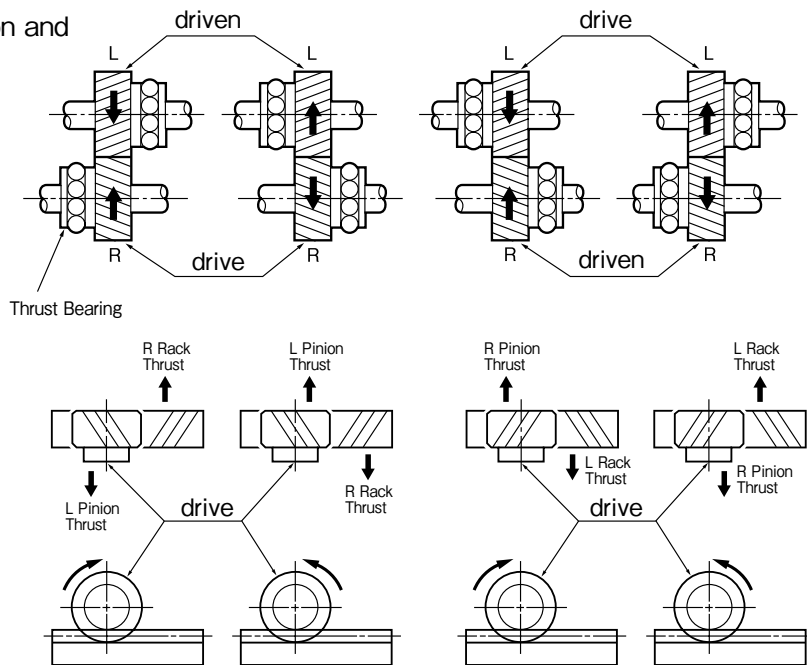
- ① KHK stock helical gears are designed to give the proper backlash when assembled using the center distance given by the formula on the right (center distance tolerance of H7/H8). The amount of backlash is given in the product table for each gear.
- ② Please refer to overall length tolerance for Helical Gears on page 37.
- ③ Because of the helix of the gear teeth, helical gears in mesh produce thrust forces in the axial directions. The axial thrust bearings must be able to resist these forces. The direction of the thrust forces depend on the helix hand and the direction of rotation as shown below. For details, please refer to the technical reference, section of "Gear Forces" (Page 699).



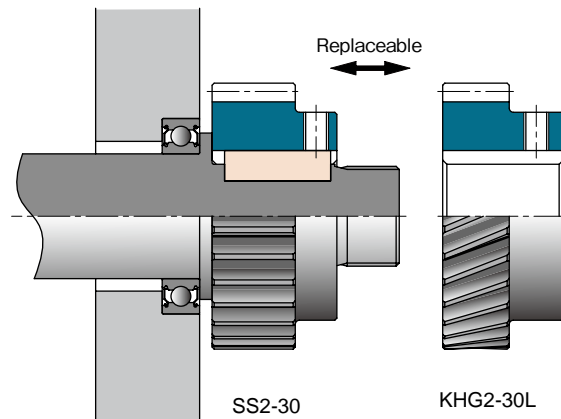
$$a = \frac{d_1 + d_2}{2}$$

where  
 a : Center Distance  
 d<sub>1</sub> : Pitch Diameter of Pinion  
 d<sub>2</sub> : Pitch Diameter of Gear

### Direction of Rotation and Thrust Force



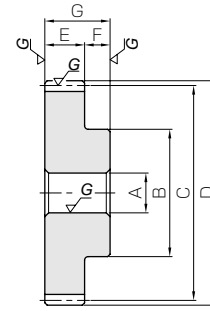
## Application Examples



To increase strength, the SS2-30 Spur Gear is replaced with the KHG2-30R Helical Gear (mating with the left hand of KHG).



Specifications	
Precision grade	JIS grade N6 (JIS B1702-1: 1998) JIS grade 2 (JIS B1702: 1976)
Reference section of gear	Rotating plane
Gear teeth	Standard full depth
Transverse pressure angle	20°
Helix angle	21°30'
Material	SCM440
Heat treatment	Thermal refined, tooth surface induction hardened
Tooth hardness	45 ~ 55HRC

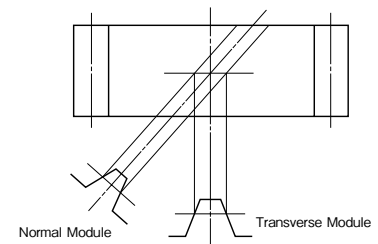


S1

Catalog No.	Module	No. of teeth	Direction of helix	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length
					AH7	B	C	D	E	F	G
KHG1-20R KHG1-20L	m1	20	R L	S1	6	17	20	22	8	10	18
KHG1-22R KHG1-22L		22	R L	S1	8	18	22	24	8	10	18
KHG1-24R KHG1-24L		24	R L	S1	8	20	24	26	8	10	18
KHG1-25R KHG1-25L		25	R L	S1	8	20	25	27	8	10	18
KHG1-28R KHG1-28L		28	R L	S1	8	20	28	30	8	10	18
KHG1-30R KHG1-30L		30	R L	S1	10	25	30	32	8	10	18
KHG1-32R KHG1-32L		32	R L	S1	10	25	32	34	8	10	18
KHG1-35R KHG1-35L		35	R L	S1	10	25	35	37	8	10	18
KHG1-36R KHG1-36L		36	R L	S1	10	25	36	38	8	10	18
KHG1-40R KHG1-40L		40	R L	S1	10	30	40	42	8	10	18
KHG1-44R KHG1-44L		44	R L	S1	10	30	44	46	8	10	18
KHG1-45R KHG1-45L		45	R L	S1	10	30	45	47	8	10	18
KHG1-48R KHG1-48L		48	R L	S1	10	30	48	50	8	10	18
KHG1-50R KHG1-50L		50	R L	S1	12	35	50	52	8	10	18
KHG1-60R KHG1-60L		60	R L	S1	12	40	60	62	8	10	18
KHG1-70R KHG1-70L		70	R L	S1	12	40	70	72	8	10	18
KHG1-80R KHG1-80L		80	R L	S1	15	50	80	82	8	10	18
KHG1-90R KHG1-90L		90	R L	S1	15	50	90	92	8	10	18
KHG1-100R KHG1-100L		100	R L	S1	15	50	100	102	8	10	18

[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 349 for more details.
- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.
- ③ These gears produce axial thrust forces. See page 351 for more details.
- ④ Right handed and left handed helical gears in the same module are designed to mesh as a pair, but KHG gears are not interchangeable with SH type helical gears.



\* Above is for illustration purposes only and differs from actual tooth forms. To find more details, please see the section "4.3 Helical Gears" in the technical reference (Page 614).



Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No.
Bending strength	Surface durability	Bending strength	Surface durability			
7.79	4.98	0.79	0.51	0.08~0.16	0.034	<b>KHG1-20R</b> <b>KHG1-20L</b>
8.92	6.14	0.91	0.63	0.08~0.16	0.037	<b>KHG1-22R</b> <b>KHG1-22L</b>
10.1	7.43	1.03	0.76	0.08~0.16	0.046	<b>KHG1-24R</b> <b>KHG1-24L</b>
10.7	8.12	1.09	0.83	0.08~0.16	0.048	<b>KHG1-25R</b> <b>KHG1-25L</b>
12.4	10.4	1.27	1.06	0.08~0.16	0.056	<b>KHG1-28R</b> <b>KHG1-28L</b>
13.6	12.1	1.39	1.23	0.08~0.16	0.072	<b>KHG1-30R</b> <b>KHG1-30L</b>
13.5	12.6	1.37	1.29	0.08~0.16	0.078	<b>KHG1-32R</b> <b>KHG1-32L</b>
15.1	15.4	1.54	1.57	0.08~0.16	0.088	<b>KHG1-35R</b> <b>KHG1-35L</b>
15.7	16.3	1.60	1.67	0.08~0.16	0.091	<b>KHG1-36R</b> <b>KHG1-36L</b>
17.9	20.5	1.83	2.10	0.08~0.16	0.12	<b>KHG1-40R</b> <b>KHG1-40L</b>
20.2	25.3	2.06	2.58	0.08~0.16	0.14	<b>KHG1-44R</b> <b>KHG1-44L</b>
20.7	26.5	2.12	2.71	0.08~0.16	0.14	<b>KHG1-45R</b> <b>KHG1-45L</b>
22.5	30.5	2.29	3.11	0.08~0.16	0.16	<b>KHG1-48R</b> <b>KHG1-48L</b>
23.6	33.3	2.41	3.40	0.08~0.16	0.18	<b>KHG1-50R</b> <b>KHG1-50L</b>
29.3	49.4	2.99	5.04	0.10~0.18	0.26	<b>KHG1-60R</b> <b>KHG1-60L</b>
35.2	68.9	3.58	7.02	0.10~0.18	0.32	<b>KHG1-70R</b> <b>KHG1-70L</b>
41.0	91.8	4.18	9.36	0.10~0.18	0.44	<b>KHG1-80R</b> <b>KHG1-80L</b>
46.9	118	4.78	12.1	0.10~0.18	0.53	<b>KHG1-90R</b> <b>KHG1-90L</b>
50.4	142	5.14	14.5	0.10~0.18	0.62	<b>KHG1-100R</b> <b>KHG1-100L</b>

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 350) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 1 to 2 mm).
- ③ While cutting off the entire hub may cause curvature deformation by residual stress, some products are straightened and annealed after refining the material.

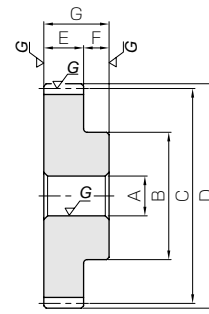
Spur  
GearsHelical  
GearsInternal  
Gears

Racks

CP Racks  
& PinionsMiter  
GearsBevel  
GearsScrew  
GearsWorm  
Gear PairBevel  
GearboxesOther  
Products



Specifications	
Precision grade	JIS grade N6 (JIS B1702-1: 1998) JIS grade 2 (JIS B1702: 1976)
Reference section of gear	Rotating plane
Gear teeth	Standard full depth
Transverse pressure angle	20°
Helix angle	21°30'
Material	SCM440
Heat treatment	Thermal refined, tooth surface induction hardened
Tooth hardness	45 ~ 55HRC

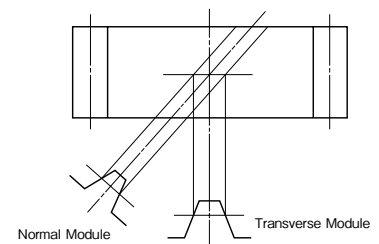


S1

Catalog No.	Module	No. of teeth	Direction of helix	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length
					A <sub>H7</sub>	B	C	D	E	F	G
KHG1.5-20R KHG1.5-20L	m1.5	20	R L	S1	12	24	30	33	12	12	24
KHG1.5-22R KHG1.5-22L		22	R L	S1	12	26	33	36	12	12	24
KHG1.5-24R KHG1.5-24L		24	R L	S1	12	28	36	39	12	12	24
KHG1.5-25R KHG1.5-25L		25	R L	S1	12	30	37.5	40.5	12	12	24
KHG1.5-26R KHG1.5-26L		26	R L	S1	12	32	39	42	12	12	24
KHG1.5-28R KHG1.5-28L		28	R L	S1	15	36	42	45	12	12	24
KHG1.5-30R KHG1.5-30L		30	R L	S1	15	38	45	48	12	12	24
KHG1.5-32R KHG1.5-32L		32	R L	S1	15	40	48	51	12	12	24
KHG1.5-35R KHG1.5-35L		35	R L	S1	15	42	52.5	55.5	12	12	24
KHG1.5-36R KHG1.5-36L		36	R L	S1	15	45	54	57	12	12	24
KHG1.5-40R KHG1.5-40L		40	R L	S1	15	50	60	63	12	12	24
KHG1.5-44R KHG1.5-44L		44	R L	S1	15	50	66	69	12	12	24
KHG1.5-45R KHG1.5-45L		45	R L	S1	18	50	67.5	70.5	12	12	24
KHG1.5-48R KHG1.5-48L		48	R L	S1	18	50	72	75	12	12	24
KHG1.5-50R KHG1.5-50L		50	R L	S1	18	60	75	78	12	12	24
KHG1.5-52R KHG1.5-52L		52	R L	S1	18	60	78	81	12	12	24
KHG1.5-60R KHG1.5-60L		60	R L	S1	20	60	90	93	12	12	24
KHG1.5-70R KHG1.5-70L		70	R L	S1	20	60	105	108	12	12	24
KHG1.5-80R KHG1.5-80L		80	R L	S1	20	70	120	123	12	12	24
KHG1.5-90R KHG1.5-90L		90	R L	S1	20	70	135	138	12	12	24
KHG1.5-100R KHG1.5-100L	100	R L	S1	20	70	150	153	12	12	24	

[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 349 for more details.
- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.
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Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No.
Bending strength	Surface durability	Bending strength	Surface durability			
26.3	18.5	2.68	1.89	0.08~0.16	0.088	<b>KHG1.5-20R</b> <b>KHG1.5-20L</b>
27.4	20.8	2.79	2.12	0.08~0.16	0.11	<b>KHG1.5-22R</b> <b>KHG1.5-22L</b>
30.9	25.3	3.15	2.58	0.08~0.16	0.13	<b>KHG1.5-24R</b> <b>KHG1.5-24L</b>
32.7	27.7	3.33	2.83	0.08~0.16	0.15	<b>KHG1.5-25R</b> <b>KHG1.5-25L</b>
34.5	30.2	3.52	3.08	0.08~0.16	0.17	<b>KHG1.5-26R</b> <b>KHG1.5-26L</b>
38.1	35.7	3.89	3.64	0.08~0.16	0.19	<b>KHG1.5-28R</b> <b>KHG1.5-28L</b>
41.8	41.6	4.26	4.24	0.08~0.16	0.22	<b>KHG1.5-30R</b> <b>KHG1.5-30L</b>
45.5	48.0	4.64	4.89	0.08~0.16	0.26	<b>KHG1.5-32R</b> <b>KHG1.5-32L</b>
51.1	58.5	5.21	5.96	0.10~0.18	0.30	<b>KHG1.5-35R</b> <b>KHG1.5-35L</b>
52.9	62.2	5.40	6.35	0.10~0.18	0.33	<b>KHG1.5-36R</b> <b>KHG1.5-36L</b>
60.5	78.5	6.17	8.00	0.10~0.18	0.42	<b>KHG1.5-40R</b> <b>KHG1.5-40L</b>
68.1	96.8	6.95	9.87	0.10~0.18	0.47	<b>KHG1.5-44R</b> <b>KHG1.5-44L</b>
70.0	102	7.14	10.4	0.10~0.18	0.47	<b>KHG1.5-45R</b> <b>KHG1.5-45L</b>
75.8	117	7.73	12.0	0.10~0.18	0.52	<b>KHG1.5-48R</b> <b>KHG1.5-48L</b>
79.6	128	8.12	13.1	0.10~0.18	0.63	<b>KHG1.5-50R</b> <b>KHG1.5-50L</b>
83.5	140	8.51	14.2	0.10~0.18	0.67	<b>KHG1.5-52R</b> <b>KHG1.5-52L</b>
99.1	191	10.1	19.5	0.10~0.18	0.81	<b>KHG1.5-60R</b> <b>KHG1.5-60L</b>
114	256	11.6	26.1	0.12~0.20	1.02	<b>KHG1.5-70R</b> <b>KHG1.5-70L</b>
132	343	13.5	35.0	0.12~0.20	1.37	<b>KHG1.5-80R</b> <b>KHG1.5-80L</b>
151	442	15.4	45.1	0.12~0.20	1.65	<b>KHG1.5-90R</b> <b>KHG1.5-90L</b>
170	554	17.4	56.5	0.12~0.20	1.97	<b>KHG1.5-100R</b> <b>KHG1.5-100L</b>

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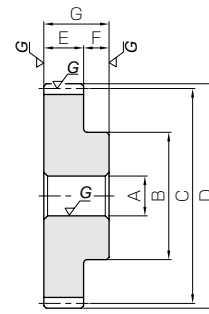
Spur  
GearsHelical  
GearsInternal  
Gears

Racks

CP Racks  
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Gear PairBevel  
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Products



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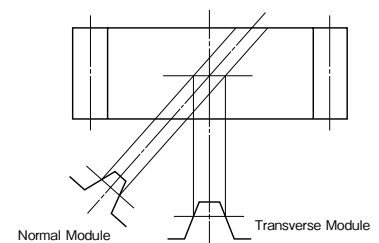
S1

Catalog No.	Module	No. of teeth	Direction of helix	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length
					AH7	B	C	D	E	F	G
KHG2-15R KHG2-15L	m2	15	R L	S1	12	24	30	34	16	13	29
KHG2-16R KHG2-16L		16	R L	S1	12	26	32	36	16	13	29
KHG2-18R KHG2-18L		18	R L	S1	12	30	36	40	16	13	29
KHG2-20R KHG2-20L		20	R L	S1	15	32	40	44	16	13	29
KHG2-22R KHG2-22L		22	R L	S1	15	36	44	48	16	13	29
KHG2-24R KHG2-24L		24	R L	S1	15	38	48	52	16	13	29
KHG2-25R KHG2-25L		25	R L	S1	15	40	50	54	16	13	29
KHG2-26R KHG2-26L		26	R L	S1	15	42	52	56	16	13	29
KHG2-28R KHG2-28L		28	R L	S1	15	45	56	60	16	13	29
KHG2-30R KHG2-30L		30	R L	S1	18	50	60	64	16	13	29
KHG2-32R KHG2-32L		32	R L	S1	18	50	64	68	16	13	29
KHG2-35R KHG2-35L		35	R L	S1	18	50	70	74	16	13	29
KHG2-36R KHG2-36L		36	R L	S1	18	50	72	76	16	13	29
KHG2-40R KHG2-40L		40	R L	S1	20	60	80	84	16	13	29
KHG2-44R KHG2-44L		44	R L	S1	20	60	88	92	16	13	29
KHG2-45R KHG2-45L		45	R L	S1	20	60	90	94	16	13	29
KHG2-48R KHG2-48L		48	R L	S1	20	60	96	100	16	13	29
KHG2-50R KHG2-50L		50	R L	S1	25	60	100	104	16	13	29
KHG2-52R KHG2-52L		52	R L	S1	25	65	104	108	16	13	29
KHG2-60R KHG2-60L		60	R L	S1	25	65	120	124	16	13	29
KHG2-70R KHG2-70L	70	R L	S1	25	70	140	144	16	13	29	
KHG2-80R KHG2-80L	80	R L	S1	25	80	160	164	16	13	29	
KHG2-90R KHG2-90L	90	R L	S1	25	90	180	184	16	13	29	
KHG2-100R KHG2-100L	100	R L	S1	25	100	200	204	16	13	29	

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- ④ Right handed and left handed helical gears in the same module are designed to mesh as a pair, but KHG gears are not interchangeable with SH type helical gears.

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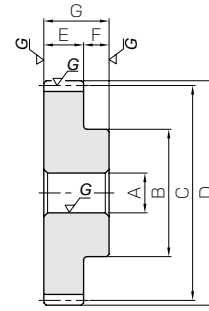


Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No.
Bending strength	Surface durability	Bending strength	Surface durability			
40.5	22.8	4.13	2.32	0.10~0.20	0.11	KHG2-15R KHG2-15L
40.6	24.1	4.14	2.46	0.10~0.20	0.13	KHG2-16R KHG2-16L
48.5	31.9	4.95	3.25	0.10~0.20	0.17	KHG2-18R KHG2-18L
56.6	40.8	5.77	4.16	0.10~0.20	0.20	KHG2-20R KHG2-20L
64.9	50.6	6.62	5.16	0.10~0.20	0.25	KHG2-22R KHG2-22L
73.3	61.4	7.47	6.26	0.10~0.20	0.30	KHG2-24R KHG2-24L
77.5	67.3	7.90	6.86	0.10~0.20	0.33	KHG2-25R KHG2-25L
81.8	73.4	8.34	7.49	0.12~0.22	0.37	KHG2-26R KHG2-26L
90.4	86.6	9.21	8.83	0.12~0.22	0.43	KHG2-28R KHG2-28L
99.1	101	10.1	10.3	0.12~0.22	0.50	KHG2-30R KHG2-30L
108	117	11.0	11.9	0.12~0.22	0.55	KHG2-32R KHG2-32L
121	142	12.3	14.5	0.12~0.22	0.63	KHG2-35R KHG2-35L
126	151	12.8	15.4	0.12~0.22	0.65	KHG2-36R KHG2-36L
143	191	14.6	19.5	0.12~0.22	0.85	KHG2-40R KHG2-40L
161	236	16.5	24.0	0.12~0.22	0.98	KHG2-44R KHG2-44L
166	248	16.9	25.3	0.12~0.22	1.02	KHG2-45R KHG2-45L
172	273	17.5	27.9	0.12~0.22	1.13	KHG2-48R KHG2-48L
181	299	18.4	30.5	0.12~0.22	1.16	KHG2-50R KHG2-50L
189	326	19.3	33.2	0.14~0.24	1.29	KHG2-52R KHG2-52L
225	447	22.9	45.6	0.14~0.24	1.65	KHG2-60R KHG2-60L
269	625	27.4	63.7	0.14~0.24	2.21	KHG2-70R KHG2-70L
301	799	30.7	81.4	0.14~0.24	2.93	KHG2-80R KHG2-80L
344	1030	35.0	105	0.14~0.24	3.73	KHG2-90R KHG2-90L
387	1290	39.4	132	0.14~0.24	4.64	KHG2-100R KHG2-100L

- [Caution on Secondary Operations]
- ① Please read "Caution on Performing Secondary Operations" (Page 350) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
  - ② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 1 to 2 mm).
  - ③ While cutting off the entire hub may cause curvature deformation by residual stress, some products are straightened and annealed after refining the material.



Specifications	
Precision grade	JIS grade N6 (JIS B1702-1: 1998) JIS grade 2 (JIS B1702: 1976)
Reference section of gear	Rotating plane
Gear teeth	Standard full depth
Transverse pressure angle	20°
Helix angle	21°30'
Material	SCM440
Heat treatment	Thermal refined, tooth surface induction hardened
Tooth hardness	45 ~ 55HRC

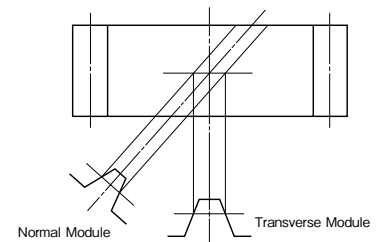


S1

Catalog No.	Module	No. of teeth	Direction of helix	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length
					A <sub>H7</sub>	B	C	D	E	F	G
KHG2.5-15R KHG2.5-15L	m2.5	15	R L	S1	15	30	37.5	42.5	20	14	34
KHG2.5-16R KHG2.5-16L		16	R L	S1	15	32	40	45	20	14	34
KHG2.5-18R KHG2.5-18L		18	R L	S1	15	38	45	50	20	14	34
KHG2.5-20R KHG2.5-20L		20	R L	S1	18	40	50	55	20	14	34
KHG2.5-22R KHG2.5-22L		22	R L	S1	18	44	55	60	20	14	34
KHG2.5-24R KHG2.5-24L		24	R L	S1	18	48	60	65	20	14	34
KHG2.5-25R KHG2.5-25L		25	R L	S1	20	50	62.5	67.5	20	14	34
KHG2.5-26R KHG2.5-26L		26	R L	S1	20	50	65	70	20	14	34
KHG2.5-28R KHG2.5-28L		28	R L	S1	20	60	70	75	20	14	34
KHG2.5-30R KHG2.5-30L		30	R L	S1	20	65	75	80	20	14	34
KHG2.5-32R KHG2.5-32L		32	R L	S1	20	70	80	85	20	14	34
KHG2.5-35R KHG2.5-35L		35	R L	S1	20	70	87.5	92.5	20	14	34
KHG2.5-36R KHG2.5-36L		36	R L	S1	20	70	90	95	20	14	34
KHG2.5-40R KHG2.5-40L		40	R L	S1	25	70	100	105	20	14	34
KHG2.5-44R KHG2.5-44L		44	R L	S1	25	75	110	115	20	14	34
KHG2.5-45R KHG2.5-45L		45	R L	S1	25	75	112.5	117.5	20	14	34
KHG2.5-48R KHG2.5-48L		48	R L	S1	25	75	120	125	20	14	34
KHG2.5-50R KHG2.5-50L		50	R L	S1	25	80	125	130	20	14	34
KHG2.5-52R KHG2.5-52L		52	R L	S1	25	80	130	135	20	14	34
KHG2.5-60R KHG2.5-60L		60	R L	S1	25	80	150	155	20	14	34

[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 349 for more details.
- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.
- ③ These gears produce axial thrust forces. See page 351 for more details.
- ④ Right handed and left handed helical gears in the same module are designed to mesh as a pair, but KHG gears are not interchangeable with SH type helical gears.



\* Above is for illustration purposes only and differs from actual tooth forms. To find more details, please see the section "4.3 Helical Gears" in the technical reference (Page 614).

Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No.
Bending strength	Surface durability	Bending strength	Surface durability			
71.8	41.1	7.32	4.19	0.10~0.20	0.20	KHG2.5-15R KHG2.5-15L
79.4	47.9	8.09	4.89	0.10~0.20	0.24	KHG2.5-16R KHG2.5-16L
94.8	63.4	9.67	6.47	0.10~0.20	0.33	KHG2.5-18R KHG2.5-18L
111	81.3	11.3	8.29	0.10~0.20	0.38	KHG2.5-20R KHG2.5-20L
127	101	12.9	10.3	0.12~0.22	0.47	KHG2.5-22R KHG2.5-22L
143	122	14.6	12.5	0.12~0.22	0.57	KHG2.5-24R KHG2.5-24L
151	134	15.4	13.7	0.12~0.22	0.61	KHG2.5-25R KHG2.5-25L
160	146	16.3	14.9	0.12~0.22	0.65	KHG2.5-26R KHG2.5-26L
176	173	18.0	17.6	0.12~0.22	0.83	KHG2.5-28R KHG2.5-28L
193	201	19.7	20.5	0.12~0.22	0.97	KHG2.5-30R KHG2.5-30L
211	232	21.5	23.7	0.12~0.22	1.13	KHG2.5-32R KHG2.5-32L
236	284	24.1	28.9	0.12~0.22	1.28	KHG2.5-35R KHG2.5-35L
245	302	25.0	30.8	0.12~0.22	1.34	KHG2.5-36R KHG2.5-36L
268	365	27.3	37.2	0.12~0.22	1.53	KHG2.5-40R KHG2.5-40L
302	451	30.8	46.0	0.14~0.24	1.85	KHG2.5-44R KHG2.5-44L
310	474	31.6	48.3	0.14~0.24	1.92	KHG2.5-45R KHG2.5-45L
336	547	34.2	55.8	0.14~0.24	2.13	KHG2.5-48R KHG2.5-48L
353	599	36.0	61.0	0.14~0.24	2.35	KHG2.5-50R KHG2.5-50L
370	652	37.7	66.5	0.14~0.24	2.51	KHG2.5-52R KHG2.5-52L
439	890	44.7	90.8	0.14~0.24	3.20	KHG2.5-60R KHG2.5-60L

- [Caution on Secondary Operations]
- ① Please read "Caution on Performing Secondary Operations" (Page 350) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
  - ② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 1 to 2 mm).
  - ③ While cutting off the entire hub may cause curvature deformation by residual stress, some products are straightened and annealed after refining the material.

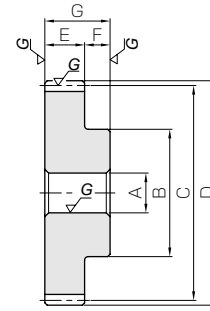
Spur  
GearsHelical  
GearsInternal  
Gears

Racks

CP Racks  
& PinionsMiter  
GearsBevel  
GearsScrew  
GearsWorm  
Gear PairBevel  
GearboxesOther  
Products



Specifications	
Precision grade	JIS grade N6 (JIS B1702-1: 1998) JIS grade 2 (JIS B1702: 1976)
Reference section of gear	Rotating plane
Gear teeth	Standard full depth
Transverse pressure angle	20°
Helix angle	21°30'
Material	SCM440
Heat treatment	Thermal refined, tooth surface induction hardened
Tooth hardness	45 ~ 55HRC

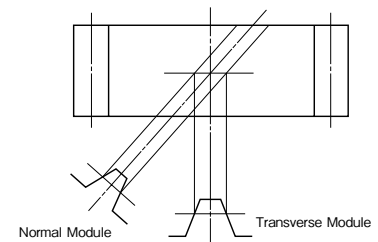


S1

Catalog No.	Module	No. of teeth	Direction of helix	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length
					A <sub>H7</sub>	B	C	D	E	F	G
KHG3-15R KHG3-15L	m3	15	R L	S1	18	36	45	51	25	16	41
KHG3-16R KHG3-16L		16	R L	S1	18	38	48	54	25	16	41
KHG3-18R KHG3-18L		18	R L	S1	18	40	54	60	25	16	41
KHG3-20R KHG3-20L		20	R L	S1	20	50	60	66	25	16	41
KHG3-22R KHG3-22L		22	R L	S1	20	54	66	72	25	16	41
KHG3-24R KHG3-24L		24	R L	S1	20	58	72	78	25	16	41
KHG3-25R KHG3-25L		25	R L	S1	20	60	75	81	25	16	41
KHG3-26R KHG3-26L		26	R L	S1	20	60	78	84	25	16	41
KHG3-28R KHG3-28L		28	R L	S1	20	70	84	90	25	16	41
KHG3-30R KHG3-30L		30	R L	S1	25	75	90	96	25	16	41
KHG3-32R KHG3-32L		32	R L	S1	25	75	96	102	25	16	41
KHG3-35R KHG3-35L		35	R L	S1	25	80	105	111	25	16	41
KHG3-36R KHG3-36L		36	R L	S1	25	80	108	114	25	16	41
KHG3-40R KHG3-40L		40	R L	S1	25	80	120	126	25	16	41
KHG3-44R KHG3-44L		44	R L	S1	25	80	132	138	25	16	41
KHG3-45R KHG3-45L		45	R L	S1	25	80	135	141	25	16	41
KHG3-48R KHG3-48L		48	R L	S1	25	85	144	150	25	16	41
KHG3-50R KHG3-50L		50	R L	S1	30	85	150	156	25	16	41
KHG3-52R KHG3-52L		52	R L	S1	30	85	156	162	25	16	41
KHG3-60R KHG3-60L		60	R L	S1	30	90	180	186	25	16	41

[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 349 for more details.
- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.
- ③ These gears produce axial thrust forces. See page 351 for more details.
- ④ Right handed and left handed helical gears in the same module are designed to mesh as a pair, but KHG gears are not interchangeable with SH type helical gears.



\* Above is for illustration purposes only and differs from actual tooth forms. To find more details, please see the section "4.3 Helical Gears" in the technical reference (Page 614).



Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No.
Bending strength	Surface durability	Bending strength	Surface durability			
129	74.7	13.2	7.62	0.10~0.20	0.36	KHG3-15R KHG3-15L
143	87.2	14.6	8.89	0.10~0.20	0.42	KHG3-16R KHG3-16L
171	115	17.4	11.8	0.12~0.22	0.53	KHG3-18R KHG3-18L
199	148	20.3	15.1	0.12~0.22	0.70	KHG3-20R KHG3-20L
228	184	23.3	18.8	0.12~0.22	0.86	KHG3-22R KHG3-22L
258	224	26.3	22.8	0.12~0.22	1.03	KHG3-24R KHG3-24L
272	245	27.8	25.0	0.12~0.22	1.12	KHG3-25R KHG3-25L
287	268	29.3	27.3	0.12~0.22	1.19	KHG3-26R KHG3-26L
318	316	32.4	32.2	0.12~0.22	1.47	KHG3-28R KHG3-28L
348	369	35.5	37.6	0.12~0.22	1.65	KHG3-30R KHG3-30L
363	407	37.0	41.5	0.12~0.22	1.82	KHG3-32R KHG3-32L
407	498	41.5	50.7	0.14~0.24	2.17	KHG3-35R KHG3-35L
422	530	43.0	54.0	0.14~0.24	2.27	KHG3-36R KHG3-36L
482	670	49.2	68.3	0.14~0.24	2.69	KHG3-40R KHG3-40L
543	828	55.4	84.4	0.14~0.24	3.16	KHG3-44R KHG3-44L
558	869	56.9	88.6	0.14~0.24	3.28	KHG3-45R KHG3-45L
604	1000	61.6	102	0.14~0.24	3.75	KHG3-48R KHG3-48L
635	1090	64.7	112	0.14~0.24	3.95	KHG3-50R KHG3-50L
666	1190	67.9	122	0.14~0.24	4.24	KHG3-52R KHG3-52L
757	1560	77.2	159	0.14~0.24	5.57	KHG3-60R KHG3-60L

- [Caution on Secondary Operations]
- ① Please read "Caution on Performing Secondary Operations" (Page 350) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
  - ② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 1 to 2 mm).
  - ③ While cutting off the entire hub may cause curvature deformation by residual stress, some products are straightened and annealed after refining the material.

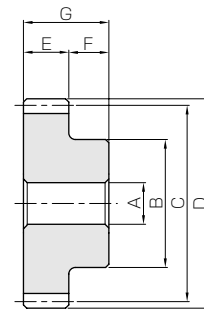
Spur  
GearsHelical  
GearsInternal  
Gears

Racks

CP Racks  
& PinionsMiter  
GearsBevel  
GearsScrew  
GearsWorm  
Gear PairBevel  
GearboxesOther  
Products



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) JIS grade 4 (JIS B1702: 1976)
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Transverse pressure angle	20°
Helix angle	15°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB

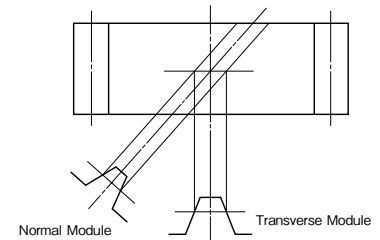


S1

Catalog No.	Module	No. of teeth	Direction of helix	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length
					A <sub>H7</sub>	B	C	D	E	F	G
SH2-15R SH2-15L	m2	15	R L	S1	12	24	31.06	35.06	25	10	35
SH2-20R SH2-20L		20	R L	S1	12	32	41.41	45.41	25	10	35
SH2-30R SH2-30L		30	R L	S1	12	50	62.12	66.12	25	10	35
SH2-40R SH2-40L		40	R L	S1	18	60	82.82	86.82	25	10	35
SH2-60R SH2-60L		60	R L	S1	18	70	124.23	128.23	25	10	35
SH2-90R SH2-90L		90	R L	S1	18	120	186.35	190.35	25	10	35
SH3-15R SH3-15L		m3	15	R L	S1	15	36	46.59	52.59	35	15
SH3-20R SH3-20L	20		R L	S1	15	50	62.12	68.12	35	15	50
SH3-30R SH3-30L	30		R L	S1	20	70	93.17	99.17	35	15	50
SH3-40R SH3-40L	40		R L	S1	20	80	124.23	130.23	35	15	50
SH3-60R SH3-60L	60		R L	S1	20	140	186.35	192.35	35	15	50

[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 349 for more details.
- ② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.
- ③ These gears produce axial thrust forces. See page 351 for more details.
- ④ Right handed and left handed helical gears in the same module are designed to mesh as a pair, but SH gears are not interchangeable with KHG type helical gears.



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Spur Gears  
Helical Gears  
Internal Gears  
Racks  
CP Racks & Pinions  
Miter Gears  
Bevel Gears  
Screw Gears  
Worm Gear Pair  
Bevel Gearboxes  
Other Products

Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No.
Bending strength	Surface durability	Bending strength	Surface durability			
43.7	2.90	4.46	0.30	0.12~0.26	0.15	SH2-15R SH2-15L
67.1	5.85	6.84	0.60	0.12~0.26	0.30	SH2-20R SH2-20L
117	15.3	11.9	1.56	0.14~0.30	0.72	SH2-30R SH2-30L
169	28.9	17.2	2.95	0.14~0.30	1.21	SH2-40R SH2-40L
275	70.8	28.0	7.22	0.18~0.36	2.61	SH2-60R SH2-60L
437	173	44.6	17.6	0.20~0.44	6.17	SH2-90R SH2-90L
138	9.67	14.0	0.99	0.14~0.32	0.52	SH3-15R SH3-15L
211	19.4	21.6	1.98	0.14~0.32	0.99	SH3-20R SH3-20L
368	50.2	37.5	5.12	0.18~0.38	2.20	SH3-30R SH3-30L
531	95.5	54.1	9.73	0.18~0.38	3.80	SH3-40R SH3-40L
866	236	88.3	24.0	0.20~0.44	9.18	SH3-60R SH3-60L

- [Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 350) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.

#### ■ SH Helical Gear Center Distance

Catalog No.	SH2-15 <sup>R</sup> <sub>L</sub>	SH2-20 <sup>R</sup> <sub>L</sub>	SH2-30 <sup>R</sup> <sub>L</sub>	SH2-40 <sup>R</sup> <sub>L</sub>	SH2-60 <sup>R</sup> <sub>L</sub>	SH2-90 <sup>R</sup> <sub>L</sub>
SH2-15 <sup>R</sup> <sub>L</sub>	31.06	—	—	—	—	—
SH2-20 <sup>R</sup> <sub>L</sub>	36.23	41.41	—	—	—	—
SH2-30 <sup>R</sup> <sub>L</sub>	46.59	51.76	62.12	—	—	—
SH2-40 <sup>R</sup> <sub>L</sub>	56.94	62.12	72.47	82.82	—	—
SH2-60 <sup>R</sup> <sub>L</sub>	77.65	82.82	93.17	103.53	124.23	—
SH2-90 <sup>R</sup> <sub>L</sub>	108.70	113.88	124.23	134.59	155.29	186.35

#### ■ SH Helical Gear Center Distance

Catalog No.	SH3-15 <sup>R</sup> <sub>L</sub>	SH3-20 <sup>R</sup> <sub>L</sub>	SH3-30 <sup>R</sup> <sub>L</sub>	SH3-40 <sup>R</sup> <sub>L</sub>	SH3-60 <sup>R</sup> <sub>L</sub>
SH3-15 <sup>R</sup> <sub>L</sub>	46.59	—	—	—	—
SH3-20 <sup>R</sup> <sub>L</sub>	54.35	62.12	—	—	—
SH3-30 <sup>R</sup> <sub>L</sub>	69.88	77.65	93.17	—	—
SH3-40 <sup>R</sup> <sub>L</sub>	85.41	93.17	108.70	124.23	—
SH3-60 <sup>R</sup> <sub>L</sub>	116.47	124.23	139.76	155.29	186.35

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks &amp; Pinions

Miter Gears

Bevel Gears

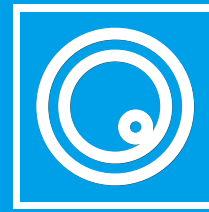
Screw Gears

Worm Gear Pair

Bevel Gearboxes

Other Products



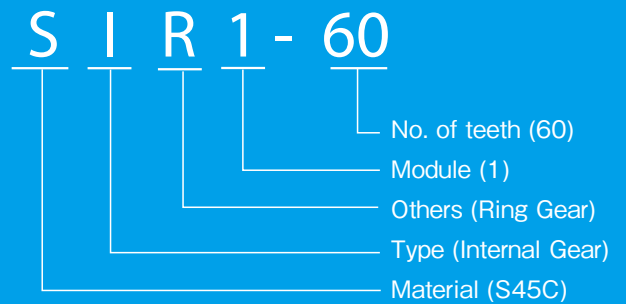


# Internal Gears

## Catalog Number of KHK Stock Gears

The Catalog Number for KHK stock gears is based on the simple formula listed below. Please order KHK gears by specifying the Catalog Numbers.

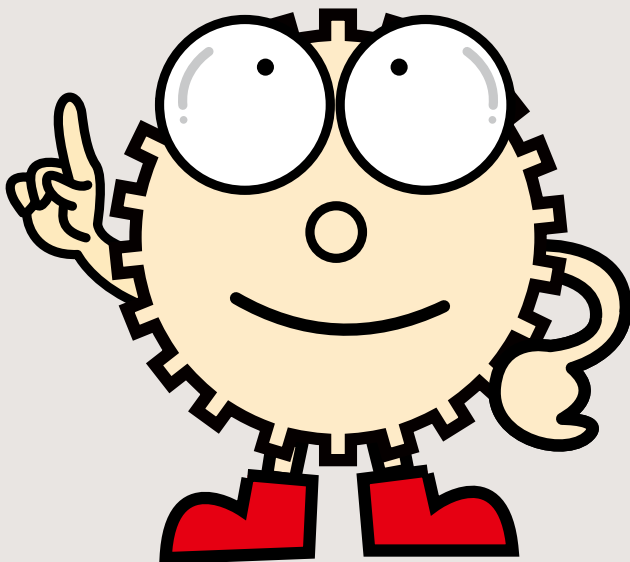
(Example) Internal Geas











**Material**  
S S45C

**Type**  
I Internal Gears

**Other Information**  
R Ring Gears



### Feature Icons

- |  |  |
|--|--|
|  RoHS Compliant Product |  Stainless Product          |
|  Re-machinable Product  |  Resin Product              |
|  Finished Product       |  Copper Alloy Product       |
|  Heat Treated Product   |  Injection Molded Product   |
|  Ground Gear            |  Black Oxide coated Product |

- Spur Gears
- Helical Gears
- Internal Gears**
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

## Characteristics



KHK stock internal gears are offered in modules 0.5 to 3 in 50 to 200 teeth. They can be used in many applications including planetary gear drives.

Catalog No.	SI	SIR
Module	0.5 ~ 3	2 ~ 3
Material	S45C	S45C
Heat Treatment	—	—
Tooth Surface Finish	Cut	Cut
Precision JIS B 1702-1:1998	N8 NOTE 1	N9
Secondary Operations	Possible	Possible
Features	A popular type of internal gear; low cost and suitable for many applications.	Ring gear large in size / number of tooth. It can be cut to make segment gears and corner racks.

(Note 1) The Product accuracy class having a module less than 0.8 corresponds to 'equivalent' as shown in the table.

## Selection Hints



Please select the most suitable products by carefully considering the characteristics of items and contents of the product tables. It is also important to read all applicable notes before the final selection.

### 1. Caution in Selecting the Mating Gears

KHK stock internal gears can mate with any spur gears of the same module, however, there are cases of involute, trochoid and trimming interference occurrences, depending on the number of teeth of the mating gear. Various types of interference and their symptoms and causes are tabulated below, also shown, the number of teeth of allowable mating pinions.

#### Interferences and the symptoms

TYPE	SYMPTOMS	CAUSES
Involute interference	The tip of the internal gear digs into the root of the pinion.	Too few teeth on the pinion.
Trochoid interference	The exiting pinion tooth contacts the internal gear tooth.	Too little difference in number of teeth of the two gears.
Trimming interference	Pinion can slide in or out axially but cannot move radially.	Too little difference in number of teeth of the two gears.

#### Allowable Mating Pinions and Number of Teeth

No. of teeth of Internal Gear	No. of teeth of Allowable Mating Pinions		
	Lower limit No. of teeth by Involute interference	Upper limit No. of teeth by Trochoid interference	Upper limit No. of teeth by Trimming interference
50	22	41	33
60	21	51	43
80	20	72	64
100	19	92	84
120	19	112	104
160	19	152	144
200	18	192	184

## Established equipment and technology. Custom Gears are also available.

Diameter  $\phi$ 700mm maximum, Module 6.5 maximum, Cutting Stroke 170 mm



Gear cutting by CNC Gear Shaper

### 2. Caution in Selecting Gears Based on Gear Strength

The gear strength values shown in the product pages were computed by assuming a certain application environment. Therefore, they should be used as reference only. We recommend that each user computes his own values by applying the actual usage conditions. The table below contains the assumptions established for these products in order to compute gear strengths.

#### Calculation assumptions for Bending Strength of Gears

Item	Catalog No.	SI	SIR
Formula NOTE 1		Formula of spur and helical gears on bending strength (JGMA401-01)	
No. of teeth of mating gears		30	
Rotation		100rpm	
Durability		Over $10^7$ cycles	
Impact from motor		Uniform load	
Impact from load		Uniform load	
Direction of load		Bidirectional	
Allowable beam stress at root $\sigma_{Fim}$ (kgf/mm <sup>2</sup> ) Note 2		19	
Safety factor $S_F$		1.2	

#### Calculation assumptions for Surface Durability (Except where it is common with bending strength)

Item	SI	SIR
Formula NOTE 1	Formula of spur and helical gears on surface durability (JGMA402-01)	
Kinematic viscosity of lubricant	100cSt (50°C)	
Gear support	Symmetric support by bearings	
Allowable Hertz stress $\sigma_{Him}$ (kgf/mm <sup>2</sup> )	49	
Safety factor $S_H$	1.15	

(Note 1) The gear strength formula is based on JGMA (Japanese Gear Manufacturers' Association) The units for the rotational speed (rpm) and the stress (kgf/mm<sup>2</sup>) are adjusted to the units needed in the formula.

(Note 2) Since the load is bidirectional, the allowable bending stress at root  $\sigma_{Fim}$  calculated is set to 2/3 of the value.

## Application Hints



In order to use KHK stock internal gears safely, read the Application Hints carefully before proceeding. Also "1. Caution on Performing Secondary Operations", "3. Notes on Starting Operations" and "4. Other Points to Consider in Applications" in the spur gear section should be consulted (Page 36).

### 1. Point of Caution in Assembling

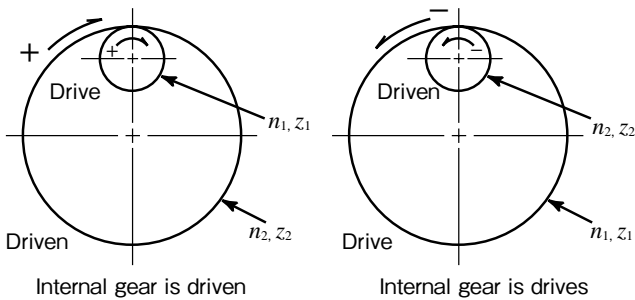
- ① KHK stock internal gears are designed to give the proper backlash when assembled using the center distance given by the formula below. The amount of backlash is given in the product table for each gear.

$$a = \frac{d_2 - d_1}{2}$$

Where  
 $a$  : Center distance  
 $d_1$  : Pitch diameter of Pinion  
 $d_2$  : Pitch diameter of Internal Gear

- ② Note that the direction of rotation of the internal gear is different from that of two spur gears in mesh.

#### Gear Ratio and Direction of Rotation



Gear Ratio  $i = \frac{z_2}{z_1} = \frac{n_1}{n_2}$        $z$  : No. of teeth  
 $n$  : Rotational speed

- ③ To use as a planetary gear drive, the following conditions must be satisfied.

#### Condition on number of teeth in planetary mechanism

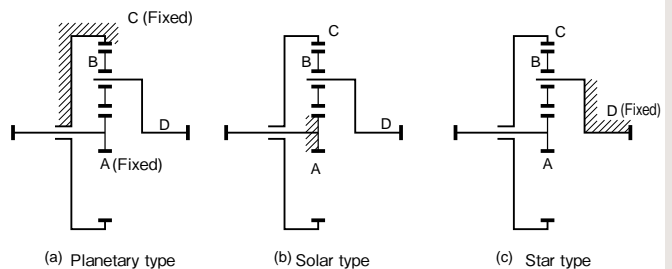
- Condition 1  $\dots z_c = z_a + 2z_b$
- Condition 2  $\dots \frac{z_a + z_c}{N} = \text{Integer}$
- Condition 3  $\dots z_b + 2 < (z_a + z_b) \sin \frac{180^\circ}{N}$

$z_a$  : No. of teeth of Sun Gear  
 $z_b$  : No. of teeth of Planet Gears  
 $z_c$  : No. of teeth of Internal Gear  
 $N$  : No. of Planet Gears

#### Example of combinations

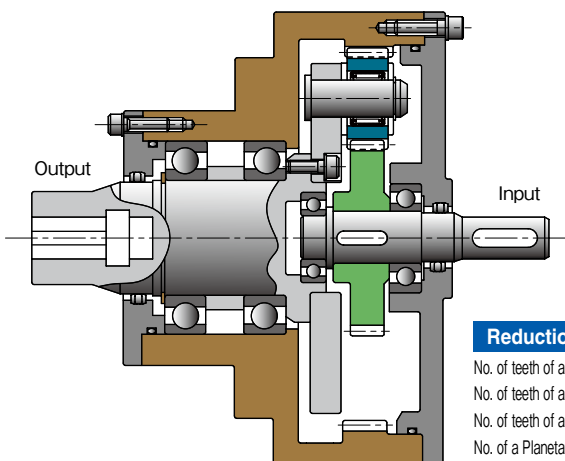
No. of teeth of internal gear	No. of planet gears	No. of teeth of sun gear	No. of teeth of planet gears	Reduction ratio of planetary type	Reduction ratio of solar type	Reduction ratio of star type
60	3	18	21	4.333	1.3	-3.333
80	3	16	32	6	1.2	-5
80	3	40	20	3	1.5	-2
100	3	20	40	6	1.2	-5
100	3	50	25	3	1.5	-2

#### Types of planetary gear reduction mechanism



## Application Examples

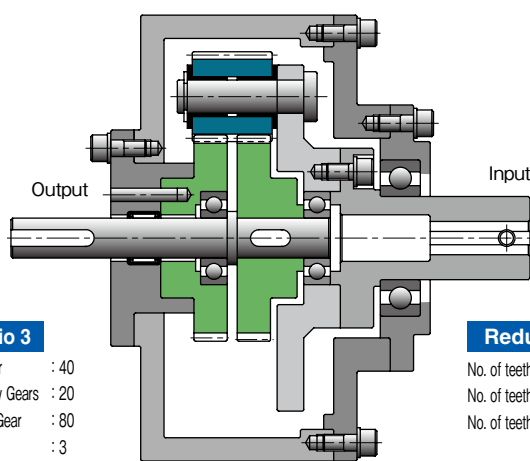
\* The illustration is a design example, not a design for machinery or a device in actual use.



#### Reduction Ratio 3

No. of teeth of a Sun Gear : 40  
 No. of teeth of a Planetary Gears : 20  
 No. of teeth of a Internal Gear : 80  
 No. of a Planetary Gears : 3

Planetary Gear Mechanism used in a reduction gear \*



#### Reduction Ratio 60

No. of teeth of a fixed Sun Gear : 60  
 No. of teeth of a Planetary Gears : 25  
 No. of teeth of a rotating Sun Gear : 61\*  
 \*Negative dislocation

Mechanical Paradox Gear Mechanism used in a large reduction gear

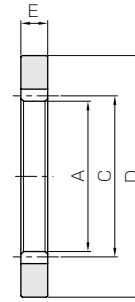


**Newly added**



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB

\* The precision grade of products with a module of less than 0.8 is equivalent to the value shown in the table.



T1

Catalog No. <small>New items indicated in blue letters.</small>	Module	No. of teeth	Shape	Internal dia.				Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)
				A	C	D	E	Bending strength	Surface durability	Bending strength	Surface durability		
<b>SI0.5-60</b> <b>SI0.5-80</b> <b>SI0.5-100</b>	<b>m0.5</b>	60	T1	29	30	50	5	3.75	0.67	0.38	0.07	0.04~0.15	0.049
80		T1	39	40	60	5	4.85	0.75	0.49	0.08	0.04~0.15	0.062	
100		T1	49	50	70	5	5.97	0.87	0.61	0.09	0.04~0.15	0.074	
<b>SI0.8-60</b> <b>SI0.8-80</b> <b>SI0.8-100</b>	<b>m0.8</b>	60	T1	46.4	48	75	8	15.4	2.87	1.57	0.29	0.05~0.16	0.16
80		T1	62.4	64	90	8	19.9	3.24	2.03	0.33	0.05~0.16	0.20	
100		T1	78.4	80	105	8	24.5	3.75	2.50	0.38	0.05~0.16	0.23	
<b>SI1-60</b> <b>SI1-80</b> <b>SI1-100</b>	<b>m1</b>	60	T1	58	60	90	10	30.0	5.95	3.06	0.61	0.10~0.22	0.28
80		T1	78	80	110	10	38.8	6.59	3.96	0.67	0.10~0.22	0.35	
100		T1	98	100	130	10	47.8	7.64	4.87	0.78	0.12~0.25	0.43	
<b>SI1.5-50</b> <b>SI1.5-60</b> <b>SI1.5-80</b> <b>SI1.5-100</b>	<b>m1.5</b>	50	T1	72	75	115	15	87.1	20.9	8.88	2.13	0.13~0.29	0.70
60		T1	87	90	130	15	101	20.6	10.3	2.10	0.13~0.29	0.81	
80		T1	117	120	160	15	131	23.3	13.4	2.38	0.13~0.29	1.04	
100		T1	147	150	190	15	161	27.0	16.5	2.75	0.15~0.32	1.26	
<b>SI2-50</b> <b>SI2-60</b> <b>SI2-80</b> <b>SI2-100</b>	<b>m2</b>	50	T1	96	100	150	20	206	50.3	21.0	5.13	0.16~0.33	1.54
60		T1	116	120	170	20	240	50.5	24.5	5.15	0.16~0.33	1.79	
80		T1	156	160	210	20	311	57.0	31.7	5.81	0.16~0.33	2.28	
100		T1	196	200	250	20	382	65.7	39.0	6.70	0.17~0.37	2.77	
<b>SI2.5-50</b> <b>SI2.5-60</b> <b>SI2.5-80</b>	<b>m2.5</b>	50	T1	120	125	185	25	403	101	41.1	10.3	0.17~0.37	2.87
60		T1	145	150	210	25	469	101	47.8	10.3	0.17~0.37	3.33	
80		T1	195	200	260	25	607	114	61.9	11.6	0.17~0.37	4.25	
<b>SI3-50</b> <b>SI3-60</b>	<b>m3</b>	50	T1	144	150	220	30	697	178	71.0	18.1	0.19~0.41	4.79
60		T1	174	180	250	30	811	178	82.7	18.2	0.19~0.41	5.57	

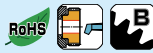
[Caution on Product Characteristics]

- ① The backlash values shown in the table are the theoretical values for the normal direction for the internal ring in mesh with a 30 tooth SS spur gear.
- ② The allowable torque shown in the table are the calculated values according to the assumed usage conditions. Please see page 366 for more details
- ③ Please check for the involute interference, trochoid interference and trimming interference prior to using internal gears.

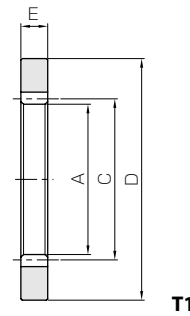
[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.





Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB



Catalog No.	Module	No. of teeth	Shape	Internal dia.				Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)
				A	C	D	E	Bending strength	Surface durability	Bending strength	Surface durability		
<b>SIR2-120</b> <b>SIR2-200</b>	<b>m2</b>	120	T1	236	240	286	20	413	68.8	42.1	7.02	0.17~0.37	2.98
		200	T1	396	400	446	20	677	110	69.0	11.2	0.20~0.41	4.80
<b>SIR2.5-120</b> <b>SIR2.5-200</b>	<b>m2.5</b>	120	T1	295	300	355	25	807	138	82.3	14.0	0.19~0.41	5.55
		200	T1	495	500	555	25	1320	220	135	22.5	0.22~0.46	8.94
<b>SIR3-120</b> <b>SIR3-160</b>	<b>m3</b>	120	T1	354	360	424	30	1390	244	142	24.9	0.22~0.45	9.28
		160	T1	474	480	544	30	1840	315	188	32.1	0.22~0.45	12.1

[Caution on Product Characteristics]

- ① The backlash values shown in the table are the theoretical values for the normal direction for the internal ring in mesh with a 30 tooth SS spur gear.
- ② The allowable torque shown in the table are the calculated values according to the assumed usage conditions. Please see page 366 for more details
- ③ Please check for the involute interference, trochoid interference and trimming interference prior to using internal gears.

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

Bevel Gearboxes

Other Products



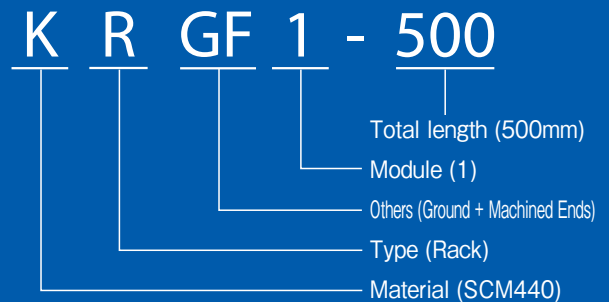


# Racks

## Catalog Number of KHK Stock Gears

The Catalog Number for KHK stock gears is based on the simple formula listed below. Please order KHK gears by specifying their Catalog Numbers.

(Example) Racks



### Material

S S45C  
 K SCM440  
 SU SUS304  
 BS Free Cutting brass C3604  
 P MC901  
 D DURACON

### Other Information

F Racks with Machined Ends  
 D Racks with Bolt Holes  
 K Racks with Drill Holes  
 G Ground Racks

### Type

R Racks  
 RH Helical Racks  
 RO Round Racks

### Feature Icons

- |                        |                            |
|------------------------|----------------------------|
| RoHS Compliant Product | Stainless Product          |
| Re-machinable Product  | Resin Product              |
| Finished Product       | Copper Alloy Product       |
| Heat Treated Product   | Injection Molding Product  |
| Ground Gear            | Black Oxide coated Product |

<b>KRG · KRGF · KRGD</b> Ground Racks  m1 ~ 3 Page 378 	<b>KRF</b> Thermal Refined Racks with Machined Ends  m1.5 ~ 5 Page 378 	<b>SRG · SRGF · SRGFD · SRGFK</b> Ground Racks  m0.5 ~ 6 Page 380 
<b>SR</b> Steel Racks  m0.5 ~ 10 Page 382 	<b>SRF</b> Steel Racks with Machined Ends  m0.5 ~ 10 Page 383 	<b>SRFD · SRFK</b> Steel Racks with Bolt Holes  m0.5 ~ 6 Page 384 
<b>SUR · SURF · SURFD</b> Stainless Steel Racks  m1 ~ 4 Page 386 	<b>PR · PRF</b> Plastic Racks  m1 ~ 3 Page 388 	<b>BSR</b> Brass Racks  m0.5 ~ 1 Page 389 
<b>DR</b> Molded Flexible Racks  m0.8 ~ 2 Page 390 	<b>SSDR Pinions</b> <b>ARL Rack Guide Rails</b> <b>SRS Rack Clamps</b> For Molded Flexible Racks  Page 390 	<b>SRO · SROS</b> Steel Round Racks  m1 ~ 6 Page 392 
<b>SURO</b> Stainless Steel Round Racks  m1 ~ 3 Page 393 	<b>KRHG · KRHGF</b> Ground Helical Racks  m1 ~ 3 Page 394 	<b>SRH · SRHF · SRHFD</b> Steel Helical Racks  m2, 3 Page 396 

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

Bevel Gearboxes

Other Products

Bevel Gearboxes

Other Products

Other Products

## Characteristics



KHK stock racks are made for high precision linear motion applications. We offer a large selection of racks ranging from module 0.5 to 10 and lengths from 100 to 2000 mm. The following table lists the main features.

Catalog No.	Module	Total Length (mm)	Material	Heat Treatment	Tooth Surface Finish	Precision KHK R 001 Note 3	Features
<b>KRG · KRGF · KRGD</b> Note 1	1 ~ 3	100,500, 1000	SCM440	Thermal refined	Ground	1	High strength and abrasion-resistant for precision linear motion.
<b>KRF</b>	1.5 ~ 5	1000	SCM440	Thermal refined	Cut	4	Increased strength with SCM440 material which is thermal refined.
<b>SRG · SRGF · SRGFD · SRGFK</b> Note 1	0.5 ~ 6	100,300, 500,1000	S45C	Gear teeth induction hardened Note 2	Ground	3	Reasonably priced ground racks with abrasion-resistant characteristics. J Series products are also available.
<b>SR · SRF · SRFD · SRFK</b> Note 1	0.5 ~ 10	100,300,500, 1000,1500,2000	S45C	Straightened & annealed	Cut	4	Low cost, large selections of modules and number of teeth. J Series products are also available.
<b>SUR · SURF · SURFD</b> Note 1	1 ~ 4	500,1000	SUS304	Solution treated	Cut	5	Suitable for food machinery due to SUS304 material's rust-resistant quality.
<b>PR · PRF</b> Note 1	1 ~ 3	500,1000	MC901	—	Cut	5	Made form MC nylon, can be used without lubrication.
<b>BSR</b>	0.5 ~ 1	300	C3604	—	Cut	4	Small pitch racks made of free-cutting brass, excellent workability and high rust resistance.
<b>DR</b>	0.8 ~ 2	2000	Duracon (M25-44)	—	Injection Molded	8	Used in applications due to its flexibility, where metal racks do no have this attribute. Pinions and accessories are also available.
<b>SRO · SROS</b>	1 ~ 6	500,1000	S45C	Straightened & annealed	Cut	4	Convenient in applications where the rack has the reciprocal motion. S Type is easy to install.
<b>SURO</b>	1 ~ 3	500,1000	SUS303	—	Cut	5	Same dimensions as SRO racks, except in stainless steel. Use where rust-resistance is required.
<b>KRHG · KRHGF</b> Note 1	1 ~ 3	100,500, 1000	SCM440	Thermal refined	Ground	1	Excellent products with high precision and strength, and low noise and abrasion characteristics.
<b>SRH · SRHF · SRHFD</b> Note 1	2 ~ 3	100,500, 1000	S45C	Straightened & annealed	Cut	5	Effective in reducing noise and vibration due to larger contact ratio of helical gears.

(NOTE 1) The catalog numbers in the above table with (F) suffix have both ends machined so that they can be butted against each other to make any desired length. The items with (D) have mounting screw holes for easier assembly.

(NOTE 2) Products with module less than 0.8 are thermal refined, without their gear teeth being induction hardened.

(NOTE 3) Precision grade standard of racks are set by KHK. Please see "Precision of Racks" in Selection Hints section for details.

- For safe handling and to prevent damage such as deformation, KHK stock racks have round chamfering at the corners of the top land of the gear tooth. This rounded chamfered shape is patented by KHK. Because it is effective for reducing noise, all of KHK products, except for BSR and PR racks, have this chamfering treatment.
- Black colored products are KHK stock gears that have an applied black oxide coating for rust resistance; this 'blackness' is a product characteristic of KHK stock gears.

## We proudly offer cutting edge technology for rack production.

Providing quality, affordable products with assurance is our policy. You can count on us for safe and durable produced racks.



Double Row Rack Cutting Machine



CNC Rack Grinding Machine (NRG-130)

## Selection Hints



Please select the most suitable products by carefully considering the characteristics of items and contents of the product tables. It is also important to read all applicable notes before the final selection.

### 1. Caution in selecting the mating Gears

- ① With the exception of helical racks, KHK stock racks can mate with any spur gears of the same module. Products with different tooth width can also be mated as a pinion.
- ② There are limited choices for of mating gears for KRHG · KRHGF Ground Helical Racks and Helical Racks. There are limited choices for of mating gears for KRHG(F) Ground Helical Racks and SH Helical Racks. Be sure to check the helix hand (right or left) when selecting.

### 2. Caution in Selecting Gears Based on Gear Strength

Allowable bending strength and surface durability values shown in product tables were computed by assuming a certain application environment. They should be used as reference only. We recommend that each user computes his own values by applying the actual usage conditions. The table below contains the assumptions established for various products in order to compute gear strengths.

### Mating Gear Selection Chart (○ Allowable × Not allowable)

Catalog No. & Helix Hand	KRHG KRHGF		SRH · SRHF SRHFD	
	RH	LH	RH	LH
<b>KHG</b>	LH	○	×	×
	RH	×	○	×
<b>SH</b>	LH	×	×	○
	RH	×	×	○



Pinion Left (L) & Rack Right (R)



Pinion Right (R) & Rack Left (L)

### Calculation assumptions for Bending Strength of Gears

Item	Catalog No.	KRG · KRHG KRGF · KRHGF KRGD · KRF	SRG SRGF SRGFD SRGFK	SR · SRF SRFD · SRFK SRO · SROS SRH · SRHF · SRHFD	SUR SURF SURFD SURO	BSR	PR PRF	DR	
Formula <small>NOTE 1</small>	Formula of spur and helical gears on bending strength (JGMA401-01)						The Lewis formula		
No. of teeth of mating gear	30						(30)		
Rotation	100rpm						(100rpm)		
Durability	Over 10 <sup>7</sup> cycles						Allowable Bending Stress (kgf/mm <sup>2</sup> )		
Impact from motor	Uniform load						1.15 (40°C with No Lubrication)	m 0.8 4.0 m 1.0 3.5 m 1.5 1.8 <small>NOTE 4</small> m 2.0 1.2 (Grease lubrication 40°C)	
Impact from load	Uniform load								
Direction of load	Bidirectional								
Allowable bending stress at root $\sigma_{Fim}$ (kgf/mm <sup>2</sup> ) <small>NOTE 2</small>	32	20 (24.5) <small>NOTE 3</small>	20	10.5	4				
Safety factor $S_F$	1.2								

### Calculation assumptions for Surface Durability (Except where it is common with Bending Strength)

Formula <small>NOTE 1</small>	Formula of spur and helical gears on surface durability (JGMA402-01)			
Kinematic viscosity of lubricant	100cSt (50°C)			
Gear support	Supported on one end.			
Allowable Hertz stress $\sigma_{Hlim}$ (kgf/mm <sup>2</sup> )	79	90 (62.5)	52.5	41.3
Safety factor $S_H$	1.15			

**(NOTE 1)** JGMA (Japanese Manufacturers' Association), "MC Nylon Technical Data" of Nippon Polypenco Limited and "Duracon Gear" of Polyplastic Co. The units for rotational speed (rpm) and the load (kgf/mm<sup>2</sup>) were matched to the units needed in the equation.

**(NOTE 2)** Since the load is bidirectional, the allowable bending stress at root  $\sigma_{Fim}$ , calculated from JGMA 401-01, is set to 2/3 of the value.

**(NOTE 3)** For SRG, or SRGF Ground Racks, with a module less than 0.8, the rack teeth are not induction hardened. Allowable bending stress and allowable hertz stress are referred to the value shown in the parentheses.

**(NOTE 4)** The values for DR m 1.5 racks were assumed by KHK. Usage conditions for SDDR (DR Rack Pinion) are the same for the SSCP Pinion, shown on page 401.

#### Definition of bending strength by JGMA 401-01 (1974)

The allowable bending strength of a gear is defined as the allowable tangential force at the pitch circle based on the mutually allowable root stress of two meshing gears under load.



Example of the failure due to insufficient bending strength.

#### Definition of surface durability by JGMA 402-01 (1975)

The surface durability of a gear is defined as the allowable tangential force at the pitch circle, which permits the force to be transmitted safely without incurring surface failure.



Example of the defacement due to insufficient surface durability.



### 3. Selecting Racks By Precision

The precision standards of KHK stock racks are established by us. The table below indicates the tolerance ranges of our racks.

#### ① Pitch Errors of Racks (KHK R 001)

Our precision grades for pitch errors are established by referring to JIS Standards. The precision grades are set from 1 to 8, in accordance with the tolerance of a single pitch error (S.P.E.), adjacent tooth-to-tooth error (T.T.E.), and the total composite error (T.C.E.) for each module and length.

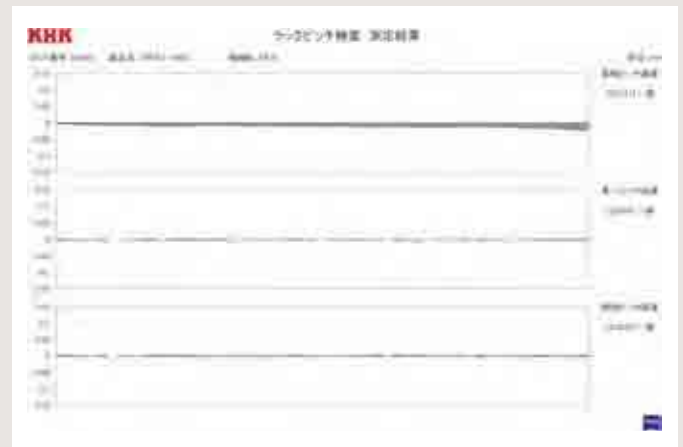
#### ■ Precision Grades of Racks (KHK R 001)

Unit :  $\mu\text{m}$

Grade	Pitch Error	over m0.4 up to 1		over m1 up to 1.6		over m1.6 up to 2.5		over m2.5 up to 4		over m4 up to 6		over m6 up to 10	
		Rack Length (nominal)											
		1000 or less	1500 up to 2000	1000 or less	1500 up to 2000	1000 or less	1500 up to 2000	1000 or less	1500 up to 2000	1000 or less	1500 up to 2000	1000 or less	1500 up to 2000
1	SPE	10	—	10	12	11	12	11	13	13	14	14	16
	TTE	10	—	11	13	12	14	13	15	14	16	16	18
	TCE	28	—	29	33	30	35	32	37	35	40	40	45
2	SPE	14	—	14	17	15	17	16	18	18	20	20	23
	TTE	16	—	16	19	17	19	18	21	20	24	24	27
	TCE	39	—	41	48	43	49	46	53	50	57	58	64
3	SPE	20	—	20	24	21	25	23	26	25	29	29	32
	TTE	22	—	24	28	25	29	27	31	30	34	34	40
	TCE	56	—	57	67	60	70	64	74	71	80	81	91
4	SPE	28	—	29	33	30	35	32	37	35	40	40	45
	TTE	33	—	34	42	38	43	40	46	44	50	51	57
	TCE	79	—	81	95	85	99	91	105	100	115	115	130
5	SPE	39	—	41	48	43	49	46	53	50	57	58	64
	TTE	49	—	51	59	53	62	57	69	66	75	76	85
	TCE	110	—	115	135	120	140	130	145	140	160	160	180
8	SPE	206	206	212	212	219	219	—	—	—	—	—	—
	TTE	330	330	339	339	350	350	—	—	—	—	—	—
	TCE	—	—	—	—	—	—	—	—	—	—	—	—

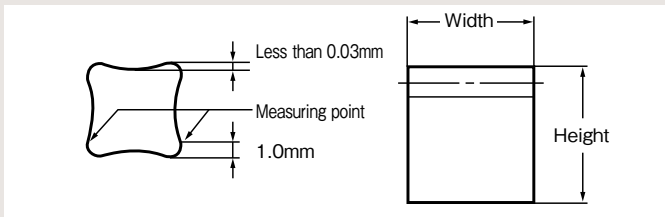
(NOTE) Since the pitch accuracy of racks may vary due to humidity, the precision grades are evaluated at the bottom surface of the product, at the temperature of 20°C. The dimensions of the KHK PR Plastic Racks may vary widely due to humidity. Therefore, the total composite error is assumed to be excluded from this accuracy standard. Please refer to "Design of Plastic Gears" (Page 693) for change in dimensions.

#### ■ Pitch inspection and a sample report using Karl Zeiss UMC-550 Coordinate Measuring Machine. (KHK R 001 Grade 1)



## ② Precision of Rack Blanks (KHK R 002)

### ■ Tolerance on Face Width and Height (unit: mm)

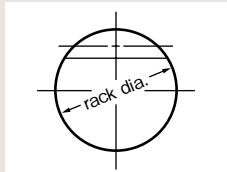


Precision grade (KHK R 001) Face width & height	Precision grade (KHK R 001)			
	Grade 1	Grades 3 to 4 (Excludes thermal refined racks)	Grades 5 (Includes thermal refined racks)	Grade 8
Below 6	—	0 - 0.09	—	± 0.25
6 up to 10	0 - 0.05	0 - 0.09	0 - 0.22	± 0.30
10 up to 18	0 - 0.05	0 - 0.11	0 - 0.27	± 0.35
18 up to 30	0 - 0.05	0 - 0.13	0 - 0.33	± 0.40
30 up to 50	0 - 0.05	0 - 0.16	0 - 0.39	—
50 up to 90	0 - 0.05	0 - 0.19	0 - 0.46	—

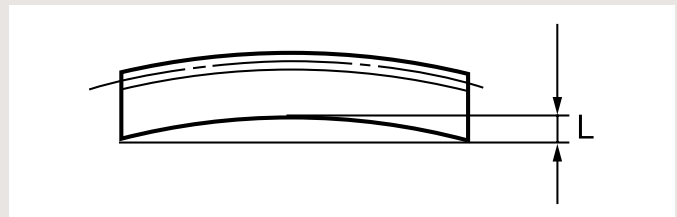
**[CAUTION]** The width and height tolerances of KHK R 001 grades 3 to 5 products are measured at 1mm inside from each corner. Dimensional tolerance for plastic racks is the value obtained when machining is performed, and the maximum tolerance value is +0.2 x Module (+0.40 for m2 products.), with consideration for aging.

### ■ Tolerance on Diameter of Round Racks

KHK Stock Round Racks have diameter tolerances of h10 for  $\phi$  60 (SRO6-1000) round racks, and h9 for others.



### ■ Tolerance on Straightness, L (unit: mm)



Precision grade (KHK R 001) Length (nominal)	Precision grade (KHK R 001)		
	Grade 1	Grade 3	Grades 4 & 5
500	0.05	0.1	0.2
1000	0.05	0.2	0.3
1500	—	—	0.3
2000	—	—	0.4

**[CAUTION]** The straightness tolerances of round racks are 0.15/500 mm and 0.2/1000 mm.

### ■ Tolerance on Overall Length (unit: mm)

Type of product	Module	Allowable error
Type F racks with machined ends	0.5	(- 0.1) (- 0.3)
	0.8 (CP2.5)	(- 0.1) (- 0.5)
	1 up to 2.5	(- 0.2) (- 0.6)
	Over 2.5	(- 0.2) (- 0.8)
FRCP, DR flexible racks	Uniform	± 10
Other racks	Uniform	+ 3 - 2

**[CAUTION]** For Type-F racks with machined ends, the dimensional tolerance is a calculated value according to assumed usage conditions, without consideration of pitch errors and aged deterioration.

## ③ Backlash of Rack Tooth (KHK R 003)

### ■ Backlash of Rack Tooth (Amount of Tooth Thinning)

**Unit: mm**

Precision grade (KHK R 001) Module (m) or Pitch (CP)	Precision grade (KHK R 001)		Grade 4		Grade 5	
	Grade 1	Grade 3	Excludes thermal refined racks	Includes thermal refined racks	Metal Products	Plastic Products
m0.5	—	0 ~ 0.07	0.02 ~ 0.10	—	—	—
m0.8, CP2.5	0 ~ 0.05	0 ~ 0.08	0.03 ~ 0.12	0.03 ~ 0.14	0.03 ~ 0.14	—
m1	0 ~ 0.05	0 ~ 0.10	0.03 ~ 0.12	0.03 ~ 0.14	0.03 ~ 0.14	0 ~ 0.20
m1.5, CP5	0 ~ 0.05	0 ~ 0.10	0.04 ~ 0.13	0.04 ~ 0.15	0.04 ~ 0.15	0 ~ 0.21
m2	0 ~ 0.05	0 ~ 0.10	0.05 ~ 0.14	0.05 ~ 0.16	0.05 ~ 0.16	0 ~ 0.22
m2.5	0 ~ 0.05	0 ~ 0.10	0.06 ~ 0.16	0.06 ~ 0.18	0.06 ~ 0.18	0.06 ~ 0.18
m3, CP10	0 ~ 0.05	0 ~ 0.10	0.07 ~ 0.18	0.07 ~ 0.20	0.07 ~ 0.20	0 ~ 0.24
m4	—	0 ~ 0.10	0.08 ~ 0.22	0.08 ~ 0.24	0.08 ~ 0.24	0 ~ 0.27
m5, CP15	—	0 ~ 0.10	0.09 ~ 0.24	0.09 ~ 0.26	0.09 ~ 0.26	—
m6, CP20	—	0 ~ 0.10	0.10 ~ 0.28	—	—	—
m8	—	—	0.13 ~ 0.32	—	—	—
m10	—	—	0.15 ~ 0.34	—	—	—

**[NOTE]** The values shown in the table are amount of tooth thinning. The theoretical backlash of assembled rack and pinion is given by:

$$\text{Rack \& pinion backlash} = \text{Amount of tooth thinning of the rack} + \text{Amount of tooth thinning of the pinion}$$

Amount of tooth thinning of the rack : See above table.

Amount of tooth thinning of the pinion : Take 1/2 of backlash given in the product table.

## Application Hints



In order to use KHK stock gears safely, carefully read the Application Hints before proceeding.

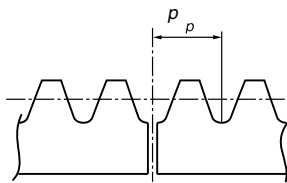
If there are questions or if you require clarifications, please contact our technical department or your nearest distributor.

KHK CO., LTD.  
 PHONE: 81-48-254-1744 FAX: 81-48-254-1765  
 E-mail export@khkgears.co.jp

### 1. Caution on Performing Secondary Operations

- ① Secondary operations can be performed on all KHK stock racks except for the racks with their gear teeth induction hardened. To avoid problems of gear precision, do not reduce the face width. The precision of ground racks and racks with mounting holes may drop if you do not exercise extreme caution during installation or while modifying.
- ② Pitch lines of racks are controlled by using the bottom surface as the reference datum and over-pin measurements on tooth thickness. If you machine the bottom surfaces, the precision of the racks may be affected.
- ③ When connecting two racks, the machining of the mating ends requires careful consideration. The meshing will be poor if the pitch straddling the connection has a positive tolerance. We recommend a minus tolerance on pitch of at the connection. The below is an indication of pitch tolerance for each module.

Unit : mm



$$p = \pi \cdot m$$

$p$  : Reference pitch  
 $\pi$  : Pi  
 $m$  : Module

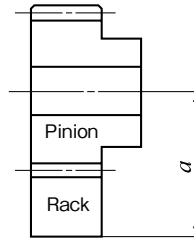
Module	Pitch (p)	Tolerance
m0.5	1.57	-0.05 -0.15
m0.8	2.51	-0.05 -0.25
m1	3.14	-0.1 -0.3
m1.5	4.71	
m2	6.28	
m2.5	7.85	
m3	9.42	
m4	12.57	-0.1 -0.4
m5	15.71	
m6	18.85	
m8	25.13	
m10	31.42	

- ④ To use dowel pins to secure racks, attach the racks to the base and drill both simultaneously.
- ⑤ KHK stock racks made of S45C and SCM440 (except for ground racks) can be induction hardened. However, the precision of pitch is decreased.
- ⑥ To be able to handle parts safely, all burrs and sharp corners should be removed after the secondary operations are done.
- ⑦ If you are going to modify the gear by gripping the teeth, please exercise caution not to crush the teeth by applying too much pressure. Any scarring will cause noise during operation.

### 2. Points of Caution in Assembling

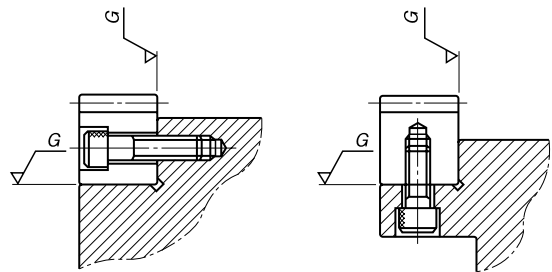
- ① KHK stock racks are designed to give the proper backlash when assembled using the mounting distance given by the formula below (mounting distance tolerance of H7 to H8 required). The backlash values are given in the table on page 375. Make sure that the mounting distance stays constant for the length of the rack.

$$\text{Mounting distance } a = \text{Height of pitch line of rack} + \text{Pitch radius of pinion}$$



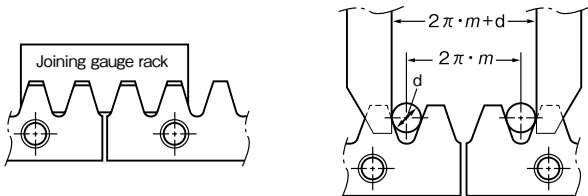
**(CAUTION)**  
 Pinions are assumed to be standard stock spur gears ( $x=0$ ).

- ② KRG type of KHK stock ground racks have four surfaces ground parallel to within 10-15 $\mu$ m. To maintain true angle, they should be mounted on high precision bases as shown below. It is even possible to correct for the angular errors of racks by compensating the mounting base. With recent increases in the requirement for zero backlash linear drives, such accurate assembly as shown is becoming more important.



- ③ If the racks are not secured properly to the base, they could shift during operation and cause unexpected problems. It is very important to insure firm mounting by the use of dowel pins or similar devices.
- ④ Machined end type racks such as SRF and SRFD series have the pitch tolerance of -0.05 to -0.4mm at the end face. If you try to connect the racks without any space, the pitch at the connection will be too small and will cause problems. Please follow the following diagrams for assembly.

An example of Rack Joining, we recommend the following method.

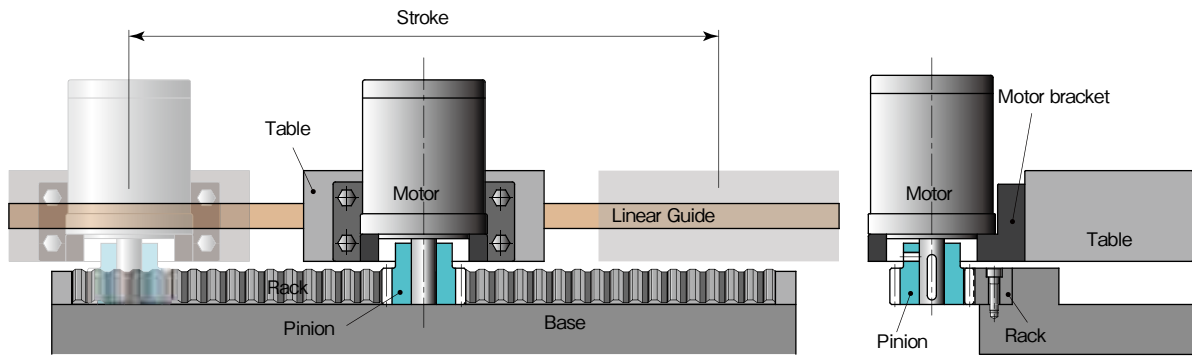
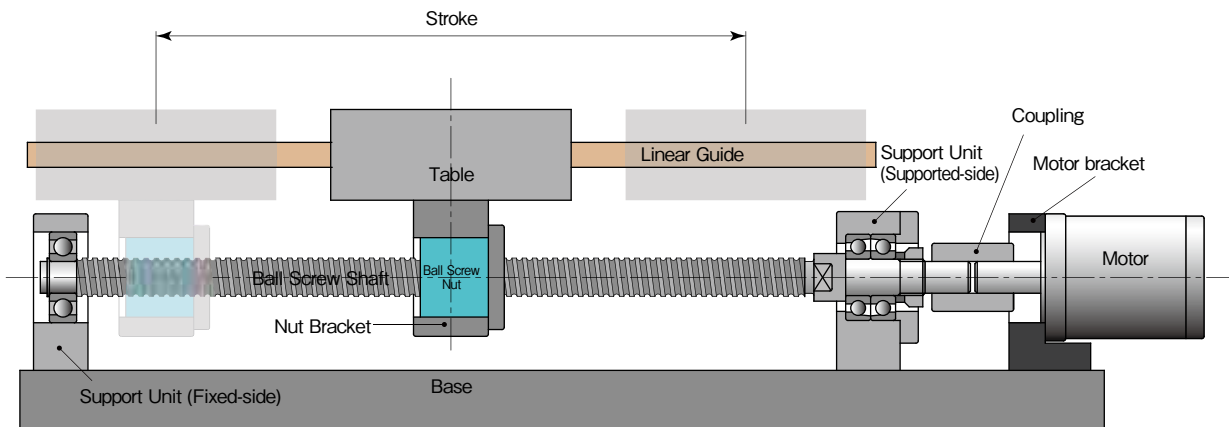


**(CAUTION)** Joining gauge racks for helical racks must have the opposite hand from the racks. Please use Module 1-10 100 racks as a joining gauge rack, or alternatively the rack of the same specifications on hand.

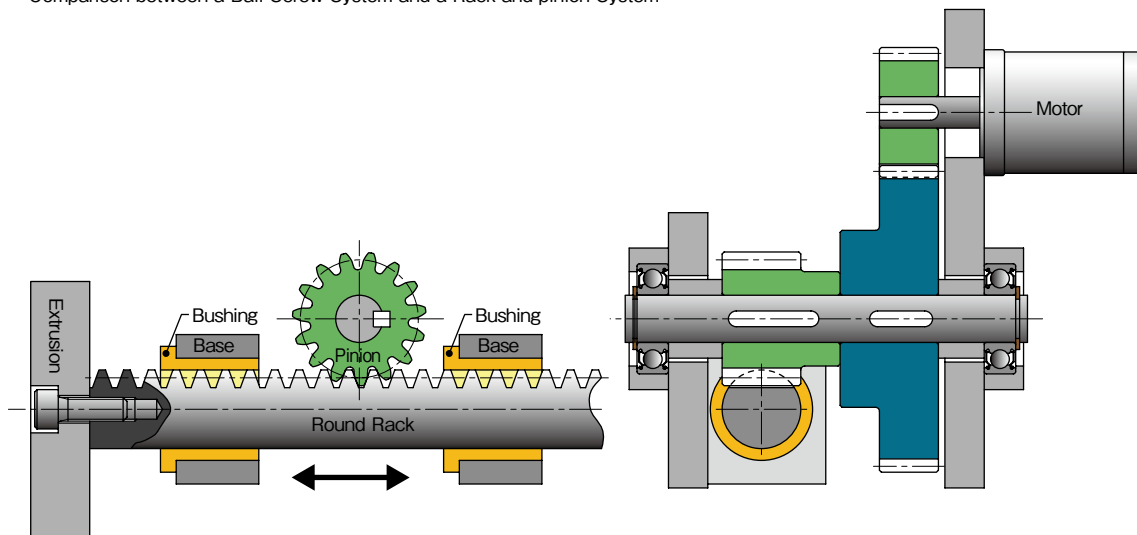


Application Examples

\* The illustration is a design example, not a design for machinery or a device in actual use.



Comparison between a Ball Screw System and a Rack-and-pinion System\*



Extrusion device with a round rack\* (It can also be a lifting/lowering device by setting up vertically.)



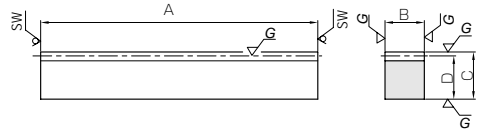
KRG Ground Rack and SSG Ground Spur Gear used as a work conveying device of the auto loader.



SRO Round Rack used as a work storage device (fluctuating table) of the auto loader.



Specifications	
Precision grade	KHK R 001 grade 1
Gear teeth	Standard full depth
Pressure angle	20°
Material	SCM440
Heat treatment	Thermal refining only
Tooth hardness	250 ~ 285HB



\* SW Saw Blade Finished

R1

Catalog No.	Module	Effective no. of teeth	Shape	Total length				Allowable force (N)		Allowable force (kgf)		Weight (kg)
				A	B	C	D	Bending strength	Surface durability	Bending strength	Surface durability	
<b>KRG1-100</b> <b>KRG1-500</b>	<b>m1</b>	29 159	R1	98 505	10	15	14	1530	641	156	65.3	0.11 0.55
<b>KRG1.5-100</b> <b>KRG1.5-500</b>	<b>m1.5</b>	20 105	R1	101 505	15	20	18.5	3450	1440	352	147	0.22 1.10
<b>KRG2-100</b> <b>KRG2-500</b>	<b>m2</b>	14 79	R1	98 505	20	25	23	6130	2560	625	261	0.35 1.82
<b>KRG2.5-100</b> <b>KRG2.5-500</b>	<b>m2.5</b>	11 63	R1	100 505	25	30	27.5	9580	4010	977	408	0.54 2.73
<b>KRG3-100</b> <b>KRG3-500</b>	<b>m3</b>	9 52	R1	101 505	30	35	32	13800	5770	1410	588	0.76 3.81

Catalog No.	Module	No. of teeth	Shape	Total length				Allowable force (N)		Allowable force (kgf)		Weight (kg)
				A	B	C	D	Bending strength	Surface durability	Bending strength	Surface durability	
<b>KRGF1-1000</b>	<b>m1</b>	318	RF	999.03	10	15	14	1530	641	156	65.3	1.49
<b>KRGF1.5-1000</b>	<b>m1.5</b>	212	RF	999.03	15	20	18.5	3450	1440	352	147	2.18
<b>KRGF2-1000</b>	<b>m2</b>	160	RF	1005.31	20	25	23	6130	2560	625	261	3.63
<b>KRGF2.5-1000</b>	<b>m2.5</b>	128	RF	1005.31	25	30	27.5	9580	4010	977	408	5.43
<b>KRGF3-1000</b>	<b>m3</b>	106	RF	999.03	30	35	32	13800	5770	1410	588	7.53

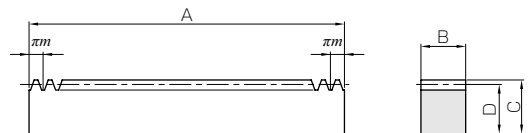
Catalog No.	Module	No. of teeth	Shape	Total length				Height	Height to pitch line	Mounting hole dimensions			No. of mounting holes	Mounting screw size
				A	B	C	D			E	F	G		
<b>KRGD1-500</b>	<b>m1</b>	159	RD	499.51	10	15	14	14	6	39.75	140	4	M4	
<b>KRGD1.5-500</b>	<b>m1.5</b>	106	RD	499.51	15	20	18.5	18.5	8	39.75	140	4	M5	
<b>KRGD2-500</b>	<b>m2</b>	80	RD	502.65	20	25	23	23	10	41.32	140	4	M6	
<b>KRGD2.5-500</b>	<b>m2.5</b>	64	RD	502.65	25	30	27.5	27.5	12	41.32	140	4	M8	
<b>KRGD3-500</b>	<b>m3</b>	53	RD	499.51	30	35	32	32	14	39.75	140	4	M10	



KRF  
Thermal Refined Racks with Machined Ends



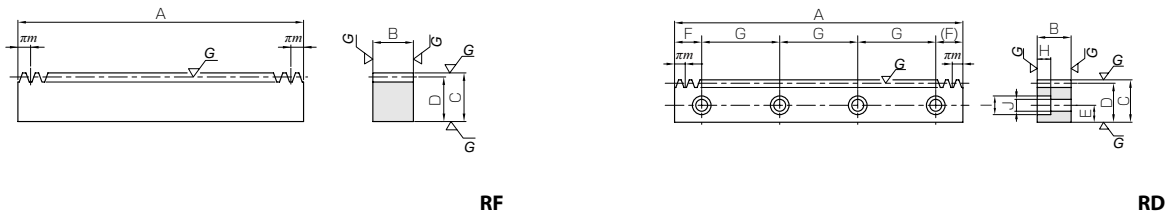
Specifications	
Precision grade	KHK R 001 grade 4
Gear teeth	Standard full depth
Pressure angle	20°
Material	SCM440
Heat treatment	Thermal refining only
Tooth hardness	250 ~ 285HB*



\* Due to the decarburization layer of about 0.5 mm thickness, the rectangular surface have less than HB187 hardness.

RF

Catalog No.	Module	No. of teeth	Shape	Total length				Allowable force (N)		Allowable force (kgf)		Weight (kg)
				A	B	C	D	Bending strength	Surface durability	Bending strength	Surface durability	
<b>KRF1.5-1000</b>	<b>m1.5</b>	212	RF	999.03	15	20	18.5	3450	953	352	97.2	2.18
<b>KRF2-1000</b>	<b>m2</b>	160	RF	1005.31	20	25	23	6130	1760	625	179	3.63
<b>KRF2.5-1000</b>	<b>m2.5</b>	128	RF	1005.31	25	30	27.5	9580	2810	977	287	5.43
<b>KRF3-1000</b>	<b>m3</b>	106	RF	999.03	30	35	32	13800	4120	1410	421	7.53
<b>KRF4-1000</b>	<b>m4</b>	80	RF	1005.31	40	45	41	24500	7530	2500	768	12.9
<b>KRF5-1000</b>	<b>m5</b>	64	RF	1005.31	50	50	45	38300	12000	3910	1220	17.8



**\* Ground racks with these specifications: Module 8, Total length (A) 1000 mm, Height (C) 90 mm or less, are also available by request as custom-made products.**

- [Caution on Product Characteristics]
- ① The allowable forces shown in the table are the calculated values according to the assumed usage conditions. Please see page 373 for more details.
  - ② The backlash of racks differ depending on the size of the mating pinion. Please calculate the backlash from the backlash value of the mating pinion. Also, please refer to the data in the section called 'Backlash of Rack Tooth (Amount of Tooth Thinning)' on Page 375.
  - ③ After attaching the racks to the base, please fasten with dowel pins. Clamping only with mounting screws could possibly cause the screws to be broken, due to a heavy load.
- [Caution on Secondary Operations]
- ① Please read "Caution on Performing Secondary Operations" (Page 376) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.

Counterbore dimensions			Allowable force (N)		Allowable force (kgf)		Weight (kg)	Catalog No.
H	I	J	Bending strength	Surface durability	Bending strength	Surface durability		
5	8	4.5	1530	641	156	65.3	0.54	<b>KRGD1-500</b> <b>KRGD1.5-500</b> <b>KRGD2-500</b> <b>KRGD2.5-500</b> <b>KRGD3-500</b>
6	10	6	3450	1440	352	147	1.06	
7	11	7	6130	2560	625	261	1.77	
8.6	14	9	9580	4010	977	408	2.62	
10.8	17.5	11	13800	5770	1410	588	3.59	

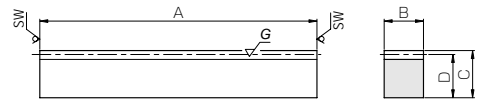
**KRF**

**Racks with Machined Ends**

- [Caution on Product Characteristics]
- ① The allowable forces shown in the table are the calculated values according to the assumed usage conditions. Please see page 373 for more details.
  - ② The backlash of racks differ depending on the size of the mating pinion. Please calculate the backlash from the backlash value of the mating pinion. Also, please refer to the data in the section called 'Backlash of Rack Tooth (Amount of Tooth Thinning)' on Page 375.
- [Caution on Secondary Operations]
- ① Please read "Caution on Performing Secondary Operations" (Page 376) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
  - ② If gear tooth hardening, or thermal refining, is applied, the decarburization layer (approx. 0.5 mm thickness) on the rectangular surfaces cannot have the hardness you designate.

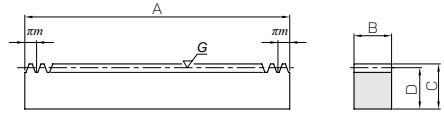


Specifications	
Precision grade	KHK R 001 grade 3 *
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	Tooth surface induction hardened *
Tooth hardness	45 ~ 55HRC *



\* SW Saw Blade Finished

R1



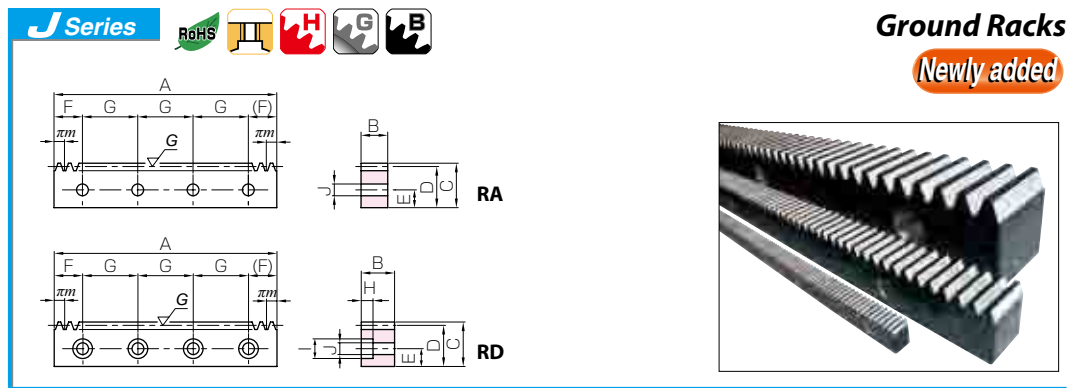
RF

\* The precision grade of J Series products is equivalent to the value shown in the table.  
 \* Tooth surfaces, where the pitch is less than module 0.8, hardness range is 225HB ~ 260HB.  
 \* Due to the decarburization layer of about 0.5 mm thickness, the rectangular surface have less than HB187 hardness.

Catalog No.	Module	Effective no. of teeth	Shape	Total length				Allowable force (N)		Allowable force (kgf)		Weight (kg)
				A	B	C	D	Bending strength	Surface durability	Bending strength	Surface durability	
SRG0.5-100	m0.5	61	R1	101	5	12	11.5	293	80.5	29.9	8.21	0.046
SRG0.8-100	m0.8	38	R1	101	8	12.3	11.5	751	206	76.6	21.0	0.073
SRG1-100	m1	29	R1	98	10	12	11	862	514	87.9	52.4	0.085
SRG1.5-100	m1.5	20	R1	101	15	20	18.5	2160	1360	220	138	0.22
SRG2-100	m2	14	R1	98	20	25	23	3830	2410	391	246	0.35
SRG2.5-100	m2.5	11	R1	100	25	30	27.5	5990	3770	611	384	0.54
SRG3-100	m3	9	R1	101	30	35	32	8620	5420	879	553	0.76
SRG4-100	m4	6	R1	98	40	45	41	15300	9640	1560	983	1.26
SRG5-110	m5	5	R1	108	50	50	45	24000	15100	2440	1540	1.91
SRG6-110	m6	4	R1	111	60	60	54	34500	21700	3520	2210	2.82

Catalog No.	Module	No. of teeth	Shape	Total length				Allowable force (N)		Allowable force (kgf)		Weight (kg)
				A	B	C	D	Bending strength	Surface durability	Bending strength	Surface durability	
SRGF0.5-300	m0.5	191	RF	300.02	5	12	11.5	293	80.5	29.9	8.21	0.14
SRGF0.8-300	m0.8	119	RF	299.08	8	12.3	11.5	751	206	76.6	21.0	0.22
SRGF1-300	m1	96	RF	301.59	10	12	11	862	514	87.9	52.4	0.26
SRGF1-500	m1	159	RF	499.51	10	12	11	862	514	87.9	52.4	0.43
SRGF1.5-500	m1.5	106	RF	499.51	15	20	18.5	2160	1360	220	138	1.09
SRGF1.5-1000	m1.5	212	RF	999.03	15	20	18.5	2160	1360	220	138	2.18
SRGF2-500	m2	80	RF	502.65	20	25	23	3830	2410	391	246	1.82
SRGF2-1000	m2	160	RF	1005.31	20	25	23	3830	2410	391	246	3.63
SRGF2.5-500	m2.5	64	RF	502.65	25	30	27.5	5990	3770	611	384	2.71
SRGF2.5-1000	m2.5	128	RF	1005.31	25	30	27.5	5990	3770	611	384	5.43
SRGF3-500	m3	53	RF	499.51	30	35	32	8620	5420	879	553	3.76
SRGF3-1000	m3	106	RF	999.03	30	35	32	8620	5420	879	553	7.53
SRGF4-500	m4	40	RF	502.65	40	45	41	15300	9640	1560	983	6.47
SRGF4-1000	m4	80	RF	1005.31	40	45	41	15300	9640	1560	983	12.9
SRGF5-500	m5	32	RF	502.65	50	50	45	24000	15100	2440	1540	8.88
SRGF5-1000	m5	64	RF	1005.31	50	50	45	24000	15100	2440	1540	17.8
SRGF6-500	m6	26	RF	490.09	60	60	54	34500	21700	3520	2210	12.5
SRGF6-1000	m6	53	RF	999.03	60	60	54	34500	21700	3520	2210	25.4

Catalog No.	Module	No. of teeth	Shape	Total length				Mounting hole dimensions			No. of mounting holes	Mounting screw size
				A	B	C	D	E	F	G		
● SRGFK0.5-300J	m0.5	191	RA	300.02	5	12	11.5	5.5	15.01	90	4	M3
● SRGFK0.8-300J	m0.8	119	RA	299.08	8	12.3	11.5	5.5	14.54	90	4	M4
● SRGFK1-300J	m1	96	RA	301.59	10	12	11	5	20.80	130	3	M4
● SRGFK1-500J		159		24.76					150	4		
● SRGFD1.5-500J	m1.5	106	RD	499.51	15	20	18.5	8	24.76	150	4	M5
● SRGFD1.5-1000J		212		49.51					180	6		
● SRGFD2-500J	m2	80	RD	502.65	20	25	23	10	26.33	150	4	M6
● SRGFD2-1000J		160		52.65					180	6		
● SRGFD2.5-500J	m2.5	64	RD	502.65	25	30	27.5	12	26.33	150	4	M8
● SRGFD2.5-1000J		128		52.65					180	6		
● SRGFD3-500J	m3	53	RD	499.51	30	35	32	14	24.76	150	4	M10
● SRGFD3-1000J		106		49.51					180	6		
● SRGFD4-500J	m4	40	RD	502.65	40	45	41	18	26.33	150	4	M12
● SRGFD4-1000J		80		52.65					180	6		
● SRGFD5-500J	m5	32	RD	502.65	50	50	45	20	31.33	220	3	M14
● SRGFD5-1000J		64		62.65					220	5		
● SRGFD6-500J	m6	26	RD	490.09	60	60	54	23	25.04	220	3	M16
● SRGFD6-1000J		53		59.51					220	5		



- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

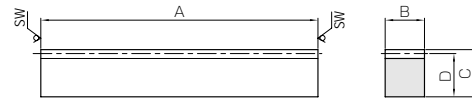
\* Ground racks with these specifications: Module 8, Total length (A) 1000 mm, Height (C) 90 mm or less, are also available by request as custom-made products.

- [Caution on Product Characteristics]
- ① The allowable forces shown in the table are the calculated values according to the assumed usage conditions. Please see page 373 for more details.
  - ② The backlash of racks differ depending on the size of the mating pinion. Please calculate the backlash from the backlash value of the mating pinion. Also, please refer to the data in the section called 'Backlash of Rack Tooth (Amount of Tooth Thinning)' on Page 375.
- [Caution on Secondary Operations]
- ① Please read “Caution on Performing Secondary Operations” (Page 376) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK’s system for quick modification of KHK stock gears is also available.
  - ② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 1 mm to 2 mm). Please use wire EDM or other carbide tools to modify the length.
- [Caution on J series]
- ① As available-on-request products, requires a lead-time for shipping within **3 working-days (excludes the day ordered), after placing an order.** Please allow additional shipping time to get to your local distributor.
  - ② Number of products we can process for one order is **1 to 20 units.** For quantities of 21 or more pieces, we need to quote price and lead time.
  - ③ No black oxide is re-applied after adding secondary operation of mounting holes.

Counterbore dimensions			Allowable force (N)		Allowable force (kgf)		Weight (kg)	Catalog No. ● : J Series (Available-on-request)
H	I	J	Bending strength	Surface durability	Bending strength	Surface durability		
—	—	3.4	293	80.5	29.9	8.21	0.13	●SRGFK0.5-300J
—	—	4.5	751	206	76.6	21.0	0.21	●SRGFK0.8-300J
—	—	4.5	862	514	87.9	52.4	0.26 0.43	●SRGFK1-300J ●SRGFK1-500J
6	10	6	2160	1360	220	138	1.07 2.14	●SRGFD1.5-500J ●SRGFD1.5-1000J
7	11	7	3830	2410	391	246	1.78 3.58	●SRGFD2-500J ●SRGFD2-1000J
8.6	14	9	5990	3770	611	384	2.64 5.31	●SRGFD2.5-500J ●SRGFD2.5-1000J
10.8	17.5	11	8620	5420	879	553	3.63 7.32	●SRGFD3-500J ●SRGFD3-1000J
13	20	14	15300	9640	1560	983	6.21 12.6	●SRGFD4-500J ●SRGFD4-1000J
15.2	23	16	24000	15100	2440	1540	8.56 17.2	●SRGFD5-500J ●SRGFD5-1000J
17.5	26	18	34500	21700	3520	2210	12.0 24.6	●SRGFD6-500J ●SRGFD6-1000J



Specifications	
Precision grade	KHK R 001 grade 4
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	Stress relief annealing
Tooth hardness	less than 95HRB



\* SW Saw Blade Finished

R1

Catalog No.	Module	Effective no. of teeth	Shape	Total length				Allowable force (N)		Allowable force (kgf)		Weight (kg)
				A	B	C	D	Bending strength	Surface durability	Bending strength	Surface durability	
<b>SR0.5-100</b>	<b>m0.5</b>	62	R1	101	5	12	11.5	240	39.6	24.4	4.04	0.046
<b>SR0.8-100</b>	<b>m0.8</b>	38	R1	101	8	12.3	11.5	613	108	62.5	11.0	0.073
<b>SR1-100</b> <b>SR1-300</b> <b>SR1-500</b>	<b>m1</b>	29 94 159	R1	98 303 505	10	12	11	958	177	97.7	18.0	0.085 0.26 0.44
<b>SR1.5-100</b> <b>SR1.5-300</b> <b>SR1.5-500</b>	<b>m1.5</b>	20 62 105	R1	101 303 505	15	20	18.5	2160	421	220	42.9	0.22 0.66 1.10
<b>SR2-100</b> <b>SR2-300</b> <b>SR2-500</b>	<b>m2</b>	14 46 79	R1	98 303 505	20	25	23	3830	775	391	79.0	0.35 1.09 1.82
<b>SR2.5-100</b> <b>SR2.5-300</b> <b>SR2.5-500</b>	<b>m2.5</b>	11 37 63	R1	100 303 505	25	30	27.5	5990	1240	611	127	0.54 1.64 2.73
<b>SR3-100</b> <b>SR3-300</b> <b>SR3-500</b>	<b>m3</b>	9 30 52	R1	101 303 505	30	35	32	8620	1820	879	186	0.76 2.28 3.81
<b>SR4-100</b> <b>SR4-500</b>	<b>m4</b>	6 39	R1	98 505	40	45	41	15300	3330	1560	339	1.26 6.50
<b>SR5-110</b> <b>SR5-500</b>	<b>m5</b>	5 31	R1	108 505	50	50	45	24000	5300	2440	540	1.91 8.92
<b>SR6-110</b> <b>SR6-500</b>	<b>m6</b>	4 25	R1	111 505	60	60	54	34500	7740	3520	789	2.82 12.8
<b>SR8-130</b>	<b>m8</b>	3	R1	123	75	75	67	44200	10400	4510	1060	4.85
<b>SR10-160</b>	<b>m10</b>	3	R1	155	90	80	70	66300	16100	6770	1640	7.67

[Caution on Product Characteristics]

- ① The allowable forces shown in the table are the calculated values according to the assumed usage conditions. Please see page 373 for more details.
- ② The backlash of racks differ depending on the size of the mating pinion. Please calculate the backlash from the backlash value of the mating pinion. Also, please refer to the data in the section called 'Backlash of Rack Tooth (Amount of Tooth Thinning)' on Page 375.

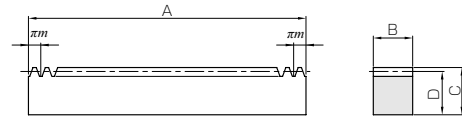
[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 376) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② If gear tooth hardening, or thermal refining, is applied, the decarburization layer (approx. 0.5 mm thickness) on the rectangular surfaces cannot have the hardness you designate.

Spur Gears  
Helical Gears  
Internal Gears  
Racks  
CP Racks & Pinions  
Miter Gears  
Bevel Gears  
Screw Gears  
Worm Gear Pair  
Bevel Gearboxes  
Other Products



Specifications	
Precision grade	KHK R 001 grade 4
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	Stress relief annealing
Tooth hardness	less than 95HRB



RF

Catalog No.	Module	No. of teeth	Shape	Total length				Allowable force (N)		Allowable force (kgf)		Weight (kg)
				A	B	C	D	Bending strength	Surface durability	Bending strength	Surface durability	
SRF0.5-300	m0.5	191	RF	300.02	5	12	11.5	240	39.6	24.4	4.04	0.14
SRF0.8-300	m0.8	119	RF	299.08	8	12.3	11.5	613	108	62.5	11.0	0.22
SRF1-300	m1	96	RF	301.59	10	12	11	958	177	97.7	18.0	0.26
SRF1-500		159		499.51								0.43
SRF1-1000		318		999.03								0.86
SRF1.5-300	m1.5	64	RF	301.59	15	20	18.5	2160	421	220	42.9	0.66
SRF1.5-500		106		499.51								1.09
SRF1.5-1000		212		999.03								2.18
SRF1.5-1500		320		1507.96								3.28
SRF1.5-2000		435		2049.88								4.47
SRF2-300	m2	48	RF	301.59	20	25	23	3830	775	391	79.0	1.09
SRF2-500		80		502.65								1.82
SRF2-1000		160		1005.31								3.63
SRF2-1500		240		1507.96								5.45
SRF2-2000		326		2048.31								7.40
SRF2.5-300	m2.5	38	RF	298.45	25	30	27.5	5990	1240	611	127	1.61
SRF2.5-500		64		502.65								2.71
SRF2.5-1000		128		1005.31								5.43
SRF2.5-1500		192		1507.96								8.14
SRF2.5-2000		261		2049.88								11.1
SRF3-300	m3	32	RF	301.59	30	35	32	8620	1820	879	186	2.27
SRF3-500		53		499.51								3.76
SRF3-1000		106		999.03								7.53
SRF3-1500		160		1507.96								11.4
SRF3-2000		217		2045.17								15.4
SRF4-500	m4	40	RF	502.65	40	45	41	15300	3330	1560	339	6.47
SRF4-1000		80		1005.31								12.9
SRF4-1500		120		1507.96								19.4
SRF4-2000		163		2048.31								26.4
SRF5-500		m5		32								RF
SRF5-1000	64		1005.31	17.8								
SRF5-1500	96		1507.96	26.6								
SRF5-2000	130		2042.04	36.1								
SRF6-500	m6	26	RF	490.09	60	60	54	34500	7740	3520	789	12.5
SRF6-1000		53		999.03								25.4
SRF6-1500		80		1507.96								38.4
SRF6-2000		108		2035.75								51.8
SRF8-500	m8	20	RF	502.66	75	75	67	44200	10400	4510	1060	19.8
SRF8-1000		40		1005.31								39.7
SRF10-1000	m10	32	RF	1005.31	90	80	70	66300	16100	6770	1640	49.7

[Caution on Product Characteristics]

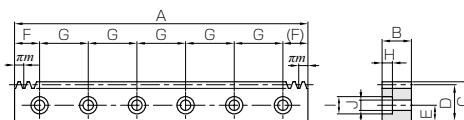
- ① The allowable forces shown in the table are the calculated values according to the assumed usage conditions. Please see page 373 for more details.
- ② The backlash of racks differ depending on the size of the mating pinion. Please calculate the backlash from the backlash value of the mating pinion. Also, please refer to the data in the section called 'Backlash of Rack Tooth (Amount of Tooth Thinning)' on Page 375.

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 376) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② If gear tooth hardening, or thermal refining, is applied, the decarburization layer (approx. 0.5 mm thickness) on the rectangular surfaces cannot have the hardness you designate.



Specifications	
Precision grade	KHK R 001 grade 4 *
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	Stress relief annealing
Tooth hardness	less than 95HRB



\* The precision grade of J Series products is equivalent to the value shown in the table.

RD

Catalog No. ● : J Series (Available-on-request)	Module	No. of teeth	Shape	Total length	Face width	Height	Height to pitch line	Mounting hole dimensions			No. of mounting holes	Mounting screw size		
				A	B	C	D	E	F	G				
●SRFK0.5-300J	<b>m0.5</b>	191	RA	300.02	5	12	11.5	5.5	15.01	90	4	M3		
●SRFK0.8-300J	<b>m0.8</b>	119	RA	299.08	8	12.3	11.5	5.5	14.54	90	4	M4		
●SRFK1-300J	<b>m1</b>	96	RA	301.59	10	12	11	5	20.80	130	3	M4		
●SRFK1-500J		159		499.51					24.76				150	4
●SRFD1.5-300J	<b>m1.5</b>	64	RD	301.59	15	20	18.5	8	20.80	130	3	M5		
●SRFD1.5-500J		106	RD	499.51					24.76				150	4
SRFD1.5-1000		212	RD	999.03					49.51				180	6
SRFD1.5-1500		320	RD	1507.96					33.98				180	9
SRFD1.5-2000		435	RD	2049.88					34.94				180	12
●SRFD2-300J	<b>m2</b>	48	RD	301.59	20	25	23	10	20.80	130	3	M6		
●SRFD2-500J		80	RD	502.65					26.33				150	4
SRFD2-1000		160	RD	1005.31					52.65				180	6
SRFD2-1500		240	RD	1507.96					33.98				180	9
SRFD2-2000		326	RD	2048.31					34.15				180	12
●SRFD2.5-300J	<b>m2.5</b>	38	RD	298.45	25	30	27.5	12	19.23	130	3	M8		
●SRFD2.5-500J		64	RD	502.65					26.33				150	4
SRFD2.5-1000		128	RD	1005.31					52.65				180	6
SRFD2.5-1500		192	RD	1507.96					33.98				180	9
SRFD2.5-2000		261	RD	2049.88					34.94				180	12
●SRFD3-300J	<b>m3</b>	32	RD	301.59	30	35	32	14	20.80	130	3	M10		
●SRFD3-500J		53	RD	499.51					24.76				150	4
SRFD3-1000		106	RD	999.03					49.51				180	6
SRFD3-1500		160	RD	1507.96					33.98				180	9
SRFD3-2000		217	RD	2045.17					32.58				180	12
●SRFD4-500J	<b>m4</b>	40	RD	502.65	40	45	41	18	26.33	150	4	M12		
SRFD4-1000		80	RD	1005.31					52.65				180	6
SRFD4-1500		120	RD	1507.96					33.98				180	9
SRFD4-2000		163	RD	2048.31					34.15				180	12
●SRFD5-500J	<b>m5</b>	32	RD	502.65	50	50	45	20	31.33	220	3	M14		
SRFD5-1000		64	RD	1005.31					62.65				220	5
SRFD5-1500		96	RD	1507.96					93.98				220	7
SRFD5-2000		130	RD	2042.04					31.02				220	10
●SRFD6-500J	<b>m6</b>	26	RD	490.09	60	60	54	23	25.04	220	3	M16		
SRFD6-1000		53	RD	999.03					59.51				220	5
SRFD6-1500		80	RD	1507.96					93.98				220	7
SRFD6-2000		108	RD	2035.75					27.88				220	10

[Caution on Product Characteristics]

- ① The allowable forces shown in the table are the calculated values according to the assumed usage conditions. Please see page 373 for more details.
- ② The backlash of racks differ depending on the size of the mating pinion. Please calculate the backlash from the backlash value of the mating pinion. Also, please refer to the data in the section called 'Backlash of Rack Tooth (Amount of Tooth Thinning)' on Page 375.
- ③ After attaching the racks to the base, please fasten with dowel pins. Clamping only with mounting screws could possibly cause the screws to be broken, due to the heavy load.

[Caution on Secondary Operations]

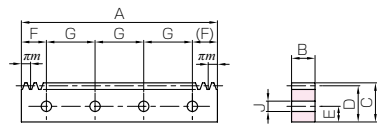
- ① Please read "Caution on Performing Secondary Operations" (Page 376) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Avoid hardening Racks with bolt holes, due to deformation occurring at the mounting hole and the difficulty of straightening the rack after hardening.



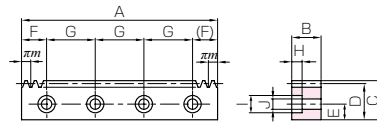
## J series



## Steel Racks with Bolts Holes



RA



RD



Counterbore dimensions			Allowable force (N)		Allowable force (kgf)		Weight (kg)	Catalog No. ● : J Series (Available-on-request)
H	I	J	Bending strength	Surface durability	Bending strength	Surface durability		
—	—	3.4	240	39.6	24.4	4.04	0.13	●SRFK0.5-300J
—	—	4.5	613	108	62.5	11.0	0.21	●SRFK0.8-300J
—	—	4.5	958	177	97.7	18.0	0.26 0.43	●SRFK1-300J ●SRFK1-500J
6	10	6	2160	421	220	42.9	0.64 1.07 2.14 3.23 4.40	●SRFD1.5-300J ●SRFD1.5-500J SRFD1.5-1000 SRFD1.5-1500 SRFD1.5-2000
7	11	7	3830	775	391	79.0	1.06 1.78 3.58 5.36 7.29	●SRFD2-300J ●SRFD2-500J SRFD2-1000 SRFD2-1500 SRFD2-2000
8.6	14	9	5990	1240	611	127	1.55 2.64 5.31 7.97 10.8	●SRFD2.5-300J ●SRFD2.5-500J SRFD2.5-1000 SRFD2.5-1500 SRFD2.5-2000
10.8	17.5	11	8620	1820	879	186	2.17 3.63 7.32 11.1 15.0	●SRFD3-300J ●SRFD3-500J SRFD3-1000 SRFD3-1500 SRFD3-2000
13	20	14	15300	3330	1560	339	6.21 12.6 18.8 25.6	●SRFD4-500J SRFD4-1000 SRFD4-1500 SRFD4-2000
15.2	23	16	24000	5300	2440	540	8.56 17.2 25.9 35.0	●SRFD5-500J SRFD5-1000 SRFD5-1500 SRFD5-2000
17.5	26	18	34500	7740	3520	789	12.0 24.6 37.2 50.2	●SRFD6-500J SRFD6-1000 SRFD6-1500 SRFD6-2000

## [Caution on J series]

- ① As available-on-request products, requires a lead-time for shipping within **3 working-days (excludes the day ordered)**, **after placing an order**. Please allow additional shipping time to get to your local distributor.
- ② Number of products we handle for one order is **1 to 20 pieces**. For quantities of 21 pieces or more, we need to quote price and lead time.
- ③ No black oxide is re-applied after adding secondary operation of mounting holes.

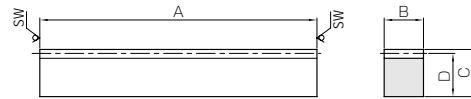
Spur  
GearsHelical  
GearsInternal  
Gears

Racks

CP Racks  
& PinionsMiter  
GearsBevel  
GearsScrew  
GearsWorm  
Gear PairBevel  
GearboxesOther  
Products



Specifications	
Precision grade	KHK R 001 grade 5
Gear teeth	Standard full depth
Pressure angle	20°
Material	SUS304
Heat treatment	Solution heat treatment
Tooth hardness	less than 187HB



\* SW Saw Blade Finished

R1

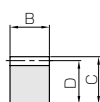
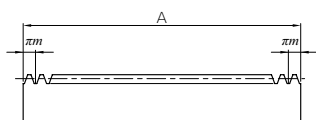
Catalog No.	Module	Effective no. of teeth	Shape	Total length				Allowable force (N)		Allowable force (kgf)		Weight (kg)
				A	B	C	D	Bending strength	Surface durability	Bending strength	Surface durability	
<b>SUR1-500</b>	<b>m1</b>	159	R1	505	10	12	11	457	99.4	46.6	10.1	0.43
<b>SUR1.5-500</b> <b>SUR1.5-1000</b>	<b>m1.5</b>	105 212	R1	505 1010	15	20	18.5	1030	237	105	24.2	1.09 2.19
<b>SUR2-500</b> <b>SUR2-1000</b>	<b>m2</b>	79 159	R1	505 1010	20	25	23	1830	436	187	44.5	1.81 3.63
<b>SUR2.5-500</b> <b>SUR2.5-1000</b>	<b>m2.5</b>	63 127	R1	505 1010	25	30	27.5	2860	698	292	71.2	2.71 5.42
<b>SUR3-500</b> <b>SUR3-1000</b>	<b>m3</b>	52 105	R1	505 1010	30	35	32	4120	1030	420	105	3.79 7.57
<b>SUR4-500</b> <b>SUR4-1000</b>	<b>m4</b>	39 79	R1	505 1010	40	45	41	7320	1870	746	191	6.47 12.9

Catalog No.	Module	No. of teeth	Shape	Total length				Allowable force (N)		Allowable force (kgf)		Weight (kg)
				A	B	C	D	Bending strength	Surface durability	Bending strength	Surface durability	
<b>SURF1.5-1000</b>	<b>m1.5</b>	212	RF	999.03	15	20	18.5	1030	237	105	24.2	2.17
<b>SURF2-1000</b>	<b>m2</b>	160	RF	1005.31	20	25	23	1830	436	187	44.5	3.61
<b>SURF2.5-1000</b>	<b>m2.5</b>	128	RF	1005.31	25	30	27.5	2860	698	292	71.2	5.40
<b>SURF3-1000</b>	<b>m3</b>	106	RF	999.03	30	35	32	4120	1030	420	105	7.49
<b>SURF4-1000</b>	<b>m4</b>	80	RF	1005.31	40	45	41	7320	1870	746	191	12.9

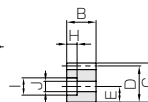
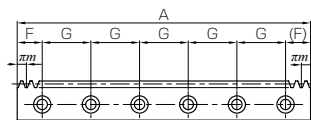
Catalog No.	Module	No. of teeth	Shape	Total length				Height	Height to pitch line	Mounting hole dimensions			No. of mounting holes	Mounting screw size
				A	B	C	D			E	F	G		
<b>SURFD1.5-1000</b>	<b>m1.5</b>	212	RD	999.03	15	20	18.5	8	49.52	180	6	M5		
<b>SURFD2-1000</b>	<b>m2</b>	160	RD	1005.31	20	25	23	10	52.66	180	6	M6		
<b>SURFD2.5-1000</b>	<b>m2.5</b>	128	RD	1005.31	25	30	27.5	12	52.66	180	6	M8		
<b>SURFD3-1000</b>	<b>m3</b>	106	RD	999.03	30	35	32	14	49.52	180	6	M10		
<b>SURFD4-1000</b>	<b>m4</b>	80	RD	1005.31	40	45	41	18	52.66	180	6	M12		

[Caution on Product Characteristics]

- The allowable forces shown in the table are the calculated values according to the assumed usage conditions. Please see page 373 for more details.
- The backlash of racks differ depending on the size of the mating pinion. Please calculate the backlash from the backlash value of the mating pinion. Also, please refer to the data in the section called 'Backlash of Rack Tooth (Amount of Tooth Thinning)' on Page 375.
- For products made of stainless steel, heat treatment\* and passivation \*\* solutions are applied. Passivation is a rust-resistance treatment, but it is not effective on the machined surface and not a totally rustproof solution.
  - \* Heat Treatment Solution  
Heat treatment by the carbon formed on the surface during blank manufacturing is made to infiltrate the material interior.
  - \*\* Passivation  
Immersion of the metal in a nitric acid solution to make it more rust-resistant.
- After attaching the racks to the base, please fasten with dowel pins. Clamping only with mounting screws could possibly cause the screws to be broken, due to a heavy load.



RF



RD

Counterbore dimensions			Allowable force (N)		Allowable force (kgf)		Weight (kg)	Catalog No.
H	I	J	Bending strength	Surface durability	Bending strength	Surface durability		
6	10	6	1030	237	105	24.2	2.13	<b>SURFD1.5-1000</b>
7	11	7	1830	436	187	44.5	3.56	
8.6	14	9	2860	698	292	71.2	5.29	<b>SURFD2.5-1000</b>
10.8	17.5	11	4120	1030	420	105	7.28	<b>SURFD3-1000</b>
13	20	14	7320	1870	746	191	12.5	<b>SURFD4-1000</b>

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 376) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

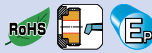
Bevel Gears

Screw Gears

Worm Gear Pair

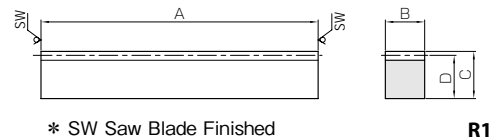
Bevel Gearboxes

Other Products

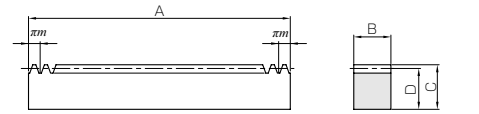


Specifications	
Precision grade	KHK R 001 grade 5 *
Gear teeth	Standard full depth
Pressure angle	20°
Material	MC901
Heat treatment	—
Tooth hardness	115 ~ 120HRR

\* The precision grade of this product is equivalent to the value shown in the table.



\* SW Saw Blade Finished



RF

Catalog No.	Module	Effective no. of teeth	Shape	Total length		Face width		Height		Height to pitch line		Allowable force (N)		Allowable force (kgf)		Weight (kg)
				A	B	C	D	Bending strength	Bending strength	Bending strength	Bending strength					
<b>PR1-500</b>	<b>m1</b>	159	R1	505	10	12	11	92.8	9.46	0.064						
<b>PR1.5-500</b> <b>PR1.5-1000</b>	<b>m1.5</b>	105 212	R1	505 1010	15	20	18.5	209	21.3	0.16 0.33						
<b>PR2-500</b> <b>PR2-1000</b>	<b>m2</b>	79 159	R1	505 1010	20	25	23	371	37.9	0.27 0.54						
<b>PR2.5-500</b> <b>PR2.5-1000</b>	<b>m2.5</b>	63 127	R1	505 1010	25	30	27.5	580	59.2	0.40 0.81						
<b>PR3-500</b> <b>PR3-1000</b>	<b>m3</b>	52 105	R1	505 1010	30	35	32	835	85.2	0.56 1.12						

Catalog No.	Module	No. of teeth	Shape	Total length		Face width		Height		Height to pitch line		Allowable force (N)		Allowable force (kgf)		Weight (kg)
				A	B	C	D	Bending strength	Bending strength	Bending strength	Bending strength					
<b>PRF1.5-1000</b>	<b>m1.5</b>	212	RF	999.03	15	20	18.5	209	21.3	0.32						
<b>PRF2-1000</b>	<b>m2</b>	160	RF	1005.31	20	25	23	371	37.9	0.54						
<b>PRF2.5-1000</b>	<b>m2.5</b>	128	RF	1005.31	25	30	27.5	580	59.2	0.80						
<b>PRF3-1000</b>	<b>m3</b>	106	RF	999.03	30	35	32	835	85.2	1.11						

[Caution on Product Characteristics]

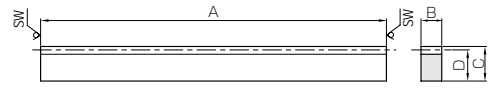
- ① The allowable forces shown in the table are the calculated values according to the assumed usage conditions. Please see page 373 for more details.
- ② The backlash of racks differ depending on the size of the mating pinion. Please calculate the backlash from the backlash value of the mating pinion. Also, please refer to the data in the section called 'Backlash of Rack Tooth (Amount of Tooth Thinning)' on Page 375.
- ③ Dimensions of Plastic Racks vary due to temperature and humidity. A 10° C rise in the ambient temperature will cause 0.45 mm increase in the length per 1000 mm. A 2% moisture absorption will cause approx. 5 mm increase in the length per 1000 mm. Please see the section "Design of Plastic Gears" in the technical reference (P 693).
- ④ The straightness deviation of Plastic Racks is less than 5mm per meter. However, for Plastic Racks with the total length of 1000 mm, the value may exceed 5 mm due to age deterioration. You may correct this error by using the bottom surface as the reference when attaching the racks.

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 376) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Plastic gears are susceptible to the effects of temperature and moisture. Dimensional changes may occur while performing secondary operations and during post-machining operations. It is recommended to modify mounting holes and the attaching portions at the same time when stringing together racks for use.



Specifications	
Precision grade	KHK R 001 grade 4
Gear teeth	Standard full depth
Pressure angle	20°
Material	Free cutting brass (C3604)
Heat treatment	—
Tooth hardness	more than 80HV



\* SW Saw Blade Finished

**R1**

Catalog No.	Module	Effective no. of teeth	Shape	Total length	Face width	Height	Height to pitch line	Allowable force (N)		Allowable force (kgf)		Weight (kg)
				A	B	C	D	Bending strength	Surface durability	Bending strength	Surface durability	
<b>BSR0.5-300</b>	<b>m0.5</b>	190	R1	303	3	9	8.5	28.7	—	2.93	—	0.066
<b>BSR0.8-300</b>	<b>m0.8</b>	118	R1	303	4	10	9.2	61.3	—	6.25	—	0.095
<b>BSR1-300</b>	<b>m1</b>	94	R1	303	6	10	9	115	—	11.7	—	0.14

[Caution on Product Characteristics]

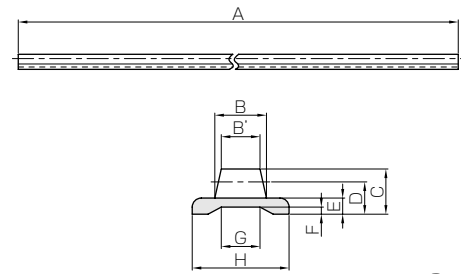
- ① The allowable forces shown in the table are the calculated values according to the assumed usage conditions. Please see page 373 for more details.
- ② The backlash of racks differ depending on the size of the mating pinion. Please calculate the backlash from the backlash value of the mating pinion. Also, please refer to the data in the section called 'Backlash of Rack Tooth (Amount of Tooth Thinning)' on Page 375.

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 376) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.



Specifications	
Precision grade	KHK R 001 grade 8
Gear teeth	Standard full depth
Pressure angle	20°
Material	Duracon (M25-44)
Heat treatment	—
Tooth hardness	110 ~ 120HRR



R4

Catalog No.	Module	Shape	Total length	Face width	Face width	Height	Height to pitch line	Thickness of base	Depth of groove	Width of groove	Width of base
			A	B	B'	C	D	E	F	G	H
<b>DR0.8-2000</b>	<b>m0.8</b>	R4	2000	3.8	3	3.3	2.5	1.5	0.7	3.7	8
<b>DR1-2000</b>	<b>m1</b>	R4	2000	5	4	4.3	3.3	2	0.9	4.9	10
<b>DR1.5-2000</b>	<b>m1.5</b>	R4	2000	6.5	5	5.7	4.2	2.3	1	8	12
<b>DR2-2000</b>	<b>m2</b>	R4	2000	8	6	7	5	2.5	1.1	10.1	15

[Caution on Product Characteristics]

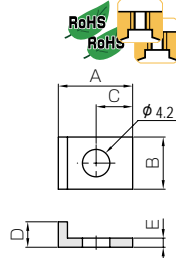
- ① The allowable forces shown in the table are the calculated values according to the assumed usage conditions. Please see page 373 for more details.
- ② To use the molded flexible rack with a 20 tooth pinion, the radius of curvature for an external or internal arc must be greater than 150 mm.
- ③ Molded Flexible Racks are not suitable for use when positioning accuracy is required.
- ④ To find the dimensional tolerance of these racks, please see the Dimensional Tolerance Table. The overall length tolerance is  $\pm 10$  mm.

### Products for DR SRS

## Rack Clamps



When fixed



### Rack Clamps Material: SS400 (Unichromic Plating)

Catalog No.	Shape	A	B	C	D	E	F	Weight (g)
<b>SRS-1</b>	T7	10.2	8	4.5	2.7	1.2	—	2.24
<b>SRS-2</b>	T7	11.4	8	5.6	3.9	1.4	—	2.52

[Caution on Product Characteristics]

- ① Cross-recessed machine head screw (M4 × 12) is included as an accessory.

### Dimensional Tolerance Table (unit: mm)

Range	Tolerance
below 3 mm	$\pm 0.20$
3 up to 6 mm	$\pm 0.25$
6 up to 10 mm	$\pm 0.30$
10 up to 18 mm	$\pm 0.35$
18 up to 30 mm	$\pm 0.40$
30 mm up	$\pm 0.50$

### Normal Bending and Dimensional Tolerance Table (unit: mm)

Range	Tolerance
below 6 mm	$\pm 0.30$
6 up to 30 mm	$\pm 0.50$
30 up to 120 mm	$\pm 0.80$
120 up to 400 mm	$\pm 1.20$
400 up to 1000 mm	$\pm 2.00$
1000 up to 2000 mm	$\pm 3.00$

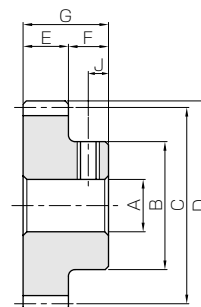


# SSDR DR Rack Pinions



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) * JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB

\* The precision grade of products with a module of less than 0.8 is equivalent to the value shown in the table.



S1T

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Set Screw	
				A <sub>H7</sub>	B	C	D	E	F	G	Size	J
<b>SSDR0.8-35</b>	<b>m0.8</b>	35	S1T	5	16	28	29.6	3	7	10	M4	3.5
<b>SSDR1-30</b>	<b>m1</b>	30	S1T	6	20	30	32	4	8	12	M4	4
<b>SSDR1.5-20</b>	<b>m1.5</b>	20	S1T	6	20	30	33	5	10	15	M4	5
<b>SSDR2-15</b>	<b>m2</b>	15	S1T	8	22	30	34	6	10	16	M5	5

[Caution on Product Characteristics]

- ① For products with a tapped hole, a set screw is included.
- ② The allowable torque shown in the table are calculated values according to the assumed usage conditions. Please see page 373 (NOTE 4) for more details.

## Products for DR Molded Flexible Racks

Molded Flexible Racks	Rack Clamps	Rack Guide Rails	DR Rack Pinions
<b>DR0.8-2000</b>	<b>SRS-1</b>	<b>ARL-0.8</b>	<b>SSDR0.8-35</b>
<b>DR1-2000</b>	<b>SRS-1</b>	<b>ARL-1</b>	<b>SSDR1-30</b>
<b>DR1.5-2000</b>	<b>SRS-2</b>	<b>ARL-1.5</b>	<b>SSDR1.5-20</b>
<b>DR2-2000</b>	<b>SRS-2</b>	<b>ARL-2</b>	<b>SSDR2-15</b>

\* We also accept special orders for longer racks over 2 m.

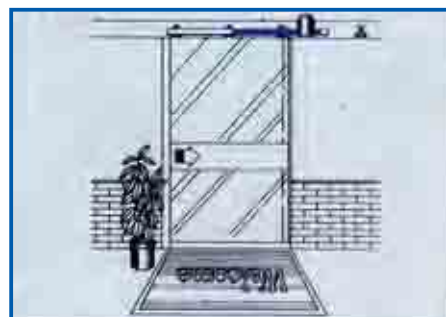
Allowable force (N)	Allowable force (kgf)	Weight (kg)	Catalog No.
Bending strength	Bending strength		
112	11.4	0.036	<b>DR0.8-2000</b>
161	16.4	0.060	<b>DR1-2000</b>
161	16.5	0.085	<b>DR1.5-2000</b>
265	27.0	0.12	<b>DR2-2000</b>

## DR Molded Flexible Rack Applications

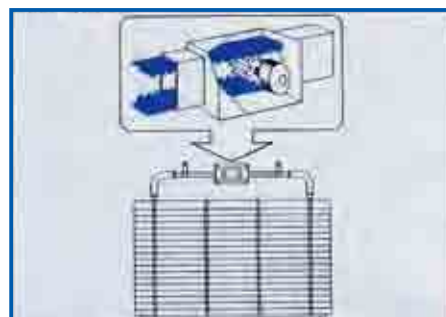
By fastening the positions of the pinions and adjusting the shape freely, DS Molded Flexible Racks can be used for various uses.



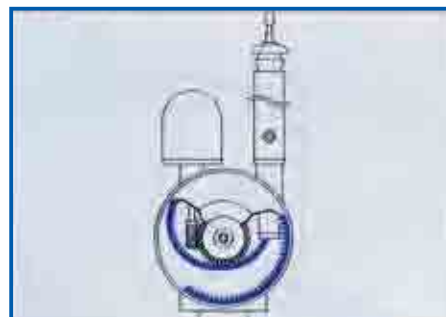
Motor Drive Curtain



Double Window with a built-in Blind

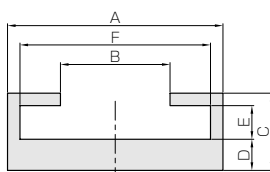


Motor Drive Antenna



Automatic Door

## Products for DR ARL Rack Guide Rails



T6

■ Rack Guide Rails Material: Aluminum (A6063S-T5) Total Length : 1000 mm

Catalog No.	Shape	A	B	C	D	E	F	Weight (kg)
<b>ARL-0.8</b>	T6	10.3	4.4	4.7	2	1.7	8.3	0.081
<b>ARL-1</b>	T6	12.3	5.6	5.2	2	2.2	10.3	0.096
<b>ARL-1.5</b>	T6	14.3	7.2	5.5	2	2.5	12.3	0.11
<b>ARL-2</b>	T6	17.3	8.8	6.2	2.5	2.7	15.3	0.15

## Steel Spur Gears

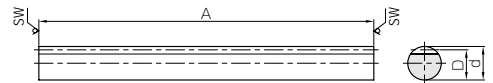
Allowable torque (N-m)	Allowable torque (kgf-m)	Weight (g)	Catalog No.
Bending strength	Bending strength		
2.59	0.26	23.5	<b>SSDR0.8-35</b>
4.46	0.45	38.6	<b>SSDR1-30</b>
7.35	0.75	48.4	<b>SSDR1.5-20</b>
10.4	1.06	56.1	<b>SSDR2-15</b>

[Caution on Secondary Operations]

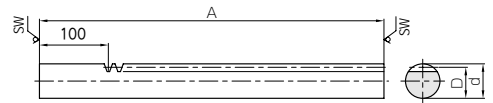
① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.



Specifications	
Precision grade	KHK R 001 grade 4
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	Stress relief annealing
Tooth hardness	less than 95HRB



R2



R7

\* SW Saw Blade Finished

Catalog No.	Module	Effective no. of teeth	Shape	Total length			Allowable force (N)		Allowable force (kgf)		Weight (kg)
				A	Outside dia. $d_{h9}$	Height to pitch line D	Bending strength	Surface durability	Bending strength	Surface durability	
<b>SRO1-500</b>	<b>m1</b>	159	R2	505	10	9	800	121	81.6	12.3	0.29
<b>SRO1.5-500</b>	<b>m1.5</b>	105	R2	505	15	13.5	1800	288	184	29.3	0.65
<b>SRO2-500</b>	<b>m2</b>	79	R2	505	20	18	3200	530	326	54.0	1.16
<b>SRO2-1000</b>		159		1010							
<b>SRO2.5-500</b>	<b>m2.5</b>	63	R2	505	25	22.5	5000	848	510	86.5	1.81
<b>SRO2.5-1000</b>		127		1010							
<b>SRO3-500</b>	<b>m3</b>	52	R2	505	30	27	7200	1240	735	127	2.60
<b>SRO3-1000</b>		105		1010							
<b>SRO4-500</b>	<b>m4</b>	39	R2	505	40	36	12800	2270	1310	232	4.62
<b>SRO4-1000</b>		79		1010							
<b>SRO5-1000</b>	<b>m5</b>	63	R2	1010	50	45	20000	3620	2040	369	14.4
<b>SRO6-1000</b>	<b>m6</b>	52	R2	1010	60	54	28800	5290	2940	539	20.8

Catalog No.	Module	Effective no. of teeth	Shape	Total length			Allowable force (N)		Allowable force (kgf)		Weight (kg)
				A	Outside dia. $d_{h9}$	Height to pitch line D	Bending strength	Surface durability	Bending strength	Surface durability	
<b>SROS1-500</b>	<b>m1</b>	128	R7	505	10	9	800	121	81.6	12.3	0.29
<b>SROS1.5-500</b>	<b>m1.5</b>	85	R7	505	15	13.5	1800	288	184	29.3	0.66
<b>SROS2-500</b>	<b>m2</b>	64	R7	505	20	18	3200	530	326	54.0	1.17
<b>SROS2.5-500</b>	<b>m2.5</b>	51	R7	505	25	22.5	5000	848	510	86.5	1.83
<b>SROS3-500</b>	<b>m3</b>	42	R7	505	30	27	7200	1240	735	127	2.64

[Caution on Product Characteristics]

- ① The allowable forces shown in the table are the calculated values according to the assumed usage conditions. Please see page 373 for more details.
- ② The backlash of racks differ depending on the size of the mating pinion. Please calculate the backlash from the backlash value of the mating pinion. Also, please refer to the data in the section called 'Backlash of Rack Tooth (Amount of Tooth Thinning)' on Page 375.
- ③ Tolerance of "d" dimension of SRO6-1000 is h10.

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 376) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Please avoid hardening of Round Racks. It causes contortion and deformation, and straightening processes can hardly be applied.

Spur Gears  
Helical Gears  
Internal Gears  
Racks  
CP Racks & Pinions  
Miter Gears  
Bevel Gears  
Screw Gears  
Worm Gear Pair  
Bevel Gearboxes  
Other Products

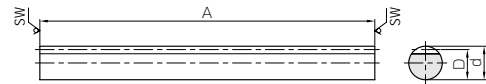




Newly added



Specifications	
Precision grade	KHK R 001 grade 5
Gear teeth	Standard full depth
Pressure angle	20°
Material	SUS303
Heat treatment	—
Tooth hardness	less than 187HB



\* SW Saw Blade Finished

R2

Catalog No. <small>New items indicated in blue letters.</small>	Module	Effective no. of teeth	Shape	Total length	Outside dia.	Height to pitch line	Allowable force (N)		Allowable force (kgf)		Weight (kg)
				A	d <sub>h9</sub>	D	Bending strength	Surface durability	Bending strength	Surface durability	
<b>SURO1-500</b>	<b>m1</b>	159	R2	505	10	9	382	67.9	39.0	6.93	0.29
<b>SURO1.5-500</b>	<b>m1.5</b>	105	R2	505	15	13.5	859	162	87.6	16.5	0.65
<b>SURO2-500</b> <b>SURO2-1000</b>	<b>m2</b>	79 159	R2	505 1010	20	18	1530	298	156	30.4	1.15 2.30
<b>SURO2.5-500</b> <b>SURO2.5-1000</b>	<b>m2.5</b>	63 127	R2	505 1010	25	22.5	2390	477	243	48.7	1.79 3.59
<b>SURO3-500</b> <b>SURO3-1000</b>	<b>m3</b>	52 105	R2	505 1010	30	27	3440	700	351	71.4	2.58 5.17

[Caution on Product Characteristics]

- ① The allowable forces shown in the table are the calculated values according to the assumed usage conditions. Please see page 373 for more details.
- ② The backlash of racks differ depending on the size of the mating pinion. Please calculate the backlash from the backlash value of the mating pinion. Also, please refer to the data in the section called 'Backlash of Rack Tooth (Amount of Tooth Thinning)' on Page 375.

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 376) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

Bevel Gearboxes

Other Products



Specifications	
Precision grade	KHK R 001 grade 1
Reference section of gear	Rotating plane
Gear teeth	Standard full depth
Transverse pressure angle	20°
Helix angle	21°30'
Material	SCM440
Heat treatment	Thermal refining only
Tooth hardness	250 ~ 285HB

Catalog No.	Module	Effective no. of teeth	Direction of helix	Shape	Total length		Face width	Height	Height to pitch line	Allowable force (N)		Allowable force (kgf)	
					A	B				C	D	Bending strength	Surface durability
KRHG1-100R KRHG1-100L	<b>m1</b>	28	R L	RR RL	98	8	15	14	1290	955	131	97.4	
KRHG1.5-100R KRHG1.5-100L	<b>m1.5</b>	19	R L	RR RL	101	12	20	18.5	2890	2380	295	243	
KRHG2-100R KRHG2-100L	<b>m2</b>	13	R L	RR RL	98	16	25	23	5140	4230	524	432	
KRHG2.5-100R KRHG2.5-100L	<b>m2.5</b>	10	R L	RR RL	100	20	30	27.5	8030	6610	819	674	
KRHG3-100R KRHG3-100L	<b>m3</b>	8	R L	RR RL	102	25	35	32	12000	9810	1230	1000	

Catalog No.	Module	No. of teeth	Direction of helix	Shape	Total length		Face width	Height	Height to pitch line	Allowable force (N)	
					A	A'				B	C
KRHGF1-500R KRHGF1-500L	<b>m1</b>	159	R L	RFR RFL	499.51	502.66	8	15	14	1290	955
KRHGF1.5-500R KRHGF1.5-500L	<b>m1.5</b>	106	R L	RFR RFL	499.51	504.23	12	20	18.5	2890	2380
KRHGF2-1000R KRHGF2-1000L	<b>m2</b>	160	R L	RFR RFL	1005.31	1011.61	16	25	23	5140	4230
KRHGF2.5-1000R KRHGF2.5-1000L	<b>m2.5</b>	128	R L	RFR RFL	1005.31	1013.19	20	30	27.5	8030	6610
KRHGF3-1000R KRHGF3-1000L	<b>m3</b>	106	R L	RFR RFL	999.03	1008.88	25	35	32	12000	9810

[Caution on Product Characteristics]

- ① The allowable forces shown in the table are the calculated values according to the assumed usage conditions. Please see page 373 for more details.
- ② The backlash of racks differ depending on the size of the mating pinion. Please calculate the backlash from the backlash value of the mating pinion. Also, please refer to the data in the section called 'Backlash of Rack Tooth (Amount of Tooth Thinning)' on Page 375.
- ③ Please use KHG Ground Helical Gears as the mating pinion.
- ④ These racks produce axial thrust forces. See page 351 for more details.

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks &amp; Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

Bevel Gearboxes

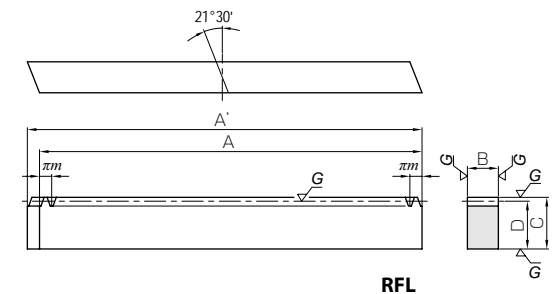
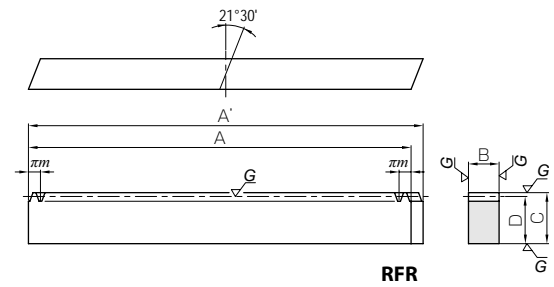
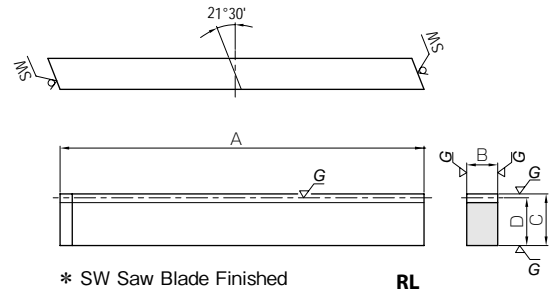
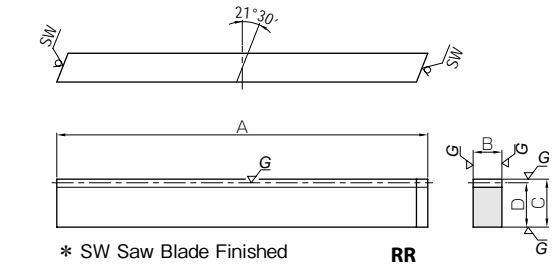
Other Products

Ground Helical Racks

Weight (kg)	Catalog No.
0.086	<b>KRHG1-100R</b> <b>KRHG1-100L</b>
0.18	<b>KRHG1.5-100R</b> <b>KRHG1.5-100L</b>
0.28	<b>KRHG2-100R</b> <b>KRHG2-100L</b>
0.43	<b>KRHG2.5-100R</b> <b>KRHG2.5-100L</b>
0.64	<b>KRHG3-100R</b> <b>KRHG3-100L</b>

Allowable force (kgf)		Weight (kg)	Catalog No.
Bending strength	Surface durability		
131	97.4	0.44	<b>KRHGF1-500R</b> <b>KRHGF1-500L</b>
295	243	0.87	<b>KRHGF1.5-500R</b> <b>KRHGF1.5-500L</b>
524	432	2.90	<b>KRHGF2-1000R</b> <b>KRHGF2-1000L</b>
819	674	4.34	<b>KRHGF2.5-1000R</b> <b>KRHGF2.5-1000L</b>
1230	1000	6.27	<b>KRHGF3-1000R</b> <b>KRHGF3-1000L</b>

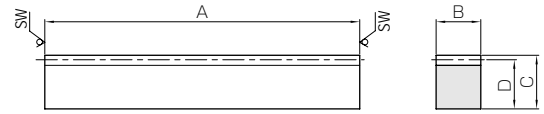
[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 376) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.



- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products



Specifications	
Precision grade	KHK R 001 grade 5
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Helix angle	15°
Material	S45C
Heat treatment	Stress relief annealing
Tooth hardness	less than 95HRB



\* SW Saw Blade Finished

R1

Catalog No.	Module	Effective no. of teeth	Direction of helix	Shape	Total length		Face width	Height	Height to pitch line	Allowable force (N)		Allowable force (kgf)	
					A	B				Bending strength	Surface durability	Bending strength	Surface durability
SRH2-100R SRH2-100L	m2	12	R L	RR RL	95	25	25	23	4710	1570	481	160	
SRH2-500R SRH2-500L		75	R L	R1	505								
SRH2-1000R SRH2-1000L		152	R L		1010								
SRH3-100R SRH3-100L	m3	7	R L	RR RL	95	35	35	32	9910	3520	1010	359	
SRH3-500R SRH3-500L		49	R L	R1	505								
SRH3-1000R SRH3-1000L		101	R L		1010								

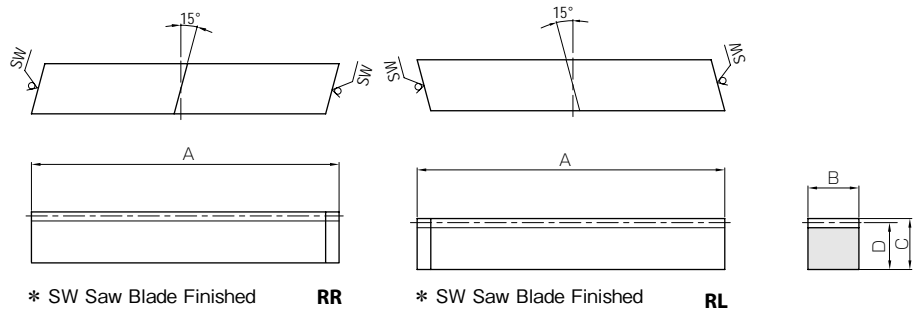
Catalog No.	Module	No. of teeth	Direction of helix	Shape	Total length		Face width	Height	Height to pitch line	Allowable force (N)	
					A	A'				Bending strength	Surface durability
SRHF2-1000R SRHF2-1000L	m2	153	R L	RFR RFL	995.24	1001.94	25	25	23	4710	1570
SRHF3-1000R SRHF3-1000L	m3	102	R L	RFR RFL	995.24	1004.62	35	35	32	9910	3520

Catalog No.	Module	No. of teeth	Direction of helix	Shape	Total length		Face width	Height	Height to pitch line	Mounting hole dimensions			No. of mounting holes	Mounting screw size
					A	A'				E	F	G		
SRHFD2-1000R SRHFD2-1000L	m2	153	R L	RDR RDL	995.24	1001.94	25	25	23	10	47.62	180	6	M6
SRHFD3-1000R SRHFD3-1000L	m3	102	R L	RDR RDL	995.24	1004.62	35	35	32	14	47.62	180	6	M10

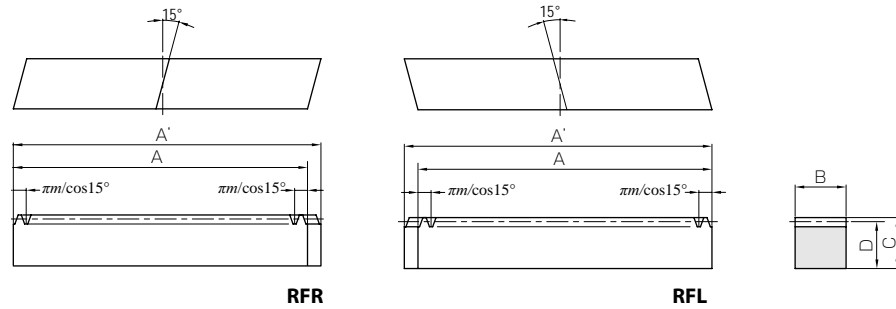
[Caution on Product Characteristics]

- ① The allowable forces shown in the table are the calculated values according to the assumed usage conditions. Please see page 373 for more details.
- ② The backlash of racks differ depending on the size of the mating pinion. Please calculate the backlash from the backlash value of the mating pinion. Also, please refer to the data in the section called 'Backlash of Rack Tooth (Amount of Tooth Thinning)' on Page 375.
- ③ Please use SH Helical Gears as the mating pinion.
- ④ These racks produce axial thrust forces. See page 351 for more details.
- ⑤ After attaching the racks to the base, please fasten with dowel pins. Clamping only with mounting screws could possibly cause the screws to be broken, due to a heavy load.

Spur Gears  
 Helical Gears  
 Internal Gears  
 Racks  
 CP Racks & Pinions  
 Miter Gears  
 Bevel Gears  
 Screw Gears  
 Worm Gear Pair  
 Bevel Gearboxes  
 Other Products



Weight (kg)	Catalog No.
0.43	<b>SRH2-100R</b> <b>SRH2-100L</b>
2.28	<b>SRH2-500R</b> <b>SRH2-500L</b>
4.56	<b>SRH2-1000R</b> <b>SRH2-1000L</b>
0.84	<b>SRH3-100R</b> <b>SRH3-100L</b>
4.44	<b>SRH3-500R</b> <b>SRH3-500L</b>
8.88	<b>SRH3-1000R</b> <b>SRH3-1000L</b>

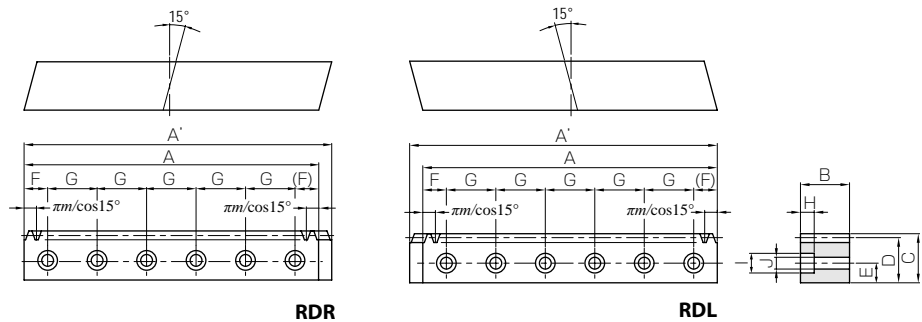


Allowable force (kgf)		Weight (kg)	Catalog No.
Bending strength	Surface durability		
481	160	4.49	<b>SRHF2-1000R</b> <b>SRHF2-1000L</b>
1010	359	8.75	<b>SRHF3-1000R</b> <b>SRHF3-1000L</b>

Counterbore dimensions			Allowable force (N)		Allowable force (kgf)		Weight (kg)	Catalog No.
H	I	J	Bending strength	Surface durability	Bending strength	Surface durability		
7	11	7	4710	1570	481	160	4.43	<b>SRHFD2-1000R</b> <b>SRHFD2-1000L</b>
10.8	17.5	11	9910	3520	1010	359	8.52	<b>SRHFD3-1000R</b> <b>SRHFD3-1000L</b>

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 376) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② If gear tooth hardening, or thermal refining, is applied, the decarburization layer (approx. 0.5 mm thickness) on the rectangular surfaces cannot have the hardness you designate.
- ③ Avoid hardening Racks with bolt holes, due to deformation occurring at the mounting hole and the difficulty of straightening after hardening.



Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

Bevel Gearboxes

Other Products





# CP Racks & Pinions

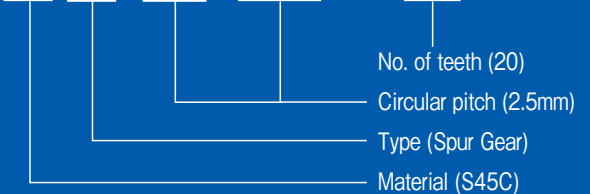
## Catalog Number of KHK Stock Gears

Catalog Numbers of KHK stock gears are based on simple principles as follows. Please order KHK gears by specifying their Catalog Numbers.

(Example) CP Racks & Pinions

Pinions

S S CP 2.5 - 20



### Material

S S45C  
SU SUS303, SUS304  
K SCM440

### Type

S Spur Gears  
TS Tapered Spur Gears

### Other Information

G Ground Gears  
S Pinion Shafts

### Racks

S R CP 5 - 100



### Material

S S45C  
K SCM440  
SU SUS304  
F SS400

### Other Information

F Racks with Machined Ends  
D Racks with Bolt Holes  
K Racks with Drill Holes  
G Ground Racks

### Type

R Racks  
RO Round Racks  
TR Tapered Racks

<b>KTSCP</b> CP Tapered Pinions  CP5, 10 Page 404 RoHS, H, B	<b>STRCPF · STRCPFD</b> CP Tapered Racks  CP5, 10 Page 404 RoHS, H, B	<b>SSCPGS</b> CP Ground Spur Pinion Shafts  CP5, 10 Page 406 RoHS, H, G, B
<b>SSCPG</b> CP Ground Spur Gears  CP5 ~ 20 Page 406 RoHS, H, G, B	<b>KRGCP · KRGCPF · KRGCPD</b> CP Ground Racks  CP5, 10 Page 408 RoHS, H, G, B	<b>SRGCP · SRGCPF · SRGCPD</b> CP Ground Racks  CP5 ~ 20 Page 410 RoHS, H, G, B <i>Newly added</i>
<b>SSCP</b> CP Steel Spur Gears  CP2.5 ~ 20 Page 412 RoHS, H, B	<b>KRCPF</b> CP Thermal Refined Racks  CP5, 10 Page 412 RoHS, H, B	<b>SRCP · SRCPF · SRCPFD</b> CP Racks  CP2.5 ~ 20 Page 414 RoHS, H, G, B
<b>SUSCP</b> CP Stainless Steel Spur Gears  CP5, 10 Page 416 RoHS, SUS	<b>SURCPF · SURCPFD</b> CP Stainless Steel Racks  CP5, 10 Page 416 RoHS, H, SUS	<b>SROCP</b> CP Round Racks  CP2.5 ~ 10 Page 418 RoHS, H, B
<b>FRCP</b> CP Metal Flexible Racks  CP5 Page 418 RoHS		

### Feature Icons

- |                        |                            |
|------------------------|----------------------------|
| RoHS Compliant Product | Stainless Product          |
| Re-machinable Product  | Resin Product              |
| Finished Product       | Copper Alloy Product       |
| Heat Treated Product   | Injection Molded Product   |
| Ground Gear            | Black Oxide coated Product |

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

Bevel Gearboxes

Other Products

## Characteristics



KHK stock CP racks and pinions are suitable in applications where very accurate positioning in linear motion is required. For your convenience, we offer circular pitches of 2.5 to 20 mm and in lengths of 100 to 2000 mm. (FRCP is available to 4000 mm)

### About CP Racks & Pinions

The reference pitch of a metric module is computed by multiplying the number of module by  $\pi$  (3.14159). For example, the reference pitch of  $m3$  rack is 9.425 mm ( $3 \times \pi$ ). When using a rack and a pinion in a linear motion application, the fact that the pitch is not an integral number presents a difficulty in accurate positioning. This problem is solved by CP racks and pinions where one rotation of a pinion moves it precisely 50, 100, 150, ... or 600 mm. The following table lists the main features. The following table lists the main features.

### Racks

Catalog No.	Pitch (mm)	Total Length (mm) ( ) No. of teeth	Material	Heat Treatment	Tooth Surface Finish	Precision KHK R 001 ( ) denotes JIS B 1702-1	Features
<b>STRCPF</b> · <b>STRCPFD</b> <small>Note 1</small>	5, 10	1000	S45C	Straightened & annealed	Cut	4	By pairing with KTSCP pinion, the backlash may be adjusted.
<b>KRGCP</b> · <b>KRGCPF</b> · <b>KRGCPD</b> <small>Note 1</small>	5, 10	100, 500, 1000	SCM440	Thermal Refined	Ground	1	High strength and abrasion-resistant for precision linear motion.
<b>SRGCP</b> · <b>SRGCPF</b> · <b>SRGCPFD</b> <small>Note 1</small>	5, 10, 15, 20	100, 500, 1000	S45C	Gear teeth induction hardened	Ground	3	Reasonably priced ground racks with abrasion-resistant characteristics. J Series products are also available.
<b>KRCPF</b>	5, 10	1000	SCM440	Thermal Refined	Cut	4	Increased strength with SCM440 material which is thermal refined.
<b>SRPC</b> · <b>SRCPF</b> · <b>SRCPFD</b> <small>Note 1</small>	2.5, 5, 10, 15, 20	100, 500, 1000, 1500, 2000	S45C	Straightened & annealed	Cut	4	Widely applicable due to low cost and large selection of pitches and lengths.
<b>SURCPF</b> · <b>SURCPFD</b> <small>Note 1</small>	5, 10	500, 1000	SUS304	Solution treated	Cut	5	Suitable for food machinery due to SUS304 material's rust-resistant quality.
<b>SROCP</b>	2.5, 5, 10	500	S45C	Straightened & annealed	Cut	4	Convenient in applications where the rack has reciprocal motion.
<b>FRCP</b>	5	2000, 3000, 4000	SS400	—	Cut	8	Cut continuously. Long length and bendable to a contour.

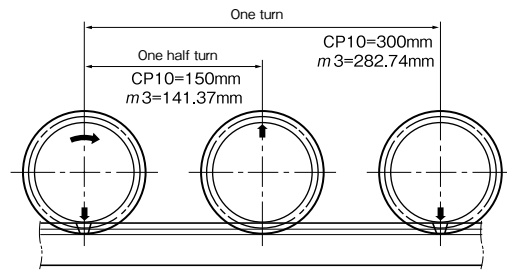
### Pinions

<b>KTSCP</b>	5, 10	(20 ~ 40)	SCM440	Thermal refined	Cut	(N8)	By pairing with STRCPF rack, the backlash may be adjusted.
<b>SSCPGS</b>	5, 10	(10 ~ 25)	S45C	Gear teeth induction hardened	Ground	(N7)	Ground Spur Gears with Pinions, can be directly assembled with the shaft bearing, by modifying the pinion.
<b>SSCPG</b>	5, 10, 15, 20	(20 ~ 40)	S45C	Gear teeth induction hardened	Ground	(N7)	Perform secondary operations to suit your requirement on these ground CP spur gears.
<b>SSCP</b>	2.5, 5, 10, 15, 20	(20 ~ 40)	S45C	—	Cut	(N8)	Low cost and widely applicable, with a large selection of pitches and numbers of teeth.
<b>SUSCP</b>	5, 10	(20 ~ 30)	SUS303	—	Cut	(N8)	Suitable for food machinery due to SUS303 material's rust-resistant quality.

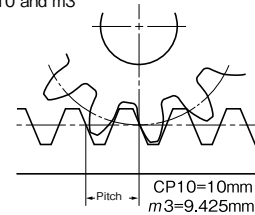
**(NOTE 1)** The catalog numbers in the above tables with a suffix of F have both ends machined so that they can be butted against each other to make any desired length. The items with (D) have mounting screw holes for easier assembly.

- For safer handling and to prevent damage such as deformation, KHK stock CP racks have round chamfering on the corners of the top land of the gear tooth. This rounded chamfered shape is patented by KHK. Because it is effective for reducing noise, all of KHK CP racks have this chamfering treatment.
- Black colored products are KHK stock gears that have an applied black oxide coating for rust resistance; this 'blackness' is a product characteristic of KHK stock gears.

Movement of one cycle of the CP10-30 pinion on a CP rack vs. SS3-30 (m3) on a m3 rack.



Difference between CP10 and m3





## Selection Hints



Please select the most suitable products by carefully considering the characteristics of items and contents of the product tables. It is also important to read all applicable notes before the final selection.

### 1. Caution in Selecting the Mating Gears

- ① KHK stock CP racks are mated with CP spur gears having the same pitch. Since CP2.5 (m0.796), CP5 (m1.592) and CP10 (m3.183) are very close in size to m0.8, m1.5 and m3 respectively, the selecting the proper mating gear should be verified to make sure that the items are correct. Otherwise, complications could arise.
- ② STRCPF and STRCPFD Tapered Racks are mated with KTSCP Spur Gears having the same pitch. They can also be mated with other spur gears, however, they can not be used as parallel axis gears due to the setting angles.

### 2. Caution in Selecting Gears Based on Gear Strength

The gear strength values shown in the product pages were computed by assuming a certain application environment. Therefore, they should be used as reference only. We recommend that each user computes his own values by applying the actual usage conditions. The table below contains the assumptions established for these products in order to compute gear strengths.

### Calculation assumptions for Bending Strength

Racks

Pinions

Item	Catalog No.	Racks					Pinions			
		KRGCP KRGCPF KRGCPD KRCPPF	SRGCP SRGCPF SRGCPFD	SRCP · SRCPF SRCPPFD SROCP STRCPF STRCPFD	SURCPF SURCPFD FRCP	SSCPGS	SSCPG	KTSCP	SSCP	SUSCP
Formula <small>NOTE 1</small>		Formula of spur and helical gears on bending strength (JGMA401-01)								
No. of teeth of mating gear		30				Same number of teeth				
Rotation		100rpm								
Durability		Over 10 <sup>7</sup> cycles								
Impact from motor		Uniform load								
Impact from load		Uniform load								
Direction of load		Bidirectional								
Allowable bending stress at root $\sigma_{\text{lim}}$ (kgf/mm <sup>2</sup> ) <small>NOTE 2</small>		32	20	20	10.5	24.5	19	28.5	19	10.5
Safety factor $S_F$		1.2								

### Calculation assumptions for Surface Durability (Except those in common with bending strength)

Formula <small>NOTE 1</small>	Formula of spur and helical gears on surface durability (JGMA402-01)									
Kinematic viscosity of lubricant	100cSt (50°C)									
Gear support	Support on one end									
Allowable Hertz stress $\sigma_{\text{Hlim}}$ (kgf/mm <sup>2</sup> )	79	90	52.5	41.3	99	90	74.5	49	41.3	
Safety factor $S_H$	1.15									

**(NOTE 1)** The gear strength formula is based on JGMA (Japanese Gear Manufacturers Association) specifications. The units for the number of rotations (rpm) and the stress (kgf/mm<sup>2</sup>) are adjusted to the units needed in the formula.

**(NOTE 2)** Since the load is bidirectional, the allowable bending stress at root  $\sigma_{\text{lim}}$  is set to 2/3 of the value.

#### Definition of bending strength by JGMA 401-01 (1974)

The allowable bending strength of a gear is defined as the allowable tangential force at the pitch circle based on the mutually allowable root stress of two meshing gears under load.



Example of the failure due to insufficient bending strength.

#### Definition of surface durability by JGMA 402-01 (1975)

The surface durability of a gear is defined as the allowable tangential force at the pitch circle, which permits the force to be transmitted safely without incurring surface failure.



Example of the defacement due to insufficient surface durability.

### 3. Selecting Racks By Precision

The precision standards of KHK stock racks are established by us. Please be sure to see the pages below when selecting.

- ① Pitch Error of Racks NOTE 2 (KHKR001) → page 374
- ② Precision of Rack Blanks (KHKR002) → page 375
- ③ Backlash of Rack Tooth (KHKR003) → page 375

**(NOTE 2)** Convert CP to m (module) when reference is made to the data in the table. ( $m=CP/\pi$ )

## Application Hints



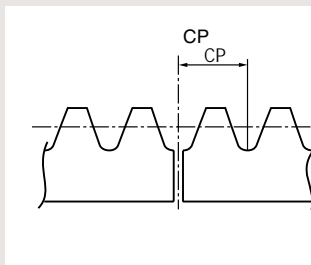
In order to use KHK stock gears safely, carefully read the Application Hints before proceeding.

If there are questions or if you require clarifications, please contact our technical department or your nearest distributor.

KHK CO., LTD.  
 PHONE: 81-48-254-1744 FAX: 81-48-254-1765  
 E-mail export@khkgears.co.jp

### 1. Caution on Performing Secondary Operations

- ① Secondary operations can be performed on all KHK stock CP racks except for the racks where the gear teeth are induction hardened. To avoid problems of gear precision, do not reduce the face width. The precision of ground racks and racks with mounting holes may drop if you do not exercise extreme caution during installation or while modifying.
- ② Pitch lines of racks are controlled by using the bottom surface as the reference datum and over-pin measurements on tooth thickness. If you machine the bottom surfaces, the precision of the racks may be affected.
- ③ When connecting two racks, the machining of the mating ends requires careful consideration. The meshing will be poor if the pitch (CP) straddling the connection has a positive tolerance. We recommend a minus tolerance on pitch of at the connection. The below is an indication of pitch tolerance for each module.



Unit : mm

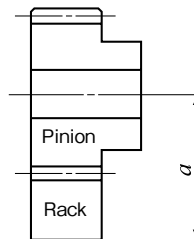
CP	Tolerance
CP2.5	-0.05 -0.25
CP5	-0.1 -0.3
CP10	-0.1 -0.4
CP15	
CP20	

- ④ To use dowel pins to secure racks, attach the racks to the base and drill both simultaneously.
- ⑤ KHK stock CP racks made of S45C and SCM440 (except for ground racks) can be induction hardened. However, the precision of pitch is decreased.
- ⑥ To be able to handle parts safely, all burrs and sharp corners should be removed after the secondary operations are done.
- ⑦ If you are going to modify the gear by gripping the teeth, please exercise caution not to crush the teeth by applying too much pressure. Any scarring will cause noise during operation.

### 2. Points of Caution in Assembling

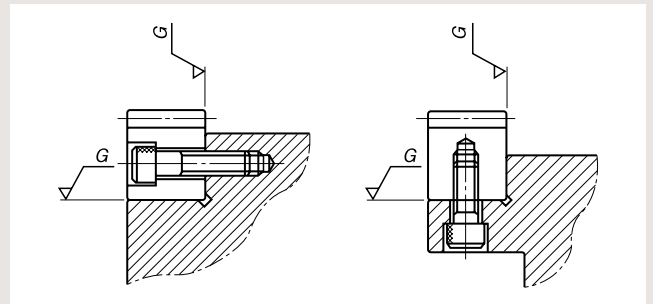
- ① KHK stock CP racks are designed to give the proper backlash when assembled using the mounting distance given by the formula below (mounting distance tolerance of H7 to H8 required). The backlash values are given in the table on page 375. Make sure that the mounting distance stays constant for the length of the rack.

Mounting distance  $a = \text{Height of pitch line of rack} + \text{Pitch radius of pinion}$



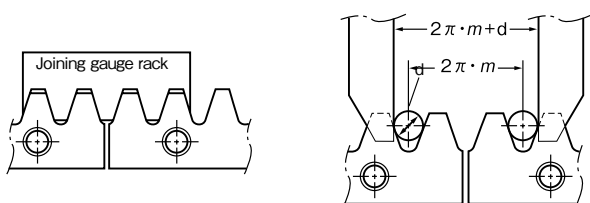
**(CAUTION)**  
 Pinions are assumed to be standard stock spur gears ( $x=0$ ).

- ② KRGCP type of KHK stock ground racks have four surfaces ground parallel to within  $10 \sim 15 \mu\text{m}$ . To maintain true angle, they should be mounted on high precision bases as shown below. It is even possible to correct for the angular errors of racks by compensating the mounting base. With recent increases in the requirement for zero backlash linear drives, such accurate assembly as shown is becoming more important.



- ③ If the racks are not secured properly to the base, they could shift during operation and cause unexpected problems. It is very important to insure firm mounting by the use of dowel pins or similar devices.
- ④ Machined end type racks such as SRCPF and SRCPFD series have the pitch tolerance of  $-0.1/-0.3$  for modules less than Module 2.5, and  $-0.1/-0.4$  for larger modules. If you try to connect the racks without any space, the pitch at the connection will be too small and will cause problems. Please follow the following diagrams for assembly.

### An example of Rack Joining, we recommend the following method.



**(CAUTION)** Joining gauge racks for helical racks must have the opposite hand from the racks. Please use Module 1-10 100 racks as a joining gauge rack, or alternatively the rack of the same specifications on hand.



### ■ Features of KHK Tapered Racks and Pinions

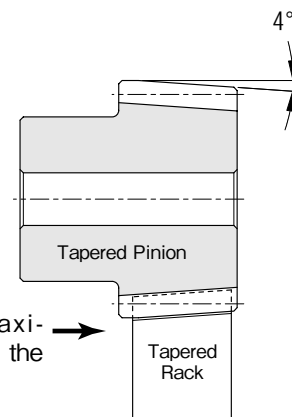
1. Easy adjustment of Backlash value  
 Generally, adjustment of backlash value is made by changing mounting distance (adjusting the height of the motor shaft). The backlash of KHK stock tapered racks and pinions are adjustable only by moving the pinion axially.
2. Reasonable Prices  
 The precision of KHK stock tapered racks and pinions are obtained by rationalization in the production process with our cutting-edge technologies. This enables us to offer quality tapered racks and pinions in the same price range as the CP racks and pinions. (SRCPF and SSC).



### ■ Example of Comparison

- SRCP5-1000 and SSCP5-30 combination produces a backlash value of 0.1 to 0.26.
- STRCPF5-1000 and KTSCP5-30 combination produces a backlash value of 0.05 or less. (Target value)

- ※ Note above backlash values are theoretical values when meshed under ideal conditions.
- ※ Tapered racks and pinions are not interchangeable with KHK stock CP racks and pinions.
- ※ Different modules, number of teeth, ground gear versions and custom-made items are available as special orders.



Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

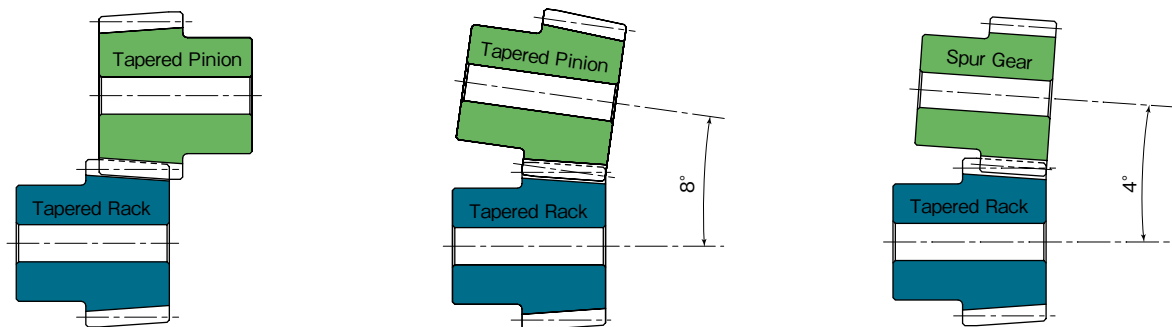
Worm Gear Pair

Bevel Gearboxes

Other Products

### ■ Examples of special applications of Tapered Rack & Pinions

(1) Mounting distance of Tapered Spur Gears and the Shaft Angle when mated with regular Spur Gears.

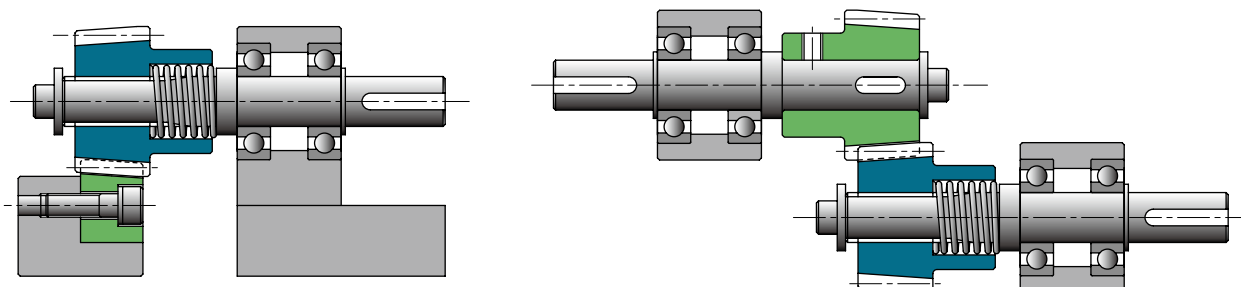


When mating a tapered rack and a tapered pinion, where each hub is set in opposite directions, a 0° shaft angle is obtained. (Axis Parallel).

When mating a tapered rack and a tapered pinion, where each hub is set in the same direction, an 8° shaft angle is obtained.

When mating a tapered rack and a spur gear, a 4° shaft angle is obtained.

(2) Example of an assembly with zero backlash (no backlash) for a spring device



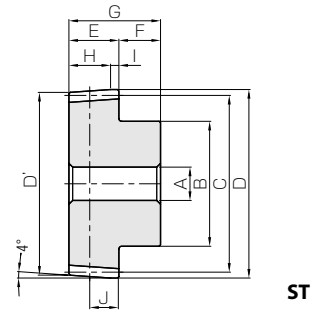
An assembled tapered rack and the pinion with zero backlash. \*

An assembly of tapered pinions, as a pair, with zero backlash.\*

\* The illustration is a design example, not a design for machinery or a device in actual use.



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	SCM440
Heat treatment	Thermal refining only
Tooth hardness	225 ~ 260HB



Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks &amp; Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

Bevel Gearboxes

Other Products

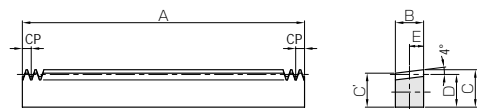
Catalog No.	Pitch mm (Module)	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia. (major)	Outside dia. (minor)	Face width	Hub width	Total length
				A <sub>H7</sub>	B	C	D	D'	E	F	G
KTSCP5-20	CP5 (1.5915)	20	ST	8	25	31.83	36.06	33.97	18	15	33
KTSCP5-25		25		10	32	39.79	44.02	41.92			
KTSCP5-30		30		10	38	47.75	51.98	49.88			
KTSCP5-40		40		12	45	63.66	67.89	65.8			
KTSCP10-20	CP10 (3.1831)	20	ST	15	50	63.66	72.13	67.93	36	20	56
KTSCP10-25		25		20	60	79.58	88.04	83.85			
KTSCP10-30		30		20	75	95.49	103.96	99.76			
KTSCP10-40		40		20	80	127.32	135.79	131.59			

[Caution on Product Characteristics]

- The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 401 for more details.
- The backlash values shown in the table are the theoretical values when these gears and STRCP Tapered Racks are in mesh.



Specifications	
Precision grade	KHK R 001 grade 4
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	Stress relief annealing
Tooth hardness	less than 95HRB



RF

Catalog No.	Pitch mm (Module)	No. of teeth	Shape	Total length	Face width	Height (major)	Height (minor)	Height to pitch line	Reference position
				A	B	C	C'	D	E
STRCPF5-1000	CP5 (1.5915)	200	RF	1000	15	19.5	18.45	17.38	7.5
STRCPF10-1000	CP10 (3.1831)	100	RF	1000	30	34.5	32.4	30.27	15

Catalog No.	Pitch mm (Module)	No. of teeth	Shape	Total length	Face width	Height (major)	Height (minor)	Height to pitch line	Reference position	Mounting hole dimensions				No. of mounting holes	Mounting screw size
				A	B	C	C'	D	E	F	G	H			
STRCPFD5-1000	CP5 (1.5915)	200	RD	1000	15	19.5	18.45	17.38	7.5	8	50	180	6	M5	
STRCPFD10-1000	CP10 (3.1831)	100	RD	1000	30	34.5	32.4	30.27	15	14	50	180	6	M10	

[Caution on Product Characteristics]

- The allowable forces shown in the table are the calculated values according to the assumed usage conditions. Please see page 401 for more details.
- The backlash of the CP Tapered Racks equates to the value of the mating gear shown in the table.
- After attaching the racks to the base, please fasten with dowel pins. Clamping only with mounting screws could possibly cause the screws to be broken, due to a heavy load.

Tapered Spur Gears



Reference face width H	Adjustable width I	Reference position J	Distance traveled in one turn (mm)	Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No.
				Bending strength	Surface durability	Bending strength	Surface durability			
15	3	10.5	100	41.2	8.13	4.20	0.83	0~0.11	0.16	KTSCP5-20
			125	55.6	14.0	5.67	1.43	0~0.11	0.25	KTSCP5-25
			150	70.3	21.9	7.16	2.23	0~0.11	0.37	KTSCP5-30
			200	100	43.3	10.2	4.41	0~0.11	0.61	KTSCP5-40
30	6	21	200	329	71.2	33.6	7.26	0~0.12	1.13	KTSCP10-20
			250	445	122	45.3	12.4	0~0.12	1.71	KTSCP10-25
			300	562	189	57.3	19.2	0~0.12	2.58	KTSCP10-30
			400	801	371	81.7	37.8	0~0.12	4.25	KTSCP10-40

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 402) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.  
 ② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.

Spur Gears

Helical Gears

Internal Gears

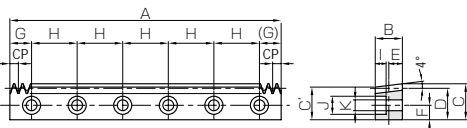
Racks

CP Racks & Pinions

Miter Gears

STRCPF · STRCPFD

Tapered Racks



RD

Allowable force (N)		Allowable force (kgf)		Weight (kg)	Catalog No.
Bending strength	Surface durability	Bending strength	Surface durability		
2290	468	233	47.7	2.05	STRCPF5-1000
9150	1870	933	191	7.13	STRCPF10-1000

Counterbore dimensions			Allowable force (N)		Allowable force (kgf)		Weight (kg)	Catalog No.
H	I	J	Bending strength	Surface durability	Bending strength	Surface durability		
6	10	6	2290	468	233	47.7	2.01	STRCPFD5-1000
10.8	17.5	11	9150	1870	933	191	6.92	STRCPFD10-1000

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 402) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.  
 ② If gear tooth hardening, or thermal refining, is applied, the decarburization layer (approx. 0.5 mm thickness) on the rectangular surfaces cannot have the hardness you designate.  
 ③ Avoid hardening Racks with bolt holes, due to deformation occurring at the mounting hole and the difficulty of straightening the rack after hardening.

Bevel Gears

Screw Gears

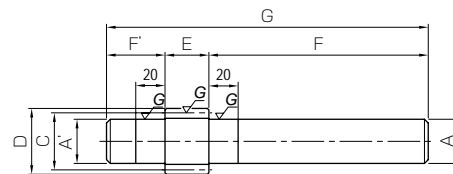
Worm Gear Pair

Bevel Gearboxes

Other Products



Specifications	
Precision grade	JIS grade N7 (JIS B1702-1: 1998) JIS grade 3 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	Thermal refined, tooth surface induction hardened
Tooth hardness	45 ~ 55HRC



S7

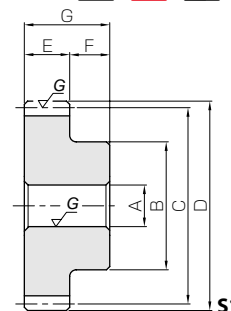
Catalog No.	Pitch mm (Module)	No. of teeth	Profile shift coefficient	Shape	Shaft dia. (L)		Pitch dia.	Outside dia.		Face width	Shaft dia. (R)	
					A'	F'		C	D		A	F
SSCPGS5-15	CP5 (1.5915)	15	0	S7	19.2	25	23.87	27.06	15	19.2	100	
SSCPGS5-20		20	0		27.2		31.83	35.01		27.2		
SSCPGS5-25		25	0		30.2		39.79	42.97		30.2		
SSCPGS10-10	CP10 (3.1831)	10	+0.5	S7	25.2	40	31.83	41.05	30	25.2	150	
SSCPGS10-15		15	0		35.2		47.75	54.11		35.2		
SSCPGS10-20		20	0		40.2		63.66	70.03		40.2		

[Caution on Product Characteristics]

- ① The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 401 for more details.
- ② The backlash values shown in the table are the theoretical values when these gears and SRGCP Racks are in mesh.
- ③ To find the center distance of profile shifted spur gears, please see the appropriate section on page 51 - 52.



Specifications	
Precision grade	JIS grade N7 (JIS B1702-1: 1998) JIS grade 3 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	Tooth surface induction hardened
Tooth hardness	45 ~ 55HRC



S1

Catalog No.	Pitch mm (Module)	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length
				A <sub>H7</sub>	B	C	D	E	F	G
SSCPG5-20	CP5 (1.5915)	20	S1	8	25	31.83	35.01	15	15	30
SSCPG5-25		25		10	32	39.79	42.97			
SSCPG5-30		30		10	38	47.75	50.93			
SSCPG5-40		40		12	50	63.66	66.85			
SSCPG10-20	CP10 (3.1831)	20	S1	15	50	63.66	70.03	30	20	50
SSCPG10-25		25		20	60	79.58	85.94			
SSCPG10-30		30		20	75	95.49	101.86			
SSCPG10-40		40		25	80	127.32	133.69			
SSCPG15-20	CP15 (4.7746)	20	S1	25	75	95.49	105.04	50	27	77
SSCPG15-25		25		25	100	119.37	128.92			
SSCPG15-30		30		25	110	143.24	152.79			
SSCPG20-20	CP20 (6.3662)	20	S1	25	100	127.32	140.06	60	30	90
SSCPG20-25		25		30	130	159.15	171.89			
SSCPG20-30		30		30	150	190.99	203.72			

[Caution on Product Characteristics]

- ① The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 401 for more details.
- ② The backlash values shown in the table are the theoretical values when these gears and SRGCP Racks are in mesh.

Total length G	Distance traveled in one turn (mm)	Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No.
		Bending strength	Surface durability	Bending strength	Surface durability			
140	75	21.2	8.49	2.16	0.87	0.04~0.18	0.34	<b>SSCPGS5-15</b> <b>SSCPGS5-20</b> <b>SSCPGS5-25</b>
	100	32.0	16.6	3.26	1.70	0.04~0.18	0.66	
	125	43.2	27.8	4.40	2.83	0.04~0.18	0.85	
220	100	121	25.9	12.4	2.64	0.05~0.20	0.97	<b>SSCPGS10-10</b> <b>SSCPGS10-15</b> <b>SSCPGS10-20</b>
	150	169	67.9	17.3	6.93	0.05~0.20	1.87	
	200	256	133	26.1	13.6	0.06~0.21	2.64	

- [Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 402) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 1 to 2 mm). Use carbide tools for the modification of the shaft area near the bottom land.

## SSCPG

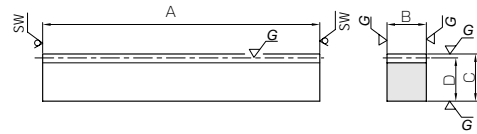
## CP Ground Spur Gears

Distance traveled in one turn (mm)	Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No.
	Bending strength	Surface durability	Bending strength	Surface durability			
100	24.8	13.7	2.53	1.40	0.04~0.18	0.14	<b>SSCPG5-20</b> <b>SSCPG5-25</b> <b>SSCPG5-30</b> <b>SSCPG5-40</b>
125	33.5	23.0	3.41	2.34	0.04~0.18	0.22	
150	42.3	35.0	4.32	3.57	0.04~0.18	0.33	
200	60.4	66.9	6.16	6.82	0.05~0.19	0.58	
200	198	110	20.2	11.2	0.06~0.21	0.99	<b>SSCPG10-20</b> <b>SSCPG10-25</b> <b>SSCPG10-30</b> <b>SSCPG10-40</b>
250	268	184	27.3	18.7	0.06~0.21	1.49	
300	339	280	34.5	28.5	0.06~0.21	2.26	
400	483	535	49.3	54.6	0.07~0.22	3.59	
300	744	399	75.9	40.7	0.07~0.23	3.45	<b>SSCPG15-20</b> <b>SSCPG15-25</b> <b>SSCPG15-30</b>
375	1005	667	102	68.0	0.09~0.25	5.76	
450	1270	1020	130	104	0.09~0.25	8.04	
400	1590	880	162	89.7	0.09~0.25	7.50	<b>SSCPG20-20</b> <b>SSCPG20-25</b> <b>SSCPG20-30</b>
500	2140	1470	219	150	0.09~0.25	12.0	
600	2710	2240	276	228	0.09~0.25	17.2	

- [Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 402) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 1 to 2 mm).



Specifications	
Precision grade	KHK R 001 grade 1
Gear teeth	Standard full depth
Pressure angle	20°
Material	SCM440
Heat treatment	Thermal refining only
Tooth hardness	250 ~ 285HB



\* SW Saw Blade Finished

**R1**

Catalog No.	Pitch mm (Module)	Effective no. of teeth	Shape	Total length				Allowable force (N)		Allowable force (kgf)		Weight (kg)
				A	B	C	D	Bending strength	Surface durability	Bending strength	Surface durability	
<b>KRGCP5-100</b> <b>KRGCP5-500</b>	<b>CP5</b> (1.5915)	18 99	R1	98 505	15	20	18.41	3660	1560	373	159	0.21 1.09
<b>KRGCP10-100</b> <b>KRGCP10-500</b>	<b>CP10</b> (3.1831)	8 49	R1	98 505	30	35	31.82	14600	6230	1490	635	0.73 3.78

Catalog No.	Pitch mm (Module)	No. of teeth	Shape	Total length				Allowable force (N)		Allowable force (kgf)		Weight (kg)
				A	B	C	D	Bending strength	Surface durability	Bending strength	Surface durability	
<b>KRGCPF5-1000</b> <b>KRGCPF10-1000</b>	<b>CP5</b> (1.5915) <b>CP10</b> (3.1831)	200 100	RF RF	1000 1000	15 30	20 35	18.41 31.82	3660 14600	1560 6230	373 1490	159 635	2.17 7.49

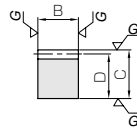
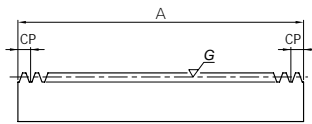
Catalog No.	Pitch mm (Module)	No. of teeth	Shape	Total length				Mounting hole dimensions			No. of mounting holes	Mounting screw size
				A	B	C	D	E	F	G		
<b>KRGCPD5-500</b> <b>KRGCPD10-500</b>	<b>CP5</b> (1.5915) <b>CP10</b> (3.1831)	100 50	RD RD	500 500	15 30	20 35	18.41 31.82	8 14	40 40	140 140	4 4	M5 M10

[Caution on Product Characteristics]

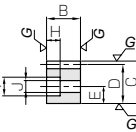
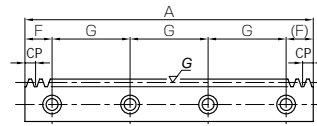
- ① The allowable forces shown in the table are the calculated values according to the assumed usage conditions. Please see page 401 for more details.
- ② Backlash of racks vary depending on mating pinions. Please calculate the backlash in accordance with the backlash of the mating pinion and values in the table "Backlash of Rack Tooth (Amount of Tooth-Thinning)" (Page 375).
- ③ After attaching the racks to the base, please fasten with dowel pins. Clamping only with mounting screws could possibly cause the screws to be broken, due to a heavy load.

 Spur Gears  
 Helical Gears  
 Internal Gears  
 Racks  
 CP Racks & Pinions  
 Miter Gears  
 Bevel Gears  
 Screw Gears  
 Worm Gear Pair  
 Bevel Gearboxes  
 Other Products





RF



RD

**\* Orders for special, customized ground racks are accepted within the following specifications: CP20, Total length (A): Max. 1000mm, Height (C): Max. 90mm.**

Counterbore dimensions			Allowable force (N)		Allowable force (kgf)		Weight (kg)	Catalog No.
H	I	J	Bending strength	Surface durability	Bending strength	Surface durability		
6	10	6	3660	1560	373	159	1.06	<b>KRGCPD5-500</b>
10.8	17.5	11	14600	6230	1490	635	3.61	<b>KRGCPD10-500</b>

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 402) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.

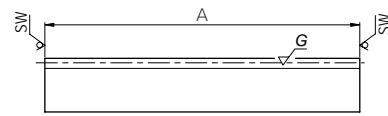
- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products



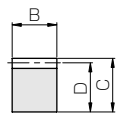
Specifications	
Precision grade	KHK R 001 grade 3 *
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	Tooth surface induction hardened
Tooth hardness	45 ~ 55HRC *

\* The precision grade of J Series products is equivalent to the value shown in the table.

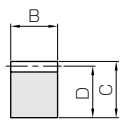
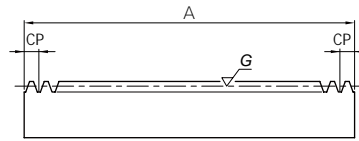
\* Due to the decarburization layer of about 0.5 mm thickness, the rectangular surface have less than HB187 hardness.



\* SW Saw Blade Finished



**R1**



**RF**

Catalog No.	Pitch mm (Module)	Effective no. of teeth	Shape	Total length				Allowable force (N)		Allowable force (kgf)		Weight (kg)
				A	B	C	D	Bending strength	Surface durability	Bending strength	Surface durability	
<b>SRGCP5-100</b>	<b>CP5</b> (1.5915)	18	R1	98	15	20	18.41	2290	1460	233	149	0.21
<b>SRGCP10-100</b>	<b>CP10</b> (3.1831)	8	R1	98	30	35	31.82	9150	5860	933	597	0.73
<b>SRGCP15-100</b>	<b>CP15</b> (4.7746)	5	R1	103	50	50	45.23	22900	14200	2330	1450	1.83
<b>SRGCP20-100</b>	<b>CP20</b> (6.3662)	3	R1	98	60	60	53.63	36600	23400	3730	2390	2.48

Catalog No.	Pitch mm (Module)	No. of teeth	Shape	Total length				Allowable force (N)		Allowable force (kgf)		Weight (kg)
				A	B	C	D	Bending strength	Surface durability	Bending strength	Surface durability	
<b>SRGCPF5-500</b>	<b>CP5</b> (1.5915)	100	RF	500	15	20	18.41	2290	1460	233	149	1.08
<b>SRGCPF5-1000</b>		200		1000								
<b>SRGCPF10-500</b>	<b>CP10</b> (3.1831)	50	RF	500	30	35	31.82	9150	5860	933	597	3.75
<b>SRGCPF10-1000</b>		100		1000								
<b>SRGCPF15-500</b>	<b>CP15</b> (4.7746)	33	RF	495	50	50	45.23	22900	14200	2330	1450	8.79
<b>SRGCPF15-1000</b>		67		1005								
<b>SRGCPF20-500</b>	<b>CP20</b> (6.3662)	25	RF	500	60	60	53.63	36600	23400	3730	2390	12.6
<b>SRGCPF20-1000</b>		50		1000								

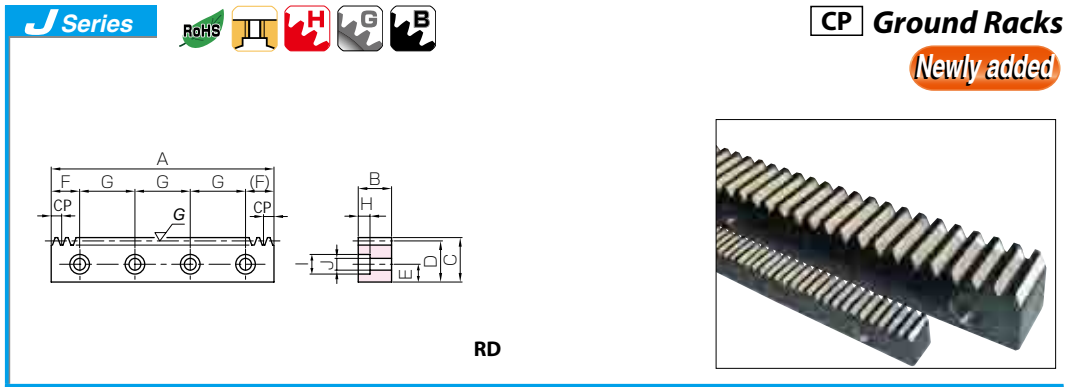
Catalog No. ● : J Series (Available-on-request)	Pitch mm (Module)	No. of teeth	Shape	Total length				Mounting hole dimensions			No. of mounting holes	Mounting screw size
				A	B	C	D	E	F	G		
● <b>SRGCPFD5-500J</b> ● <b>SRGCPFD5-1000J</b>	<b>CP5</b> (1.5915)	100	RD	500	15	20	18.41	8	25	150	4	M5
		200		1000								
● <b>SRGCPFD10-500J</b> ● <b>SRGCPFD10-1000J</b>	<b>CP10</b> (3.1831)	50	RD	500	30	35	31.82	14	25	150	4	M10
		100		1000								
● <b>SRGCPFD15-500J</b> ● <b>SRGCPFD15-1000J</b>	<b>CP15</b> (4.7746)	33	RD	495	50	50	45.23	20	27.5	220	3	M14
		67		1005								
● <b>SRGCPFD20-500J</b> ● <b>SRGCPFD20-1000J</b>	<b>CP20</b> (6.3662)	25	RD	500	60	60	53.63	23	30	220	3	M16
		50		1000								

[Caution on Product Characteristics] ① The allowable forces shown in the table are the calculated values according to the assumed usage conditions. Please see page 401 for more details.

② Backlash of racks vary depending on mating pinions. Please calculate the backlash in accordance with the backlash of the mating pinion and values in the table "Backlash of Rack Tooth (Amount of Tooth-Thinning)" (Page 375).

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 402) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.

② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 1 to 2 mm). Please use wire cutters or other carbide tools to modify the length.



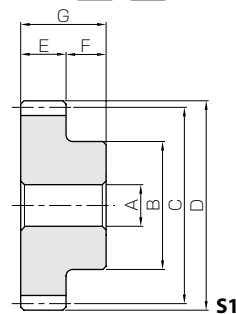
- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

Counterbore dimensions			Allowable force (N)		Allowable force (kgf)		Weight (kg)	Catalog No. ● : J Series (Available-on-request)
H	I	J	Bending strength	Surface durability	Bending strength	Surface durability		
6	10	6	2290	1460	233	149	1.06 2.13	● SRGCPFD5-500J ● SRGCPFD5-1000J
10.8	17.5	11	9150	5860	933	597	3.61 7.28	● SRGCPFD10-500J ● SRGCPFD10-1000J
15.2	23	16	22900	14200	2330	1450	8.47 17.3	● SRGCPFD15-500J ● SRGCPFD15-1000J
17.5	26	18	36600	23400	3730	2390	12.2 24.5	● SRGCPFD20-500J ● SRGCPFD20-1000J

- [Caution on J series]**
- ① As available-on-request products, requires a lead-time for shipping within **3 working-days (excludes the day ordered), after placing an order**. Please allow additional shipping time to get to your local distributor.
  - ② Number of products we can process for one order is **1 to 20 units**. For quantities of 21 or more pieces, we need to quote price and lead time.
  - ③ No black oxide is re-applied after adding secondary operation of mounting holes.



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB

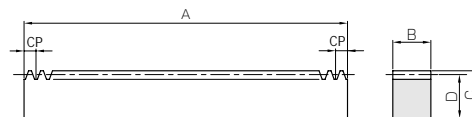


Catalog No.	Pitch mm (Module)	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length
				A <sub>H7</sub>	B	C	D	E	F	G
<b>SSCP2.5-20</b> <b>SSCP2.5-25</b> <b>SSCP2.5-30</b> <b>SSCP2.5-40</b>	<b>CP2.5</b> (0.7958)	20	S1	6	13	15.92	17.51	10	10	20
25		8		17	19.89	21.49				
30		8		21	23.87	25.46				
40		10		28	31.83	33.42				
<b>SSCP5-20</b> <b>SSCP5-25</b> <b>SSCP5-30</b> <b>SSCP5-40</b>	<b>CP5</b> (1.5915)	20	S1	8	25	31.83	35.01	15	15	30
25		10		32	39.79	42.97				
30		10		38	47.75	50.93				
40		12		45	63.66	66.85				
<b>SSCP10-20</b> <b>SSCP10-25</b> <b>SSCP10-30</b> <b>SSCP10-40</b>	<b>CP10</b> (3.1831)	20	S1	15	50	63.66	70.03	30	20	50
25		20		60	79.58	85.94				
30		20		75	95.49	101.86				
40		20		80	127.32	133.69				
<b>SSCP15-20</b> <b>SSCP15-25</b> <b>SSCP15-30</b>	<b>CP15</b> (4.7746)	20	S1	22	75	95.49	105.04	50	27	77
25		25		100	119.37	128.92				
30		25		110	143.24	152.79				
<b>SSCP20-20</b> <b>SSCP20-25</b> <b>SSCP20-30</b>	<b>CP20</b> (6.3662)	20	S1	25	100	127.32	140.06	60	30	90
25		30		130	159.15	171.89				
30		30		150	190.99	203.72				

- [Caution on Product Characteristics] ① The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 401 for more details.
- ② The backlash values shown in the table are the theoretical values when these gears and SRCP Racks are in mesh.
- ③ If the bore diameter is less than  $\phi 4$ , then the bore tolerance class is H8. If the bore diameter is  $\phi 5$  or  $\phi 6$ , and the hole length (total length) exceeds 3 times the diameter, then the class is also H8.



Specifications	
Precision grade	KHK R 001 grade 4
Gear teeth	Standard full depth
Pressure angle	20°
Material	SCM440
Heat treatment	Thermal refining only
Tooth hardness	250 ~ 285HB*



\* Due to the decarburization layer of about 0.5 mm thickness, the rectangular surface have less than HB187 hardness.

RF

Catalog No.	Pitch mm (Module)	No. of teeth	Shape	Total length	Face width	Height	Height to pitch line	Allowable force (N)		Allowable force (kgf)		Weight (kg)
				A	B	C	D	Bending strength	Surface durability	Bending strength	Surface durability	
<b>KRCPF5-1000</b>	<b>CP5</b> (1.5915)	200	RF	1000	15	20	18.41	3660	1040	373	106	2.17
<b>KRCPF10-1000</b>												

- [Caution on Product Characteristics] ① The allowable forces shown in the table are the calculated values according to the assumed usage conditions. Please see page 401 for more details.
- ② Backlash of racks vary depending on mating pinions. Please calculate the backlash in accordance with the backlash of the mating pinion and values in the table "Backlash of Rack Tooth (Amount of Tooth-Thinning)" (Page 375).

- [Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 402) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② If gear tooth hardening, or thermal refining, is applied, the decarburization layer (approx. 0.5 mm thickness) on the rectangular surfaces cannot have the hardness you designate.

Distance traveled in one turn (mm)	Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No.
	Bending strength	Surface durability	Bending strength	Surface durability			
50	4.14	0.48	0.42	0.049	0.05~0.20	0.022	<b>SSCP2.5-20</b>
62.5	5.58	0.83	0.57	0.085	0.07~0.22	0.034	<b>SSCP2.5-25</b>
75	7.06	1.30	0.72	0.13	0.07~0.22	0.054	<b>SSCP2.5-30</b>
100	10.1	2.64	1.03	0.27	0.07~0.22	0.098	<b>SSCP2.5-40</b>
100	24.8	3.52	2.53	0.36	0.08~0.24	0.14	<b>SSCP5-20</b>
125	33.5	6.06	3.42	0.62	0.09~0.26	0.22	<b>SSCP5-25</b>
150	42.3	9.45	4.32	0.96	0.09~0.26	0.33	<b>SSCP5-30</b>
200	60.4	18.7	6.16	1.91	0.09~0.26	0.54	<b>SSCP5-40</b>
200	198	30.8	20.2	3.14	0.13~0.33	0.99	<b>SSCP10-20</b>
250	268	52.7	27.3	5.37	0.15~0.36	1.49	<b>SSCP10-25</b>
300	339	81.7	34.5	8.33	0.15~0.36	2.26	<b>SSCP10-30</b>
400	483	160	49.3	16.4	0.15~0.36	3.66	<b>SSCP10-40</b>
300	744	116	75.9	11.9	0.18~0.45	3.52	<b>SSCP15-20</b>
375	1000	199	102	20.3	0.20~0.48	5.76	<b>SSCP15-25</b>
450	1270	308	130	31.4	0.20~0.48	8.04	<b>SSCP15-30</b>
400	1590	264	162	26.9	0.20~0.51	7.50	<b>SSCP20-20</b>
500	2140	449	219	45.8	0.22~0.55	12.0	<b>SSCP20-25</b>
600	2710	693	276	70.7	0.22~0.55	17.2	<b>SSCP20-30</b>

- [Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 402) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Avoid performing secondary operations that narrow the tooth width as it affects precision and strength.

KRCPF

CP Thermal Refined Racks

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks &amp; Pinions

Miter Gears

Bevel Gears

Screw Gears

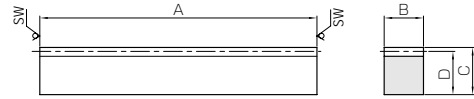
Worm Gear Pair

Bevel Gearboxes

Other Products



Specifications	
Precision grade	KHK R 001 grade 4
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	Stress relief annealing
Tooth hardness	less than 95HRB



\* SW Saw Blade Finished

R1

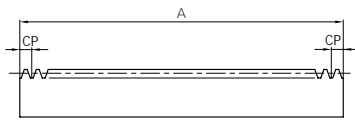
Catalog No.	Pitch mm (Module)	Effective no. of teeth	Shape	Total length				Allowable force (N)		Allowable force (kgf)		Weight (kg)
				A	B	C	D	Bending strength	Surface durability	Bending strength	Surface durability	
<b>SRCP2.5-100</b>	<b>CP2.5</b> (0.7958)	38	R1	98	10	12	11.2	763	143	77.8	14.5	0.086
<b>SRCP5-100</b>	<b>CP5</b> (1.5915)	18	R1	98	15	20	18.41	2290	468	233	47.7	0.21
<b>SRCP10-100</b>	<b>CP10</b> (3.1831)	8	R1	98	30	35	31.82	9150	1870	933	191	0.73
<b>SRCP15-100</b>	<b>CP15</b> (4.7746)	5	R1	103	50	50	45.23	22900	4530	2330	462	1.83
<b>SRCP20-100</b>	<b>CP20</b> (6.3662)	3	R1	98	60	60	53.63	36600	7480	3730	763	2.48

Catalog No.	Pitch mm (Module)	No. of teeth	Shape	Total length				Allowable force (N)		Allowable force (kgf)		Weight (kg)
				A	B	C	D	Bending strength	Surface durability	Bending strength	Surface durability	
<b>SRCPF2.5-500</b>	<b>CP2.5</b> (0.7958)	200	RF	500	10	12	11.2	763	143	77.8	14.5	0.44
<b>SRCPF2.5-1000</b>		400		1000								0.88
<b>SRCPF5-500</b>	<b>CP5</b> (1.5915)	100	RF	500	15	20	18.41	2290	468	233	47.7	1.08
<b>SRCPF5-1000</b>		200		1000								2.17
<b>SRCPF5-1500</b>		300		1500								3.25
<b>SRCPF5-2000</b>		410		2050								4.44
<b>SRCPF10-500</b>	<b>CP10</b> (3.1831)	50	RF	500	30	35	31.82	9150	1870	933	191	3.75
<b>SRCPF10-1000</b>		100		1000								7.49
<b>SRCPF10-1500</b>		150		1500								11.2
<b>SRCPF10-2000</b>		205		2050								15.4
<b>SRCPF15-500</b>	<b>CP15</b> (4.7746)	33	RF	495	50	50	45.23	22900	4530	2330	462	8.79
<b>SRCPF15-1000</b>		67		1005								17.8
<b>SRCPF15-1500</b>		100		1500								26.6
<b>SRCPF15-2000</b>		136		2040								36.2
<b>SRCPF20-500</b>	<b>CP20</b> (6.3662)	25	RF	500	60	60	53.63	36600	7480	3730	763	12.6
<b>SRCPF20-1000</b>		50		1000								25.3
<b>SRCPF20-1500</b>		75		1500								37.9
<b>SRCPF20-2000</b>		102		2040								51.5

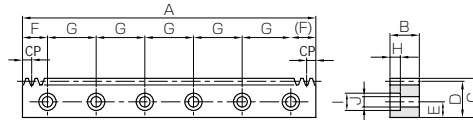
Catalog No.	Pitch mm (Module)	No. of teeth	Shape	Total length				Mounting hole dimensions			No. of mounting holes	Mounting screw size
				A	B	C	D	E	F	G		
<b>SRCPFD5-1000</b>	<b>CP5</b> (1.5915)	200	RD	1000	15	20	18.41	8	50	180	6	M5
<b>SRCPFD5-1500</b>		300		30					9			
<b>SRCPFD5-2000</b>		410		35					12			
<b>SRCPFD10-1000</b>	<b>CP10</b> (3.1831)	100	RD	1000	30	35	31.82	14	50	180	6	M10
<b>SRCPFD10-1500</b>		150		30					9			
<b>SRCPFD10-2000</b>		205		35					12			
<b>SRCPFD15-1000</b>	<b>CP15</b> (4.7746)	67	RD	1005	50	50	45.23	20	62.5	220	5	M14
<b>SRCPFD15-1500</b>		100		90					7			
<b>SRCPFD15-2000</b>		136		30					10			
<b>SRCPFD20-1000</b>	<b>CP20</b> (6.3662)	50	RD	1000	60	60	53.63	23	60	220	5	M16
<b>SRCPFD20-1500</b>		75		90					7			
<b>SRCPFD20-2000</b>		102		30					10			

[Caution on Product Characteristics]

- ① The allowable forces shown in the table are the calculated values according to the assumed usage conditions. Please see page 401 for more details.
- ② Backlash of racks vary depending on mating pinions. Please calculate the backlash in accordance with the backlash of the mating pinion and values in the table "Backlash of Rack Tooth (Amount of Tooth-Thinning)" (Page 375).
- ③ After attaching the racks to the base, please fasten with dowel pins. Clamping only with mounting screws could possibly cause the screws to be broken, due to a heavy load.



RF



RD

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

Bevel Gearboxes

Other Products

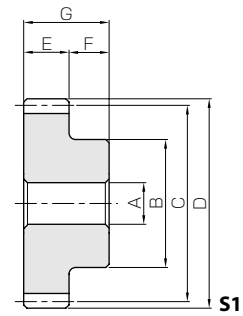
Counterbore dimensions			Allowable force (N)		Allowable force (kgf)		Weight (kg)	Catalog No.
H	I	J	Bending strength	Surface durability	Bending strength	Surface durability		
6	10	6	2290	468	233	47.7	2.13	<b>SRCPFD5-1000</b> <b>SRCPFD5-1500</b> <b>SRCPFD5-2000</b>
							3.20	
							4.38	
10.8	17.5	11	9150	1870	933	191	7.29	<b>SRCPFD10-1000</b> <b>SRCPFD10-1500</b> <b>SRCPFD10-2000</b>
							10.9	
							14.9	
15.2	23	16	22900	4530	2330	462	17.3	<b>SRCPFD15-1000</b> <b>SRCPFD15-1500</b> <b>SRCPFD15-2000</b>
							25.9	
							35.2	
17.5	26	18	36600	7480	3730	763	24.5	<b>SRCPFD20-1000</b> <b>SRCPFD20-1500</b> <b>SRCPFD20-2000</b>
							36.8	
							50.0	

[Caution on Secondary Operations]

- ① Please read “Caution on Performing Secondary Operations” (Page 402) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK’s system for quick modification of KHK stock gears is also available.
- ② If gear tooth hardening, or thermal refining, is applied, the decarburization layer (approx. 0.5 mm thickness) on the rectangular surfaces cannot have the hardness you designate.
- ③ Avoid hardening Racks with bolt holes, due to deformation occurring at the mounting hole and the difficulty of straightening the rack after hardening.



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998) JIS grade 4 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	SUS303
Heat treatment	—
Tooth hardness	less than 187HB



Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

Bevel Gearboxes

Other Products

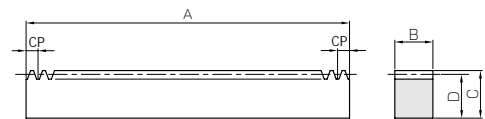
Catalog No.	Pitch mm (Module)	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length
				A <sub>H7</sub>	B	C	D	E	F	G
<b>SUSCP5-20</b> <b>SUSCP5-25</b> <b>SUSCP5-30</b>	<b>CP5</b> (1.5915)	20	S1	8	25	31.83	35.01	15	15	30
25		10		32	39.78	42.97				
30		10		38	47.74	50.93				
<b>SUSCP10-20</b> <b>SUSCP10-25</b> <b>SUSCP10-30</b>	<b>CP10</b> (3.1831)	20	S1	15	50	63.66	70.03	30	20	50
25		20		60	79.57	85.94				
30		20		75	95.49	101.86				

[Caution on Product Characteristics]

- ① The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 401 for more details.
- ② The backlash values shown in the table are the theoretical values when these gears and SURCPF Racks are in mesh.



Specifications	
Precision grade	KHK R 001 grade 5
Gear teeth	Standard full depth
Pressure angle	20°
Material	SUS304
Heat treatment	Solution heat treatment
Tooth hardness	less than 187HB



**RF**

Catalog No.	Pitch mm (Module)	No. of teeth	Shape	Total length	Face width	Height	Height to pitch line	Allowable force (N)		Allowable force (kgf)		Weight (kg)
				A	B	C	D	Bending strength	Surface durability	Bending strength	Surface durability	
<b>SURCPF5-500</b> <b>SURCPF5-1000</b>	<b>CP5</b> (1.5915)	100	RF	500	15	20	18.41	1090	263	111	26.8	1.08 2.16
200		1000										
<b>SURCPF10-500</b> <b>SURCPF10-1000</b>	<b>CP10</b> (3.1831)	50	RF	500	30	35	31.82	4370	1050	445	107	3.73 7.46
100		1000										

Catalog No.	Pitch mm (Module)	No. of teeth	Shape	Total length	Face width	Height	Height to pitch line	Mounting hole dimensions			No. of mounting holes	Mounting screw size
				A	B	C	D	E	F	G		
<b>SURCPFD5-1000</b> <b>SURCPFD10-1000</b>	<b>CP5</b> (1.5915)	200	RD	1000	15	20	18.41	8	50	180	6	M5
	<b>CP10</b> (3.1831)	100	RD	1000	30	35	31.82	14	50	180	6	M10

[Caution on Product Characteristics]

- ① The allowable forces shown in the table are the calculated values according to the assumed usage conditions. Please see page 401 for more details.
- ② Backlash of racks vary depending on mating pinions. Please calculate the backlash in accordance with the backlash of the mating pinion and values in the table "Backlash of Rack Tooth (Amount of Tooth-Thinning)" (Page 375).
- ③ For products made of stainless steel, heat treatment\* and passivation \*\* solutions are applied. Passivation is a rust-resistance treatment, but it is not effective on the machined surface and not a totally rustproof solution.
  - \* Heat Treatment Solution  
Heat treatment by the carbon formed on the surface during blank manufacturing is made to infiltrate the material interior.
  - \*\* Passivation  
Immersion of the metal in a nitric acid solution to make it more rust-resistant.
- ④ After attaching the racks to the base, please fasten with dowel pins. Clamping only with mounting screws could possibly cause the screws to be broken, due to a heavy load.

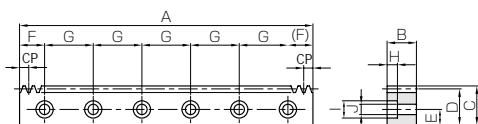


Distance traveled in one turn (mm)	Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No.
	Bending strength	Surface durability	Bending strength	Surface durability			
100	13.7	2.50	1.40	0.25	0.08~0.26	0.14	<b>SUSCP5-20</b> <b>SUSCP5-25</b> <b>SUSCP5-30</b>
125	18.5	4.31	1.89	0.44	0.09~0.28	0.22	
150	23.4	6.72	2.39	0.68	0.09~0.28	0.32	
200	110	21.9	11.2	2.23	0.13~0.35	0.98	<b>SUSCP10-20</b> <b>SUSCP10-25</b> <b>SUSCP10-30</b>
250	148	37.4	15.1	3.82	0.15~0.38	1.48	
300	187	58.0	19.1	5.92	0.15~0.38	2.24	

- [Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 402) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Avoid performing secondary operations that narrow the tooth width, as it affects precision and strength.

**SURCPF · SURCPFD**

**CP** *Stainless Steel Racks*



RD

Counterbore dimensions			Allowable force (N)		Allowable force (kgf)		Weight (kg)	Catalog No.
H	I	J	Bending strength	Surface durability	Bending strength	Surface durability		
6	10	6	1090	263	111	26.8	<b>SURCPFD5-1000</b> <b>SURCPFD10-1000</b>	
10.8	17.5	11	4370	1050	445	107		

- [Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 402) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.



Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

Bevel Gearboxes

Other Products



Specifications	
Precision grade	KHK R 001 grade 4
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	Stress relief annealing
Tooth hardness	less than 95HRB



\* SW Saw Blade Finished

R2

Catalog No.	Pitch mm (Module)	Effective no. of teeth	Shape	Total length A	Outside dia. d <sub>h9</sub>	Height to pitch line D	Allowable force (N)		Allowable force (kgf)		Weight (kg)
							Bending strength	Surface durability	Bending strength	Surface durability	
<b>SROCP2.5-500</b>	<b>CP2.5</b> (0.7958)	200	R2	505	10	9.2	474	91.8	48.3	9.36	0.30
<b>SROCP5-500</b>	<b>CP5</b> (1.5915)	99	R2	505	15	13.41	1650	324	169	33.1	0.65
<b>SROCP10-1000</b>	<b>CP10</b> (3.1831)	99	R2	1010	30	26.82	6610	1300	674	132	5.16

[Caution on Product Characteristics] ① The allowable forces shown in the table are the calculated values according to the assumed usage conditions. Please see page 401 for more details.

② Backlash of racks vary depending on mating pinions. Please calculate the backlash in accordance with the backlash of the mating pinion and values in the table "Backlash of Rack Tooth (Amount of Tooth-Thinning)" (Page 375).

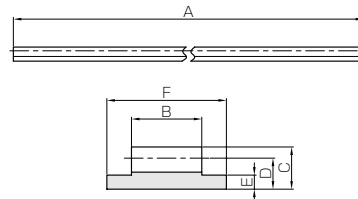
[Caution on Secondary Operations]

① Please read "Caution on Performing Secondary Operations" (Page 402) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.

② Please avoid hardening Round Racks. It causes contortion and deformation, and straightening processes are difficult to apply.



Specifications	
Precision grade	KHK R 001 grade 8
Gear teeth	Standard full depth
Pressure angle	20°
Material	SS400
Heat treatment	—
Tooth hardness	less than 187HB



R3

Catalog No.	Pitch mm (Module)	Shape	Total length	Face width	Height	Height to pitch line	Thickness of base	Width of base	Allowable force (N)		Allowable force (kgf)	Weight (kg)
			A	B	C	D	E	F	Bending strength	Bending strength		
<b>FRCP5-2000</b>	<b>CP5</b> (1.5915)	R3	2000	10	6	4.41	2	17	801	81.7	0.91	
<b>FRCP5-3000</b>		R3	3000	10	6	4.41	2	17	801	81.7	1.37	
<b>FRCP5-4000</b>		R3	4000	10	6	4.41	2	17	801	81.7	1.83	

[Caution on Product Characteristics] ① The allowable forces shown in the table are the calculated values according to the assumed usage conditions. Please see page 401 for more details.

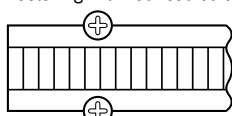
② When using the metal flexible rack with a 20 tooth pinion, allow a minimum radius of curvature of 150 mm for the teeth on the exterior and 300 mm for the teeth in the interior side.

③ Metal Flexible racks are not suitable for use when positioning accuracy is required.

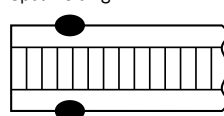
④ The tolerance of the height (C) is 0 to -0.15 and the tolerance of the width of the base (F) is 0 to -0.1.

**Example: Fastening of FRCP Metal Flexible Racks**

Fastening with flat head screws



Spot welding



(Overhead view of Flexible Racks)

<b>MMSG</b> Ground Spiral Miter Gears  m2 ~ 4 Page 424 RoHS  	<b>SMSG</b> Ground Spiral Miter Gears  m2 ~ 5 Page 426 RoHS   	<b>MMSA · MMSB</b> Finished Bore Spiral Miter Gears  m1 ~ 10 Page 428 RoHS 
<b>MMS</b> Spiral Miter Gears  <b>Newly added</b> m2 ~ 5 Page 430 RoHS 	<b>SMS</b> Spiral Miter Gears  m1 ~ 8 Page 432 RoHS  	<b>SMZG</b> Ground Zerol Miter Gears  <b>New</b> m2 ~ 3 Page 434 RoHS   
<b>SMA · SMB · SMC</b> Finished Bore Miter Gears  m1 ~ 8 Page 436 RoHS  	<b>MM</b> Carburized & Hardened Miter Gears  <b>Newly added</b> m2 ~ 5 Page 438 RoHS 	<b>LM</b> Sintered Metal Miter Gears  m0.8 ~ 1.5 Page 438 RoHS  
<b>SM</b> Steel Miter Gears  m1 ~ 8 Page 440 RoHS 	<b>SAM</b> Angular Miter Gears  m1.5 ~ 3 Page 442 RoHS 	<b>SUM</b> Stainless Steel Miter Gears  m1 ~ 4 Page 444 RoHS 
<b>SUMA</b> Finished Bore Stainless Steel Miter Gears  m1 ~ 4 Page 444 RoHS 	<b>PM</b> Plastic Miter Gears  m1 ~ 4 Page 446 RoHS 	<b>DM</b> Injection Molded Miter Gears  m0.5 ~ 1.5 Page 446 RoHS  
<b>BB</b> Sintered Metal Bushings  φ 5 ~ 8 Page 447 RoHS 	<b>Nissei KSP</b> Ground Spiral Miter Gears  m1.5 ~ 6 Page 486 RoHS  	



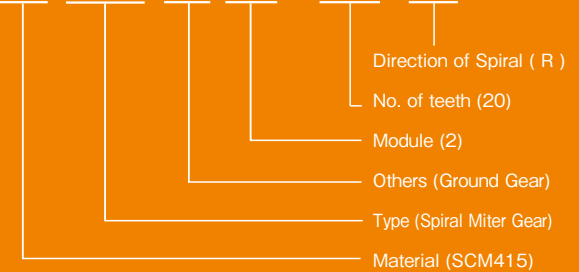
# Miter Gears

## Catalog Number of KHK Stock Gears

The Catalog Number for KHK stock gears is based on the simple formula listed below. Please order KHK gears by specifying the Catalog Numbers.

(Example) Miter Gears

M M S G 2 - 20 R



### Material

S	S45C
M	SCM415
SU	SUS303
L	SMF5040
P	MC901
D	DURACON











### Type

M	Straight Miter Gears
MS	Spiral Miter Gears
AM	Angular Miter Gears

### Other Information

G	Ground Gears
---	--------------

### Feature Icons

	RoHS Compliant Product		Stainless Product
	Re-machinable Product		Resin Product
	Finished Product		Copper Alloy Product
	Heat Treated Product		Injection Molded Product
	Ground Gear		Black Oxide coated Product

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

Bevel Gearboxes

Other Products



## Characteristics



Miter gears are a special class of bevel gears where the shafts intersect at 90° and the gear ratio is 1:1. KHK stock miter gears are available in two types, spiral and straight tooth, with high precision grade for demanding torques and speeds, and commercial grade for economical applications. The following table lists the main features for easy selection.

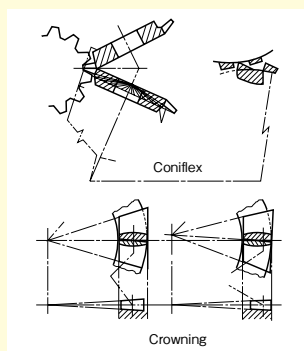
Type	Catalog No.	Module	No. of Teeth ( ) Shaft Angle	Material	Heat Treatment	Tooth Surface Finish	Precision JIS B 1704	Secondary Operations	Features
Spiral Miter Gears	<b>MMSG</b>	2 ~ 4	20, 25, 30	SCM415	Carburized Note 1	Ground	2	△	High strength, abrasion-resistant and compact for high speed & torque use.
	<b>SMSG</b>	2 ~ 5	20, 25, 30	S45C	Gear teeth induction hardened	Ground	2	△	Reasonably priced ground gear, yet remachinable except for the gear teeth.
	<b>MMSA · MMSB</b>	1 ~ 10	20	SCM415	Carburized	Cut	4	×	Ready to use without performing secondary operations. Strong and abrasion resistant.
	<b>MMS</b>	2 ~ 5	20, 25, 30	SCM415	Carburized Note 1	Cut	4	△	Only teeth are induction hardened, allowing user to perform secondary operations elsewhere.
	<b>SMS</b>	1 ~ 8	20, 25, 30	S45C	Gear teeth induction hardened	Cut	4	△	Large numbers of teeth and modules are offered in these affordable spiral miter gears.
Zenit miter gears	<b>SMZG</b>	2 ~ 3	20	S45C	Gear teeth induction hardened	Ground	2	△	A spiral miter gear with a helix angle less than 10°. Receives forces from the same direction as straight miter gears receive and have excellent precision properties..
Straight Miter Gears	<b>SMA · SMB · SMC</b>	1 ~ 8	20, 25, 30	S45C	Gear teeth induction hardened	Cut	4	△	Usable without remachining, offered in 3 bore sizes.
	<b>MM</b>	2 ~ 5	20, 25, 30	SCM415	Carburized Note 1	Cut	4	△	Compared to SM miters, these are stronger and less abrasive, and allow secondary operations.
	<b>LM</b>	0.8 ~ 1.5	20	SMF5040 (Equiv. to S45C)	—	Sintered	5	○	Mass-produced, low cost sintered products. Small and light weight.
	<b>SM</b>	1 ~ 8	16, 20, 25, 30	S45C	—	Cut	3	○	Popular straight miter for many uses.
	<b>SAM</b>	1.5 ~ 3	20 (45°, 60°, 120°)	S45C	—	Cut	3	○	3 types are available for shafts at 45°, 60° and 120°.
	<b>SUM</b>	1 ~ 4	20, 25	SUS303	—	Cut	3	○	Suitable for food machinery due to SUS303's rust-resistant quality.
	<b>SUMA</b>	1 ~ 4	20, 25	SUS303	—	Cut	3	△	Stainless steel products, usable without remachining.
	<b>PM</b>	1 ~ 4	20, 25	MC901	—	Cut	4	○	MC nylon products are light and can be used without lubricant.
	<b>DM</b>	0.5 ~ 1.5	20	DURACON (M90-44)	—	Injection Molded	8	△	Injection molded, mass-produced products, suitable for office machines.

(NOTE 1) Although these are carburized products, secondary operations can be performed as the bore and the hub portions are masked during the carburization. However, as a precaution, high hardness (HRC40 at maximum) occurs in some cases.

○ Possible △ Partly Possible  
× Not possible

### We use Crowning method for gear cutting

KHK utilizes Gleason Coniflex No.104, 102 and 114 bevel gear generating machinery, also equipped for mass production of straight miter gears. You can count on a stable supply of economically priced straight miter gears from KHK



Gleason Coniflex No.104

## Selection Hints



Please select the most suitable products by carefully considering the characteristics of items and contents of the product tables. It is also important to read all applicable "CAUTION" notes shown below before the final selection.

### 1. Caution in Selecting the Mating Gears

Among KHK stock miter gears, there are products which are not interchangeable even when the module and the number of teeth are the same. Also, spiral miter gears require additional consideration since the right-hand mates with the left-hand spiral as shown in the table below.



#### ■ Straight Miter (○ Allowable × Not allowable)

Catalog No.	SMA SMB SMC	MM	SM	SUM	SUMA	PM	DM	LM	SAM
SMA · SMB · SMC	○	○	○	○	○	○	×	×	×
MM	○	○	○	○	○	○	×	×	×
SM	○	○	○	○	○	○	×	×	×
SUM	○	○	○	○	○	○	×	×	×
SUMA	○	○	○	○	○	○	×	×	×
PM	○	○	○	○	○	○	×	×	×
DM	×	×	×	×	×	×	○	×	×
LM	×	×	×	×	×	×	×	○	×
SAM	×	×	×	×	×	×	×	×	○

#### ■ Spiral Miter (○ Allowable △ Allowable in certain cases × Not allowable)

Catalog No.	Series	MMSG	SMSG	MMSA MMSB	MMS	SMS
Series	Spiral hand	R	R	R	R	R
MMSG	L	○	×	×	×	×
SMSG	L	×	○	×	×	×
MMSA · MMSB	L	×	×	○	△	×
MMS	L	×	×	△	○	×
SMS	L	×	×	×	△	○

(CAUTION) For selecting items in the "△" category, please reconfirm with your nearest KHK dealer that the pair can work.

### 2. Caution in Selecting Gears Based on Gear Strength

The gear strength values shown in the product pages were computed by assuming a certain application environment. Therefore, they should be used as reference only. We recommend that each user computes their own values by applying the actual usage conditions. To learn more about the strength calculations, please refer to the technical information contained in the "Bending Strength of Bevel Gears" section on page 679, and the "Surface Durability of Bevel Gears" section on page 685.

#### ■ Calculation assumptions for Bending Strength of Gears

Catalog No.	MMSG MMSA · MMSB MMS · MM	SMSG · SMZG SMS SMA · SMB · SMC	SM SAM	SUM SUMA LM <sup>NOTE 3</sup>	PM	DM
Formula <sup>NOTE 1</sup>	Formula of bevel gears on bending strength (JGMA403-01)				The Lewis formula	
No. of teeth of mating gear	Same number of teeth				—	
Rotation	100rpm (600rpm for MMSG, SMSG and SMZG)				100rpm	
Durability	Over 10 <sup>7</sup> cycles				—	
Impact from motor	Uniform load				Allowable bending stress (kgf/mm <sup>2</sup> )	
Impact from load	Uniform load				1.15 (40°C with No Lubrication)	m 0.5 4.0 m 0.8 4.0 m 1.0 3.5 m 1.5 1.8 <sup>NOTE 3</sup> (40°C with Grease Lubrication)
Direction of load	Bidirectional					
Allowable bending stresses at root $\sigma_{F_{lim}}$ (kgf/mm <sup>2</sup> ) <sup>NOTE 2</sup>	47	21	19	10.5		
Safety factor $K_R$	1.2					

#### ■ Calculation assumptions for Surface Durability (Except those in common with bending strength)

Formula <sup>NOTE 1</sup>	Formula of bevel gears on bending strength (JGMA404-01)			
Kinematic viscosity of lubricant	100cSt (50°C)			
Gear support	Shafts & gear box have normal stiffness, and gears are supported on one end			
Allowable Hertz stress $\sigma_{H_{lim}}$ (kgf/mm <sup>2</sup> )	166	90	49	41.3
Safety factor $C_R$	1.15			

(NOTE 1) The gear strength formula is based on JGMA (Japanese Gear Manufacturers Association) specifications, "MC Nylon Technical Data" by Nippon Polypenco Limited and "Duracon Gear Data" by Polyplastic Co. The units for the number of rotations (rpm) and the the stress (kgf/mm<sup>2</sup>) are adjusted to the units needed in the formula.

(NOTE 2) Since the load is bidirectional, the allowable bending stress at root  $\sigma_{F_{lim}}$ , used in JGMA 403-01 formula is set to 2/3 of the value.

(NOTE 3) The values of the allowable bending stresses for DM m1.5 and the allowable root bending stress for LM gears are our own estimates.



## Application Hints



In order to use KHK stock gears safely, carefully read the Application Hints before proceeding. If there are questions or you require clarifications, please contact our technical department or your nearest distributor.

KHK Co., Ltd.

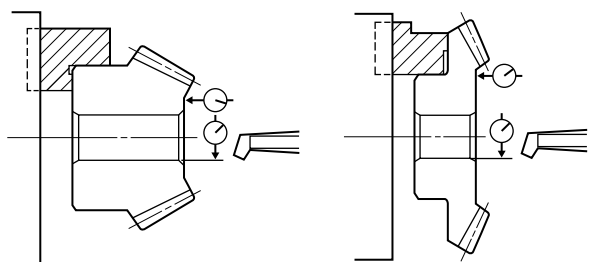
TEL.048-254-1744

FAX.048-254-1765

E-mail export@khkgears.co.jp

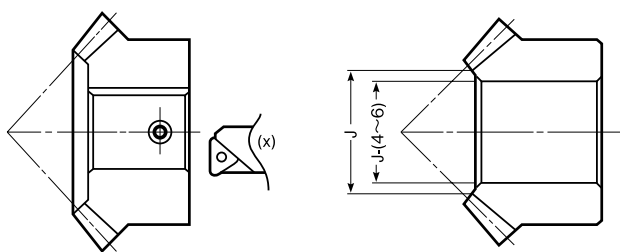
### 1. Caution on Performing Secondary Operations

- ① If you are reboring, it is important to pay special attention to locating the center in order to avoid runout.
- ② The reference datum for gear cutting is the bore. Therefore, it is best to use the bore for locating the center. If it is too difficult to do for small bores, the alternative is to use one spot on the bore and the runout of the side surface.
- ③ If reworking using scroll chucks, we recommend the use of new or rebored jaws for improved precision. Please exercise caution not to crush the teeth by applying too much pressure. Any scarring will cause noise during operation.



Lathe operations

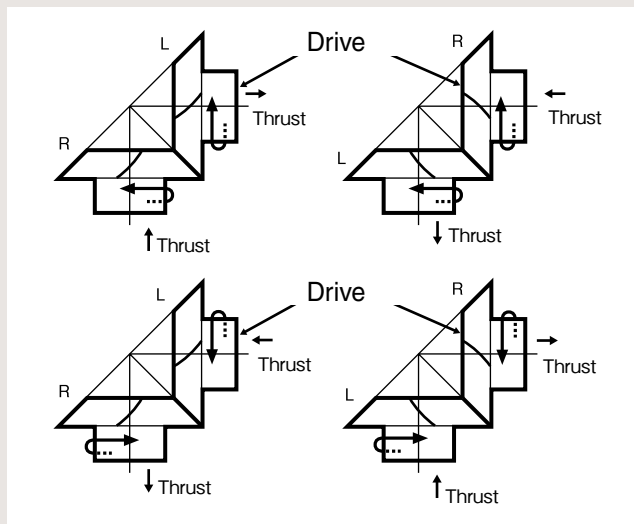
- ④ For items with induction hardened teeth, such as SMSG and SMS series, the hardness is high near the tooth root. When machining the front face, the machined area should be 4 to 6mm smaller than the dimension, J.



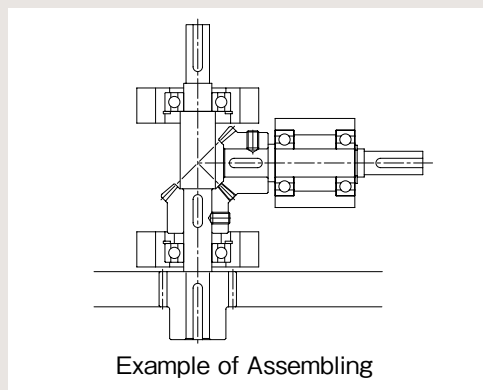
- ⑤ For tapping and keyway operations, see the examples given in "1. Caution on Performing Secondary Operations" in KHK Stock Spur Gear section. When cutting keyways, to avoid stress concentration, always leave radii on corners.
- ⑥ PM plastic miter gears are susceptible to changes due to temperature and humidity. Dimensions may change between during and after remachining operations.
- ⑦ When heat-treating S45C products, it is possible to get thermal stress cracks. It is best to subject them to penetrant inspection afterwards. If tooth strength is not sufficient, it can be increased approximately four times by heat-treating. On the other hand, the precision of the gear will drop about one grade.

### 2. Points of Caution in Assembling

- ① Since miter gears are cone shaped, they produce axial thrust forces. Specifically with regard to spiral miter gears, the directions of thrust change with the hand of spiral and the direction of rotation. This is illustrated below. The bearings must be selected properly to be able to handle these thrust forces. For more technical information see the section "Gear Forces" (Page 699).

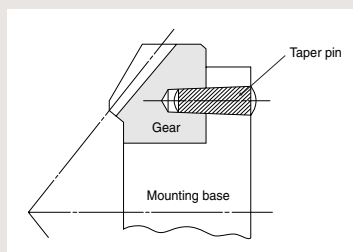


- ② If a miter gear is mounted on a shaft far from the bearings, the shaft may bend. We recommend mounting bevel gears as close to the bearings as possible. This is especially important since most miter gears are supported on one end. The bending of shafts will cause abnormal noise and wear, and may even cause fatigue failure of the shafts. Both shafts and bearings must be designed with sufficient strength.



Example of Assembling

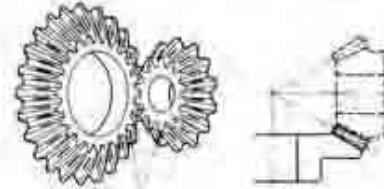
- ③ Due to the thrust load of miter gears, the gears, shafts and bearings have the tendency to loosen up during operation. Miter gears should be fastened to the shaft with keys and set screws, taper pins, step shafts, etc.
- ④ When installing MMSA or MMSB finished bore spiral miter gears in B7 style (ring type), always secure the gears onto the mounting base with taper pins to absorb the rotational loads. It is dangerous to secure with bolts only.



- ⑤ KHK stock miter gears are designed such that, when assembled according to the specified mounting distance with a tolerance of H7 to H8, the backlash shown in the table are obtained. Mounting distance error, offset error and shaft angle error must be minimized to avoid excessive noise and wear. Inaccurate assembly will lead to irregular noises and uneven wear. Various conditions of teeth contact are shown below.

## Correct Tooth Contact

- When assembled correctly, the contact will occur on both gears in the middle of the flank and center of face width but somewhat closer to the toe.

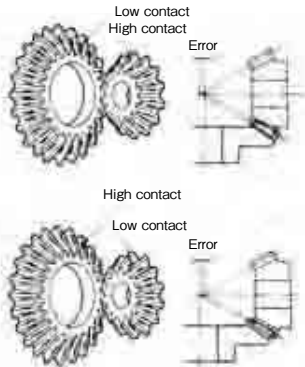


Center contact closer to toes

## Incorrect Tooth Contact

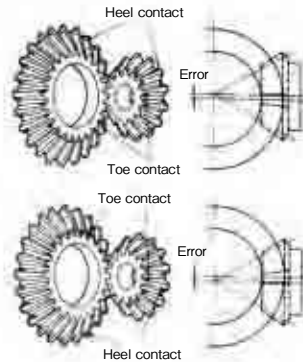
### ■ Mounting Distance Error

- When the mounting distance of the pinion is incorrect, the contact will occur too high on the flank on one gear and too low on the other.



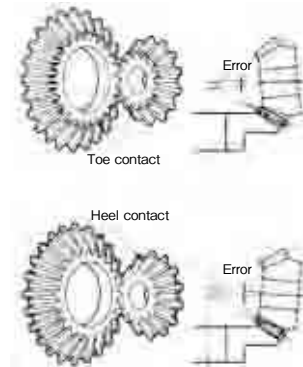
### ■ Offset Error

- When the pinion shaft is offset, the contact surface is near the toe of one gear and near the heel of the other.



### ■ Shaft Angle Error

- When there is an angular error of shafts, the gears will contact at the toes or heels depending on whether the angle is greater or less than 90°.



## Application Examples



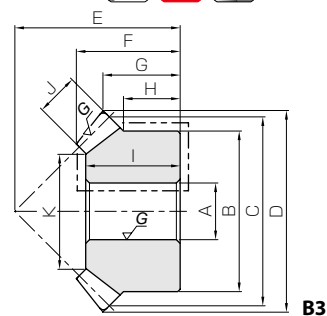
Automatic packaging machine (Miter gears - inset)



Electric components assembly line (Miter gears <SM and PM>)



Specifications	
Precision grade	JIS B 1704 grade 2
Gear teeth	Gleason
Pressure angle	20°
Helix angle	35°
Material	SCM415
Heat treatment	Carburizing
Tooth hardness	55 ~ 60HRC



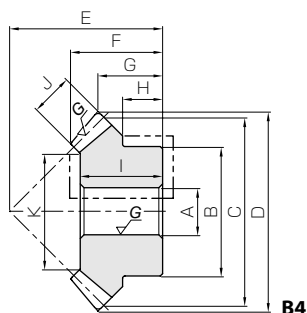
- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

Catalog No.	Gear ratio	Module	No. of teeth	Direction of spiral	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Mounting distance	Total length	Crown to back length
						A <sub>H7</sub>	B	C	D	E	F	G
MMSG2-20R MMSG2-20L	1	<b>m2</b>	20	R L	B3	12	35	40	42.7	35	21.98	16.35
MMSG2.5-20R MMSG2.5-20L		<b>m2.5</b>	20	R L	B3	14	42	50	53.2	45	28.63	21.6
MMSG3-20R MMSG3-20L		<b>m3</b>	20	R L	B3	16	52	60	63.99	50	30.78	21.99
MMSG3.5-20R MMSG3.5-20L		<b>m3.5</b>	20	R L	B4	20	50	70	74.53	55	32.45	22.26
MMSG4-20R MMSG4-20L		<b>m4</b>	20	R L	B4	20	55	80	84.99	65	39.13	27.5
MMSG2-25R MMSG2-25L	1	<b>m2</b>	25	R L	B4	12	38	50	52.5	40	23.43	16.25
MMSG2.5-25R MMSG2.5-25L		<b>m2.5</b>	25	R L	B4	16	45	62.5	65.54	50	29.57	20.27
MMSG3-25R MMSG3-25L		<b>m3</b>	25	R L	B4	20	55	75	78.78	60	35.6	24.39
MMSG3.5-25R MMSG3.5-25L		<b>m3.5</b>	25	R L	B4	25	65	87.5	91.81	70	41.65	28.41
MMSG4-25R MMSG4-25L		<b>m4</b>	25	R L	B4	28	75	100	104.7	80	47.8	32.35
MMSG2-30R MMSG2-30L	1	<b>m2</b>	30	R L	B4	14	45	60	62.42	50	29.27	21.21
MMSG2.5-30R MMSG2.5-30L		<b>m2.5</b>	30	R L	B4	16	55	75	78.04	60	34.08	24.02
MMSG3-30R MMSG3-30L		<b>m3</b>	30	R L	B4	20	65	90	93.61	70	40.25	26.8
MMSG3.5-30R MMSG3.5-30L		<b>m3.5</b>	30	R L	B4	25	80	105	109.21	80	44.4	29.6
MMSG4-30R MMSG4-30L		<b>m4</b>	30	R L	B4	28	90	120	124.7	90	49.27	32.35

- [Caution on Product Characteristics]
- ① A sets of miter gears must be identical in module and number of teeth, but opposite in spiral hands.
  - ② The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 421 for more details.
  - ③ Dimensions of the outside diameter, the overall length and crown to back length are all theoretical values, and some differences will occur due to the corner chamfering of the gear tips.
  - ④ These gears produce axial thrust forces. See page 422 for more details.



Ground Spiral Miter Gears



B4

Hub width H	Length of bore I	Face width J	Holding surface dia. K	Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No.
				Bending strength	Surface durability	Bending strength	Surface durability			
12.5	20	9	24.54	15.6	21.7	1.59	2.21	0.05~0.11	0.14	MMSG2-20R MMSG2-20L
16	26	11	30.89	30.0	42.6	3.06	4.35	0.06~0.12	0.27	MMSG2.5-20R MMSG2.5-20L
16	27	14	34.4	53.8	77.6	5.48	7.91	0.07~0.13	0.43	MMSG3-20R MMSG3-20L
14	29	16	42.75	84.3	124	8.60	12.6	0.08~0.14	0.51	MMSG3.5-20R MMSG3.5-20L
17	35	18	49.08	125	185	12.7	18.9	0.10~0.16	0.80	MMSG4-20R MMSG4-20L
11	21	11	30.89	25.3	43.5	2.57	4.44	0.05~0.11	0.21	MMSG2-25R MMSG2-25L
14	26	14	37.4	49.9	87.6	5.09	8.94	0.06~0.12	0.37	MMSG2.5-25R MMSG2.5-25L
17	31	17	43.92	86.8	155	8.85	15.8	0.07~0.13	0.65	MMSG3-25R MMSG3-25L
19	37	20	52.43	139	251	14.1	25.6	0.08~0.14	1.04	MMSG3.5-25R MMSG3.5-25L
22	42	23	58.95	192	353	19.6	36.0	0.10~0.16	1.57	MMSG4-25R MMSG4-25L
15	26	12	38.06	35.4	72.9	3.61	7.43	0.05~0.11	0.36	MMSG2-30R MMSG2-30L
16	30	15	47.57	69.1	145	7.05	14.8	0.06~0.12	0.66	MMSG2.5-30R MMSG2.5-30L
18	36	20	55.43	128	274	13.0	27.9	0.07~0.13	1.11	MMSG3-30R MMSG3-30L
20	40	22	67.77	181	393	18.4	40.1	0.08~0.14	1.75	MMSG3.5-30R MMSG3.5-30L
22	44	25	77.29	268	593	27.4	60.5	0.10~0.16	2.49	MMSG4-30R MMSG4-30L

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 422) when performing modification and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② In the illustration, the area surrounded with ---line is masked during the carburization process and can be modified. However, care should be exercised since the hardness is high (approx. HRC40, maximum).

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

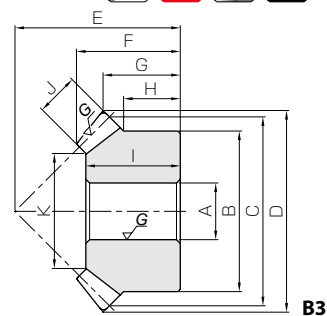
Worm Gear Pair

Bevel Gearboxes

Other Products



Specifications	
Precision grade	JIS B 1704 grade 2
Gear teeth	Gleason
Pressure angle	20°
Helix angle	35°
Material	S45C
Heat treatment	Teeth induction hardened
Tooth hardness	45 ~ 55HRC



Spur Gears  
Helical Gears  
Internal Gears  
Racks  
CP Racks & Pinions  
Miter Gears  
Bevel Gears  
Screw Gears  
Worm Gear Pair  
Bevel Gearboxes  
Other Products

Catalog No.	Gear ratio	Module	No. of teeth	Direction of spiral	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Mounting distance	Total length	Crown to back length
						A <sub>H7</sub>	B	C	D	E	F	G
<b>SMSG2-20R</b> <b>SMSG2-20L</b>	1	<b>m2</b>	20	R L	B3	12	34	40	42.4	37	24.75	18.2
<b>SMSG2.5-20R</b> <b>SMSG2.5-20L</b>		<b>m2.5</b>	20	R L	B3	14	42	50	52.94	48	32.42	24.47
<b>SMSG3-20R</b> <b>SMSG3-20L</b>		<b>m3</b>	20	R L	B3	16	50	60	63.72	58	39.6	29.86
<b>SMSG3.5-20R</b> <b>SMSG3.5-20L</b>		<b>m3.5</b>	20	R L	B3	20	60	70	74.47	65	43.81	32.23
<b>SMSG4-20R</b> <b>SMSG4-20L</b>		<b>m4</b>	20	R L	B3	20	64	80	84.88	75	50.51	37.44
<b>SMSG5-20R</b> <b>SMSG5-20L</b>		<b>m5</b>	20	R L	B3	25	80	100	105.9	90	60.16	42.95
<b>SMSG2-25R</b> <b>SMSG2-25L</b>	1	<b>m2</b>	25	R L	B3	12	40	50	52.4	40	24.19	16.2
<b>SMSG2.5-25R</b> <b>SMSG2.5-25L</b>		<b>m2.5</b>	25	R L	B3	16	50	62.5	65.54	50	30.24	20.27
<b>SMSG3-25R</b> <b>SMSG3-25L</b>		<b>m3</b>	25	R L	B3	20	60	75	78.77	60	37.57	24.39
<b>SMSG3.5-25R</b> <b>SMSG3.5-25L</b>		<b>m3.5</b>	25	R L	B3	25	70	87.5	91.81	70	42.98	28.41
<b>SMSG4-25R</b> <b>SMSG4-25L</b>		<b>m4</b>	25	R L	B3	28	80	100	104.7	80	49.14	32.35
<b>SMSG5-25R</b> <b>SMSG5-25L</b>		<b>m5</b>	25	R L	B3	28	100	125	130.86	100	60.59	40.43
<b>SMSG2-30R</b> <b>SMSG2-30L</b>	1	<b>m2</b>	30	R L	B3	12	45	60	62.42	50	29.27	21.21
<b>SMSG2.5-30R</b> <b>SMSG2.5-30L</b>		<b>m2.5</b>	30	R L	B3	16	60	75	78.04	62	36.08	26.02
<b>SMSG3-30R</b> <b>SMSG3-30L</b>		<b>m3</b>	30	R L	B3	20	70	90	93.61	75	45.25	31.8
<b>SMSG3.5-30R</b> <b>SMSG3.5-30L</b>		<b>m3.5</b>	30	R L	B3	25	90	105	109.21	85	49.4	34.6
<b>SMSG4-30R</b> <b>SMSG4-30L</b>		<b>m4</b>	30	R L	B3	28	100	120	124.71	95	54.28	37.35

[Caution on Product Characteristics]

- ① A sets of miter gears must be identical in module and number of teeth, but opposite in spiral hands.
- ② The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 421 for more details.
- ③ Dimensions of the outside diameter, the overall length and crown to back length are all theoretical values, and some differences will occur due to the corner chamfering of the gear tips.
- ④ These gears produce axial thrust forces. See page 422 for more details.

## Ground Spiral Miter Gears

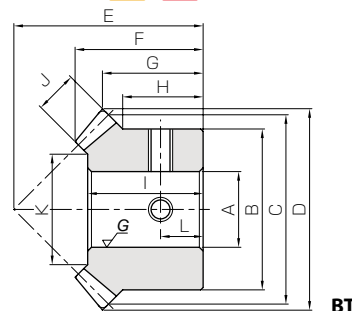
Hub width H	Length of bore I	Face width J	Holding surface dia. K	Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No.
				Bending strength	Surface durability	Bending strength	Surface durability			
14	22	10	21.72	7.83	6.79	0.80	0.69	0.05~0.11	0.15	SMSG2-20R SMSG2-20L
19	29	12	28.06	14.9	13.2	1.52	1.35	0.06~0.12	0.30	SMSG2.5-20R SMSG2.5-20L
23	35	15	31.57	26.4	23.7	2.69	2.42	0.07~0.13	0.52	SMSG3-20R SMSG3-20L
25	40	18	39.09	42.6	v38.8	4.35	3.96	0.08~0.14	0.82	SMSG3.5-20R SMSG3.5-20L
27	45	20	43.43	62.6	57.8	6.39	5.90	0.10~0.16	1.15	SMSG4-20R SMSG4-20L
30	54	26	54.46	115	109	11.8	11.1	0.12~0.18	2.13	SMSG5-20R SMSG5-20L
10	20	12	26.06	12.6	13.5	1.28	1.37	0.05~0.11	0.21	SMSG2-25R SMSG2-25L
12.5	26	15	34.57	24.5	26.8	2.50	2.74	0.06~0.12	0.42	SMSG2.5-25R SMSG2.5-25L
15	32	20	37.43	45.0	50.0	4.59	5.10	0.07~0.13	0.74	SMSG3-25R SMSG3-25L
17.5	37	22	46.77	69.2	78.1	7.05	7.97	0.08~0.14	1.14	SMSG3.5-25R SMSG3.5-25L
20	43	25	55.29	95.0	109	9.68	11.1	0.10~0.16	1.71	SMSG4-25R SMSG4-25L
25	50	30	65.15	181	213	18.5	21.7	0.12~0.18	3.39	SMSG5-25R SMSG5-25L
12.5	25	12	36.06	16.7	21.4	1.70	2.18	0.05~0.11	0.37	SMSG2-30R SMSG2-30L
17	32	15	47.57	32.6	42.7	3.32	4.36	0.06~0.12	0.76	SMSG2.5-30R SMSG2.5-30L
20	40	20	53.43	60.3	80.4	6.15	8.20	0.07~0.13	1.32	SMSG3-30R SMSG3-30L
25	45	22	67.77	85.1	115	8.68	11.8	0.08~0.14	2.19	SMSG3.5-30R SMSG3.5-30L
25	50	25	79.29	127	174	12.9	17.8	0.10~0.16	3.07	SMSG4-30R SMSG4-30L

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 422) when performing modification and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 1 to 2 mm).



Specifications	
Precision grade	JIS B 1704 grade 4
Gear teeth	Gleason
Pressure angle	20°
Helix angle	35°
Material	SCM415
Heat treatment	Overall carburizing
Tooth hardness	55 ~ 60HRC

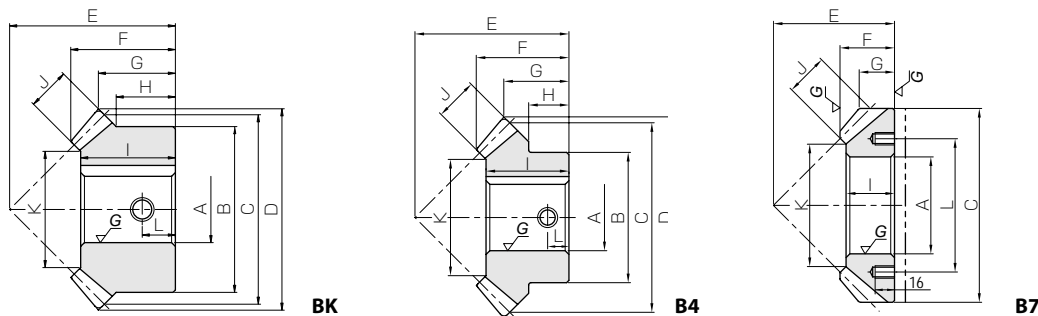


Catalog No.	Gear ratio	Module	No. of teeth	Direction of spiral	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Mounting distance	Total length	Crown to back length	Hub width	Length of bore
						A <sub>H7</sub>	B	C	D	E	F	G	H	I
MMSA1-20R MMSB1-20R MMSA1-20L MMSB1-20L	1	m1	20	R	BT	8 10	17	20	21.29	20	13.53	10.64	8.5	12.2
L				BT	8 10									
MMSA1.5-20R MMSB1.5-20R MMSA1.5-20L MMSB1.5-20L		m1.5	20	R	BT BK	10 12	25	30	31.9	28	18.48	13.95	10.5	16.5
L				BT BK	10 12									
MMSA2-20R MMSB2-20R MMSA2-20L MMSB2-20L		m2	20	R	BK	14 16	35	40	42.52	35	22.09	16.26	12.5	20
L				BK	14 16									
MMSA2.5-20R MMSB2.5-20R MMSA2.5-20L MMSB2.5-20L		m2.5	20	R	BK	18 20	42	50	53.2	45	28.63	21.6	16	26
L				BK	18 20									
MMSA3-20R MMSB3-20R MMSA3-20L MMSB3-20L		m3	20	R	BK	20 22	52	60	63.99	50	30.78	21.99	16	27
L				BK	20 22									
MMSA3.5-20R MMSB3.5-20R MMSA3.5-20L MMSB3.5-20L		m3.5	20	R	B4	25 28	50	70	74.53	55	32.45	22.26	14	29
L				B4	25 28									
MMSA4-20R MMSB4-20R MMSA4-20L MMSB4-20L		m4	20	R	B4	28 30	55	80	84.99	65	39.13	27.5	17	35
L				B4	28 30									
MMSA5-20R MMSB5-20R MMSA5-20L MMSB5-20L		m5	20	R	B4	30 35	70	100	106.25	75	42.99	28.13	17	38
L				B4	30 35									
MMSA6-20R MMSB6-20R MMSA6-20L MMSB6-20L	m6	20	R	B4	40 45	80	120	127.59	90	51.13	33.8	20	45	
L			B4	40 45										
MMSA8-20R MMSA8-20L	m8	20	R	B7	80 80	—	160	—	100	45	29.16	—	40	
L			B7	80 80										
MMSA10-20R MMSA10-20L	m10	20	R	B7	100 100	—	200	—	125	58	36.48	—	50	
L			B7	100 100										

[Caution on Product Characteristics]

- ① A sets of miter gears must be identical in module and number of teeth, but opposite in spiral hands.
- ② The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 421 for more details.
- ③ Dimensions of the outside diameter, the overall length and crown to back length are all theoretical values, and some differences will occur due to the corner chamfering of the gear tips.
- ④ These gears produce axial thrust forces. See page 422 for more details.
- ⑤ Although the dimensions of the keyway are made to the JIS (Js9) tolerance, there may be some deviations due to the effects of heat treatment.
- ⑥ For products having a tapped hole (Except for B7-shaped products), a tapping screw is attached as an accessory.

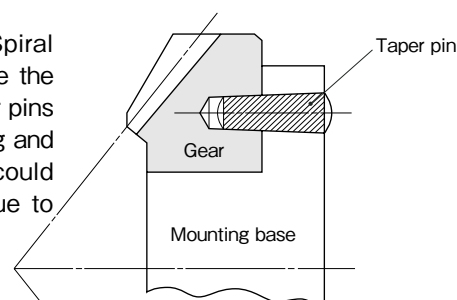
**Finished Bore Spiral Miter Gears**



Face width J	Holding surface dia. K	Keyway Width×Depth	Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No.	
			Size	L	Bending strength	Surface durability	Bending strength	Surface durability				
4.5	11.67	—	2-M4	4.5	2.24	2.09	0.23	0.21	0.03~0.13	0.018 0.015	MMSA1-20R MMSB1-20R	
			2-M4									
			2-M4	4.5								0.018 0.015
			2-M4									
7	17.2	4 x 1.8	2-M4	6	7.74	7.34	0.79	0.75	0.05~0.15	0.057 0.052	MMSA1.5-20R MMSB1.5-20R	
			M5									
			2-M4	6								0.057 0.052
			M5									
9	24.54	5 x 2.3	M5	7	18.0	17.3	1.83	1.76	0.06~0.16	0.13 0.12	MMSA2-20R MMSB2-20R	
			M5									
			M5	7								0.13 0.12
			M5									
11	30.89	6 x 2.8	M6	8	34.6	33.7	3.52	3.44	0.07~0.17	0.24 0.23	MMSA2.5-20R MMSB2.5-20R	
			M6									
			M6	8								0.24 0.23
			M6									
14	34.4	6 x 2.8	M6	8	61.9	61.1	6.32	6.23	0.08~0.18	0.40 0.39	MMSA3-20R MMSB3-20R	
			M6									
			M6	8								0.40 0.39
			M6									
16	42.75	8 x 3.3	M8	8	97.1	96.7	9.90	9.86	0.10~0.25	0.46 0.43	MMSA3.5-20R MMSB3.5-20R	
			M8									
			M8	8								0.46 0.43
			M8									
18	49.08	8 x 3.3	M8	9	144	144	14.6	14.7	0.12~0.27	0.70 0.68	MMSA4-20R MMSB4-20R	
			M8									
			M8	9								0.70 0.68
			M8									
23	60.95	8 x 3.3	M8	9	284	288	29.0	29.4	0.14~0.34	1.32 1.25	MMSA5-20R MMSB5-20R	
			M8									
			M8	9								1.32 1.25
			M8									
27	73.63	12 x 3.3	M8	10	475	496	48.4	50.6	0.16~0.36	2.11 1.99	MMSA6-20R MMSB6-20R	
			M8									
			M8	10								2.11 1.99
			M8									
35	101	—	6-M10	110	1080	1170	111	119	0.20~0.45	3.98 3.98	MMSA8-20R MMSA8-20L	
			6-M10									
45	122.72	—	6-M10	130	1660	1840	169	188	0.25~0.50	7.88 7.88	MMSA10-20R MMSA10-20L	
			6-M10									

[Caution on Secondary Operations] ① These products which are hardened by carburizing allow no secondary machining. However, for B7 type gear, the area surrounded with ---- line (in the illustration) is masked during the carburization process and can be modified. Care should be exercised since the hardness is high (approx. HRC40, maximum).

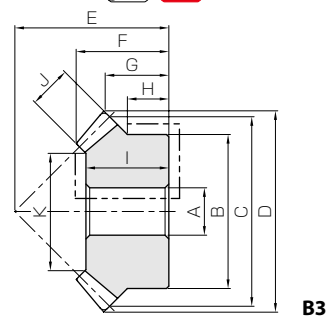
When installing B7 type (ring type) Spiral Miter Gears to the base, always secure the gears onto the mounting base with taper pins to absorb the rotational loads. Fastening and securing with only mounting screws could possibly cause the screws to snap due to heavy loads.



Spur Gears  
Helical Gears  
Internal Gears  
Racks  
CP Racks & Pinions  
Miter Gears  
Bevel Gears  
Screw Gears  
Worm Gear Pair  
Bevel Gearboxes  
Other Products



Specifications	
Precision grade	JIS B 1704 grade 4
Gear teeth	Gleason
Pressure angle	20°
Helix angle	35°
Material	SCM415
Heat treatment	Carburizing
Tooth hardness	55 ~ 60HRC



- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

Catalog No. <small>New items indicated in blue letters</small>	Gear ratio	Module	No. of teeth	Direction of spiral	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Mounting distance	Total length	Crown to back length
						A <sub>H7</sub>	B	C	D	E	F	G
<b>MMS2-20R</b> <b>MMS2-20L</b>	1	<b>m2</b>	20	R L	B3	12	34	40	42.31	35	22.14	16.15
<b>MMS2.5-20R</b> <b>MMS2.5-20L</b>		<b>m2.5</b>	20	R L	B3	15	42	50	53.2	45	28.63	21.6
<b>MMS3-20R</b> <b>MMS3-20L</b>		<b>m3</b>	20	R L	B3	16	52	60	63.99	50	30.78	21.99
<b>MMS4-20R</b> <b>MMS4-20L</b>		<b>m4</b>	20	R L	B3	20	65	80	84.99	65	39.13	27.5
<b>MMS5-20R</b> <b>MMS5-20L</b>		<b>m5</b>	20	R L	B3	25	85	100	106.25	75	42.99	28.13
<b>MMS2-25R</b> <b>MMS2-25L</b>	1	<b>m2</b>	25	R L	B3	12	45	50	52.4	40	24.19	16.2
<b>MMS2.5-25R</b> <b>MMS2.5-25L</b>		<b>m2.5</b>	25	R L	B3	16	55	62.5	65.54	50	30.24	20.27
<b>MMS3-25R</b> <b>MMS3-25L</b>		<b>m3</b>	25	R L	B3	20	65	75	78.77	60	37.57	24.39
<b>MMS4-25R</b> <b>MMS4-25L</b>		<b>m4</b>	25	R L	B3	25	85	100	104.7	80	49.14	32.35
<b>MMS5-25R</b> <b>MMS5-25L</b>		<b>m5</b>	25	R L	B3	28	100	125	130.86	100	60.59	40.43
<b>MMS2-30R</b> <b>MMS2-30L</b>	1	<b>m2</b>	30	R L	B3	12	45	60	62.42	50	29.27	21.21
<b>MMS2.5-30R</b> <b>MMS2.5-30L</b>		<b>m2.5</b>	30	R L	B3	16	60	75	78.04	62	36.08	26.02
<b>MMS3-30R</b> <b>MMS3-30L</b>		<b>m3</b>	30	R L	B3	20	70	90	93.61	75	45.25	31.8
<b>MMS4-30R</b> <b>MMS4-30L</b>		<b>m4</b>	30	R L	B3	28	100	120	124.71	95	54.28	37.35
<b>MMS5-30R</b> <b>MMS5-30L</b>		<b>m5</b>	30	R L	B3	28	130	150	155.9	120	68.2	47.95

[Caution on Product Characteristics]

- ① A sets of miter gears must be identical in module and number of teeth, but opposite in spiral hands.
- ② The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 421 for more details.
- ③ Dimensions of the outside diameter, the overall length and crown to back length are all theoretical values, and some differences will occur due to the corner chamfering of the gear tips.
- ④ These gears produce axial thrust forces. See page 422 for more details.

Hub width H	Length of bore I	Face width J	Holding surface dia. K	Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No. New items indicated in blue letters
				Bending strength	Surface durability	Bending strength	Surface durability			
12	20	9	24.54	17.0	17.3	1.73	1.76	0.06~0.16	0.13	<b>MMS2-20R</b> <b>MMS2-20L</b>
16	26	11	30.89	32.7	33.7	3.34	3.44	0.07~0.17	0.26	<b>MMS2.5-20R</b> <b>MMS2.5-20L</b>
16	27	14	34.4	58.7	61.1	5.98	6.23	0.08~0.18	0.43	<b>MMS3-20R</b> <b>MMS3-20L</b>
17.5	35	18	49.08	136	144	13.9	14.7	0.12~0.27	0.92	<b>MMS4-20R</b> <b>MMS4-20L</b>
17.5	38	23	60.95	269	288	27.5	29.4	0.14~0.34	1.65	<b>MMS5-20R</b> <b>MMS5-20L</b>
12.5	21	12	28.06	29.1	36.3	2.96	3.70	0.06~0.16	0.25	<b>MMS2-25R</b> <b>MMS2-25L</b>
15	27	15	36.57	56.7	71.8	5.79	7.32	0.07~0.17	0.47	<b>MMS2.5-25R</b> <b>MMS2.5-25L</b>
17.5	33	20	39.43	104	133	10.6	13.6	0.08~0.18	0.81	<b>MMS3-25R</b> <b>MMS3-25L</b>
22.5	44	25	57.29	238	309	24.3	31.5	0.12~0.27	1.88	<b>MMS4-25R</b> <b>MMS4-25L</b>
25	50	30	65.15	454	595	46.3	60.7	0.14~0.34	3.39	<b>MMS5-25R</b> <b>MMS5-25L</b>
12.5	25	12	36.06	42.4	57.1	4.32	5.82	0.06~0.16	0.37	<b>MMS2-30R</b> <b>MMS2-30L</b>
17	32	15	47.57	82.8	113	8.44	11.5	0.07~0.17	0.76	<b>MMS2.5-30R</b> <b>MMS2.5-30L</b>
20	40	20	53.43	153	211	15.6	21.5	0.08~0.18	1.32	<b>MMS3-30R</b> <b>MMS3-30L</b>
25	50	25	79.29	348	488	35.5	49.8	0.12~0.27	3.07	<b>MMS4-30R</b> <b>MMS4-30L</b>
35	62	30	99.15	662	941	67.5	96.0	0.14~0.34	6.44	<b>MMS5-30R</b> <b>MMS5-30L</b>

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 422) when performing modification and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② In the illustration, the area surrounded with ---- line is masked during the carburization process and can be modified. However, care should be exercised since the hardness is high (approx. HRC40, maximum).

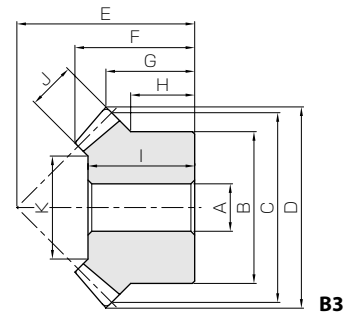
Spur  
GearsHelical  
GearsInternal  
Gears

Racks

CP Racks  
& PinionsMiter  
GearsBevel  
GearsScrew  
GearsWorm  
Gear PairBevel  
GearboxesOther  
Products



Specifications	
Precision grade	JIS B 1704 grade 4
Gear teeth	Gleason
Pressure angle	20°
Helix angle	35°
Material	S45C
Heat treatment	Teeth induction hardened
Tooth hardness	45 ~ 55HRC



B3

Catalog No.	Gear ratio	Module	No. of teeth	Direction of spiral	Shape	Bore		Pitch dia.	Outside dia.	Mounting distance	Total length	Crown to back length
						A	B					
SMS1-20R SMS1-20L	1	m1	20	R L	B3	6	16	20	21.3	20	13.84	10.65
SMS1.5-20R SMS1.5-20L		m1.5	20	R L	B3	8	26	30	31.74	30	21.18	15.87
SMS2-20R SMS2-20L		m2	20	R L	B3	12	34	40	42.4	37	24.75	18.2
SMS2.5-20R SMS2.5-20L		m2.5	20	R L	B3	14	42	50	52.94	48	32.42	24.47
SMS3-20R SMS3-20L		m3	20	R L	B3	16	50	60	63.72	58	39.6	29.86
SMS3.5-20R SMS3.5-20L		m3.5	20	R L	B3	20	60	70	74.47	65	43.81	32.23
SMS4-20R SMS4-20L		m4	20	R L	B3	20	64	80	84.88	75	50.51	37.44
SMS5-20R SMS5-20L		m5	20	R L	B3	25	80	100	105.9	90	60.16	42.95
SMS6-20R SMS6-20L		m6	20	R L	B3	28	100	120	127.16	104	67.35	47.58
SMS8-20R SMS8-20L		m8	20	R L	B3	30	130	160	169.94	125	72.6	49.97
SMS1-25R SMS1-25L	1	m1	25	R L	B3	6	20	25	26.22	23	15.08	11.11
SMS1.5-25R SMS1.5-25L		m1.5	25	R L	B3	10	30	37.5	39.3	34	22.14	16.15
SMS2-25R SMS2-25L		m2	25	R L	B3	12	40	50	52.38	40	24.2	16.19
SMS2.5-25R SMS2.5-25L		m2.5	25	R L	B3	16	50	62.5	65.54	50	30.24	20.27
SMS3-25R SMS3-25L		m3	25	R L	B3	20	60	75	78.77	60	37.57	24.39
SMS3.5-25R SMS3.5-25L		m3.5	25	R L	B3	25	70	87.5	91.81	70	42.98	28.41
SMS4-25R SMS4-25L		m4	25	R L	B3	28	80	100	104.7	80	49.14	32.35
SMS5-25R SMS5-25L		m5	25	R L	B3	28	100	125	130.86	100	60.59	40.43
SMS6-25R SMS6-25L		m6	25	R L	B3	28	120	150	157.17	120	71.97	48.58
SMS1-30R SMS1-30L		1	m1	30	R L	B3	8	24	30	31.26	28	17.61
SMS1.5-30R SMS1.5-30L	m1.5		30	R L	B3	10	36	45	46.84	43	28.11	21.42
SMS2-30R SMS2-30L	m2		30	R L	B3	12	45	60	62.42	50	29.27	21.21
SMS2.5-30R SMS2.5-30L	m2.5		30	R L	B3	16	60	75	78.04	62	36.08	26.02
SMS3-30R SMS3-30L	m3		30	R L	B3	20	70	90	93.61	75	45.25	31.8
SMS3.5-30R SMS3.5-30L	m3.5		30	R L	B3	25	90	105	109.21	85	49.4	34.6
SMS4-30R SMS4-30L	m4		30	R L	B3	28	100	120	124.71	95	54.28	37.35
SMS5-30R SMS5-30L	m5		30	R L	B3	28	130	150	155.90	120	68.2	47.95

[Caution on Product Characteristics]

- ① A sets of miter gears must be identical in module and number of teeth, but opposite in spiral hands.
- ② The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 421 for more details.
- ③ Dimensions of the outside diameter, the overall length and crown to back length are all theoretical values, and some differences will occur due to the corner chamfering of the gear tips.
- ④ These gears produce axial thrust forces. See page 422 for more details.
- ⑤ Due to heat treating, some deformation of the bore may occur. It may be necessary to ream the bore to bring it to the stated dimensions.



## Spiral Miter Gears

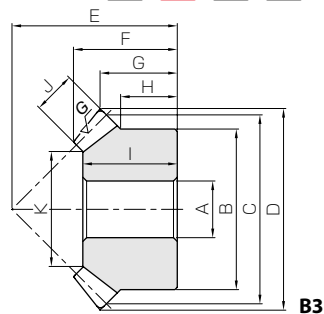
Hub width H	Length of bore I	Face width J	Holding surface dia. K	Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No.
				Bending strength	Surface durability	Bending strength	Surface durability			
8	12	5	9.86	1.07	0.65	0.11	0.067	0.03~0.13	0.019	SMS1-20R SMS1-20L
13	19	8	15.37	3.73	2.33	0.38	0.24	0.05~0.15	0.074	SMS1.5-20R SMS1.5-20L
14	22	10	21.72	8.54	5.40	0.87	0.55	0.06~0.16	0.15	SMS2-20R SMS2-20L
19	29	12	28.06	16.3	10.5	1.66	1.07	0.07~0.17	0.30	SMS2.5-20R SMS2.5-20L
23	35	15	31.57	28.8	18.7	2.94	1.91	0.08~0.18	0.52	SMS3-20R SMS3-20L
25	40	18	39.09	46.5	30.4	4.74	3.10	0.10~0.25	0.82	SMS3.5-20R SMS3.5-20L
27	45	20	43.43	68.3	45.0	6.97	4.59	0.12~0.27	1.15	SMS4-20R SMS4-20L
30	54	26	54.46	136	90.9	13.9	9.27	0.14~0.34	2.13	SMS5-20R SMS5-20L
34	60	30	67.15	226	155	23.0	15.8	0.16~0.36	3.65	SMS6-20R SMS6-20L
30	62	35	95	484	344	49.4	35.1	0.20~0.45	7.00	SMS8-20R SMS8-20L
8	14	6	15.03	1.71	1.28	0.17	0.13	0.03~0.13	0.035	SMS1-25R SMS1-25L
11.5	19	9	19.54	5.78	4.42	0.59	0.45	0.05~0.15	0.11	SMS1.5-25R SMS1.5-25L
10	20	12	26.06	13.7	10.7	1.40	1.09	0.06~0.16	0.21	SMS2-25R SMS2-25L
12.5	26	15	34.57	26.8	21.1	2.73	2.15	0.07~0.17	0.42	SMS2.5-25R SMS2.5-25L
15	32	20	37.43	49.1	39.1	5.00	3.98	0.08~0.18	0.74	SMS3-25R SMS3-25L
17.5	37	22	46.77	75.4	60.6	7.69	6.18	0.10~0.25	1.14	SMS3.5-25R SMS3.5-25L
20	43	25	55.29	112	90.7	11.5	9.25	0.12~0.27	1.71	SMS4-25R SMS4-25L
25	50	30	65.15	214	175	21.8	17.8	0.14~0.34	3.39	SMS5-25R SMS5-25L
30	61	35	83	357	300	36.4	30.6	0.16~0.36	5.99	SMS6-25R SMS6-25L
10	16	6	19.03	2.28	2.03	0.23	0.21	0.03~0.13	0.057	SMS1-30R SMS1-30L
16	25	10	25.72	8.22	7.48	0.84	0.76	0.05~0.15	0.21	SMS1.5-30R SMS1.5-30L
12.5	25	12	36.06	18.2	16.9	1.86	1.72	0.06~0.16	0.37	SMS2-30R SMS2-30L
17	32	15	47.57	35.6	33.4	3.63	3.40	0.07~0.17	0.76	SMS2.5-30R SMS2.5-30L
20	40	20	53.43	65.8	62.3	6.71	6.35	0.08~0.18	1.32	SMS3-30R SMS3-30L
25	45	22	67.77	101	96.0	10.3	9.79	0.10~0.25	2.19	SMS3.5-30R SMS3.5-30L
25	50	25	79.29	150	144	15.3	14.7	0.12~0.27	3.07	SMS4-30R SMS4-30L
35	62	30	99.15	284	276	29.0	28.1	0.14~0.34	6.44	SMS5-30R SMS5-30L

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 422) when performing modification and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 1 to 2 mm).



Specifications	
Precision grade	JIS B 1704 grade 2
Gear teeth	Gleason
Pressure angle	20°
Material	S45C
Heat treatment	Teeth induction hardened
Tooth hardness	45 ~ 55HRC



Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

Bevel Gearboxes

Other Products

Catalog No. <small>New items indicated in blue letters</small>	Gear ratio	Module	No. of teeth	Helix angle	Direction of spiral	Shape	Bore		Pitch dia.	Outside dia.	Mounting distance	Total length	Crown to back length
							A	B	C	D	E	F	G
<b>SMZG2-20R</b> <b>SMZG2-20L</b>	1	<b>m2</b>	20	5°	R L	B3	12	34	40	43.32	37	24.69	18.66
<b>SMZG2.5-20R</b> <b>SMZG2.5-20L</b>		<b>m2.5</b>	20	5°	R L	B3	14	42	50	54.16	48	32.34	25.08
<b>SMZG3-20R</b> <b>SMZG3-20L</b>		<b>m3</b>	20	5°	R L	B3	16	50	60	64.89	58	39.52	30.45

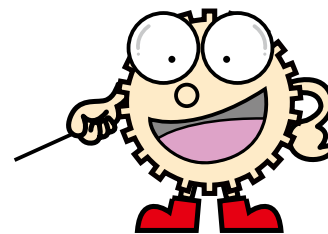
[Caution on Product Characteristics]

- ① A set of miter gears must be identical in module and number of teeth, but opposite in spiral hands.
- ② Allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 421 for more details.
- ③ Dimensions of the outside diameter, the overall length and crown to back length are all theoretical values, and some differences will occur due to the corner chamfering of the gear tips.
- ④ It produces an axial thrust force, which has the same direction as straight bevel gears. For details, see page 700.

### Features of Zerol Miter Gears

Zerol Miter Gears are spiral miter gears with a helix angle of less than 10 degree. Balanced, and good in performance as they combine the features of straight / spiral bevel gears.

- Allows compact design as no inward thrust force ( \* Reference to the figure) is produced, which causes problems on spiral miter gears.
- Unlike straight miter gears, grinding can be applied to Zerol Miter Gears, allowing higher precision, wear-resistance and are quieter, compared with straight miter gears.
- Replacements for SM Miter Gears can easily be made due to the gears have similar dimensions for the mounting distance. When replacing, please use a set of zerol miter gears with opposite spiral hands, one right-hand and the other left-hand.



### Performance Comparison

Gear Type	Bearing Design *	Interchangeability Mounting Distance	Precision JIS B 1704	Strength Bending Strength	Durability Surface Durability	Noise/Vibration Surface Roughness/Total Contact Ratio	Price for single item
 SM2-20	 No thrust force produced inward	 SUM, PM, <b>SMZG</b>	 grade 3	 7.13N · m	 0.72N · m	 3.2a/1.62	
 SMZG2-20R/L	 No thrust force produced inward	 <b>SM</b> , SUM, PM	 grade 2	 7.76N · m	 4.40N · m	 0.4a/1.74	
 MMSG2-20R/L	 Thrust force produced inward	 —	 grade 2	 15.6N · m	 21.7N · m	 0.4a/2.49	

NOTE: The above evaluations were based on a comparison of 3 products.

Hub width H	Length of bore I	Face width J	Holding surface dia. K	Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No. New items indicated in blue letters
				Bending strength	Surface durability	Bending strength	Surface durability			
14	22	10	21.72	7.76	4.10	0.79	0.42	0.05~0.11	0.15	<b>SMZG2-20R</b> <b>SMZG2-20L</b>
19	29	12	28.06	14.8	7.92	1.51	0.81	0.06~0.12	0.30	<b>SMZG2.5-20R</b> <b>SMZG2.5-20L</b>
23	35	15	31.57	26.2	14.3	2.67	1.45	0.07~0.13	0.53	<b>SMZG3-20R</b> <b>SMZG3-20L</b>

[Caution on Secondary Operations]

- ① Care must be exercised when performing modification and/or secondary operations of miter gears. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Due to gear teeth induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 1 to 2 mm).

Spur  
GearsHelical  
GearsInternal  
Gears

Racks

CP Racks  
& PinionsMiter  
GearsBevel  
GearsScrew  
GearsWorm  
Gear PairBevel  
GearboxesOther  
Products

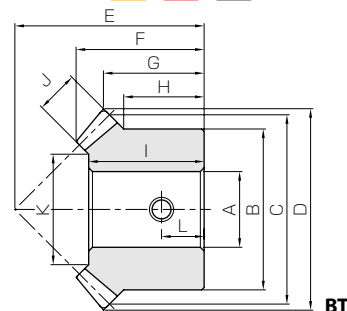


# SMA · SMB · SMC Finished Bore Miter Gears

Module 1 ~ 8



Specifications	
Precision grade	JIS B 1704 grade 4
Gear teeth	Gleason
Pressure angle	20°
Helix angle	—
Material	S45C
Heat treatment	Teeth induction hardened
Tooth hardness	45 ~ 55HRC



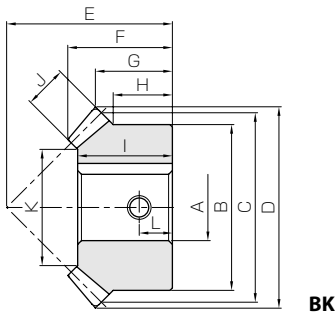
Spur Gears  
Helical Gears  
Internal Gears  
Racks  
CP Racks & Pinions  
Miter Gears  
Bevel Gears  
Screw Gears  
Worm Gear Pair  
Bevel Gearboxes  
Other Products

Catalog No.	Gear ratio	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Mounting distance	Total length	Crown to back length	Hub width	Length of bore	
					A <sub>H7</sub>	B	C	D	E	F	G	H	I	
SMA1-20 SMB1-20	1	m1	20	BT	8	16	20	21.41	20	13.95	10.71	8	12	
				BT	10									12.07
SMA1.5-20 SMB1.5-20	1	m1.5	20	BT	10	26	30	32.12	30	21.24	16.06	13	19	
				BK	12									19
SMA2-20 SMB2-20	1	m2	20	BK	14	34	40	42.83	37	24.89	18.41	14	22	
				BK	15									22
SMA2.5-20 SMB2.5-20	1	m2.5	20	BK	18	42	50	53.54	48	32.54	24.77	19	29	
				BK	20									29
SMA3-20 SMB3-20 SMC3-20	1	m3	20	BK	22	50	60	64.24	58	39.84	30.12	23	35	
				BK	25									35
				BK	20									35
SMA3.5-20 SMB3.5-20	1	m3.5	20	BK	28	60	70	74.95	65	44.13	32.47	25	40	
				BK	30									40
SMA4-20 SMB4-20 SMC4-20	1	m4	20	BK	30	64	80	85.65	75	50.78	37.83	27	45	
				BK	32									45
				BK	25									45
SMA5-20 SMB5-20 SMC5-20	1	m5	20	BK	40	80	100	107.07	90	60.38	43.54	30	54	
				BK	30									54
				BK	35									54
SMA6-20 SMB6-20 SMC6-20	1	m6	20	BK	45	100	120	128.48	104	67.67	48.24	34	60	
				BK	50									60
SMA8-20	1	m8	20	BK	60	130	160	171.31	125	73.33	50.66	30	62	
SMA1-25	1	m1	25	BT	10	20	25	26.41	23	15.16	11.21	8	14	
SMA1.5-25		m1.5	25	BK	12	30	37.5	39.62	34	22.25	16.31	11.5	19	
SMA2-25 SMB2-25	1	m2	25	BK	18	40	50	52.83	40	24.33	16.41	10	20	
				BK	15									
SMA2.5-25 SMB2.5-25	1	m2.5	25	BK	20	50	62.5	66.04	50	30.41	20.52	12.5	26	
				BK	18									
SMA3-25 SMB3-25	1	m3	25	BK	30	60	75	79.24	60	37.81	24.62	15	32	
				BK	25									
SMA3.5-25 SMB3.5-25	1	m3.5	25	BK	32	70	87.5	92.45	70	43.23	28.72	17.5	37	
				BK	28									
SMA4-25 SMB4-25	1	m4	25	BK	35	80	100	105.66	80	49.32	32.83	20	43	
				BK	30									
SMA5-25	1	m5	25	BK	50	100	125	132.07	100	60.82	41.04	25	50	
SMA6-25		m6	25	BK	55	120	150	158.48	120	72.32	49.24	30	61	
SMA1-30	1	m1	30	BK	12	24	30	31.41	28	17.71	13.71	10	16	
SMA1.5-30		m1.5	30	BK	15	36	45	47.12	43	28.24	21.56	16	25	
SMA2-30 SMB2-30	1	m2	30	BK	20	45	60	62.83	50	29.42	21.41	12.5	25	
				BK	15									
SMA2.5-30 SMB2.5-30	1	m2.5	30	BK	25	60	75	78.54	62	36.28	26.27	17	32	
				BK	20									
SMA3-30 SMB3-30	1	m3	30	BK	32	70	90	94.24	75	45.47	32.12	20	40	
				BK	25									
SMA3.5-30 SMB3.5-30	1	m3.5	30	BK	35	90	105	109.95	85	49.66	34.97	25	45	
				BK	30									
SMA4-30 SMB4-30	1	m4	30	BK	40	100	120	125.66	95	54.52	37.83	25	50	
				BK	30									
SMA5-30	1	m5	30	BK	55	130	150	157.07	120	68.56	48.54	35	62	

[Caution on Product Characteristics]

- ① For products with a tapped hole, a set screw is included.
- ② The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 421 for more details.
- ③ Dimensions of the outside diameter, the overall length and crown to back length are all theoretical values, and some differences will occur due to the corner chamfering of the gear tips.
- ④ The keyway dimensions of items with "※" marks do not conform to JIS Standards.

## Finished Bore Miter Gear



BK

Face width J	Holding surface dia. K	Keyway Width×Depth	Set Screw		Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No.
			Size	L	Bending strength	Surface durability	Bending strength	Surface durability			
5	9.86 10	—	M4 M4	4	0.90	0.37	0.091	0.038	0.03~0.13	0.016 0.014	<b>SMA1-20</b> <b>SMB1-20</b>
8	15.37 15.37	— 4 x 1.8	M4 M5	6.5	3.13	1.31	0.32	0.13	0.05~0.15	0.069 0.06	<b>SMA1.5-20</b> <b>SMB1.5-20</b>
10	21.72 21.72	5 x 2.3 5 x 2.3	M5 M5	7	7.17	3.05	0.73	0.31	0.06~0.16	0.14 0.13	<b>SMA2-20</b> <b>SMB2-20</b>
12	28.06 28.06	5 x 2.3* 6 x 2.8	M6 M6	9.5	13.7	5.90	1.39	0.60	0.07~0.17	0.27 0.26	<b>SMA2.5-20</b> <b>SMB2.5-20</b>
15	31.57 31.57 31.57	7 x 3* 7 x 3* 6 x 2.8	M6 M8 M6	11.5	24.2	10.5	2.47	1.08	0.08~0.18	0.47 0.44 0.49	<b>SMA3-20</b> <b>SMB3-20</b> <b>SMC3-20</b>
18	39.09 39.09	7 x 3* 8 x 3.3	M8 M8	12.5	39.0	17.2	3.98	1.75	0.10~0.25	0.71 0.68	<b>SMA3.5-20</b> <b>SMB3.5-20</b>
20	43.43 43.43 43.43	7 x 3* 10 x 3.3 8 x 3.3	M8 M8 M8	13.5	57.3	25.4	5.85	2.59	0.12~0.27	1.00 0.96 1.07	<b>SMA4-20</b> <b>SMB4-20</b> <b>SMC4-20</b>
26	54.46 54.46 54.46	10 x 3.3* 8 x 3.3 10 x 3.3	M8 M8 M8	15	114	51.3	11.7	5.23	0.14~0.34	1.80 2.04 1.93	<b>SMA5-20</b> <b>SMB5-20</b> <b>SMC5-20</b>
30	67.15 67.15 67.15	12 x 3.3* 14 x 3.8 12 x 3.3	M8 M8 M8	17	190	87.5	19.3	8.92	0.16~0.36	3.19 3.01 3.35	<b>SMA6-20</b> <b>SMB6-20</b> <b>SMC6-20</b>
35	95	18 x 4.4	M10	15	406	194	41.4	19.8	0.20~0.45	5.96	<b>SMA8-20</b>
6	15.03	—	M4	4	1.48	0.71	0.15	0.072	0.03~0.13	0.029	<b>SMA1-25</b>
9	19.54	4 x 1.8	M5	5.75	4.98	2.44	0.51	0.25	0.05~0.15	0.10	<b>SMA1.5-25</b>
12	26.06	6 x 2.8 5 x 2.3	M6 M5	5	11.8	5.90	1.20	0.60	0.06~0.16	0.19 0.20	<b>SMA2-25</b> <b>SMB2-25</b>
15	34.57	5 x 2.3* 6 x 2.8	M6 M6	6	23.1	11.7	2.35	1.19	0.07~0.17	0.39 0.40	<b>SMA2.5-25</b> <b>SMB2.5-25</b>
20	37.43	7 x 3* 8 x 3.3	M8 M8	7.5	42.3	21.6	4.31	2.20	0.08~0.18	0.63 0.69	<b>SMA3-25</b> <b>SMB3-25</b>
22	46.77	10 x 3.3 8 x 3.3	M8 M8	8.5	65.0	33.5	6.63	3.42	0.10~0.25	1.04 1.09	<b>SMA3.5-25</b> <b>SMB3.5-25</b>
25	55.29	10 x 3.3 8 x 3.3	M8 M8	10	96.8	50.2	9.87	5.12	0.12~0.27	1.59 1.68	<b>SMA4-25</b> <b>SMB4-25</b>
30	65.15	12 x 3.3* 16 x 4.3	M8 M10	12.5 15	185 307	96.8 166	18.8 31.3	9.87 16.9	0.14~0.34 0.16~0.36	2.86 5.13	<b>SMA5-25</b> <b>SMA6-25</b>
6	19.03	4 x 1.8	M5	5	2.00	1.11	0.20	0.11	0.03~0.13	0.047	<b>SMA1-30</b>
10	25.71	5 x 2.3	M5	8	7.22	4.08	0.74	0.42	0.05~0.15	0.19	<b>SMA1.5-30</b>
12	36.06	6 x 2.8 5 x 2.3	M6 M5	6.25	16.0	9.20	1.63	0.94	0.06~0.16	0.32 0.35	<b>SMA2-30</b> <b>SMB2-30</b>
15	47.57	8 x 3.3 6 x 2.8	M8 M6	8.5	31.2	18.2	3.19	1.86	0.07~0.17	0.68 0.73	<b>SMA2.5-30</b> <b>SMB2.5-30</b>
20	53.43	10 x 3.3 8 x 3.3	M8 M8	10	57.8	34.0	5.89	3.46	0.08~0.18	1.15 1.25	<b>SMA3-30</b> <b>SMB3-30</b>
22	67.77	10 x 3.3 8 x 3.3	M8 M8	12.5	88.4	52.3	9.01	5.34	0.10~0.25	2.01 2.10	<b>SMA3.5-30</b> <b>SMB3.5-30</b>
25	79.29	12 x 3.3 8 x 3.3	M8 M8	12.5	131	78.3	13.4	7.99	0.12~0.27	2.81 3.03	<b>SMA4-30</b> <b>SMB4-30</b>
30	99.15	16 x 4.3	M10	17.5	250	150	25.5	15.3	0.14~0.34	5.56	<b>SMA5-30</b>

[Caution on Secondary Operations]

- Please read "Caution on Performing Secondary Operations" (Page 422) when performing modification and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 1 to 2 mm).



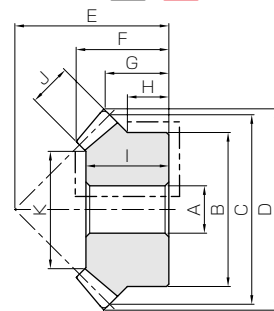
MM

## Carburized &amp; Hardened Miter Gears

Module 2 ~ 5



Specifications	
Precision grade	JIS B 1704 grade 4
Gear teeth	Gleason
Pressure angle	20°
Material	SCM415
Heat treatment	Carburizing
Tooth hardness	55 ~ 60HRC



B3

Catalog No. <small>New items indicated in blue letters</small>	Gear ratio	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Mounting distance	Total length	Crown to back length	Hub width
					A <sub>H7</sub>	B	C	D	E	F	G	H
<b>MM2-20</b>	1	<b>m2</b>	20	B3	12	34	40	42.83	35	22.24	16.41	12
<b>MM2.5-20</b>		<b>m2.5</b>	20	B3	15	42	50	53.54	45	28.89	21.77	16
<b>MM3-20</b>		<b>m3</b>	20	B3	16	52	60	64.24	50	31.19	22.12	16
<b>MM4-20</b>		<b>m4</b>	20	B3	20	65	80	85.66	65	39.49	27.83	17.5
<b>MM5-20</b>		<b>m5</b>	20	B3	25	80	100	107.07	90	60.38	43.54	30
<b>MM2-25</b>	1	<b>m2</b>	25	B3	12	45	50	52.83	40	24.33	16.41	12.5
<b>MM2.5-25</b>		<b>m2.5</b>	25	B3	16	55	62.5	66.03	50	30.41	20.52	15
<b>MM3-25</b>		<b>m3</b>	25	B3	20	65	75	79.24	60	37.81	24.62	17.5
<b>MM4-25</b>		<b>m4</b>	25	B3	25	85	100	105.66	80	49.32	32.83	22.5
<b>MM5-25</b>		<b>m5</b>	25	B3	28	100	125	132.07	100	60.82	41.04	25
<b>MM2-30</b>	1	<b>m2</b>	30	B3	12	45	60	62.83	50	29.43	21.41	12.5
<b>MM2.5-30</b>		<b>m2.5</b>	30	B3	16	60	75	78.54	62	36.28	26.27	17
<b>MM3-30</b>		<b>m3</b>	30	B3	20	70	90	94.24	75	45.47	32.12	20
<b>MM4-30</b>		<b>m4</b>	30	B3	28	100	120	125.66	95	54.52	37.83	25
<b>MM5-30</b>		<b>m5</b>	30	B3	28	130	150	157.07	120	68.56	48.54	35

[Caution on Product Characteristics]

- The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 421 for more details.
- Dimensions of the outside diameter, the overall length and crown to back length are all theoretical values, and some differences will occur due to the corner chamfering of the gear tips.



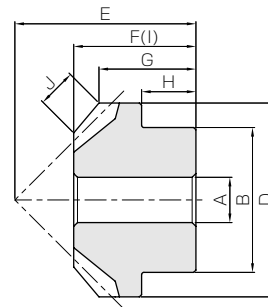
LM

## Sintered Metal Miter Gears

Module 0.8 ~ 1.5



Specifications	
Precision grade	JIS B 1704 grade 5
Gear teeth	Gleason
Pressure angle	20°
Material	SMF5040
Heat treatment	—
Tooth hardness	70 ~ 95HRB



B1

Catalog No.	Gear ratio	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Mounting distance	Total length	Crown to back length	Hub width
					A <sub>H8</sub>	B	C	D	E	F	G	H
<b>LM0.8-20</b>	1	<b>m0.8</b>	20	B1	4	12	16	17.13	16	11	8.57	5.5
<b>LM1-20</b>		<b>m1</b>	20	B1	5	16	20	21.41	20	13.5	10.71	6
<b>LM1.25-20</b>		<b>m1.25</b>	20	B1	6	22	25	26.77	23	15	11.38	6
<b>LM1.5-20</b>		<b>m1.5</b>	20	B1	6	26	30	32.12	30	21	16.06	9

[Caution on Product Characteristics]

- The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 421 for more details.
- Steam treatment (an effect creating surface oxidation) provides rust prevention; however, it is not a complete solution.
- Although the sintering process allows for the inclusion of oil to maintain lubrication, these gears have not been oil impregnated.

## Carburized &amp; Hardened Miter Gears

Newly added

Length of bore I	Face width J	Holding surface dia. K	Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No. New items indicated in blue letters
			Bending strength	Surface durability	Bending strength	Surface durability			
20	9	24.54	15.1	9.74	1.54	0.99	0.06~0.16	0.13	<b>MM2-20</b>
26	11	30.89	29.0	19.0	2.96	1.94	0.07~0.17	0.27	<b>MM2.5-20</b>
27	14	34.4	52.0	34.5	5.30	3.52	0.08~0.18	0.43	<b>MM3-20</b>
35	18	49.09	121	81.2	12.3	8.28	0.12~0.27	0.93	<b>MM4-20</b>
54	26	54.46	256	175	26.1	17.8	0.14~0.34	2.15	<b>MM5-20</b>
21	12	28.06	26.4	20.1	2.70	2.05	0.06~0.16	0.25	<b>MM2-25</b>
27	15	36.57	51.6	39.7	5.27	4.05	0.07~0.17	0.47	<b>MM2.5-25</b>
33	20	39.43	94.7	73.5	9.66	7.49	0.08~0.18	0.81	<b>MM3-25</b>
44	25	57.29	217	171	22.1	17.4	0.12~0.27	1.89	<b>MM4-25</b>
50	30	65.15	413	329	42.1	33.6	0.14~0.34	3.41	<b>MM5-25</b>
25	12	36.06	35.7	31.1	3.64	3.17	0.06~0.16	0.37	<b>MM2-30</b>
32	15	47.57	69.7	61.5	7.11	6.27	0.07~0.17	0.76	<b>MM2.5-30</b>
40	20	53.43	129	115	13.2	11.7	0.08~0.18	1.32	<b>MM3-30</b>
50	25	79.29	293	266	29.9	27.1	0.12~0.27	3.09	<b>MM4-30</b>
62	30	99.15	558	513	56.9	52.3	0.14~0.34	6.47	<b>MM5-30</b>

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 422) when performing modification and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② In the illustration, the area surrounded with --- line is masked during the carburization process and can be modified. However, care should be exercised since the hardness is high (approx. HRC40, maximum).

LM

## Sintered Metal Miter Gears

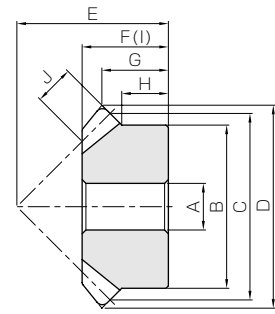
Length of bore I	Face width J	Holding surface dia. K	Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No.
			Bending strength	Surface durability	Bending strength	Surface durability			
11	4.24	—	0.22	0.027	0.022	0.0027	0~0.16	9.67	<b>LM0.8-20</b>
13.5	4.95	—	0.41	0.050	0.042	0.0051	0~0.18	20.7	<b>LM1-20</b>
15	6.36	—	0.81	0.099	0.083	0.010	0~0.20	38.8	<b>LM1.25-20</b>
21	8.48	—	1.48	0.19	0.15	0.019	0~0.22	78.6	<b>LM1.5-20</b>

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 422) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.



Specifications	
Precision grade	JIS B 1704 grade 3
Gear teeth	Gleason
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB



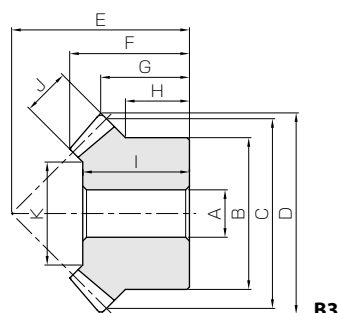
B2

Catalog No.	Gear ratio	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Mounting distance	Total length	Crown to back length	Hub width	
					AH7	B	C	D	E	F	G	H	
<b>SM2-16</b>	1	<b>m2</b>	16	B2	10	27	32	34.83	30	19	15.41	11.5	
<b>SM2.5-16</b>		<b>m2.5</b>	16	B2	12	34	40	43.53	35	21	16.77	12	
<b>SM3-16</b>		<b>m3</b>	16	B2	14	42	48	52.24	40	23	18.12	13	
<b>SM4-16</b>		<b>m4</b>	16	B2	16	55	64	69.66	50	28	20.83	13.5	
<b>SM5-16</b>		<b>m5</b>	16	B2	20	70	80	87.07	65	37	28.54	20	
<b>SM1-20</b>	1	<b>m1</b>	20	B3	6	16	20	21.41	20	13.94	10.71	8	
<b>SM1.25-20</b>		<b>m1.25</b>	20	B3	8	22	25	26.77	23	15.27	11.38	9	
<b>SM1.5-20</b>		<b>m1.5</b>	20	B3	8	26	30	32.12	30	21.24	16.06	13	
<b>SM2-20</b>		<b>m2</b>	20	B3	12	34	40	42.83	37	24.89	18.41	14	
<b>SM2.5-20</b>		<b>m2.5</b>	20	B3	14	42	50	53.54	48	32.54	24.77	19	
<b>SM3-20</b>		<b>m3</b>	20	B3	16	50	60	64.24	58	39.84	30.12	23	
<b>SM3.5-20</b>		<b>m3.5</b>	20	B3	20	60	70	74.95	65	44.13	32.47	25	
<b>SM4-20</b>		<b>m4</b>	20	B3	20	64	80	85.65	75	50.78	37.83	27	
<b>SM5-20</b>		<b>m5</b>	20	B3	25	80	100	107.07	90	60.38	43.54	30	
<b>SM6-20</b>		<b>m6</b>	20	B3	28	100	120	128.48	104	67.67	48.24	34	
<b>SM8-20</b>	<b>m8</b>	20	B3	30	130	160	171.31	125	73.33	50.66	30		
<b>SM1-25</b>	1	<b>m1</b>	25	B3	6	20	25	26.41	23	15.16	11.21	8	
<b>SM1.25-25</b>		<b>m1.25</b>	25	B3	8	25	31.25	33.02	28	17.88	13.26	9.25	
<b>SM1.5-25</b>		<b>m1.5</b>	25	B3	10	30	37.5	39.62	34	22.25	16.31	11.5	
<b>SM2-25</b>		<b>m2</b>	25	B3	12	40	50	52.83	40	24.33	16.41	10	
<b>SM2.5-25</b>		<b>m2.5</b>	25	B3	16	50	62.5	66.04	50	30.41	20.52	12.5	
<b>SM3-25</b>		<b>m3</b>	25	B3	20	60	75	79.24	60	37.81	24.62	15	
<b>SM3.5-25</b>		<b>m3.5</b>	25	B3	25	70	87.5	92.45	70	43.23	28.72	17.5	
<b>SM4-25</b>		<b>m4</b>	25	B3	28	80	100	105.66	80	49.32	32.83	20	
<b>SM5-25</b>		<b>m5</b>	25	B3	28	100	125	132.07	100	60.82	41.04	25	
<b>SM6-25</b>		<b>m6</b>	25	B3	28	120	150	158.48	120	72.32	49.24	30	
<b>SM1-30</b>		1	<b>m1</b>	30	B3	8	24	30	31.41	28	17.71	13.71	10
<b>SM1.25-30</b>			<b>m1.25</b>	30	B3	10	30	37.5	39.27	36	23.47	18.13	13.5
<b>SM1.5-30</b>	<b>m1.5</b>		30	B3	10	36	45	47.12	43	28.24	21.56	16	
<b>SM2-30</b>	<b>m2</b>		30	B3	12	45	60	62.83	50	29.42	21.41	12.5	
<b>SM2.5-30</b>	<b>m2.5</b>		30	B3	16	60	75	78.54	62	36.28	26.27	17	
<b>SM3-30</b>	<b>m3</b>		30	B3	20	70	90	94.24	75	45.47	32.12	20	
<b>SM3.5-30</b>	<b>m3.5</b>		30	B3	25	90	105	109.95	85	49.66	34.97	25	
<b>SM4-30</b>	<b>m4</b>		30	B3	28	100	120	125.66	95	54.52	37.83	25	
<b>SM5-30</b>	<b>m5</b>		30	B3	28	130	150	157.07	120	68.56	48.54	35	

[Caution on Product Characteristics]

- ① The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 421 for more details.
- ② Dimensions of the outside diameter, the overall length and crown to back length are all theoretical values, and some differences will occur due to the corner chamfering of the gear tips.





B3

Length of bore I	Face width J	Holding surface dia. K	Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No.
			Bending strength	Surface durability	Bending strength	Surface durability			
19	7	—	3.84	0.33	0.39	0.034	0.06~0.16	0.076	<b>SM2-16</b>
21	9	—	7.63	0.68	0.78	0.069	0.07~0.17	0.14	<b>SM2.5-16</b>
23	11	—	13.3	1.21	1.36	0.12	0.08~0.18	0.22	<b>SM3-16</b>
28	14	—	30.7	2.87	3.13	0.29	0.12~0.27	0.49	<b>SM4-16</b>
37	17	—	58.9	5.62	6.00	0.57	0.14~0.34	1.03	<b>SM5-16</b>
12	5	9.86	0.89	0.084	0.091	0.0086	0.03~0.13	0.019	<b>SM1-20</b>
13	6	13.03	1.70	0.16	0.17	0.017	0.04~0.14	0.036	<b>SM1.25-20</b>
19	8	15.37	3.12	0.30	0.32	0.031	0.05~0.15	0.074	<b>SM1.5-20</b>
22	10	21.72	7.13	0.72	0.73	0.073	0.06~0.16	0.15	<b>SM2-20</b>
29	12	28.06	13.6	1.41	1.39	0.14	0.07~0.17	0.30	<b>SM2.5-20</b>
35	15	31.57	24.1	2.54	2.45	0.26	0.08~0.18	0.53	<b>SM3-20</b>
40	18	39.09	38.8	4.15	3.96	0.42	0.10~0.25	0.82	<b>SM3.5-20</b>
45	20	43.43	57.0	6.19	5.82	0.63	0.12~0.27	1.15	<b>SM4-20</b>
54	26	54.46	114	12.6	11.6	1.29	0.14~0.34	2.15	<b>SM5-20</b>
60	30	67.15	191	21.8	19.4	2.22	0.16~0.36	3.68	<b>SM6-20</b>
62	35	95	413	49.6	42.1	5.06	0.20~0.45	7.05	<b>SM8-20</b>
14	6	15.03	1.47	0.16	0.15	0.017	0.03~0.13	0.035	<b>SM1-25</b>
16	7	18.7	2.75	0.31	0.28	0.032	0.04~0.14	0.063	<b>SM1.25-25</b>
19	9	19.54	4.96	0.57	0.51	0.059	0.05~0.15	0.11	<b>SM1.5-25</b>
20	12	26.06	11.8	1.41	1.20	0.14	0.06~0.16	0.22	<b>SM2-25</b>
26	15	34.57	23.0	2.81	2.34	0.29	0.07~0.17	0.42	<b>SM2.5-25</b>
32	20	37.43	42.1	5.24	4.29	0.53	0.08~0.18	0.74	<b>SM3-25</b>
37	22	46.77	64.7	8.19	6.60	0.83	0.10~0.25	1.15	<b>SM3.5-25</b>
43	25	55.29	96.3	12.4	9.82	1.26	0.12~0.27	1.73	<b>SM4-25</b>
50	30	65.15	184	24.2	18.7	2.47	0.14~0.34	3.41	<b>SM5-25</b>
61	35	83	309	42.1	31.5	4.29	0.16~0.36	6.03	<b>SM6-25</b>
16	6	19.03	1.99	0.26	0.20	0.026	0.03~0.13	0.057	<b>SM1-30</b>
21	8	22.37	4.05	0.54	0.41	0.055	0.04~0.14	0.12	<b>SM1.25-30</b>
25	10	25.71	7.19	0.97	0.73	0.099	0.05~0.15	0.21	<b>SM1.5-30</b>
25	12	36.06	15.9	2.22	1.62	0.23	0.06~0.16	0.37	<b>SM2-30</b>
32	15	47.57	31.1	4.43	3.17	0.45	0.07~0.17	0.76	<b>SM2.5-30</b>
40	20	53.43	57.5	8.33	5.87	0.85	0.08~0.18	1.32	<b>SM3-30</b>
45	22	67.77	88.0	13.0	8.97	1.32	0.10~0.25	2.20	<b>SM3.5-30</b>
50	25	79.29	131	19.6	13.3	2.00	0.12~0.27	3.09	<b>SM4-30</b>
62	30	99.15	249	38.3	25.4	3.91	0.14~0.34	6.47	<b>SM5-30</b>

[Caution on Secondary Operations]

① Please read "Caution on Performing Secondary Operations" (Page 422) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.

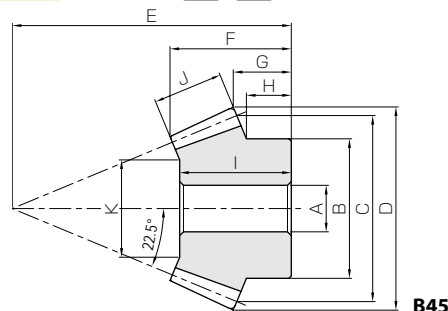
Spur  
GearsHelical  
GearsInternal  
Gears

Racks

CP Racks  
& PinionsMiter  
GearsBevel  
GearsScrew  
GearsWorm  
Gear PairBevel  
GearboxesOther  
Products



Specifications	
Precision grade	JIS B 1704 grade 3
Gear teeth	Gleason
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB



Shaft angle 45°

Catalog No.	Gear ratio	Module	No. of teeth	Shaft angle	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Mounting distance	Total length	Crown to back length
						A <sub>H7</sub>	B	C	D	E	F	G
<b>SAM1.5-20045</b>	1	<b>m1.5</b>	20	45°	B45	8	25	30	32.77	45	19.33	9.36
<b>SAM2-20045</b>		<b>m2</b>	20	45°	B45	10	30	40	43.69	60	26.08	12.48
<b>SAM2.5-20045</b>		<b>m2.5</b>	20	45°	B45	12	40	50	54.62	75	31.92	15.6
<b>SAM3-20045</b>		<b>m3</b>	20	45°	B45	14	50	60	65.54	90	38.66	18.72
<b>SAM1.5-20060</b>	1	<b>m1.5</b>	20	60°	B60	8	25	30	32.59	40	22.3	14.77
<b>SAM2-20060</b>		<b>m2</b>	20	60°	B60	12	32	40	43.46	50	26.39	16.36
<b>SAM2.5-20060</b>		<b>m2.5</b>	20	60°	B60	14	40	50	54.33	60	30.49	17.94
<b>SAM3-20060</b>		<b>m3</b>	20	60°	B60	16	50	60	65.19	70	34.59	19.54
<b>SAM1.5-20120</b>	1	<b>m1.5</b>	20	120°	B120	8	26	30	31.5	26	20.69	18.64
<b>SAM2-20120</b>		<b>m2</b>	20	120°	B120	12	34	40	42	34	26.86	24.18
<b>SAM2.5-20120</b>		<b>m2.5</b>	20	120°	B120	14	42	50	52.5	42	33.22	29.73
<b>SAM3-20120</b>		<b>m3</b>	20	120°	B120	16	50	60	63	50	39.39	35.28

[Caution on Product Characteristics]

- ① The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 421 for more details.
- ② Dimensions of the outside diameter, the overall length and crown to back length are all theoretical values, and some differences will occur due to the corner chamfering of the gear tips.



Shaft angle 60°



Shaft angle 120°

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

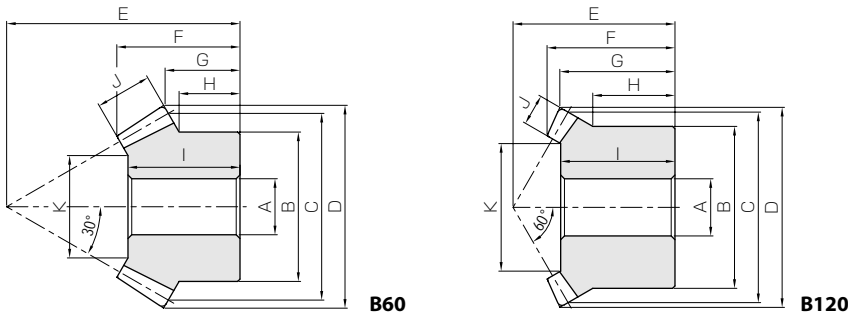
Screw Gears

Worm Gear Pair

Bevel Gearboxes

Other Products

Angular Miter Gears

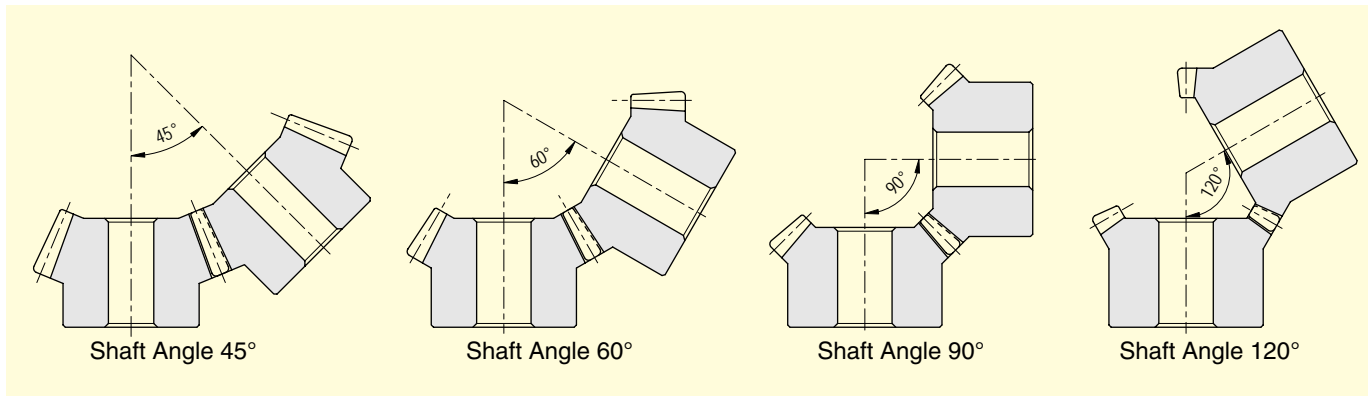


Hub width H	Length of bore I	Face width J	Holding surface dia. K	Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No.
				Bending strength	Surface durability	Bending strength	Surface durability			
7.75	18	11	17	4.30	0.38	0.44	0.039	0.05~0.15	0.067	<b>SAM1.5-20045</b>
9.65	24	15	20.92	10.3	0.95	1.05	0.097	0.06~0.16	0.15	<b>SAM2-20045</b>
12.58	30	18	30.07	19.6	1.85	2.00	0.19	0.07~0.17	0.31	<b>SAM2.5-20045</b>
15.51	36	22	34	34.4	3.30	3.51	0.34	0.08~0.18	0.55	<b>SAM3-20045</b>
12.58	21	9	18.18	3.54	0.32	0.36	0.033	0.05~0.15	0.077	<b>SAM1.5-20060</b>
13.05	24	12	21.93	8.39	0.78	0.86	0.080	0.06~0.16	0.15	<b>SAM2-20060</b>
13.82	28	15	29.15	16.4	1.56	1.67	0.16	0.07~0.17	0.27	<b>SAM2.5-20060</b>
15.16	32	18	36.36	28.3	2.74	2.89	0.28	0.08~0.18	0.47	<b>SAM3-20060</b>
13.88	18	5	19.22	2.43	0.29	0.25	0.030	0.05~0.15	0.073	<b>SAM1.5-20120</b>
17.26	24	6.5	26.78	5.66	0.70	0.58	0.072	0.06~0.16	0.16	<b>SAM2-20120</b>
20.64	29	8.5	32.03	11.4	1.45	1.16	0.15	0.07~0.17	0.31	<b>SAM2.5-20120</b>
24.02	35	10	39.59	19.4	2.53	1.98	0.26	0.08~0.18	0.53	<b>SAM3-20120</b>

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 422) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.

Angular Miter Gears

The shafts of standard Miter Gears are at 90°, Miter Gears with other angles are called Angular Miter Gears. SAM series of KHK standard Angular Miter Gears are available with 45°, 60°, 90° and 120° shaft angles. Other shaft angles may be ordered as custom gears. However, because of the limitations of our manufacturing equipment, we may not be able to produce your specific design.



- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

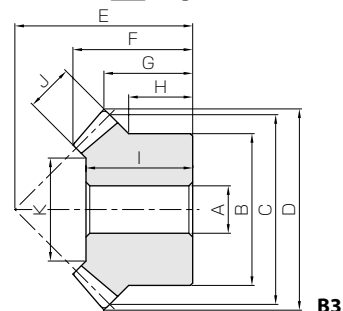


# SUM Stainless Steel Miter Gears

Module 1 ~ 4



Specifications	
Precision grade	JIS B 1704 grade 3
Gear teeth	Gleason
Pressure angle	20°
Material	SUS303
Heat treatment	—
Tooth hardness	less than 187HB



Catalog No.	Gear ratio	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Mounting distance	Total length	Crown to back length	Hub width
					A <sub>H7</sub>	B	C	D	E	F	G	H
<b>SUM1-20</b>	1	<b>m1</b>	20	B3	6	16	20	21.41	20	13.95	10.71	8
<b>SUM1.5-20</b>		<b>m1.5</b>	20	B3	8	26	30	32.12	30	21.24	16.06	13
<b>SUM2-20</b>		<b>m2</b>	20	B3	12	34	40	42.83	37	24.89	18.41	14
<b>SUM2.5-20</b>		<b>m2.5</b>	20	B3	14	42	50	53.54	48	32.54	24.77	19
<b>SUM3-20</b>		<b>m3</b>	20	B3	16	50	60	64.24	58	39.84	30.12	23
<b>SUM4-20</b>	<b>m4</b>	20	B3	20	64	80	85.65	75	50.78	37.83	27	
<b>SUM1-25</b>	1	<b>m1</b>	25	B3	6	20	25	26.41	23	15.16	11.21	8
<b>SUM1.5-25</b>		<b>m1.5</b>	25	B3	10	30	37.5	39.62	34	22.25	16.31	11.5
<b>SUM2-25</b>		<b>m2</b>	25	B3	12	45	50	52.83	40	24.33	16.41	12.5
<b>SUM2.5-25</b>		<b>m2.5</b>	25	B3	16	55	62.5	66.04	50	30.41	20.52	15
<b>SUM3-25</b>		<b>m3</b>	25	B3	20	65	75	79.24	60	37.81	24.62	17.5
<b>SUM4-25</b>	<b>m4</b>	25	B3	28	80	100	105.66	80	49.32	32.83	20	

- [Caution on Product Characteristics] ① The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 421 for more details.  
 ② Dimensions of the outside diameter, the overall length and crown to back length are all theoretical values, and some differences will occur due to the corner chamfering of the gear tips.

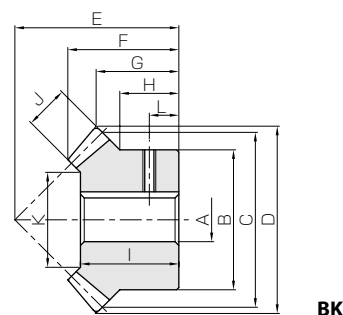


# SUMA Finished Bore Stainless Steel Miter Gears

Module 1 ~ 4



Specifications	
Precision grade	JIS B 1704 grade 3
Gear teeth	Gleason
Pressure angle	20°
Material	SUS303
Heat treatment	—
Tooth hardness	less than 187HB



Catalog No.	Gear ratio	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Mounting distance	Total length	Crown to back length	Hub width	Length of bore
					A <sub>H7</sub>	B	C	D	E	F	G	H	I
<b>SUMA1-20</b>	1	<b>m1</b>	20	BK	6	16	20	21.41	20	13.95	10.71	8	12
<b>SUMA1.5-20</b>		<b>m1.5</b>	20	BK	8	26	30	32.12	30	21.24	16.06	13	19
<b>SUMA2-20</b>		<b>m2</b>	20	BK	12	34	40	42.83	37	24.89	18.41	14	22
<b>SUMA2.5-20</b>		<b>m2.5</b>	20	BK	14	42	50	53.54	48	32.54	24.77	19	29
<b>SUMA3-20</b>		<b>m3</b>	20	BK	16	50	60	64.24	58	39.84	30.12	23	35
<b>SUMA4-20</b>	<b>m4</b>	20	BK	20	64	80	85.65	75	50.78	37.83	27	45	
<b>SUMA1-25</b>	1	<b>m1</b>	25	BK	6	20	25	26.41	23	15.16	11.21	8	14
<b>SUMA1.5-25</b>		<b>m1.5</b>	25	BK	10	30	37.5	39.62	34	22.25	16.31	11.5	19
<b>SUMA2-25</b>		<b>m2</b>	25	BK	12	45	50	52.83	40	24.33	16.41	12.5	20
<b>SUMA2.5-25</b>		<b>m2.5</b>	25	BK	16	55	62.5	66.04	50	30.41	20.52	15	26
<b>SUMA3-25</b>		<b>m3</b>	25	BK	20	65	75	79.24	60	37.81	24.62	17.5	32
<b>SUMA4-25</b>	<b>m4</b>	25	BK	30	80	100	105.66	80	49.32	32.83	20	43	

- [Caution on Product Characteristics] ① For products with a tapped hole, a set screw is included.  
 ② The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 421 for more details.  
 ③ Dimensions of the outside diameter, the overall length and crown to back length are all theoretical values, and some differences will occur due to the corner chamfering of the gear tips.

## Stainless Steel Miter Gears

Length of bore I	Face width J	Holding surface dia. K	Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No.
			Bending strength	Surface durability	Bending strength	Surface durability			
12	5	9.86	0.49	0.060	0.050	0.0061	0.03~0.13	0.019	<b>SUM1-20</b>
19	8	15.37	1.72	0.22	0.18	0.022	0.05~0.15	0.074	<b>SUM1.5-20</b>
22	10	21.72	3.94	0.51	0.40	0.052	0.06~0.16	0.15	<b>SUM2-20</b>
29	12	28.06	7.52	1.00	0.77	0.10	0.07~0.17	0.30	<b>SUM2.5-20</b>
35	15	31.57	13.3	1.80	1.36	0.18	0.08~0.18	0.52	<b>SUM3-20</b>
45	20	43.43	31.5	4.39	3.22	0.45	0.12~0.27	1.15	<b>SUM4-20</b>
14	6	15.03	0.81	0.12	0.083	0.012	0.03~0.13	0.035	<b>SUM1-25</b>
19	9	19.54	2.74	0.41	0.28	0.042	0.05~0.15	0.11	<b>SUM1.5-25</b>
20	12	26.06	6.50	1.00	0.66	0.10	0.06~0.16	0.24	<b>SUM2-25</b>
26	15	34.57	12.7	2.00	1.29	0.20	0.07~0.17	0.46	<b>SUM2.5-25</b>
32	20	37.43	23.3	3.73	2.37	0.38	0.08~0.18	0.80	<b>SUM3-25</b>
43	25	55.29	53.2	8.79	5.43	0.90	0.12~0.27	1.72	<b>SUM4-25</b>

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 422) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.

## SUMA

## Finished Bore Stainless Steel Miter Gears

Face width J	Holding surface dia. K	Keyway Width×Depth	Set Screw		Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No.
			Size	L	Bending strength	Surface durability	Bending strength	Surface durability			
5	9.86	—	M4	4	0.49	0.060	0.050	0.0061	0.03~0.13	0.018	<b>SUMA1-20</b>
8	15.37	—	M4	6.5	1.72	0.22	0.18	0.022	0.05~0.15	0.073	<b>SUMA1.5-20</b>
10	21.72	4 x 1.8	M4	7	3.94	0.51	0.40	0.052	0.06~0.16	0.14	<b>SUMA2-20</b>
12	28.06	5 x 2.3	M5	9.5	7.52	1.00	0.77	0.10	0.07~0.17	0.29	<b>SUMA2.5-20</b>
15	31.57	5 x 2.3	M5	11.5	13.3	1.80	1.36	0.18	0.08~0.18	0.52	<b>SUMA3-20</b>
20	43.43	6 x 2.8	M5	13.5	31.5	4.39	3.22	0.45	0.12~0.27	1.14	<b>SUMA4-20</b>
6	15.03	—	M4	4	0.81	0.12	0.083	0.012	0.03~0.13	0.034	<b>SUMA1-25</b>
9	19.54	—	M4	6	2.74	0.41	0.28	0.042	0.05~0.15	0.11	<b>SUMA1.5-25</b>
12	26.06	4 x 1.8	M4	6.5	6.50	1.00	0.66	0.10	0.06~0.16	0.24	<b>SUMA2-25</b>
15	34.57	5 x 2.3	M5	7.5	12.7	2.00	1.29	0.20	0.07~0.17	0.46	<b>SUMA2.5-25</b>
20	37.43	6 x 2.8	M5	9	23.3	3.73	2.37	0.38	0.08~0.18	0.79	<b>SUMA3-25</b>
25	55.29	8 x 3.3	M6	10	53.2	8.79	5.43	0.90	0.12~0.27	1.67	<b>SUMA4-25</b>

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 422) when performing modification and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.



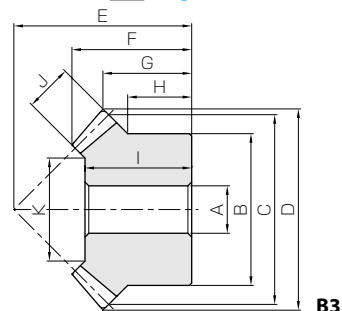
# PM Plastic Miter Gears

Module 1 ~ 4



Specifications	
Precision grade	JIS B 1704 grade 4 *
Gear teeth	Gleason
Pressure angle	20°
Material	MC901
Heat treatment	—
Tooth hardness	115 ~ 120HRR

\* The precision grade of this product is equivalent to the value shown in the table.



Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

Bevel Gearboxes

Other Products

Catalog No.	Gear ratio	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Mounting distance	Total length	Crown to back length	Hub width
					A	B	C	D	E	F	G	H
PM1-20	1	m1	20	B3	6	16	20	21.41	20	13.95	10.71	8
PM1.25-20		m1.25	20	B3	8	22	25	26.77	23	15.27	11.38	9
PM1.5-20		m1.5	20	B3	8	26	30	32.12	30	21.24	16.06	13
PM2-20		m2	20	B3	10	34	40	42.83	37	24.89	18.41	14
PM2.5-20		m2.5	20	B3	12	42	50	53.54	48	32.54	24.77	19
PM3-20		m3	20	B3	14	50	60	64.24	58	39.84	30.12	23
PM3.5-20	1	m3.5	20	B3	20	60	70	74.95	65	44.13	32.47	25
PM4-20		m4	20	B3	20	64	80	85.66	75	50.78	37.83	27
PM1-25		1	m1	25	B3	6	20	25	26.41	23	15.16	11.21
PM1.25-25	m1.25		25	B3	8	25	31.25	33.02	28	17.88	13.26	9.25
PM1.5-25	m1.5		25	B3	8	30	37.5	39.62	34	22.25	16.31	11.5
PM2-25	m2		25	B3	10	40	50	52.83	40	24.33	16.41	10
PM2.5-25	m2.5		25	B3	14	50	62.5	66.04	50	30.41	20.52	12.5
PM3-25	m3		25	B3	15	60	75	79.24	60	37.81	24.62	15

[Caution on Product Characteristics]

- ① Significant variations in temperature or humidity can cause dimensional changes in plastic gears (MC Nylon gears), including bore size (H8 when produced), tooth diameter, and backlash. Please see the section "Design of Plastic Gears" in the technical reference (Page 693).
- ② The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 421 for more details.
- ③ Dimensions of the outside diameter, the overall length and crown to back length are all theoretical values, and some differences will occur due to the corner chamfering of the gear tips.
- ④ Without lubrication, using plastic gears in pairs may generate heat and dilation. It is recommended to mate with steel gears.

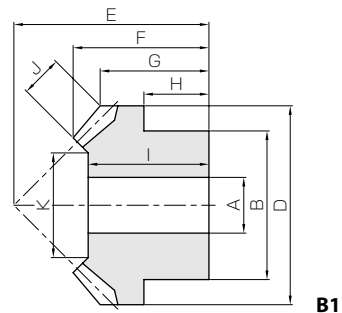


# DM Injection Molded Miter Gears

Module 0.5 ~ 1.5



Specifications	
Precision grade	JIS B 1704 grade 8
Gear teeth	Gleason
Pressure angle	20°
Material	Duracon (M90-44)
Heat treatment	—
Tooth hardness	110 ~ 120HRR



Catalog No.	Gear ratio	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Mounting distance	Total length	Crown to back length
					AH7	B	C	D	E	F	G
DM0.5-20	1	m0.5	20	B1	3	8	10	10.71	11	7.97	6.35
DM0.8-20		m0.8	20	B1	5	12	16	17.13	16	10.83	8.56
DM1-20		m1	20	B1	6	16	20	21.41	21	14.62	11.71
DM1.5-20		m1.5	20	B1	8	20	30	32.12	30	20.59	16.06

Hub width	Length of bore	Face width	Holding surface dia.	Allowable torque (N·m)	Allowable torque (kgf·m)	Backlash (mm)	Weight (kg)	Catalog No.
H	I	J	K	Bending strength	Bending strength			
4	7	2.5	4.93	0.082	0.0083	0.04~0.14	0.57	DM0.5-20
5	10	3.5	10.1	0.31	0.032	0.06~0.16	1.93	DM0.8-20
7	13	4.5	11.27	0.54	0.055	0.08~0.18	4.28	DM1-20
10	19	7	18.2	0.96	0.098	0.10~0.20	11.8	DM1.5-20

[Caution on Product Characteristics]

- ① The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 421 for more details.
- ② The bore tolerance is generally -0.05 to -0.1 but may be + values at the central portion of the hole.
- ③ To find the dimensional tolerance of these gears, please see the Dimensional Tolerance Table.

[Caution on Secondary Operations]

- ① Avoid performing secondary operations as reworking material may expose air bubbles (voids).

■ Dimensional tolerance table (Unit : mm)

Range	Tolerance
below 3 mm	± 0.20
3 up to 6 mm	± 0.25
6 up to 10 mm	± 0.30
10 up to 18 mm	± 0.35
18 up to 30 mm	± 0.40
30 mm up	± 0.50

Length of bore	Face width	Holding surface dia.	Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No.
			Bending strength	Surface durability	Bending strength	Surface durability			
12	5	9.86	0.22	—	0.022	—	0~0.23	0.0028	<b>PM1-20</b>
13	6	13.03	0.42	—	0.043	—	0~0.24	0.0053	<b>PM1.25-20</b>
19	8	15.37	0.76	—	0.077	—	0~0.25	0.011	<b>PM1.5-20</b>
22	10	21.72	1.74	—	0.18	—	0~0.26	0.023	<b>PM2-20</b>
29	12	28.06	3.34	—	0.34	—	0~0.27	0.046	<b>PM2.5-20</b>
35	15	31.57	5.89	—	0.60	—	0~0.28	0.080	<b>PM3-20</b>
40	18	39.09	9.47	—	0.97	—	0~0.30	0.12	<b>PM3.5-20</b>
45	20	43.43	14.0	—	1.42	—	0~0.32	0.17	<b>PM4-20</b>
14	6	15.03	0.36	—	0.036	—	0~0.23	0.0051	<b>PM1-25</b>
16	7	18.7	0.67	—	0.068	—	0~0.24	0.0093	<b>PM1.25-25</b>
19	9	19.54	1.20	—	0.12	—	0~0.25	0.017	<b>PM1.5-25</b>
20	12	26.06	2.84	—	0.29	—	0~0.26	0.033	<b>PM2-25</b>
26	15	34.57	5.55	—	0.57	—	0~0.27	0.064	<b>PM2.5-25</b>
32	20	37.43	10.0	—	1.02	—	0~0.28	0.11	<b>PM3-25</b>

- [Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 422) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Plastic gears are susceptible to the effects of temperature and moisture. Dimensional changes may occur while performing secondary operations and during post-machining operations.

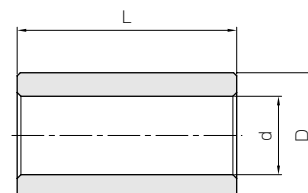


BB

## Sintered Metal Bushings



The table shows a series of standard metal bushings that can be pressed into standard Injection Molded Gears. They can be used as bearing metal on idler gears or to reduce the bore of the gears.



T8

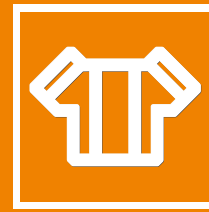
Catalog No.	I.D. of bushing	O.D. of bushing	Length	Products that can use the bushing
	$d \begin{smallmatrix} +0.02 \\ 0 \end{smallmatrix}$	$D \begin{smallmatrix} +0.02 \\ -0.01 \end{smallmatrix}$	$L \begin{smallmatrix} 0 \\ -0.3 \end{smallmatrix}$	
<b>BB30507</b>	3	5	7	DM0.8
<b>BB30608</b>	3	6	8	DM1
<b>BB40609</b>	4	6	9	DM1
<b>BB50814</b>	5	8	14	DM1.5

Material : Oil impregnated sintered bronze.









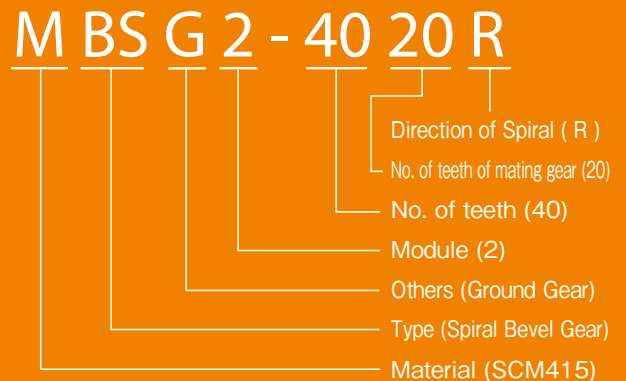
# Bevel Gears

<b>MHP</b> High-Ratio Hypoid Gears Gear Ratio 15 ~ 200  m1, 1.5 Page 456 RoHS  	<b>MBSG</b> Ground Spiral Bevel Gears Gear Ratio 2  m2 ~ 4 Page 458 RoHS   	<b>SBSG</b> Ground Spiral Bevel Gears Gear Ratio 1.5 ~ 3  m2 ~ 4 Page 460 RoHS    
<b>MBSA · MBSB</b> Finished Bore Spiral Bevel Gears Gear Ratio 1.5 ~ 3  m2 ~ 6 Page 462 RoHS  	<b>SBS</b> Spiral Bevel Gears Gear Ratio 1.5 ~ 4  m1 ~ 5 Page 466 RoHS   	<b>SBZG</b> Ground Zerol Bevel Gears Gear Ratio 1.5, 2  <b>New</b> m2 ~ 3 Page 470 RoHS    
<b>SB</b> Steel Bevel Gears Gear Ratio 1.5 ~ 4  m1.5 ~ 6 Page 472 RoHS  	<b>SBY</b> Steel Bevel Gears Gear Ratio 2 ~ 4  m5 ~ 8 Page 472 RoHS  	<b>SB</b> Steel Bevel Gears & Pinion Shafts Gear Ratio 5  m1.5 ~ 3 Page 476 RoHS   
<b>SUB</b> Stainless Steel Bevel Gears Gear Ratio 1.5 ~ 3  m1.5 ~ 3 Page 478 RoHS  	<b>PB</b> Plastic Bevel Gears Gear Ratio 1.5 ~ 3  m1 ~ 3 Page 480 RoHS  	<b>DB</b> Injection Molded Bevel Gears Gear Ratio 2  m0.5 ~ 1 Page 482 RoHS   
<b>BB</b> Sintered Metal Bushings  φ 5 ~ 8 Page 482 RoHS  	<b>Nissei KSP</b> Ground Spiral Bevel Gears Gear Ratio 1.5 ~ 2  m2 ~ 5 Page 488 RoHS   	

## Catalog Number of KHK Stock Gears

The Catalog Number for KHK stock gears is based on the simple formula listed below. Please order KHK gears by specifying their Catalog Numbers.

(Example) Bevel Gears



### Material

S S45C  
M SCM415  
SU SUS303  
P MC901  
D DURACON











### Type

B Straight Bevel Gears  
BS Spiral Bevel Gears  
HP High Ratio Hypoid Gears

### Other Information

G Ground Gears

### Feature Icons

	RoHS Compliant Product		Stainless Product
	Re-machinable Product		Resin Product
	Finished Product		Copper Alloy Product
	Heat Treated Product		Injection Molded Product
	Ground Gear		Black Oxide coated Product

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

Bevel Gearboxes

Other Products



## Characteristics



KHK stock bevel gears are available in two types, spiral and straight tooth, in gear ratios of 1.5 through 5, and are offered in a large variety of modules, numbers of teeth, materials and styles. The following table lists the main features for easy selection.

Type	Catalog No.	Module	Gear Ratio	Material	Heat Treatment	Tooth Surface Finish	Precision JIS B 1704	Secondary Operations	Features
Spiral bevel gears	<b>MHP</b>	1 ~ 1.5	15 ~ 200	SCM415	Carburized Note 1	Cut	3	△	High speed reduction ratio, high efficiency, high rigidity and compact gear assembly.
	<b>MBSG</b>	2 ~ 4	2	SCM415	Carburized Note 1	Ground	2	△	High strength, abrasion-resistant and compact for high-speed & torque use.
	<b>SBSG</b>	2 ~ 4	1.5 ~ 3	S45C	Gear teeth induction hardened	Ground	2	△	Reasonably priced ground gear, yet remachinable except for the gear teeth.
	<b>MBSA · MBSB</b>	2 ~ 6	1.5 ~ 3	SCM415	Carburized	Cut	4	×	Ready to use without performing secondary operations. Strong and abrasion resistant.
Straight bevel gears	<b>SBS</b>	1 ~ 5	1.5 ~ 4	S45C	Gear teeth induction hardened	Cut	4	△	Large nos. of teeth and modules are offered in these affordable spiral bevel gears.
	<b>SBZG</b>	2 ~ 3	1.5 ~ 2	S45C	Gear teeth induction hardened	Ground	2	△	A spiral bevel gears with a helix angle less than 10°. Receives forces from the same direction as straight bevel gears receive and have excellent precision properties.
	<b>SB · SBY</b>	1 ~ 8	1.5 ~ 5	S45C	—	Cut	3	○	Popular series of straight bevel gears for many uses.
	<b>SUB</b>	1.5 ~ 3	1.5 ~ 3	SUS303	—	Cut	3	○	Suitable for food machinery due to SUS303's rust-resistant quality.
	<b>PB</b>	1 ~ 3	1.5 ~ 3	MC901	—	Cut	4	○	MC nylon products are light and can be used without lubricant.
	<b>DB</b>	0.5 ~ 1	2	Duracon (M90-44)	—	Injection Molded	8	△	Injection molded, mass-produced productions, suitable for office machines.

**[NOTE 1]** Although these are carburized products, secondary operations can be performed as the bore and the hub portions are masked during the carburization. However, as a precaution, high hardness (HRC40 at maximum) occurs in some cases.

○ Possible △ Partly possible  
× Not possible

● For safe handling and to prevent damage such as deformation, KHK stock bevel gears have round chamfering at the corners, on the top surface plane of a gear tooth.

### ■ The chamfering of the corner gear tips for bevel gear

Module	Outside edge R	Inside edge R
0.5 up to 1	0.5	All burrs removed
1 up to 2.5	1	0.5
2.5 up to 5	2	1
Over 5	3	1.5

### Integrated combination of cutting-edge technologies and know-how.

The popularity in our large selection of product lineups is established by a production system integrated with advanced manufacturing technology and know-how, achieving quality products.



Gear cutting of Straight Bevel Gears



Bevel Gear Grinding Machine (Gleason PH-275HG)



Gear cutting of Spiral Bevel Gears



Bevel Gear Cutting Machine Equipments



Inspection Equipment

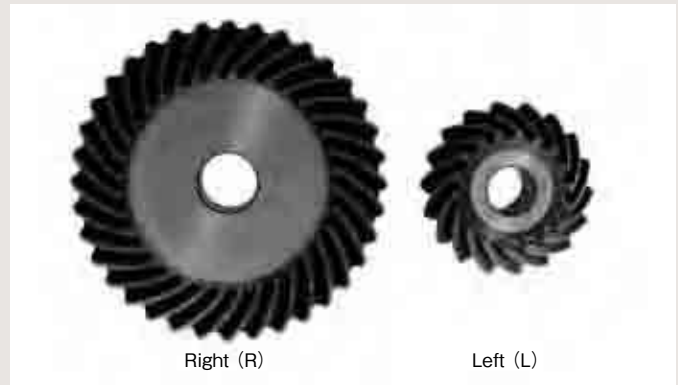
## Selection Hints



Please select the most suitable products by carefully considering the characteristics of items and contents of the product tables. It is also important to read all applicable "CAUTION" notes shown below before the final selection.

### 1. Caution in Selecting the Mating Gears

Basically, KHK stock bevel gears should be selected as shown in the catalog in pairs (e.g. MBSG2-4020R should mate with MBSG2-2040L). But, for straight tooth bevel gears, there is some interchangeability with different series. For plastic bevel gears, we recommend metal mating gears for good heat conductivity.



#### Selection Chart for Straight Bevel Gears (○ Allowable × Not allowable)

Pinion \ Gear	SB	SUB	PB	DB
SB	○	○	○	×
SUB	○	○	○	×
PB	○	○	○	×
DB	×	×	×	○

#### Selection Chart for Spiral Bevel Gears (○ Allowable × Not allowable)

Pinion \ Gear	MBSG	SBSG	MBSA MBSB	SBS
MBSG	○	×	×	×
SBSG	×	○	×	×
MBSA · MBSB	×	×	○	×
SBS	×	×	×	○

### 2. Caution in Selecting Gears Based on Gear Strength

The gear strength values shown in the product pages were computed by assuming a certain application environment. Therefore, they should be used as reference only. We recommend that each user computes their own values by applying the actual usage conditions. To learn more about strength calculation, please refer to the technical information contained in the "Bending Strength of Bevel Gears" section on page 679, and the "Surface Durability of Bevel Gears" section on page 685.

#### Calculation assumptions for Bending Strength of Gears

Item \ Catalog No.	MBSG MBSA MBSB	SBSG SBZG SBS	SB <sup>NOTE 3</sup> SBY	SUB	PB	DB
Formula <sup>NOTE 1</sup>	Formula of bevel gears on bending strength(JGMA403-01)				The Lewis formula	
No. of teeth of mating gear	No. of teeth of the mating gear of the set				—	
Rotation	100rpm (600rpm for MBSG, SBSG and SBZG)				100rpm	
Durability	Over 10 <sup>7</sup> cycles				—	
Impact from motor	Uniform load				Allowable bending stress (kgf/mm <sup>2</sup> )	
Impact from load	Uniform load				1.15 (40°C with No Lubrication)	
Direction of load	Bidirectional					
Allowable bending stress at root $\sigma_{Hlim}$ (kgf/mm <sup>2</sup> ) <sup>NOTE 2</sup>	47	21	19 (24.5)	10.5	$m$ 0.5 4.0 $m$ 0.8 4.0 $m$ 1.0 3.5 (40°C with Grease Lubrication)	
Safety factor $K_R$	1.2					

#### Calculation assumptions for Surface Durability (Except those in common with bending strength)

Formula <sup>NOTE 1</sup>	Formula of bevel gears on surface durability (JGMA404-01)			
Kinematic viscosity of lubricant	100cSt (50°C)			
Gear support	Shafts & gear box have normal stiffness, and gears are supported on one end			
Allowable Hertz stress $\sigma_{Hlim}$ (kgf/mm <sup>2</sup> )	166	90	49 (62.5)	41.3
Safety factor $C_R$	1.15			

**(NOTE 1)** The gear strength formula is based on JGMA (Japanese Gear Manufacturers Association) specifications. "MC Nylon Technical Data" by Nippon Polyplastic Limited and "Duracon Gear Data" by Polyplastic Co. Also, the units (rpm) of number of rotations and unit (kgf/mm<sup>2</sup>) of stress are adjusted to the units needed in the formula.

**(NOTE 2)** Since the load is bidirectional, the allowable bending stress at root  $\sigma_{Hlim}$ , used in JGMA 403-01 formula is set to 2/3 of the value.

**(NOTE 3)** Since SB Bevel Pinion Shafts are thermally refined, the allowable tooth-root bending stress and allowable hertz stress are referred to the value shown in parentheses.



## Application Hints

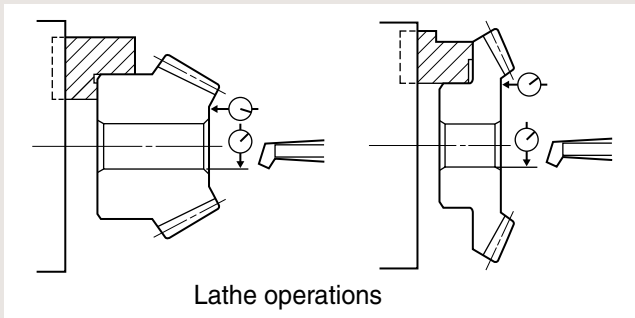


In order to use KHK stock gears safely, carefully read the Application Hints before proceeding. If there are questions or you require clarifications, please contact our technical department or your nearest distributor.

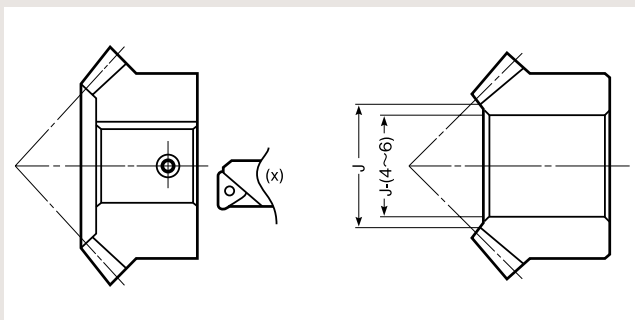
KHK Co., Ltd.  
TEL.048-254-1744 FAX.048-254-1765  
E-mail export@khkgears.co.jp

### 1. Caution on Performing Secondary Operations

- ① If you are reboring, it is important to pay special attention to locating the center in order to avoid runout.
- ② The reference datum for gear cutting is the bore. Therefore, it is best to use the bore for locating the center. If it is too difficult to do for small bores, the alternative is to use one spot on the bore and the runout of the side surface.
- ③ If reworking using scroll chucks, we recommend the use of new or rebores jaws for improved precision. Please exercise caution not to crush the teeth by applying too much pressure. Any scarring will cause noise during operation.

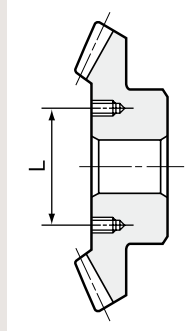


- ④ For items with induction hardened teeth, such as SBSG and SBS series, the hardness is high near the tooth root. When machining the front end, the machined area should be 4 to 6mm smaller than the dimension, J.



- ⑤ For tapping and keyway operations, see the examples given in "1. Caution on Performing Secondary Operations" in KHK Stock Spur Gear section. When cutting keyways, to avoid stress concentration, always leave radii on corners.
- ⑥ PB plastic bevel gears are susceptible to changes due to temperature and humidity. Dimensions may change between during and after remachining operations.
- ⑦ When heat treating S45C products, it is possible to get thermal stress cracks. It is best to subject them to penetrant inspection afterwards. While the teeth strength may increase four fold, the precision of the gear will drop approximately one grade.

- ⑧ For the handling conveniences, SB and SBY series listed below has the tapped holes (180° apart, 2 places) on the holding surface.

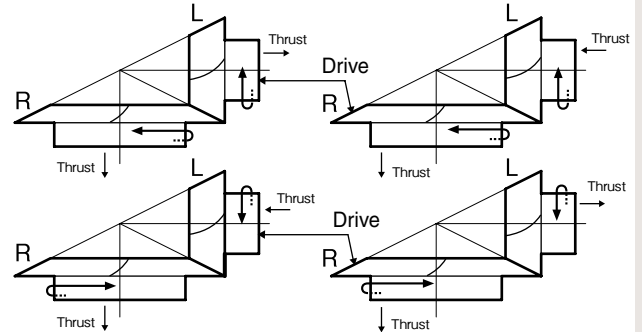


Catalog No.	L (mm)	Tap Size
SB6-4515	130	M10 deep 15
SBY8-4020	160	M10 deep 15
SBY8-4515	210	M10 deep 15
SBY5-6015	160	M10 deep 15
SBY6-6015	220	M10 deep 15

### 2. Points of Caution in Assembling

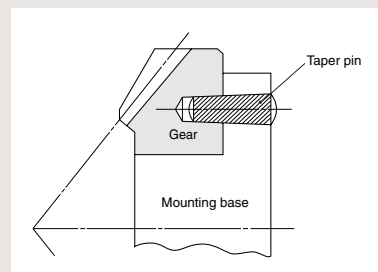
- ① Since bevel gears are cone shaped, they produce axial thrust forces. Especially for spiral bevel gears, the directions of thrust change with the hand of spiral and the direction of rotation. This is illustrated below. The bearings must be selected properly to be able to handle these thrust forces. For details, please refer to the technical reference, section of "Gear Forces" (Page 700).

Direction of rotation and thrust force



[NOTE] Bevel gears with the gear ratio 1.57 or less, produce a thrust force which has the same direction as miter gears. For details, see page 422.

- ② If a bevel gear is mounted on a shaft far from the bearings, the shaft may bend. We recommend mounting bevel gears as close to the bearings as possible. This is especially important since most bevel gears are supported on one end. The bending of shafts will cause abnormal noise and wear, and may even cause fatigue failure of the shafts. Both shafts and bearings must be designed with sufficient strength.
- ③ Due to the thrust load of bevel gears, the gears, shafts and bearings have the tendency to loosen up during operation. Bevel gears should be fastened to the shaft with keys and set screws, taper pins, step shafts, etc.
- ④ When installing MBSA or MBSB spiral bevel gears in

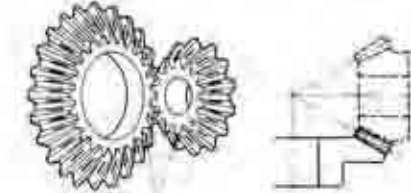


B7 style (ring type), always secure the gears onto the mounting base with taper pins to absorb the rotational loads. It is dangerous to secure with bolts only.

⑤ KHK stock bevel gears are designed such that, when assembled according to the specified mounting distance with a tolerance of H7 - H8, the backlash shown in the table is obtained. Mounting distance error, offset error and shaft angle error must be minimized to avoid excessive noise and wear. For various conditions of teeth contact, please see the following illustrations, "Correct Tooth Contact" and "Incorrect Tooth Contact".

## Correct Tooth Contact

- When assembled correctly, the contact will occur on both gears in the middle of the flank and center of face width but somewhat closer to the toe.

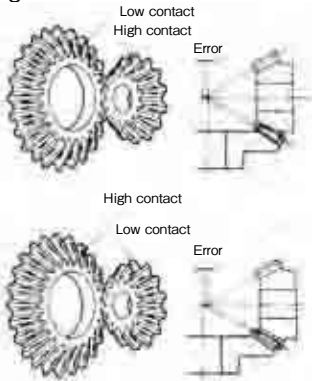


Center contact closer to toes

## Incorrect Tooth Contact

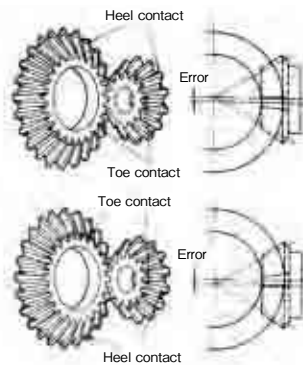
### ■ Mounting Distance Error

- When the mounting distance of the pinion is incorrect, the contact will occur too high on the flank on one gear and too low on the other.



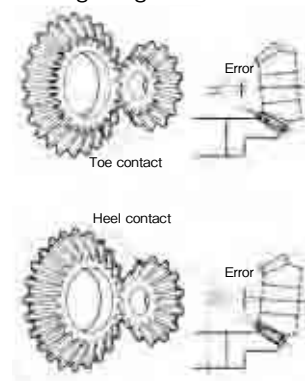
### ■ Offset Error

- When the pinion shaft is offset, the contact surface is near the toe of one gear and near the heel of the other.



### ■ Shaft Angle Error

- When there is an angular error of shafts, the gears will contact at the toes or heels depending on whether the angle is greater or less than 90°.



## Application Examples



SB Bevel Gears are used in the automatic line-feeding of a machine part processing machine.



2WD Bicycle by SHESCO  
SB Bevel Gears are used in the driving components in both the front and rear wheels.



## Features of MHP High Ratio Hypoid Gears

A pair of MHP high-ratio hypoid gears are able to produce an amazing reduction of speed of 200:1 in one stage.

### 1. Total-cost reduction

The MHP provides a compact gearing body replacing several stages of reduction gears. This reduces the cost sharply.

### 2. High efficiency

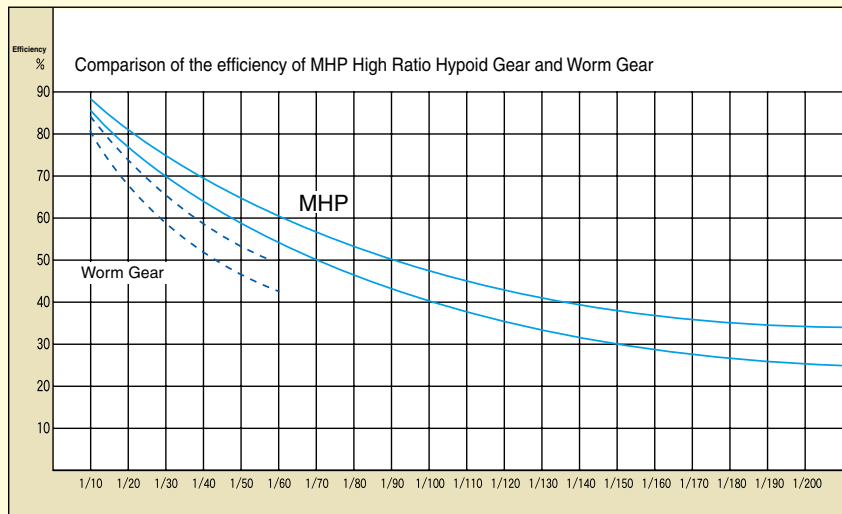
Compared to worm gear drives, the MHP has less sliding contact. The resulting higher efficiency allows the use of smaller motors (See the graph on the right).

### 3. High rigidity

The carburized hypoid gears lead to smaller size than comparable worms gears.

### 4. Compact gear assembly

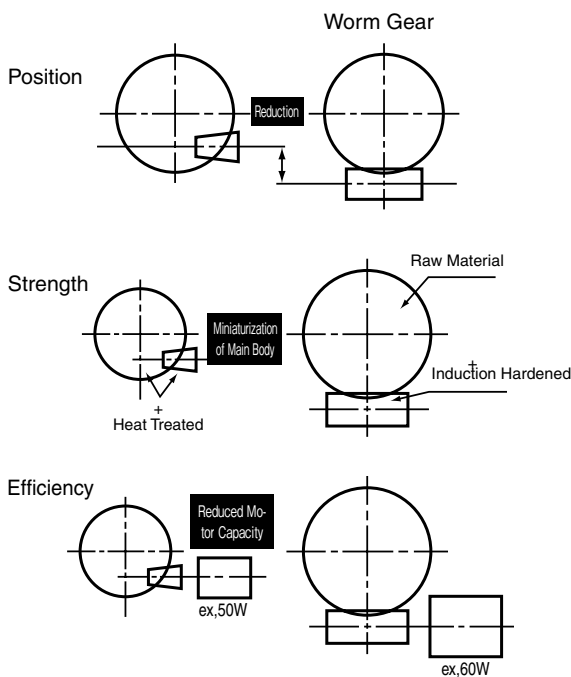
The size of the gear housing is nearly the same as outer diameter of the large gear. (See the diagrams below)



## How to determine the radial and thrust loads

Before using the MHP high-ratio hypoid gears, be sure to confirm the direction of radial and thrust loads. Following equations are used to compute these loads. The radial and thrust load coefficients are given on the product pages.

### Comparison of MHP and Worm Gear



### Radial load calculation

$W_{RP}$  : Radial load on the pinion or L(N)

$$W_{RP} = W_{KP} \times T_G \times \frac{n}{z}$$

$W_{KP}$  : Radial load coefficient of pinion or L (given on the product pages)

$T_G$  : Torque of gear or R(N·m)

$n$  : Number of teeth of pinion or L

$z$  : Number of teeth of gear or R

$W_{RG}$  : Radial load on the gear or R(N)

$$W_{RG} = W_{KG} \times T_G$$

$W_{KG}$  : Radial load coefficient of gear or R (given on the product pages)

$T_G$  : Torque of gear or R(N·m)

### Thrust load calculation

$W_{XP}$  : Thrust load on the pinion or L(N)

$$W_{XP} = W_{NP} \times T_G \times \frac{n}{z}$$

$W_{NP}$  : Thrust load coefficient of pinion or L (given on the product page)

$T_G$  : Torque of gear or R(N·m)

$n$  : Number of teeth of pinion or L

$z$  : Number of teeth of gear or R

$W_{XG}$  : Thrust load of gear or R(N)

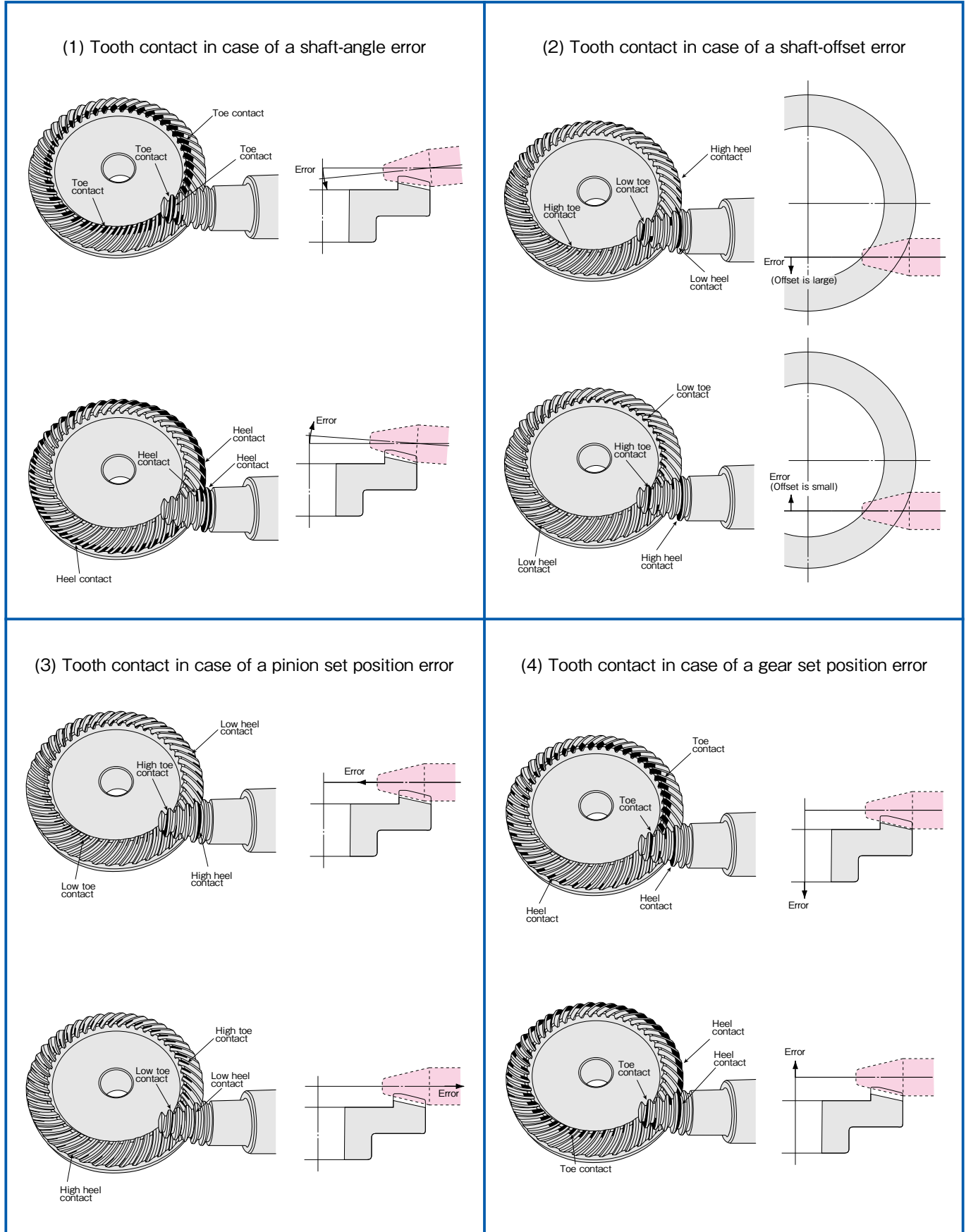
$$W_{XG} = W_{NG} \times T_G$$

$W_{NG}$  : Thrust load coefficient of gear or R (given on the product pages)

$T_G$  : Torque of gear or R(N·m)

**Variations in tooth contact due to poor alignment of gears**

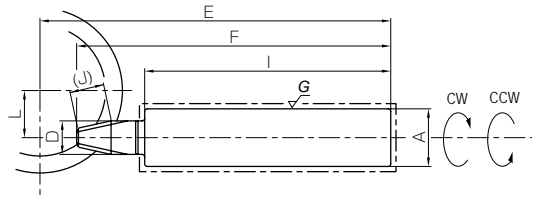
If the gear engagement position is out of the normal position, variations in tooth contact, as illustrated below, may appear.



- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products



Specifications	
Precision grade	JIS B 1704 grade 3
Gear teeth	Gleason
Pressure angle	20°
Material	SCM415
Heat treatment	Carburizing
Tooth hardness	60 ~ 63HRC



B8

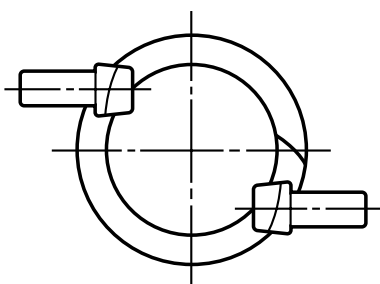
Catalog No.	Reduction ratio	Nominal module	Actual module	No. of teeth	Direction of spiral	Shape	Bore • Shaft Dia.		Pitch dia.	Outside dia.	Mounting distance	Total length	Hub width	Length of bore and shaft
							A (Bore: H7 - Shaft: h7)	B						
MHP1-0453R MHP1-3045L	15	<b>m1</b>	1.067	45 3	R L	B9 B8	12 22.1	30	48 10.3	48 10.3	19 127	16.3 113	7 —	14 94
MHP1.5-0453R MHP1.5-3045L	15	<b>m1.5</b>	1.733	45 3	R L	B9 B8	14 31.1	40	78 17.6	78 17.6	28 170	23.7 148	10 —	20 116
MHP1-0603R MHP1-3060L	20	<b>m1</b>	1.05	60 3	R L	B9 B8	12 26.1	34	63 11.7	63 11.7	21 142	18.1 125	8 —	16 102
MHP1.5-0603R MHP1.5-3060L	20	<b>m1.5</b>	1.633	60 3	R L	B9 B8	20 36.1	50	98 15.7	98 15.7	33 199	28.7 168	13 —	25 135
MHP1-0602R MHP1-2060L	30	<b>m1</b>	1.05	60 2	R L	B9 B8	12 22.1	34	63 12.8	63 12.8	21 134	17.8 120	8 —	16 94
MHP1.5-0602R MHP1.5-2060L	30	<b>m1.5</b>	1.633	60 2	R L	B9 B8	20 31.1	50	98 17.7	98 17.7	33 175	28.2 149	13 —	25 116
MHP1-0451R MHP1-1045L	45	<b>m1</b>	1.067	45 1	R L	B9 B8	12 20.1	30	48 10.1	48 10.1	19 115	16.5 104	7 —	14 85
MHP1.5-0451R MHP1.5-1045L	45	<b>m1.5</b>	1.733	45 1	R L	B9 B8	14 26.1	40	78 18.3	78 18.3	28 152	23.9 138	10 —	20 102
MHP1-0601R MHP1-1060L	60	<b>m1</b>	1.05	60 1	R L	B9 B8	12 22.1	34	63 12.9	63 12.9	21 134	17.9 122	8 —	16 94
MHP1.5-0601R MHP1.5-1060L	60	<b>m1.5</b>	1.633	60 1	R L	B9 B8	20 31.1	50	98 17.7	98 17.7	33 175	28.2 151	13 —	25 116
MHP1-0901R MHP1-1090L	90	<b>m1</b>	1.089	90 1	R L	B9 B8	20 31.1	50	98 15.7	98 15.7	33 170	28.8 149	13 —	25 116
MHP1-1201R MHP1-1120L	120	<b>m1</b>	0.817	120 1	R L	B9 B8	20 31.1	50	98 13.4	98 13.4	33 170	29.3 149	13 —	25 116
MHP1-1801R MHP1-1180L	180	<b>m1</b>	1	180 1	R L	B9 B8	25 42.1	70	180 22.4	180 22.4	47 242	40.1 200	18 —	35 154
MHP1-2001R MHP1-1200L	200	<b>m1</b>	1	200 1	R L	B9 B8	25 42.1	70	200 21.5	200 21.5	47 252	40.6 205	18 —	35 154

[Caution on Product Characteristics] ① The allowable torques are obtained from the results of experimentation with the pinion at 600 rpm, lubricated with Kingstar SG-O (NIHON GREASE).

② Radial and thrust load coefficients are the factors used for calculation of those loads. As shown in the figure B8 Shape, CW and CCW stand for clockwise and counterclockwise rotation. A plus sign means that the two gears in a set move away each other when load is applied. A minus sign means that two gears in a set approach each other when load is applied. For more details, see the section "How to determine the radial and thrust loads" on page 454.

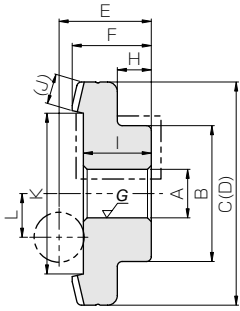
### Helix Hands and Offset Position

MHP High Ratio Hypoid Gears are designed to be right hand helix for gears, left hand helix for pinions. The opposite helix hand gears are not available for these products. Also, the offset position is already set, so please refer to the illustration bellow when designing or assembling.





## High-Ratio Hypoid Gears



B9

Face width (J)	Holding surface dia. (K)	Offset (L)	Radial load coefficient		Thrust load coefficient		Allowable torque (N·m)	Allowable torque (kgf·m)	Backlash (mm)	Weight (kg)	Catalog No.
			CW	CCW	CW	CCW					
(6)	35.1 —	10	48.48 147.3	-37.67 523.74	13 969.92	31.74 -831.16	10.3	1.05	0.05~0.15	0.15 0.29	MHP1-0453R MHP1-3045L
(10)	56.5 —	18	26.78 100.09	-18.67 338.45	8.98 566.72	21.19 -466.63	41.2	4.20	0.10~0.20	0.50 0.73	MHP1.5-0453R MHP1.5-3045L
(8)	46.4 —	15	33.88 159.43	-26.2 502.91	10.11 956.55	23.73 -829.74	23.3	2.38	0.05~0.15	0.29 0.45	MHP1-0603R MHP1-3060L
(10)	76.8 —	22	20.44 119.32	-16.54 194.45	7.15 577.56	13.95 -511.77	82.4	8.40	0.10~0.20	0.94 1.15	MHP1.5-0603R MHP1.5-3060L
(8)	46.4 —	18	33.59 186.59	-24.15 784.31	8.21 1461.23	24.77 -1248.6	24.1	2.46	0.05~0.15	0.29 0.28	MHP1-0602R MHP1-2060L
(10)	76.7 —	28	20.39 142.71	-15.29 466.2	5.96 899.1	14.75 -782.21	87.3	8.90	0.10~0.20	0.94 0.77	MHP1.5-0602R MHP1.5-2060L
(6)	34.9 —	14	48.04 400.81	-35.58 1579.79	11.13 3014.6	34.11 -2605.26	11.3	1.15	0.05~0.15	0.16 0.22	MHP1-0451R MHP1-1045L
(10)	56 —	25	26.36 233.59	-16.04 1034.08	6.88 1755.84	22.02 -1439.58	46.6	4.75	0.10~0.20	0.50 0.48	MHP1.5-0451R MHP1.5-1045L
(8)	46.3 —	20	33.34 357.61	-23.12 1564.81	7.41 2936.72	25.14 -2514.09	25.3	2.58	0.05~0.15	0.29 0.28	MHP1-0601R MHP1-1060L
(10)	76.8 —	30	22.63 303.06	-17.19 974.4	5.82 1912.11	15.81 -1675.65	94.0	9.58	0.10~0.20	0.94 0.77	MHP1.5-0601R MHP1.5-1060L
(10)	76.2 —	32	21.08 464.7	-15.72 1404.28	5.71 2777.98	15.17 -2443.73	71.4	7.28	0.05~0.15	0.94 0.76	MHP1-0901R MHP1-1090L
(10)	76.4 —	32	21.17 720.78	-16.46 1811.47	6.39 3718.13	14.76 -3326.46	51.8	5.28	0.03~0.10	0.94 0.75	MHP1-1201R MHP1-1120L
(15)	148.2 —	60	11.69 614.04	-9.25 1458.9	3.53 3026.67	7.96 -2721.83	260	26.5	0.05~0.15	3.99 1.88	MHP1-1801R MHP1-1180L
(18)	162.4 —	65	10.77 695.62	-8.9 1430.75	3.58 3074.35	7.05 -2808.83	333	34.0	0.05~0.15	4.76 1.88	MHP1-2001R MHP1-1200L

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 452) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② In the illustration, the area surrounded with ---- line is masked during the carburization process and can be modified. However, care should be exercised since the hardness is high (approx. HRC40, maximum).

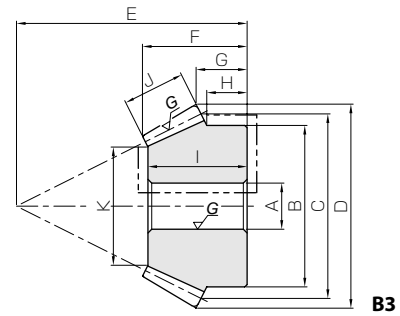
Spur  
GearsHelical  
GearsInternal  
Gears

Racks

CP Racks  
& PinionsMiter  
GearsBevel  
GearsScrew  
GearsWorm  
Gear PairBevel  
GearboxesOther  
Products



Specifications	
Precision grade	JIS B 1704 grade 2
Gear teeth	Gleason
Pressure angle	20°
Helix angle	35°
Material	SCM415
Heat treatment	Carburizing
Tooth hardness	55 ~ 60HRC



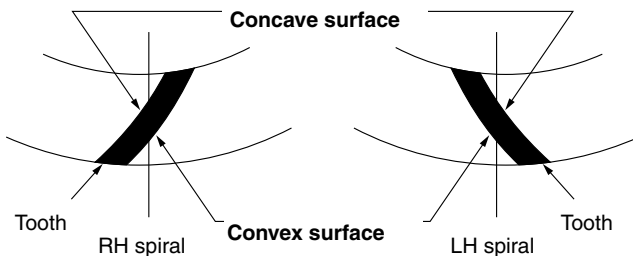
- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

Catalog No.	Gear ratio	Module	No. of teeth	Direction of spiral	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Mounting distance	Total length	Crown to back length
						A <sub>H7</sub>	B	C	D	E	F	G
MBSG2-4020R MBSG2-2040L	2	m2	40	R	B4	15	45	80	81.1	45	31.78	26.1
			20	L	B3	12	35	40	44.1	55	28.16	16.02
MBSG2.5-4020R MBSG2.5-2040L	2	m2.5	40	R	B4	16	55	100	101.29	50	33.35	26.29
			20	L	B3	12	43	50	55.12	65	31.01	16.28
MBSG3-4020R MBSG3-2040L	2	m3	40	R	B4	20	65	120	121.57	60	39.81	31.57
			20	L	B3	16	52	60	66.03	80	38.9	21.51
MBSG4-4020R MBSG4-2040L	2	m4	40	R	B4	25	80	160	162.06	75	48.27	37.06
			20	L	B3	20	70	80	88.46	100	45.38	22.12

- [Caution on Product Characteristics]
- ① Allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 451 for more details.
  - ② Dimensions of the outside diameter, the overall length and crown to back length are all theoretical values, and some differences will occur due to the corner chamfering of the gear tips.
  - ③ These gears produce axial thrust forces. Please see page 452 for more details.

### ■ Contact Surface of Spiral Bevel Gears

Tooth surfaces of spiral gears have concave and convex sides. Changes in the rotational direction of the driving gear alter the contact surface accordingly. The illustrations show the top view of RH and LH Spiral Gears, and the tables on the right explain the different contact surface depending on the situation.



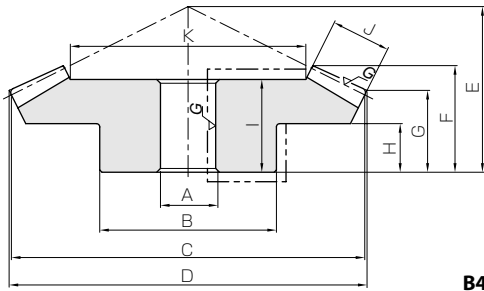
#### RH Spiral as a driving gear

Rotating Direction of Driving Gear <small>Note 1</small>	Contact Surface	
	Driving Gear (RH Spiral)	Driving Gear (LH Spiral)
RH Rotation (Clockwise)	Convex Surface	Concave Surface
LH rotation (counterclockwise)	Concave Surface	Convex Surface

#### LH Spiral as a driving gear

Rotating Direction of Driving Gear <small>Note 1</small>	Contact Surface	
	Driving Gear (LH Spiral)	Driving Gear (RH Spiral)
RH Rotation (Clockwise)	Concave Surface	Convex Surface
LH Rotation (Counterclockwise)	Convex Surface	Concave Surface

[Note 1] Rotation directions given in the tables are for viewing the gears from the hub side.



B4

Hub width H	Length of bore I	Face width J	Holding surface dia. K	Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No.
				Bending strength	Surface durability	Bending strength	Surface durability			
18 13.75	29 27	14	52.7 25.39	51.8 25.9	87.2 43.6	5.28 2.65	8.89 4.45	0.05~0.11	0.57 0.18	MBSG2-4020R MBSG2-2040L
16 13.25	30 29	17	66.99 29.97	99.3 49.7	170 85.1	10.1 5.07	17.4 8.68	0.06~0.12	1.01 0.31	MBSG2.5-4020R MBSG2.5-2040L
20 18	35 36.5	20	80.28 36.56	169 84.9	295 147	17.3 8.65	30.1 15.0	0.07~0.13	1.64 0.56	MBSG3-4020R MBSG3-2040L
22 17.5	42 43	27	106.63 51.25	405 203	722 361	41.3 20.7	73.7 36.8	0.10~0.16	3.55 1.20	MBSG4-4020R MBSG4-2040L

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 452) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② In the illustration, the area surrounded with ---- line is masked during the carburization process and can be modified. However, care should be exercised since the hardness is high (approx. HRC40, maximum).

■ Forces Acting on Spiral Bevel Gear Teeth

For a spiral bevel gear with shaft angle  $\Sigma=90^\circ$ , pressure angle  $\alpha_n=20^\circ$ , and spiral angle  $\beta_m=35^\circ$ , the tables below show the axial thrust force  $F_x$  and the radial force  $F_r$  when a tangential force  $F_t$  of 100 units is applied at the center of face width. For details, please refer to the section "Features of Tooth Surface Contact" in the technical reference.

The tables show the values of  $\frac{\text{Axial Thrust Force } F_x}{\text{Radial Force } F_r}$

(1) Forces acting upon pinion

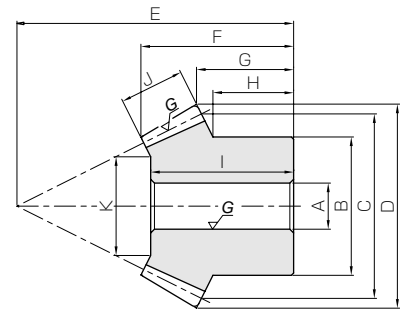
Contact Surface	Gear Ratio $z_2/z_1$						
	1.0	1.5	2.0	2.5	3.0	4.0	5.0
Concave Surface	80.9	82.9	82.5	81.5	80.5	78.7	77.4
	-18.1	-1.9	8.4	15.2	20.0	26.1	29.8
Convex Surface	-18.1	-33.6	-42.8	-48.5	-52.4	-57.2	-59.9
	80.9	75.8	71.1	67.3	64.3	60.1	57.3

(2) Forces acting upon gear

Contact Surface	Gear Ratio $z_2/z_1$						
	1.0	1.5	2.0	2.5	3.0	4.0	5.0
Concave Surface	80.9	75.8	71.1	67.3	64.3	60.1	57.3
	-18.1	-33.6	-42.8	-48.5	-52.4	-57.2	-59.9
Convex Surface	-18.1	-1.9	8.4	15.2	20.0	26.1	29.8
	80.9	82.9	82.5	81.5	80.5	78.7	77.4



Specifications	
Precision grade	JIS B 1704 grade 2
Gear teeth	Gleason
Pressure angle	20°
Helix angle	35°
Material	S45C
Heat treatment	Teeth induction hardened
Tooth hardness	45 ~ 55HRC



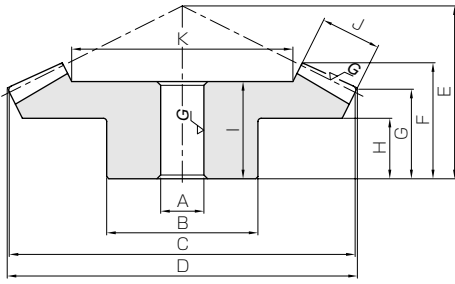
B3

Catalog No.	Gear ratio	Module	No. of teeth	Direction of spiral	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Mounting distance	Total length	Crown to back length
						A <sub>H7</sub>	B	C	D	E	F	G
SBSG2-3020R SBSG2-2030L	1.5	m2	30	R	B4	12	35	60	61.6	40	26.6	21.2
			20	L	B3	10	30	40	43.55	45	24.91	16.18
SBSG2.5-3020R SBSG2.5-2030L	1.5	m2.5	30	R	B4	15	45	75	77.09	50	33.86	26.56
			20	L	B3	12	40	50	54.43	55	30.88	18.98
SBSG3-3020R SBSG3-2030L	1.5	m3	30	R	B4	16	50	90	92.21	55	35.34	26.66
			20	L	B3	16	45	60	65.58	70	40.17	26.86
SBSG4-3020R SBSG4-2030L	1.5	m4	30	R	B4	20	70	120	122.85	75	47.49	37.14
			20	L	B3	20	60	80	87.34	90	48.17	32.45
SBSG2-4020R SBSG2-2040L	2	m2	40	R	B4	12	40	80	80.99	45	32.26	25.99
			20	L	B3	12	32	40	44.10	60	34.04	21.02
SBSG2.5-4020R SBSG2.5-2040L	2	m2.5	40	R	B4	15	50	100	101.27	55	39.65	31.27
			20	L	B3	12	40	50	55.21	75	43.61	26.30
SBSG3-4020R SBSG3-2040L	2	m3	40	R	B4	20	60	120	121.48	65	45.76	36.48
			20	L	B3	16	50	60	66.06	90	50.63	31.52
SBSG4-4020R SBSG4-2040L	2	m4	40	R	B4	20	70	160	162.07	80	53.69	42.07
			20	L	B3	20	60	80	88.50	120	66.24	42.12
SBSG2-4515R SBSG2-1545L	3	m2	45	R	B4	12	40	90	90.67	40	30.29	26.01
			15	L	B3	10	24	30	34.78	60	29.66	15.80
SBSG2.5-4515R SBSG2.5-1545L	3	m2.5	45	R	B4	15	50	112.5	113.32	50	38.25	32.47
			15	L	B3	12	30	37.5	43.36	75	38.27	19.73
SBSG3-4515R SBSG3-1545L	3	m3	45	R	B4	20	60	135	135.99	55	40.59	33.98
			15	L	B3	15	38	45	52.08	90	44.98	23.68

[Caution on Product Characteristics]

- ① Allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 451 for more details.
- ② Dimensions of the outside diameter, the overall length and crown to back length are all theoretical values, and some differences will occur due to the corner chamfering of the gear tips.
- ③ These gears produce axial thrust forces. Please see page 452 for more details.

Ground Spiral Bevel Gears



B4

Hub width H	Length of bore I	Face width J	Holding surface dia. K	Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No.
				Bending strength	Surface durability	Bending strength	Surface durability			
15 11.67	23 22	11	37.56 21.34	14.1 9.61	14.2 9.44	1.44 0.98	1.44 0.96	0.05~0.11	0.26 0.13	SBSG2-3020R SBSG2-2030L
18 14.17	30 28	15	45.61 27.42	29.0 19.8	29.7 19.8	2.96 2.02	3.03 2.02	0.06~0.12	0.55 0.28	SBSG2.5-3020R SBSG2.5-2030L
17 20	31 37	17	57.14 34.71	48.4 33.1	50.4 33.6	4.94 3.37	5.14 3.42	0.07~0.13	0.82 0.49	SBSG3-3020R SBSG3-2030L
25 23.33	40 43	20	78.59 46.89	106 72.2	113 75.3	10.8 7.36	11.5 7.68	0.10~0.16	1.90 1.05	SBSG4-3020R SBSG4-2030L
18 18	27 32	15	48.46 20.92	25.5 12.8	26.7 13.4	2.60 1.30	2.73 1.36	0.05~0.11	0.51 0.19	SBSG2-4020R SBSG2-2040L
20 22.5	34 40	20	59.28 20.56	51.7 25.9	55.1 27.6	5.27 2.64	5.62 2.81	0.06~0.12	1.06 0.42	SBSG2.5-4020R SBSG2.5-2040L
24 27.5	38 47	22	73.81 29.61	84.8 42.5	91.9 46.0	8.65 4.33	9.38 4.69	0.07~0.13	1.67 0.69	SBSG3-4020R SBSG3-2040L
28 35	45 62	28	102.39 42.78	195 97.9	217 109	19.9 9.98	22.2 11.1	0.10~0.16	3.33 1.53	SBSG4-4020R SBSG4-2040L
17 14	26 29	15	59.04 19.13	34.8 11.2	28.1 9.38	3.55 1.14	2.87 0.96	0.05~0.11	0.60 0.095	SBSG2-4515R SBSG2-1545L
22 17.5	35 37	20	72.84 20.51	59.0 18.9	48.3 16.1	6.01 1.93	4.93 1.64	0.06~0.12	1.21 0.19	SBSG2.5-4515R SBSG2.5-1545L
20 21.33	35 44	23	88.18 28.54	99.3 31.8	82.5 27.5	10.1 3.24	8.41 2.80	0.07~0.13	1.99 0.34	SBSG3-4515R SBSG3-1545L

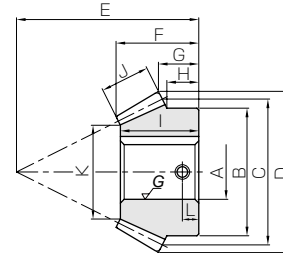
[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 452) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 1 to 2 mm).

Spur Gears  
Helical Gears  
Internal Gears  
Racks  
CP Racks & Pinions  
Miter Gears  
Bevel Gears  
Screw Gears  
Worm Gear Pair  
Bevel Gearboxes  
Other Products



Specifications	
Precision grade	JIS B 1704 grade 4
Gear teeth	Gleason
Pressure angle	20°
Helix angle	35°
Material	SCM415
Heat treatment	Overall carburizing
Tooth hardness	55 ~ 60HRC



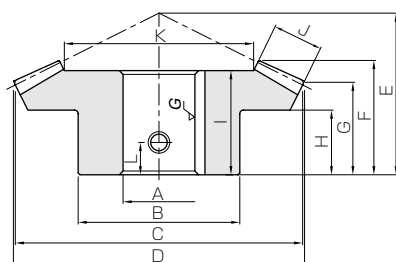
BK

Catalog No.	Gear ratio	Module	No. of teeth	Direction of spiral	Shape	Bore		Pitch dia.	Outside dia.	Mounting distance	Total length	Crown to back length	Hub width	Length of bore	
						A <sub>H7</sub>	B								
MBSA2-3020R MBSB2-3020R MBSA2-2030L MBSB2-2030L	1.5	m2	30	R	B4	20 22	40	60	61.36	40	26.8	21.02	14	23	
		m2	20	L	BK	15 18	35	40	43.49	45	24.96	16.16	13.33	23	
MBSA2.5-3020R MBSB2.5-3020R MBSA2.5-2030L MBSB2.5-2030L		m2.5	30	R	B4	22 25	48	75	76.74	50	33.6	26.31	18	30	
		m2.5	20	L	BK	18 20	43	50	54.43	55	30.08	18.98	15.17	28	
MBSA3-3020R MBSB3-3020R MBSA3-2030L MBSB3-2030L		m3	30	R	B4	25 30	60	90	92.21	60	40.34	31.66	21	36	
		m3	20	L	BK	22 25	53	60	65.58	65	35.17	21.86	17.67	32.5	
MBSA4-3020R MBSB4-3020R MBSA4-2030L MBSB4-2030L		m4	30	R	B4	35 40	75	120	122.91	70	43.99	32.18	21	39	
		m4	20	L	BK	30 35	70	80	87.34	85	45.53	27.45	21.67	42	
MBSA5-3020R MBSA5-2030L MBSB5-2030L		m5	30	R	B7	80	—	150	—	70	35.53	23.8	—	31	
		m5	20	L	BK	35 40	87	100	109.2	105	55.05	33.07	25.67	51	
MBSA6-3020R MBSA6-2030L MBSB6-2030L		m6	30	R	B7	90	—	180	—	80	38.86	24.37	—	33	
		m6	20	L	BK	45 50	105	120	130.48	125	65.57	38.49	30	60	
MBSA2-4020R MBSB2-4020R MBSA2-2040L MBSB2-2040L		2	m2	40	R	B4	20 22	45	80	81.06	45	31.83	26.06	18	29
			m2	20	L	BK	15 18	35	40	44.2	55	28.16	16.05	13.75	27
MBSA2.5-4020R MBSB2.5-4020R MBSA2.5-2040L MBSB2.5-2040L			m2.5	40	R	B4	25 28	55	100	101.29	50	33.35	26.29	16	30
			m2.5	20	L	BK	20 22	43	50	55.12	65	31.01	16.28	13.25	29
MBSA3-4020R MBSB3-4020R MBSA3-2040L MBSB3-2040L	m3		40	R	B4	30 35	65	120	121.57	60	39.81	31.57	21	35	
	m3		20	L	BK	22 25	53	60	66.03	80	38.9	21.51	18.25	36.5	
MBSA4-4020R MBSA4-2040L MBSB4-2040L	m4		40	R	B7	80	—	160	—	60	32.08	22.53	—	28	
	m4		20	L	BK	30 35	70	80	88.46	100	45.38	22.12	17.5	43	
MBSA5-4020R MBSA5-2040L MBSB5-2040L	m5		40	R	B7	90	—	200	—	70	35.2	22.98	—	30	
	m5		20	L	BK	40 45	87	100	109.91	125	57.11	27.48	21.75	53.5	
MBSA6-4020R MBSA6-2040L MBSB6-2040L	m6		40	R	B7	110	—	240	—	80	37.89	23.62	—	32	
	m6		20	L	BK	50 55	105	120	132.04	150	67.8	33.01	26.25	64	

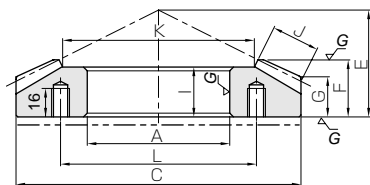
[Caution on Product Characteristics]

- ① The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 451 for more details.
- ② Dimensions of the outside diameter, the overall length and crown to back length are all theoretical values, and some differences will occur due to the corner chamfering of the gear tips.
- ③ These gears produce axial thrust forces. See page 452 for more details.
- ④ Although the dimensions of the keyway are made to the JIS (Js9) tolerance, there may be some deviations due to the effects of heat treatment.
- ⑤ For products having a tapped hole (Except for B7-shaped products), a tapping screw is attached as an accessory.

Finished Bore Spiral Bevel Gears



B4



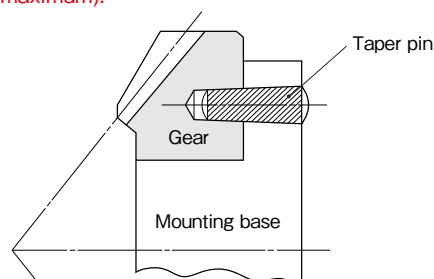
B7

Face width J	Holding surface dia. K	Keyway Width×Depth	Set Screw		Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No.
			Size	L	Bending strength	Surface durability	Bending strength	Surface durability			
11	37.56	6 x 2.8 6 x 2.8	M6 M6	7	34.4	38.4	3.51	3.91	0.06~0.16	0.26 0.24	MBSA2-3020R MBSB2-3020R
11	24.34	5 x 2.3 6 x 2.8	M5 M6	6.5	23.5	25.6	2.39	2.61		0.14 0.13	MBSA2-2030L MBSB2-2030L
14	48.01	6 x 2.8 8 x 3.3	M6 M8	9	68.0	76.8	6.93	7.84	0.07~0.17	0.52 0.49	MBSA2.5-3020R MBSB2.5-3020R
14	31.02	6 x 2.8 6 x 2.8	M6 M6	7.5	46.4	51.2	4.73	5.22		0.26 0.25	MBSA2.5-2030L MBSB2.5-2030L
17	57.14	8 x 3.3 8 x 3.3	M8 M8	11	118	135	12.1	13.8	0.08~0.18	0.96 0.90	MBSA3-3020R MBSB3-3020R
17	36.2	6 x 2.8 8 x 3.3	M6 M8	9	80.7	90.1	8.23	9.19		0.46 0.43	MBSA3-2030L MBSB3-2030L
23	76.72	10 x 3.3 12 x 3.3	M8 M8	10	283	328	28.9	33.5	0.12~0.27	1.77 1.68	MBSA4-3020R MBSB4-3020R
23	48.07	8 x 3.3 10 x 3.3	M8 M8	11	193	219	19.7	22.3		1.03 0.95	MBSA4-2030L MBSB4-2030L
28	97.36	—	6-M10	110	544	637	55.4	64.9	0.14~0.34	2.80	MBSA5-3020R
28	62.04	10 x 3.3 12 x 3.3	M8 M8	13	371	425	37.8	43.3		2.01 1.89	MBSA5-2030L MBSB5-2030L
34	115.61	—	6-M10	120	927	1120	94.6	114	0.16~0.36	4.55	MBSA6-3020R
34	72.41	14 x 3.8 14 x 3.8	M8 M8	15	633	745	64.5	76.0		3.56 3.38	MBSA6-2030L MBSB6-2030L
14	52.7	6 x 2.8 6 x 2.8	M6 M6	9	59.6	69.6	6.08	7.09	0.06~0.16	0.53 0.51	MBSA2-4020R MBSB2-4020R
14	25.39	5 x 2.3 6 x 2.8	M5 M6	7	29.9	34.8	3.05	3.55		0.16 0.14	MBSA2-2040L MBSB2-2040L
17	66.99	8 x 3.3 8 x 3.3	M8 M8	8	114	135	11.7	13.8	0.07~0.17	0.93 0.90	MBSA2.5-4020R MBSB2.5-4020R
17	29.97	6 x 2.8 6 x 2.8	M6 M6	7	57.3	67.6	5.84	6.89		0.26 0.25	MBSA2.5-2040L MBSB2.5-2040L
20	80.28	8 x 3.3 10 x 3.3	M8 M8	11	195	233	19.9	23.7	0.08~0.18	1.47 1.40	MBSA3-4020R MBSB3-4020R
20	36.56	6 x 2.8 8 x 3.3	M6 M8	9.5	97.7	116	9.97	11.9		0.51 0.48	MBSA3-2040L MBSB3-2040L
27	107.63	—	6-M10	110	466	564	47.5	57.5	0.12~0.27	3.11	MBSA4-4020R
27	51.25	8 x 3.3 10 x 3.3	M8 M8	9	234	282	23.8	28.8		1.05 0.96	MBSA4-2040L MBSB4-2040L
34	133.97	—	6-M10	120	915	1120	93.3	114	0.14~0.34	5.59	MBSA5-4020R
34	61.95	12 x 3.3 14 x 3.8	M8 M8	11	458	559	46.7	57.0		1.96 1.82	MBSA5-2040L MBSB5-2040L
40	162.56	—	6-M10	140	1530	1920	156	196	0.16~0.36	8.48	MBSA6-4020R
40	77.11	14 x 3.8 16 x 4.3	M8 M10	14	766	961	78.1	97.9		3.33 3.11	MBSA6-2040L MBSB6-2040L

[Caution on Secondary Operations]

① These products which are hardened by carburizing allow no secondary machining. However, for B7 type gear, the area surrounded with ---- line (in the illustration) is masked during the carburization process and can be modified. Care should be exercised since the hardness is high (approx. HRC40, maximum).

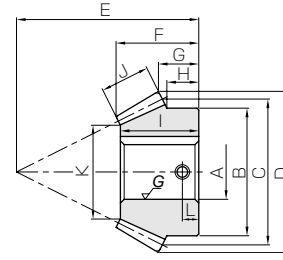
When installing B7 type (ring type) Spiral Miter Gears to the base, always secure the gears onto the mounting base with taper pins to absorb the rotational loads. Fastening and securing with only mounting screws could possibly cause the screws to snap due to heavy loads.



Spur Gears  
Helical Gears  
Internal Gears  
Racks  
CP Racks & Pinions  
Miter Gears  
Bevel Gears  
Screw Gears  
Worm Gear Pair  
Bevel Gearboxes  
Other Products



Specifications	
Precision grade	JIS B 1704 grade 4
Gear teeth	Gleason
Pressure angle	20°
Helix angle	35°
Material	SCM415
Heat treatment	Overall carburizing
Tooth hardness	55 ~ 60HRC



BK

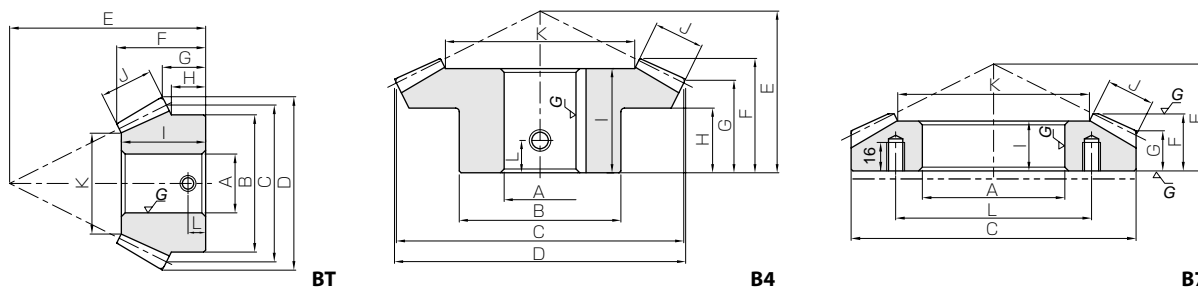
Catalog No.	Gear ratio	Module	No. of teeth	Direction of spiral	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Mounting distance	Total length	Crown to back length	Hub width	Length of bore
						A <sub>H7</sub>	B	C	D	E	F	G	H	I
MBSA2-4518R MBSB2-4518R MBSA2-1845L MBSB2-1845L	2.5	m2	45	R	B4	20 25	48	90	90.79	40	27.67	22.98	15	25
		m2	18	L	BK	12 16	32	36	40.42	60	28.54	15.88	14.2	27.5
MBSA2.5-4518R MBSB2.5-4518R MBSA2.5-1845L MBSB2.5-1845L		m2.5	45	R	B4	25 30	55	112.5	113.49	50	34.94	28.74	19	31
		m2.5	18	L	BK	15 20	40	45	50.35	72	33.19	16.82	14.75	31.5
MBSA3-4518R MBSB3-4518R MBSA3-1845L MBSB3-1845L		m3	45	R	B4	30 35	65	135	136.24	60	41.65	34.55	22	37
		m3	18	L	BK	20 25	48	54	60.69	85	37.82	18.84	16.3	36
MBSA4-4518R MBSA4-1845L MBSB4-1845L		m4	45	R	B7	80	—	180	—	55	29.77	21.25	—	25
		m4	18	L	BK	28 32	63	72	80.86	110	48.03	21.77	18.2	46
MBSA5-4518R MBSA5-1845L MBSB5-1845L		m5	45	R	B7	100	—	225	—	65	33.37	22.82	—	28
		m5	18	L	BK	35 42	80	90	101.07	135	57.3	24.71	20.5	54.5
MBSA6-4518R MBSA6-1845L MBSB6-1845L		m6	45	R	B7	110	—	270	—	75	36.97	24.19	—	30
		m6	18	L	BK	45 50	95	108	120.55	160	66.73	27.51	22.4	63
MBSA2-4515R MBSB2-4515R MBSA2-1545L MBSB2-1545L	3	m2	45	R	B4	20 22	48	90	90.66	40	30.01	25.99	18	27
		m2	15	L	BT BK	10 12	26	30	34.59	55	23.78	10.77	9.33	22.5
MBSA2.5-4515R MBSB2.5-4515R MBSA2.5-1545L MBSB2.5-1545L		m2.5	45	R	B4	22 25	55	112.5	113.28	45	32.43	27.42	18	28
		m2.5	15	L	BK	12 15	32	37.5	43.06	70	30.51	14.68	12.84	29
MBSA3-4515R MBSB3-4515R MBSA3-1545L MBSB3-1545L		m3	45	R	B4	30 32	65	135	136.03	55	39.94	34.05	22	35
		m3	15	L	BK	18 20	38	45	52	85	38.12	18.67	16.33	36.5
MBSA4-4515R MBSA4-1545L MBSB4-1545L		m4	45	R	B7	80	—	180	—	50	28.85	22.14	—	25
		m4	15	L	BK	22 25	52	60	69.24	110	47.51	21.54	18.67	45.5
MBSA5-4515R MBSA5-1545L MBSB5-1545L		m5	45	R	B7	90	—	225	—	60	33.57	25.16	—	28
		m5	15	L	BK	28 32	65	75	86.55	135	56.89	24.43	20.83	54
MBSA6-4515R MBSA6-1545L MBSB6-1545L		m6	45	R	B7	110	—	270	—	70	38.28	28.05	—	32
		m6	15	L	BK	35 40	78	90	103.13	160	66.39	27.19	23	63

[Caution on Product Characteristics]

- ① The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 451 for more details.
- ② Dimensions of the outside diameter, the overall length and crown to back length are all theoretical values, and some differences will occur due to the corner chamfering of the gear tips.
- ③ These gears produce axial thrust forces. See page 452 for more details.
- ④ Although the dimensions of the keyway are made to the JIS (Js9) tolerance, there may be some deviations due to the effects of heat treatment.
- ⑤ For products having a tapped hole (Except for B7-shaped products), a tapping screw is attached as an accessory.



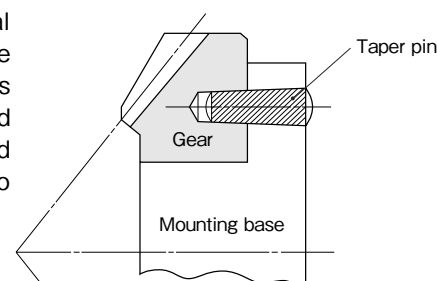
### Finished Bore Spiral Bevel Gears



Face width	Holding surface dia.	Keyway	Set Screw		Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No.
			Size	L	Bending strength	Surface durability	Bending strength	Surface durability			
J	K	Width×Depth									
14	62.24	6 x 2.8 8 x 3.3	M6 M8	8	69.3	74.3	7.06	7.58	0.06~0.16	0.60 0.56	MBSA2-4518R MBSB2-4518R
14	23.11	4 x 1.8 5 x 2.3	M5 M5	7	27.2	29.7	2.77	3.03		0.14 0.12	MBSA2-1845L MBSB2-1845L
18	76.53	8 x 3.3 8 x 3.3	M8 M8	10	138	150	14.1	15.3	0.07~0.17	1.09 1.04	MBSA2.5-4518R MBSB2.5-4518R
18	26.82	5 x 2.3 6 x 2.8	M5 M6	8	54.1	59.9	5.52	6.11		0.26 0.22	MBSA2.5-1845L MBSB2.5-1845L
21	92.96	8 x 3.3 10 x 3.3	M8 M8	11	234	256	23.8	26.1	0.08~0.18	1.92 1.84	MBSA3-4518R MBSB3-4518R
21	33.41	6 x 2.8 8 x 3.3	M6 M8	9	91.8	103	9.36	10.5		0.41 0.36	MBSA3-1845L MBSB3-1845L
29	122.33	—	6-M10	110	567	630	57.8	64.3	0.12~0.27	3.92	MBSA4-4518R
29	45.83	8 x 3.3 10 x 3.3	M8 M8	10	223	252	22.7	25.7		0.89 0.82	MBSA4-1845L MBSB4-1845L
36	153.85	—	6-M10	130	1100	1240	112	126	0.14~0.34	6.82	MBSA5-4518R
36	56.13	10 x 3.3 12 x 3.3	M8 M8	11	433	495	44.2	50.5		1.68 1.50	MBSA5-1845L MBSB5-1845L
43	184.57	—	6-M10	140	1860	2150	190	219	0.16~0.36	11.1	MBSA6-4518R
43	66.44	14 x 3.8 14 x 3.8	M8 M8	12	731	859	74.6	87.6		2.66 2.48	MBSA6-1845L MBSB6-1845L
14	61.82	6 x 2.8 6 x 2.8	M6 M6	9	67.8	61.3	6.91	6.25	0.06~0.16	0.61 0.60	MBSA2-4515R MBSB2-4515R
14	16.46	— 4 x 1.8	M4 M5	5	21.7	20.4	2.22	2.08		0.081 0.073	MBSA2-1545L MBSB2-1545L
17	77.83	6 x 2.8 8 x 3.3	M6 M8	9	130	119	13.3	12.1	0.07~0.17	1.01 0.98	MBSA2.5-4515R MBSB2.5-4515R
17	21.48	4 x 1.8 5 x 2.3	M5 M5	7	41.6	39.6	4.24	4.04		0.16 0.15	MBSA2.5-1545L MBSB2.5-1545L
21	92.39	8 x 3.3 10 x 3.3	M8 M8	11	229	211	23.3	21.6	0.08~0.18	1.78 1.75	MBSA3-4515R MBSB3-4515R
21	26.18	6 x 2.8 6 x 2.8	M6 M6	9	73.3	70.5	7.48	7.18		0.26 0.24	MBSA3-1545L MBSB3-1545L
28	124.3	—	6-M10	110	542	508	55.3	51.8	0.12~0.27	3.93	MBSA4-4515R
28	35.91	6 x 2.8 8 x 3.3	M6 M8	10	174	169	17.7	17.3		0.63 0.58	MBSA4-1545L MBSB4-1545L
35	154.88	—	6-M10	120	1060	1000	108	102	0.14~0.34	7.38	MBSA5-4515R
35	42.64	8 x 3.3 10 x 3.3	M8 M8	11	339	334	34.6	34.1		1.16 1.07	MBSA5-1545L MBSB5-1545L
42	186.12	—	6-M10	140	1790	1740	183	178	0.16~0.36	12.0	MBSA6-4515R
42	52.37	10 x 3.3 12 x 3.3	M8 M8	12	575	581	58.6	59.3		1.90 1.75	MBSA6-1545L MBSB6-1545L

[Caution on Secondary Operations] ① These products which are hardened by carburizing allow no secondary machining. However, for B7 type gear, the area surrounded with - - - - line (in the illustration) is masked during the carburization process and can be modified. Care should be exercised since the hardness is high (approx. HRC40, maximum).

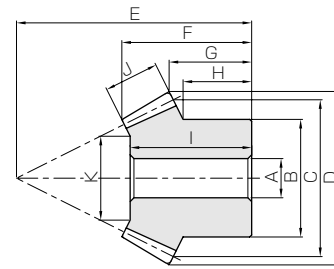
When installing B7 type (ring type) Spiral Miter Gears to the base, always secure the gears onto the mounting base with taper pins to absorb the rotational loads. Fastening and securing with only mounting screws could possibly cause the screws to snap due to heavy loads.



Spur Gears  
Helical Gears  
Internal Gears  
Racks  
CP Racks & Pinions  
Miter Gears  
Bevel Gears  
Screw Gears  
Worm Gear Pair  
Bevel Gearboxes  
Other Products



Specifications	
Precision grade	JIS B 1704 grade 4
Gear teeth	Gleason
Pressure angle	20°
Helix angle	35°
Material	S45C
Heat treatment	Teeth induction hardened
Tooth hardness	45 ~ 55HRC



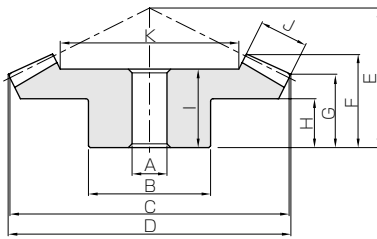
B3

Catalog No.	Gear ratio	Module	No. of teeth	Direction of spiral	Shape	Bore		Pitch dia.	Outside dia.	Mounting distance	Total length	Crown to back length
						A	B					
<b>SBS2-3020R</b> <b>SBS2-2030L</b>	1.5	<b>m2</b>	30	R	B4	12	35	60	61.36	40	26.8	21.02
20			L	B3	10	30	40	43.49	45	24.96	16.16	
<b>SBS2.5-3020R</b> <b>SBS2.5-2030L</b>		<b>m2.5</b>	30	R	B4	15	45	75	77.09	50	33.86	26.56
20			L	B3	12	40	50	54.43	55	30.88	18.98	
<b>SBS3-3020R</b> <b>SBS3-2030L</b>		<b>m3</b>	30	R	B4	16	50	90	92.21	55	35.34	26.66
20			L	B3	16	45	60	65.58	70	40.17	26.86	
<b>SBS4-3020R</b> <b>SBS4-2030L</b>		<b>m4</b>	30	R	B4	20	70	120	122.85	75	47.49	37.14
20			L	B3	20	60	80	87.34	90	48.17	32.45	
<b>SBS5-3020R</b> <b>SBS5-2030L</b>		<b>m5</b>	30	R	B4	25	90	150	153.67	90	58.08	42.75
20			L	B3	22	80	100	109.2	110	61.62	38.07	
<b>SBS1-4020R</b> <b>SBS1-2040L</b>	2	<b>m1</b>	40	R	B4	8	25	40	40.52	22	15.02	12.52
20			L	B3	6	16	20	22.08	28	13.73	8.52	
<b>SBS1.5-4020R</b> <b>SBS1.5-2040L</b>		<b>m1.5</b>	40	R	B4	10	38	60	60.75	35	24.93	20.75
20			L	B3	8	25	30	33.08	46	25.45	16.77	
<b>SBS2-4020R</b> <b>SBS2-2040L</b>		<b>m2</b>	40	R	B4	12	40	80	81	45	32.27	26
20			L	B3	12	32	40	44.1	60	34.04	21.02	
<b>SBS2.5-4020R</b> <b>SBS2.5-2040L</b>		<b>m2.5</b>	40	R	B4	15	50	100	101.27	55	39.65	31.27
20			L	B3	12	40	50	55.21	75	43.61	26.30	
<b>SBS3-4020R</b> <b>SBS3-2040L</b>		<b>m3</b>	40	R	B4	20	60	120	121.48	65	45.76	36.48
20			L	B3	16	50	60	66.06	90	50.63	31.52	
<b>SBS4-4020R</b> <b>SBS4-2040L</b>	<b>m4</b>	40	R	B4	20	70	160	162.07	80	53.69	42.07	
20		L	B3	20	60	80	88.50	120	66.24	42.12		
<b>SBS5-4020R</b> <b>SBS5-2040L</b>	<b>m5</b>	40	R	B5	25	100	200	202.54	90	55.02	42.54	
20		L	B3	22	80	100	110.45	140	68.48	42.61		
<b>SBS2.5-3618R</b> <b>SBS2.5-1836L</b>	2	<b>m2.5</b>	36	R	B4	15	55	90	91.29	43	28.38	21.79
18			L	B3	12	38	45	50.30	64	34.06	20.32	
<b>SBS3-3618R</b> <b>SBS3-1836L</b>		<b>m3</b>	36	R	B4	20	60	108	109.53	52	34.82	26.53
18			L	B3	16	46	54	60.28	75	39.79	22.57	
<b>SBS4-3618R</b> <b>SBS4-1836L</b>		<b>m4</b>	36	R	B4	20	70	144	145.99	72	48.84	37.99
18			L	B3	20	60	72	80.19	100	52.51	30.05	
<b>SBS2-4518R</b> <b>SBS2-1845L</b>	2.5	<b>m2</b>	45	R	B4	12	48	90	90.79	40	27.67	22.98
18			L	B3	10	32	36	40.42	60	28.54	15.88	
<b>SBS2.5-4518R</b> <b>SBS2.5-1845L</b>		<b>m2.5</b>	45	R	B4	15	55	112.5	113.49	50	34.94	28.74
18			L	B3	12	40	45	50.35	72	33.19	16.82	
<b>SBS3-4518R</b> <b>SBS3-1845L</b>		<b>m3</b>	45	R	B4	20	65	135	136.24	60	41.65	34.55
18			L	B3	16	48	54	60.69	85	37.82	18.84	
<b>SBS4-4518R</b> <b>SBS4-1845L</b>		<b>m4</b>	45	R	B4	25	80	180	181.57	75	50.98	40.96
18			L	B3	20	62	72	80.86	110	48.03	21.77	
<b>SBS5-4518R</b> <b>SBS5-1845L</b>		<b>m5</b>	45	R	B4	30	100	225	225.81	90	57.9	46.01
18			L	B3	22	80	90	103.87	135	56.02	25.27	

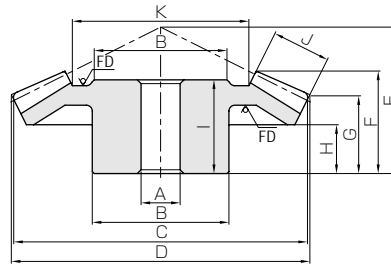
[Caution on Product Characteristics]

- ① The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 451 for more details.
- ② Dimensions of the outside diameter, the overall length and crown to back length are all theoretical values, and some differences will occur due to the corner chamfering of the gear tips.
- ③ These gears produce axial thrust forces. See page 452 for more details.
- ④ Due to heat treating, some deformation of the bore may occur. It may be necessary to ream the bore to bring it to the stated dimensions.

## Spiral Bevel Gears



B4



B5

\* FD has die-forged finish.

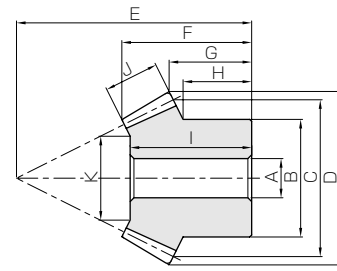
Hub width H	Length of bore I	Face width J	Holding surface dia. K	Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No.
				Bending strength	Surface durability	Bending strength	Surface durability			
15 11.67	23 22	11	37.56 21.34	15.4 10.5	11.3 7.52	1.57 1.07	1.15 0.77	0.06~0.16	0.26 0.13	SBS2-3020R SBS2-2030L
18 14.17	30 28	15	45.61 27.42	31.7 21.6	23.6 15.7	3.23 2.20	2.40 1.60	0.07~0.17	0.55 0.28	SBS2.5-3020R SBS2.5-2030L
17 20	31 37	17	57.14 34.71	52.9 36.1	39.7 26.5	5.39 3.68	4.05 2.70	0.08~0.18	0.82 0.49	SBS3-3020R SBS3-2030L
25 23.33	40 43	20	78.59 46.89	115 78.7	88.1 58.8	11.8 8.03	8.99 5.99	0.12~0.27	1.90 1.05	SBS4-3020R SBS4-2030L
24 28.33	50 56	30	91.22 54.83	253 173	195 130	25.8 17.6	19.9 13.3	0.14~0.34	4.11 2.29	SBS5-3020R SBS5-2030L
8 7	12 12	6	26.58 9.17	3.01 1.51	2.22 1.11	0.31 0.15	0.23 0.11	0.03~0.13	0.068 0.019	SBS1-4020R SBS1-2040L
15 14.75	22 24	10	39.64 17.28	10.9 5.46	8.22 4.11	1.11 0.56	0.84 0.42	0.05~0.15	0.27 0.088	SBS1.5-4020R SBS1.5-2040L
18 18	27 32	15	48.46 20.92	27.8 13.9	21.3 10.7	2.83 1.42	2.17 1.09	0.06~0.16	0.51 0.19	SBS2-4020R SBS2-2040L
20 22.5	34 40	20	59.28 20.56	56.4 28.2	43.7 21.9	5.75 2.88	4.46 2.23	0.07~0.17	1.06 0.40	SBS2.5-4020R SBS2.5-2040L
24 27.5	38 47	22	73.81 29.61	92.5 46.4	72.6 36.3	9.44 4.73	7.40 3.70	0.08~0.18	1.67 0.69	SBS3-4020R SBS3-2040L
28 35	45 62	28	102.39 42.78	213 107	170 84.8	21.7 10.9	17.3 8.65	0.12~0.27	3.33 1.46	SBS4-4020R SBS4-2040L
26 35	50 63	30	138.92 57.84	376 188	302 151	38.3 19.2	30.8 15.4	0.14~0.34	5.67 2.61	SBS5-4020R SBS5-2040L
13 17.25	24 32	16	57.72 25.45	41.7 20.9	29.3 14.7	4.26 2.13	2.99 1.49	0.07~0.17	0.72 0.27	SBS2.5-3618R SBS2.5-1836L
17 19	30 37	20	68.27 28.56	74.0 37.0	52.4 26.2	7.54 3.78	5.35 2.67	0.08~0.18	1.15 0.44	SBS3-3618R SBS3-1836L
25 25	42 49	26	91.87 39.72	173 86.4	124 62.1	17.6 8.81	12.7 6.33	0.12~0.27	2.65 1.03	SBS4-3618R SBS4-1836L
15 14.2	25 27.5	14	62.24 23.11	31.0 12.2	21.9 8.74	3.16 1.24	2.23 0.89	0.06~0.16	0.65 0.15	SBS2-4518R SBS2-1845L
18 14.75	31 31.5	18	76.53 26.82	61.6 24.2	44.0 17.6	6.28 2.47	4.49 1.80	0.07~0.17	1.23 0.28	SBS2.5-4518R SBS2.5-1845L
22 16.3	37 36	21	92.96 33.41	104 41.0	75.4 30.2	10.7 4.18	7.69 3.07	0.08~0.18	2.05 0.45	SBS3-4518R SBS3-1845L
24 18	45 46	29	122.33 45.83	253 99.5	185 74.1	25.8 10.2	18.9 7.56	0.12~0.27	4.62 1.00	SBS4-4518R SBS4-1845L
28 20.5	51 52.5	34	156.56 56.9	474 186	350 140	48.4 19.0	35.7 14.3	0.14~0.34	8.11 1.94	SBS5-4518R SBS5-1845L

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 452) when performing modification and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 1 to 2 mm).



Specifications	
Precision grade	JIS B 1704 grade 4
Gear teeth	Gleason
Pressure angle	20°
Helix angle	35°
Material	S45C
Heat treatment	Teeth induction hardened
Tooth hardness	45 ~ 55HRC



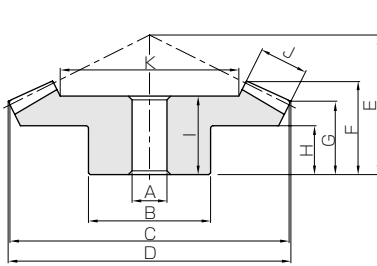
B3

Catalog No.	Gear ratio	Module	No. of teeth	Direction of spiral	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Mounting distance	Total length	Crown to back length
						A	B	C	D	E	F	G
SBS2-4515R SBS2-1545L	3	m2	45	R	B4	12	40	90	90.67	40	30.29	26.01
			15	L	B3	10	24	30	34.78	60	29.66	15.80
SBS2.5-4515R SBS2.5-1545L		m2.5	45	R	B4	15	50	112.5	113.32	50	38.25	32.47
			15	L	B3	12	30	37.5	43.36	75	38.27	19.73
SBS3-4515R SBS3-1545L		m3	45	R	B4	20	60	135	135.99	55	40.59	33.98
			15	L	B3	15	38	45	52.08	90	44.98	23.68
SBS4-4515R SBS4-1545L	m4	45	R	B5	20	80	180	181.3	70	50.62	41.95	
		15	L	B3	16	50	60	69.30	115	54.37	26.55	
SBS5-4515R SBS5-1545L	m5	45	R	B5	30	90	225	226.61	75	50.05	39.92	
		15	L	B3	20	60	75	86.55	145	66.89	34.43	
SBS1.5-6015R SBS1.5-1560L	4	m1.5	60	R	B4	12	60	90	90.36	32	24.08	21.48
			15	L	B3	8	18	22.5	26.09	56	22.95	11.45
SBS2-6015R SBS2-1560L		m2	60	R	B4	15	80	120	120.46	42	31.5	27.91
			15	L	B3	10	24	30	34.68	75	30.94	15.58
SBS2.5-6015R SBS2.5-1560L		m2.5	60	R	B4	20	100	150	150.5	53	39.68	35.24
			15	L	B3	12	30	37.5	44.16	94	38.9	19.83
SBS3-6015R SBS3-1560L		m3	60	R	B4	20	120	180	180.57	64	47.61	42.64
			15	L	B3	15	38	45	52.64	112	44.01	22.96

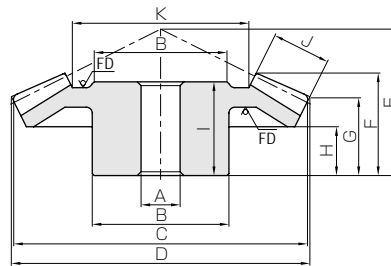
[Caution on Product Characteristics]

- ① The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 451 for more details.
- ② Dimensions of the outside diameter, the overall length and crown to back length are all theoretical values, and some differences will occur due to the corner chamfering of the gear tips.
- ③ These gears produce axial thrust forces. See page 452 for more details.
- ④ Due to heat treating, some deformation of the bore may occur. It may be necessary to ream the bore to bring it to the stated dimensions.

## Spiral Bevel Gears



B4



B5

\* FD has die-forged finish.

Hub width H	Length of bore I	Face width J	Holding surface dia. K	Allowable torque (N-m)		Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog No.
				Bending strength	Surface durability	Bending strength	Surface durability			
17 14	26 29	15	59.04 19.13	31.7 10.1	18.8 6.27	3.23 1.03	1.92 0.64	0.06~0.16	0.60 0.095	SBS2-4515R SBS2-1545L
22 17.5	35 37	20	72.82 20.51	64.3 20.6	38.7 12.9	6.56 2.10	3.94 1.31	0.07~0.17	1.21 0.19	SBS2.5-4515R SBS2.5-1545L
20 21.33	35 44	23	88.18 28.54	108 34.7	65.8 21.9	11.1 3.54	6.71 2.24	0.08~0.18	1.99 0.34	SBS3-4515R SBS3-1545L
24 23.33	45 52	30	118.08 32.26	253 81.1	156 52.0	25.8 8.27	15.9 5.30	0.12~0.27	4.04 0.76	SBS4-4515R SBS4-1545L
20 30	44 65	35	152.88 48.64	473 152	295 98.2	48.3 15.5	30.0 10.0	0.14~0.34	6.08 1.44	SBS5-4515R SBS5-1545L
12 10.43	21 22.5	12	65.39 15.55	20.7 4.89	12.3 3.07	2.12 0.50	1.25 0.31	0.05~0.15	0.70 0.042	SBS1.5-6015R SBS1.5-1560L
16 14.25	27 30	16	87.02 18.06	49.2 11.6	29.6 7.39	5.01 1.18	3.01 0.75	0.06~0.16	1.59 0.10	SBS2-6015R SBS2-1560L
20 18.06	34 37.5	20	108.64 20.58	96.1 22.6	58.4 14.6	9.79 2.31	5.95 1.49	0.07~0.17	3.13 0.20	SBS2.5-6015R SBS2.5-1560L
25 21.12	41 43	22	134.4 31.58	156 36.8	95.7 23.9	15.9 3.75	9.76 2.44	0.08~0.18	5.38 0.35	SBS3-6015R SBS3-1560L

[Caution on Secondary Operations]

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- ② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 1 to 2 mm).

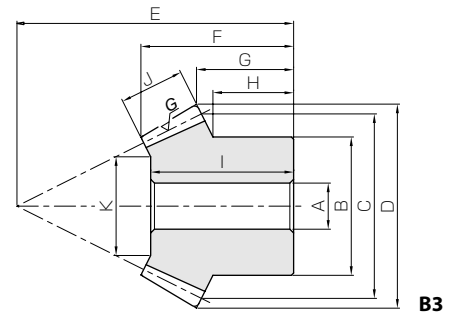
Spur  
GearsHelical  
GearsInternal  
Gears

Racks

CP Racks  
& PinionsMiter  
GearsBevel  
GearsScrew  
GearsWorm  
Gear PairBevel  
GearboxesOther  
Products



Specifications	
Precision grade	JIS B 1704 grade 2
Gear teeth	Gleason
Pressure angle	20°
Material	S45C
Heat treatment	Teeth induction hardened
Tooth hardness	45 ~ 55HRC



Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks &amp; Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

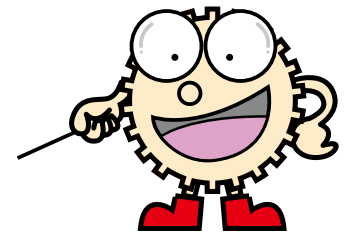
Bevel Gearboxes

Other Products

Catalog No. <small>New items indicated in blue letters</small>	Gear ratio	Module	No. of teeth	Helix angle	Direction of spiral	Shape	Bore		Hub dia.	Pitch dia.	Outside dia.	Mounting distance	Total length	Crown to back length
							A	B	C	D	E	F	G	
<b>SBZG2-3020R</b> <b>SBZG2-2030L</b>	1.5	<b>m2</b>	30	7°	R	B4	10	35	60	62.16	40	26.48	21.62	
20			L		B3	10	30	40	44.18	45	25.05	16.39		
<b>SBZG2.5-3020R</b> <b>SBZG2.5-2030L</b>		<b>m2.5</b>	30	7°	R	B4	15	45	75	77.77	50	33.69	27.08	
20			L		B3	12	35	50	55.23	55	31.05	19.24		
<b>SBZG3-3020R</b> <b>SBZG3-2030L</b>		2	<b>m3</b>	30	7°	R	B4	15	50	90	93.27	55	35.01	27.45
20				L		B3	15	45	60	66.32	70	40.50	27.11	
<b>SBZG2-4020R</b> <b>SBZG2-2040L</b>	<b>m2</b>		40	9°	R	B4	12	40	80	81.58	45	31.91	26.58	
20			L		B3	12	32	40	44.76	60	34.15	21.19		
<b>SBZG2.5-4020R</b> <b>SBZG2.5-2040L</b>	<b>m2.5</b>		40	9°	R	B4	15	50	100	102.01	55	39.16	32.01	
20			L		B3	12	40	50	55.99	75	43.77	26.50		
<b>SBZG3-4020R</b> <b>SBZG3-2040L</b>	<b>m3</b>	40	9°	R	B4	20	60	120	122.31	65	45.30	37.31		
20		L		B3	16	50	60	67.21	90	50.81	31.80			

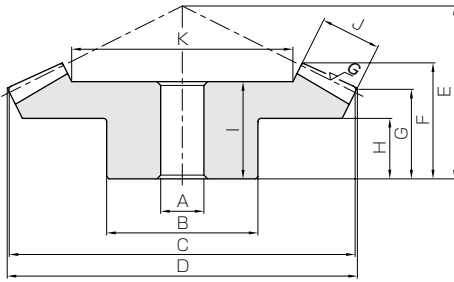
[Caution on Product Characteristics]

- ① Allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 451 for more details.
- ② Dimensions of the outside diameter, the overall length and crown to back length are all theoretical values, and some differences will occur due to the corner chamfering of the gear tips.
- ③ It produces an axial thrust force, which has the same direction as straight bevel gears. For details, see page 700.



### Performance Comparison

Gear Type	Bearing Design *	Interchangeability Mounting Distance	Precision JIS B 1704	Strength Bending Strength	Durability Surface Durability	Noise/Vibration Surface Roughness/Total Contact Ratio	Price for single item
<b>Miter Gears</b> 	 No thrust force produced inward	 SUB, PB, <b>SBZG</b>	 grade 3	 24.2N · m / 12.2N · m	 2.92N · m / 1.46N · m	 3.2a/1.63	
<b>Ground Zerol Miter Gears</b> 	 No thrust force produced inward	 <b>SB</b> , SUB, PB	 grade 2	 26.0N · m / 13.1N · m	 18.4N · m / 9.18N · m	 0.4a/1.84	
<b>Ground Spiral Miter Gears</b> 	 Thrust force produced inward	 —	 grade 2	 51.8N · m / 25.9N · m	 87.2N · m / 43.6N · m	 0.4a/3.13	



B4

Hub width H	Length of bore I	Face width J	Holding surface dia. K	Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No. New items indicated in blue letters
				Bending strength	Surface durability	Bending strength	Surface durability			
15 11.67	23 22	11 11	37.56 21.34	14.3 9.89	8.88 5.92	1.46 1.01	0.91 0.60	0.05~0.11	0.27 0.14	SBZG2-3020R SBZG2-2030L
18 12.5	30 28	15 15	45.61 27.42	29.4 20.4	18.8 12.5	3.00 2.08	1.92 1.28			0.06~0.12
17 20	31 37	17 17	57.14 34.71	51.7 35.8	31.6 21.1	5.27 3.65	3.22 2.15	0.07~0.13	0.84 0.50	SBZG3-3020R SBZG3-2030L
18 18	27 32	15 15	48.46 20.92	26.0 13.1	18.4 9.18	2.66 1.33	1.87 0.94			0.05~0.11
20 22.5	35 41	20 20	60.28 24.56	55.6 27.9	38.5 19.2	5.67 2.85	3.92 1.96	0.06~0.12	1.10 0.40	SBZG2.5-4020R SBZG2.5-2040L
24 27.5	38 47	22 22	73.81 29.61	96.3 48.4	62.8 31.4	9.82 4.93	6.40 3.20			0.07~0.13

[Caution on Secondary Operations]

- ① Please read "Cautions on Performing Secondary Operations" (Page 452) when performing modification and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Due to gear teeth induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 1 to 2 mm).

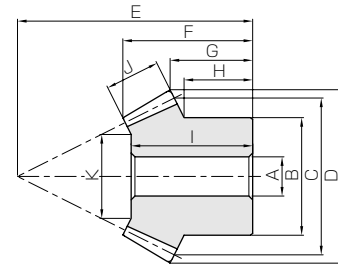
Spur  
GearsHelical  
GearsInternal  
Gears

Racks

CP Racks  
& PinionsMiter  
GearsBevel  
GearsScrew  
GearsWorm  
Gear PairBevel  
GearboxesOther  
Products



Specifications	
Precision grade	JIS B 1704 grade 3
Gear teeth	Gleason
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB



B3

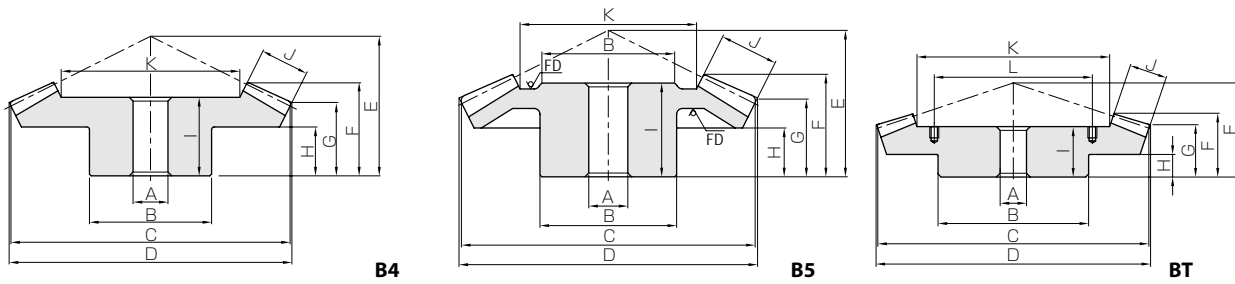
Catalog No.	Gear ratio	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Mounting distance	Total length	Crown to back length	Hub width
					AH7	B	C	D	E	F	G	H
<b>SB1.5-3020</b> <b>SB1.5-2030</b>	1.5	<b>m1.5</b>	30	B4	10	30	45	46.24	28	18.53	13.93	8
20			B3	8	25	30	33.13	33	18.63	11.54	8.83	
<b>SB2-3020</b> <b>SB2-2030</b>		<b>m2</b>	30	B4	10	35	60	61.65	40	26.87	21.24	15
20			B3	10	30	40	44.18	45	25.06	16.39	11.67	
<b>SB2.5-3020</b> <b>SB2.5-2030</b>		<b>m2.5</b>	30	B4	15	45	75	77.07	50	34.22	26.55	18
20			B3	12	35	50	55.22	55	31.06	19.24	12.5	
<b>SB3-3020</b> <b>SB3-2030</b>		<b>m3</b>	30	B4	15	50	90	92.48	55	35.56	26.86	17
20			B3	15	45	60	66.27	70	40.48	27.09	20	
<b>SB4-3020</b> <b>SB4-2030</b>		<b>m4</b>	30	B4	20	70	120	123.3	75	47.71	37.48	25
20			B3	15	60	80	88.32	90	48.53	32.77	23.33	
<b>SB5-3020</b> <b>SB5-2030</b>	<b>m5</b>	30	B4	25	90	150	154.13	90	58.45	43.1	24	
20		B3	20	80	100	110.45	110	62.11	38.48	28.33		
<b>SB1.5-3015</b> <b>SB1.5-1530</b>	2	<b>m1.5</b>	30	B4	8	25	45	45.88	25	17.85	14.63	9
15			B3	6	16	22.5	26.11	32	17.23	10.4	7.88	
<b>SB2-3015</b> <b>SB2-1530</b>		<b>m2</b>	30	B4	10	30	60	61.17	31	21.6	17.17	10
15			B3	8	22	30	34.81	40	20.59	11.2	8	
<b>SB2.5-3015</b> <b>SB2.5-1530</b>		<b>m2.5</b>	30	B4	15	40	75	76.46	40	28.75	22.71	15
15			B3	12	30	37.5	43.51	55	31.81	19	15.63	
<b>SB3-3015</b> <b>SB3-1530</b>		<b>m3</b>	30	B4	16	50	90	91.76	50	37.31	29.26	18
15			B3	12	35	45	52.22	70	43.88	26.8	22.5	
<b>SB4-3015</b> <b>SB4-1530</b>		<b>m4</b>	30	B4	20	60	120	122.34	60	42.4	32.34	20
15			B3	16	50	60	69.62	85	48.74	27.41	22.5	
<b>SB5-3015</b> <b>SB5-1530</b>	<b>m5</b>	30	B5	20	70	150	152.93	75	52.5	40.43	25	
15		B3	20	60	75	87.03	110	63.61	38.01	31.25		
<b>SB6-3015</b> <b>SB6-1530</b>	<b>m6</b>	30	B5	25	80	180	183.49	90	62.56	48.49	28	
15		B3	25	70	90	104.44	125	68.48	38.61	30		
<b>SB2.5-3618</b> <b>SB2.5-1836</b>	2	<b>m2.5</b>	36	B4	15	55	90	91.46	43	28.52	21.96	13
18			B3	12	38	45	51.01	64	34.27	20.5	17.25	
<b>SB3-3618</b> <b>SB3-1836</b>		<b>m3</b>	36	B4	20	60	108	109.76	52	34.95	26.76	17
			18	B3	16	46	54	61.23	75	40.01	22.81	19
<b>SB4-3618</b> <b>SB4-1836</b>	<b>m4</b>	36	B4	20	70	144	146.34	72	49	38.34	25	
		18	B3	20	60	72	81.62	100	52.77	30.41	25	
<b>SB1-4020</b> <b>SB1-2040</b>	2	<b>m1</b>	40	B4	8	25	40	40.59	22	15.07	12.59	8
20			B3	6	16	20	22.41	28	13.78	8.6	7	
<b>SB1.25-4020</b> <b>SB1.25-2040</b>		<b>m1.25</b>	40	B4	10	32	50	50.73	27	18.54	15.23	10
			20	B3	8	22	25	28.01	36	18.66	11.75	10.25
<b>SB1.5-4020</b> <b>SB1.5-2040</b>		<b>m1.5</b>	40	B4	10	38	60	60.88	35	25.01	20.88	15
			20	B3	8	25	30	33.61	46	25.54	16.9	14.75
<b>SB2-4020</b> <b>SB2-2040</b>		<b>m2</b>	40	B4	12	40	80	81.17	45	32.37	26.17	18
			20	B3	12	32	40	44.81	60	34.16	21.2	18
<b>SB2.5-4020</b> <b>SB2.5-2040</b>		<b>m2.5</b>	40	B4	15	50	100	101.46	55	39.73	31.46	20
			20	B3	12	40	50	56.01	75	43.78	26.5	22.5
<b>SB3-4020</b> <b>SB3-2040</b>		<b>m3</b>	40	B4	20	60	120	121.76	65	45.85	36.76	24
			20	B3	16	50	60	67.22	90	50.81	31.8	27.5
<b>SB4-4020</b> <b>SB4-2040</b>		<b>m4</b>	40	B4	20	70	160	162.34	80	53.92	42.34	28
			20	B3	20	60	80	89.62	120	66.59	42.41	35
<b>SB5-4020</b> <b>SB5-2040</b>		<b>m5</b>	40	B5	25	100	200	202.93	90	55.33	42.93	26
			20	B3	20	80	100	112.03	140	68.92	43.01	35
<b>SB6-4020</b> <b>SB6-2040</b>	<b>m6</b>	40	B5	25	85	240	243.52	105	65.05	48.52	28	
		20	B3	25	90	120	134.44	160	78.16	43.6	32.5	
<b>SBY8-4020</b> <b>SBY8-2040</b>	<b>m8</b>	40	BT	35	180	320	324.69	130	75.36	54.69	25	
20		B3	30	120	160	179.25	210	98	54.81	40		

[Caution on Product Characteristics]

- ① The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 451 for more details.
- ② Dimensions of the outside diameter, the overall length and crown to back length are all theoretical values, and some differences will occur due to the corner chamfering of the gear tips.
- ③ For convenience in handling, BT Shaped Gears have tapped holes on their holding surface. To find the L dimensions and tap sizes, please refer to page 452.



Steel Bevel Gears



\* FD has die-forged finish.

Length of bore I	Face width J	Holding surface dia. K	Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No.
			Bending strength	Surface durability	Bending strength	Surface durability			
16 17	9	27.37 17.05	5.82 4.04	0.65 0.44	0.59 0.41	0.07 0.04	0.05~0.15	0.12 0.063	<b>SB1.5-3020</b> <b>SB1.5-2030</b>
23 22	11	37.56 21.34	13.1 9.07	1.52 1.01	1.33 0.92	0.16 0.10	0.06~0.16	0.26 0.14	<b>SB2-3020</b> <b>SB2-2030</b>
30 28	15	45.61 27.42	26.9 18.7	3.21 2.14	2.75 1.91	0.33 0.22	0.07~0.17	0.55 0.25	<b>SB2.5-3020</b> <b>SB2.5-2030</b>
31 37	17	57.14 34.71	44.9 31.2	5.45 3.63	4.58 3.18	0.56 0.37	0.08~0.18	0.83 0.50	<b>SB3-3020</b> <b>SB3-2030</b>
40 43	20	78.59 46.89	98.2 68.1	12.3 8.20	10.0 6.95	1.25 0.84	0.12~0.27	1.91 1.10	<b>SB4-3020</b> <b>SB4-2030</b>
50 56	30	91.22 54.83	215 150	27.6 18.4	22.0 15.3	2.81 1.87	0.14~0.34	4.13 2.34	<b>SB5-3020</b> <b>SB5-2030</b>
15 15.5	8	28.36 10.72	5.02 2.60	0.47 0.24	0.51 0.26	0.05 0.02	0.05~0.15	0.10 0.028	<b>SB1.5-3015</b> <b>SB1.5-1530</b>
18 19	11	37.4 16.81	12.1 6.28	1.18 0.59	1.24 0.64	0.12 0.06	0.06~0.16	0.21 0.064	<b>SB2-3015</b> <b>SB2-1530</b>
24 29	15	44.21 16.42	24.9 12.9	2.48 1.24	2.54 1.32	0.25 0.13	0.07~0.17	0.41 0.15	<b>SB2.5-3015</b> <b>SB2.5-1530</b>
30 41	20	47.78 19.56	45.6 23.6	4.60 2.30	4.65 2.41	0.47 0.23	0.08~0.18	0.83 0.31	<b>SB3-3015</b> <b>SB3-1530</b>
36 46	25	70.1 32.2	104 54.0	10.9 5.43	10.7 5.51	1.11 0.55	0.12~0.27	1.64 0.66	<b>SB4-3015</b> <b>SB4-1530</b>
48 58	30	90.41 32.83	199 103	21.3 10.6	20.3 10.5	2.17 1.09	0.14~0.34	2.72 1.28	<b>SB5-3015</b> <b>SB5-1530</b>
57 63	35	109.74 45.48	336 174	36.9 18.5	34.2 17.7	3.77 1.88	0.16~0.36	4.75 1.94	<b>SB6-3015</b> <b>SB6-1530</b>
24 32	16	57.72 25.44	35.9 18.1	4.08 2.04	3.66 1.84	0.42 0.21	0.07~0.17	0.72 0.27	<b>SB2.5-3618</b> <b>SB2.5-1836</b>
30 37	20	68.28 28.56	63.7 32.0	7.34 3.67	6.49 3.27	0.75 0.37	0.08~0.18	1.15 0.44	<b>SB3-3618</b> <b>SB3-1836</b>
42 49	26	91.86 39.72	149 74.8	17.7 8.85	15.2 7.62	1.80 0.90	0.12~0.27	2.66 1.04	<b>SB4-3618</b> <b>SB4-1836</b>
12 12	6	26.58 9.17	2.61 1.32	0.29 0.15	0.27 0.13	0.03 0.02	0.03~0.13	0.068 0.019	<b>SB1-4020</b> <b>SB1-2040</b>
16 17	8	33.61 13.22	5.33 2.69	0.61 0.31	0.54 0.27	0.06 0.03	0.04~0.14	0.14 0.046	<b>SB1.25-4020</b> <b>SB1.25-2040</b>
22 24	10	39.64 17.28	9.47 4.77	1.11 0.56	0.97 0.49	0.11 0.06	0.05~0.15	0.27 0.089	<b>SB1.5-4020</b> <b>SB1.5-2040</b>
27 32	15	48.46 20.92	24.2 12.2	2.92 1.46	2.46 1.24	0.30 0.15	0.06~0.16	0.51 0.19	<b>SB2-4020</b> <b>SB2-2040</b>
35 41	20	60.28 24.56	49.0 24.7	6.04 3.02	4.99 2.52	0.62 0.31	0.07~0.17	1.09 0.40	<b>SB2.5-4020</b> <b>SB2.5-2040</b>
38 47	22	73.81 29.61	80.4 40.5	10.1 5.06	8.20 4.13	1.03 0.52	0.08~0.18	1.68 0.70	<b>SB3-4020</b> <b>SB3-2040</b>
45 62	28	102.39 42.78	185 93.3	24.1 12.0	18.9 9.51	2.46 1.23	0.12~0.27	3.34 1.47	<b>SB4-4020</b> <b>SB4-2040</b>
50 63	30	138.92 57.84	327 165	43.9 21.9	33.3 16.8	4.47 2.24	0.14~0.34	5.63 2.67	<b>SB5-4020</b> <b>SB5-2040</b>
58 70	40	158.56 61.11	600 302	83.2 41.6	61.2 30.8	8.48 4.24	0.16~0.36	7.77 4.08	<b>SB6-4020</b> <b>SB6-2040</b>
61 90	50	219.2 96.39	1350 679	196 98.1	138 69.3	20.0 10.0	0.20~0.45	25.75 9.41	<b>SBY8-4020</b> <b>SBY8-2040</b>

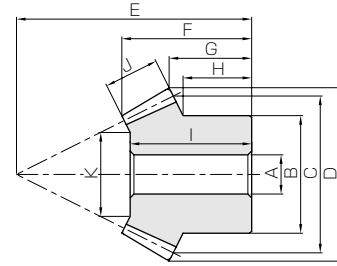
[Caution on Secondary Operations]

① Please read "Caution on Performing Secondary Operations" (Page 452) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.

Spur Gears  
Helical Gears  
Internal Gears  
Racks  
CP Racks & Pinions  
Miter Gears  
Bevel Gears  
Screw Gears  
Worm Gear Pair  
Bevel Gearboxes  
Other Products



Specifications	
Precision grade	JIS B 1704 grade 3
Gear teeth	Gleason
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB



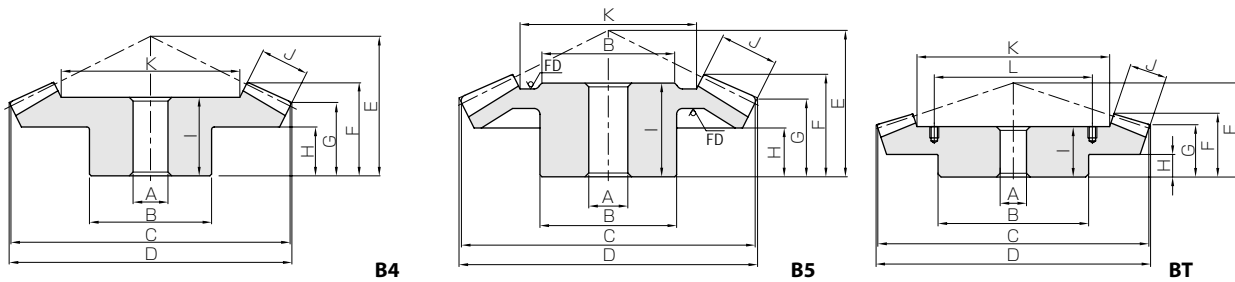
B3

Catalog No.	Gear ratio	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Mounting distance	Total length	Crown to back length	Hub width		
					AH7	B	C	D	E	F	G	H		
SB1-4518 SB1-1845 SB1.25-4518 SB1.25-1845 SB1.5-4518 SB1.5-1845 SB2-4518 SB2-1845 SB2.5-4518 SB2.5-1845 SB3-4518 SB3-1845 SB4-4518 SB4-1845 SB5-4518 SB5-1845	2.5	m1	45	B4	8	30	45	45.46	23	16.95	14.57	10		
			18	B3	6	15	18	20.57	32	16.34	10.02	8.9		
		m1.25	45	B4	10	34	56.25	56.82	26	18.53	15.46	10		
			18	B3	8	19	22.5	25.72	40	20.66	12.52	11.17		
		m1.5	45	B4	10	36	67.5	68.18	30	21.1	17.35	10		
			18	B3	8	23	27	30.86	45	21.97	12.02	10.45		
		m2	45	B4	12	48	90	90.91	40	27.91	23.14	15		
			18	B3	10	32	36	41.15	60	28.69	16.03	14.2		
		m2.5	45	B4	15	55	112.5	113.64	50	35.06	28.92	18		
			18	B3	12	40	45	51.44	72	33.31	17.04	14.75		
		m3	45	B4	20	65	135	136.37	60	41.86	34.71	22		
			18	B3	16	48	54	61.72	85	38.04	19.05	16.3		
		m4	45	B4	20	80	180	181.82	75	51.16	41.28	24		
			18	B3	20	62	72	82.3	110	48.28	22.06	18		
		m5	45	B4	25	100	225	227.28	90	59.43	47.85	28		
			18	B3	20	80	90	102.87	135	55.82	25.07	20.5		
		SB1-4515 SB1-1545 SB1.25-4515 SB1.25-1545 SB1.5-4515 SB1.5-1545 SB2-4515 SB2-1545 SB2.5-4515 SB2.5-1545 SB3-4515 SB3-1545 SB4-4515 SB4-1545 SB5-4515 SB5-1545	3	m1	45	B4	8	30	45	45.37	17	11.77	10.06	5
					15	B3	6	12	15	17.67	29	12.51	6.95	6
m1.25	45			B4	10	34	56.25	56.72	21	14.61	12.33	6		
	15			B3	8	15	18.75	22.09	36	15.85	8.43	7.25		
m1.5	45			B4	10	36	67.5	68.06	28	20.44	17.59	11		
	15			B3	8	18	22.5	26.54	47	23.19	13.92	12.5		
m2	45			B4	12	40	90	90.75	40	30.4	26.12	17		
	15			B3	10	24	30	35.35	60	29.8	15.89	14		
m2.5	45			B4	15	50	112.5	113.43	50	38.35	32.65	22		
	15			B3	12	30	37.5	44.18	75	38.41	19.86	17.5		
m3	45			B4	20	60	135	136.12	55	40.74	34.18	20		
	15			B3	15	38	45	53.02	90	45.17	23.84	21.33		
m4	45			B5	20	80	180	181.5	70	50.79	42.24	24		
	15			B3	16	50	60	70.69	115	54.6	26.78	23.33		
m5	45			B5	25	90	225	226.87	75	50.28	40.3	20		
	15			B3	20	60	75	88.37	145	67.19	34.73	30		
m6	45			BT	30	160	270	272.24	100	72.62	58.36	30		
	15			B3	25	70	90	106.03	175	89.04	42.67	36.67		
m8	45	BT	35	200	360	362.99	125	83.74	69.49	30				
	15	B3	30	100	120	141.39	230	99.93	53.56	46.67				

[Caution on Product Characteristics]

- ① The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 451 for more details.
- ② Dimensions of the outside diameter, the overall length and crown to back length are all theoretical values, and some differences will occur due to the corner chamfering of the gear tips.
- ③ For convenience in handling, BT Shaped Gears have tapped holes on their holding surface. To find the L dimensions and tap sizes, please refer to page 452.

Steel Bevel Gears



\* FD has die-forged finish.

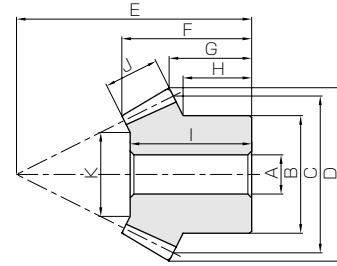
Length of bore I	Face width J	Holding surface dia. K	Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No.
			Bending strength	Surface durability	Bending strength	Surface durability			
15 15.5	7	30.73 10.31	3.35 1.33	0.35 0.14	0.34 0.14	0.04 0.01	0.03~0.13	0.11 0.019	<b>SB1-4518</b> <b>SB1-1845</b>
16 19.5	9	37.86 12.16	6.67 2.65	0.72 0.29	0.68 0.27	0.07 0.03	0.04~0.14	0.17 0.038	<b>SB1.25-4518</b> <b>SB1.25-1845</b>
18 21	11	45 16.51	11.7 4.64	1.29 0.51	1.19 0.47	0.13 0.05	0.05~0.15	0.28 0.063	<b>SB1.5-4518</b> <b>SB1.5-1845</b>
25 27.5	14	62.24 23.11	26.8 10.7	3.05 1.22	2.74 1.09	0.31 0.12	0.06~0.16	0.65 0.16	<b>SB2-4518</b> <b>SB2-1845</b>
31 31.5	18	76.53 26.82	53.4 21.2	6.20 2.48	5.44 2.16	0.63 0.25	0.07~0.17	1.23 0.28	<b>SB2.5-4518</b> <b>SB2.5-1845</b>
37 36	21	92.96 33.41	90.5 36.0	10.7 4.29	9.23 3.67	1.09 0.44	0.08~0.18	2.05 0.46	<b>SB3-4518</b> <b>SB3-1845</b>
45 46	29	122.33 45.83	220 87.3	26.8 10.7	22.4 8.91	2.73 1.09	0.12~0.27	4.69 1.01	<b>SB4-4518</b> <b>SB4-1845</b>
51 52.5	34	156.56 56.9	411 164	51.8 20.7	41.9 16.7	5.28 2.11	0.14~0.34	8.31 1.95	<b>SB5-4518</b> <b>SB5-1845</b>
9 12	6	32.02 10.05	2.84 0.98	0.27 0.09	0.29 0.10	0.027 0.0091	0.03~0.13	0.078 0.095	<b>SB1-4515</b> <b>SB1-1545</b>
12 15	8	39.63 10.9	5.80 2.00	0.56 0.19	0.59 0.20	0.057 0.019	0.04~0.14	0.15 0.018	<b>SB1.25-4515</b> <b>SB1.25-1545</b>
17 22.5	10	46.58 14.75	10.3 3.56	1.02 0.34	1.05 0.36	0.10 0.035	0.05~0.15	0.25 0.041	<b>SB1.5-4515</b> <b>SB1.5-1545</b>
26 29	15	59.04 19.13	26.4 9.10	2.68 0.89	2.69 0.93	0.27 0.091	0.06~0.16	0.60 0.096	<b>SB2-4515</b> <b>SB2-1545</b>
35 37	20	72.84 20.51	53.6 18.5	5.55 1.85	5.46 1.89	0.57 0.19	0.07~0.17	1.22 0.19	<b>SB2.5-4515</b> <b>SB2.5-1545</b>
35 43	23	88.18 22.53	90.2 31.2	9.53 3.18	9.20 3.18	0.97 0.32	0.08~0.18	1.99 0.34	<b>SB3-4515</b> <b>SB3-1545</b>
45 52	30	118.09 32.26	211 72.8	23.0 7.67	21.5 7.43	2.35 0.78	0.12~0.27	3.89 0.77	<b>SB4-4515</b> <b>SB4-1545</b>
44 65	35	152.88 48.64	394 136	44.3 14.8	40.2 13.9	4.52 1.51	0.14~0.34	6.10 1.46	<b>SB5-4515</b> <b>SB5-1545</b>
62 86	50	169.26 49.77	751 259	87.0 39.9	76.6 26.4	8.87 4.06	0.16~0.36	18.0 2.61	<b>SB6-4515</b> <b>SB6-1545</b>
67 93	50	255.92 61.77	1470 506	179 59.7	150 51.6	18.3 6.09	0.20~0.45	36.4 5.80	<b>SBY8-4515</b> <b>SBY8-1545</b>

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 452) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.

Spur Gears  
Helical Gears  
Internal Gears  
Racks  
CP Racks & Pinions  
Miter Gears  
Bevel Gears  
Screw Gears  
Worm Gear Pair  
Bevel Gearboxes  
Other Products



Specifications	
Precision grade	JIS B 1704 grade 3
Gear teeth	Gleason
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB



B3

Catalog No.	Gear ratio	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Mounting distance	Total length	Crown to back length	Hub width
					AH7	B	C	D	E	F	G	H
SB1.5-6015 SB1.5-1560		m1.5	60	B4	12	50	90	90.41	32	24.2	21.58	12
			15	B3	8	18	22.5	26.66	56	23.01	11.52	10.43
SB2-6015 SB2-1560		m2	60	B4	15	60	120	120.55	42	31.6	28.1	16
			15	B3	10	24	30	35.55	75	31.01	15.69	14.25
SB2.5-6015 SB2.5-1560		m2.5	60	B4	20	70	150	150.69	53	40	35.63	20
			15	B3	12	30	37.5	44.44	94	39.02	19.87	18.06
SB3-6015 SB3-1560	4	m3	60	B4	20	80	180	180.83	64	47.97	43.15	25
			15	B3	15	38	45	53.33	112	44.1	23.04	21.12
SB4-6015 SB4-1560		m4	60	B5	25	85	240	241.1	80	59.2	52.2	36
			15	B3	16	50	60	71.10	150	62.03	31.39	28.75
SBY5-6015 SBY5-1560		m5	60	BT	30	180	300	301.36	80	53.97	45.22	20
			15	B3	25	60	75	88.9	185	75.03	36.74	33.13
SBY6-6015 SBY6-1560		m6	60	BT	35	200	360	361.66	100	68.16	58.31	25
			15	B3	25	75	90	106.66	220	85.17	42.08	38.13

[Caution on Product Characteristics]

- The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 451 for more details.
- Dimensions of the outside diameter, the overall length and crown to back length are all theoretical values, and some differences will occur due to the corner chamfering of the gear tips.
- For convenience in handling, BT Shaped Gears have tapped holes on their holding surface. To find the L dimensions and tap sizes, please refer to page 452.

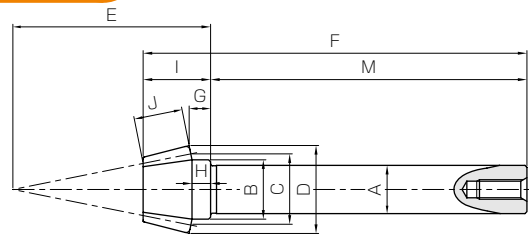


SB  
Steel Bevel Gears & Pinion Shafts



Specifications	
Precision grade	JIS B 1704 grade 3
Gear teeth	Gleason
Pressure angle	20°
Material	S45C
Heat treatment	—*
Tooth hardness	less than 194HB *

\* Pinions are thermal refined. The hardness of a gear tooth is 225 to 260HB.



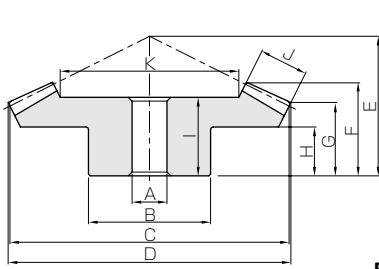
B8

Catalog No.	Gear ratio	Module	No. of teeth	Shape	Bore · Shaft dia.	Hub dia.	Pitch dia.	Outside dia.	Mounting distance	Total length	Crown to back length	Hub width	Length of bore · shaft
					AH7(Bore) AnZ(Shaft)	B	C	D	E	F	G	H	I
SB1.5-6012 SB1.5-1260		m1.5	60	B4	12	50	90	90.33	30	23.89	21.82	12	21
			12	B8	12.2	15	18	22.24	50	97.06	5.42	4.7	17.06
SB2-6012 SB2-1260		m2	60	B4	15	60	120	120.43	40	31.85	29.09	16	24
			12	B8	15.2	20	24	29.65	66	117.08	6.56	5.6	22.08
SB2.5-6012 SB2.5-1260		m2.5	60	B4	20	70	150	150.54	50	39.81	36.36	20	34
			12	B8	20.2	25	30	37.06	83	143.1	8.7	7.5	28.1
SB3-6012 SB3-1260		m3	60	B4	20	80	180	180.65	60	47.43	43.64	25	41
			12	B8	25.25	30	36	44.48	100	172.19	10.85	9.4	32.19

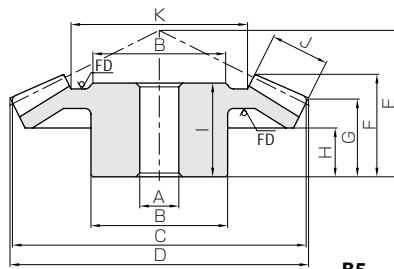
[Caution on Product Characteristics]

- The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 451 for more details.
- Dimensions of the outside diameter, the overall length and crown to back length are all theoretical values, and some differences will occur due to the corner chamfering of the gear tips.

Steel Bevel Gears



B4



B5

BT

\* FD has die-forged finish.

Length of bore I	Face width J	Holding surface dia. K	Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No.
			Bending strength	Surface durability	Bending strength	Surface durability			
21 22.5	12	65.38 15.54	17.3 4.46	1.75 0.44	1.77 0.45	0.18 0.045	0.05~0.15	0.62 0.043	<b>SB1.5-6015</b> <b>SB1.5-1560</b>
27 30	16	87.02 18.06	41.3 10.6	4.30 1.07	4.21 1.08	0.44 0.11	0.06~0.16	1.35 0.10	<b>SB2-6015</b> <b>SB2-1560</b>
34 37.5	20	108.64 20.57	80.2 20.6	8.54 2.13	8.18 2.10	0.87 0.22	0.07~0.17	2.51 0.21	<b>SB2.5-6015</b> <b>SB2.5-1560</b>
41 43	22	134.4 31.58	130 33.5	14.2 3.54	13.3 3.42	1.44 0.36	0.08~0.18	4.16 0.36	<b>SB3-6015</b> <b>SB3-1560</b>
53 60	32	174.03 36.12	328 84.5	37.0 9.24	33.5 8.62	3.77 0.94	0.12~0.27	6.00 0.91	<b>SB4-6015</b> <b>SB4-1560</b>
45 73	40	218.79 49.15	642 165	74.4 18.6	65.4 16.8	7.59 1.90	0.14~0.34	17.5 1.58	<b>SBY5-6015</b> <b>SBY5-1560</b>
56 82	45	267.73 54.92	1050 270	126 31.5	107 27.5	12.8 3.21	0.16~0.36	30.7 2.83	<b>SBY6-6015</b> <b>SBY6-1560</b>

[Caution on Secondary Operations]

① Please read "Caution on Performing Secondary Operations" (Page 452) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

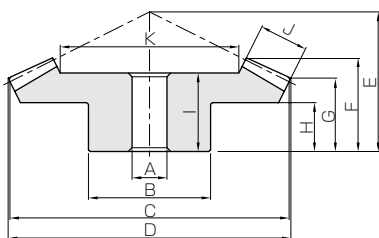
Worm Gear Pair

Bevel Gearboxes

Other Products

SB

Steel Bevel Gears & Pinion Shafts



B4

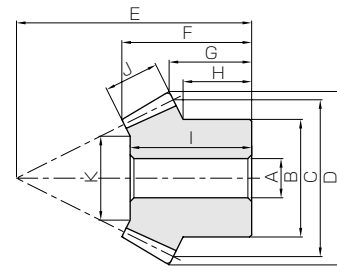
Face width J	Holding surface dia. K	Shaft length M	Screw size	Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No.
				Bending strength	Surface durability	Bending strength	Surface durability			
12	65.52 —	— 80	— M5	18.0 4.01	1.41 0.46	1.83 0.41	0.14 0.047	0.05~0.15	0.62 0.097	<b>SB1.5-6012</b> <b>SB1.5-1260</b>
16	86.96 —	— 95	— M6	42.6 9.50	3.43 1.12	4.34 0.97	0.35 0.11	0.06~0.16	1.34 0.19	<b>SB2-6012</b> <b>SB2-1260</b>
20	108.8 —	— 115	— M8	83.2 18.5	6.85 2.23	8.48 1.89	0.70 0.23	0.07~0.17	2.54 0.40	<b>SB2.5-6012</b> <b>SB2.5-1260</b>
22	134.73 —	— 140	— M8	135 30.1	11.4 3.70	13.8 3.07	1.16 0.38	0.08~0.18	4.18 0.74	<b>SB3-6012</b> <b>SB3-1260</b>

[Caution on Secondary Operations]

① Please read "Caution on Performing Secondary Operations" (Page 452) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.



Specifications	
Precision grade	JIS B 1704 grade 3
Gear teeth	Gleason
Pressure angle	20°
Material	SUS303
Heat treatment	—
Tooth hardness	less than 187HB



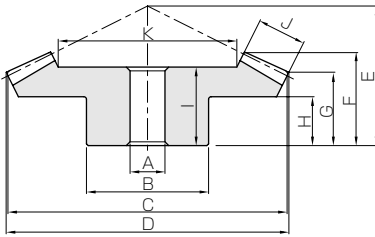
B3

Catalog No.	Gear ratio	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Mounting distance	Total length	Crown to back length	Hub width
					A <sub>H7</sub>	B	C	D	E	F	G	H
<b>SUB1.5-3020</b> <b>SUB1.5-2030</b>	1.5	<b>m1.5</b>	30	B4	10	30	45	46.24	28	18.53	13.93	8
			20	B3	8	25	30	33.13	33	18.63	11.54	8.83
<b>SUB2-3020</b> <b>SUB2-2030</b>		<b>m2</b>	30	B4	10	35	60	61.65	40	26.87	21.24	15
			20	B3	10	35	40	44.18	45	25.06	16.39	13.33
<b>SUB2.5-3020</b> <b>SUB2.5-2030</b>		<b>m2.5</b>	30	B4	15	45	75	77.07	50	34.22	26.55	18
			20	B3	12	40	50	55.22	55	31.06	19.24	14.16
<b>SUB3-3020</b> <b>SUB3-2030</b>	<b>m3</b>	30	B4	15	60	90	92.48	55	35.56	26.86	17	
		20	B3	15	50	60	66.27	70	40.48	27.09	21.66	
<b>SUB1.5-4020</b> <b>SUB1.5-2040</b>	2	<b>m1.5</b>	40	B4	10	38	60	60.88	35	25.01	20.88	15
			20	B3	8	25	30	33.61	46	25.54	16.9	14.75
<b>SUB2-4020</b> <b>SUB2-2040</b>		<b>m2</b>	40	B4	12	50	80	81.17	45	32.37	26.17	18
			20	B3	12	32	40	44.81	60	34.16	21.2	18
<b>SUB2.5-4020</b> <b>SUB2.5-2040</b>		<b>m2.5</b>	40	B4	15	60	100	101.46	55	39.73	31.46	20
			20	B3	12	40	50	56.02	75	43.78	26.5	22.5
<b>SUB3-4020</b> <b>SUB3-2040</b>	<b>m3</b>	40	B4	20	70	120	121.76	65	45.85	36.76	24	
		20	B3	16	50	60	67.22	90	50.81	31.8	27.5	
<b>SUB1.5-4515</b> <b>SUB1.5-1545</b>	3	<b>m1.5</b>	45	B4	10	36	67.5	68.06	28	20.44	17.59	11
			15	B3	8	18	22.5	26.54	47	23.20	13.92	12.5
<b>SUB2-4515</b> <b>SUB2-1545</b>		<b>m2</b>	45	B4	12	60	90	90.75	40	30.4	26.12	17
			15	B3	10	24	30	35.35	60	29.8	15.89	14
<b>SUB2.5-4515</b> <b>SUB2.5-1545</b>		<b>m2.5</b>	45	B4	15	60	112.5	113.43	50	38.35	32.65	22
			15	B3	12	30	37.5	44.18	75	38.41	19.86	17.5
<b>SUB3-4515</b> <b>SUB3-1545</b>	<b>m3</b>	45	B4	20	80	135	136.12	55	40.74	34.18	20	
		15	B3	15	38	45	53.02	90	45.17	23.84	21.33	

[Caution on Product Characteristics]

- ① The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 451 for more details.
- ② Dimensions of the outside diameter, the overall length and crown to back length are all theoretical values, and some differences will occur due to the corner chamfering of the gear tips.

## Stainless Steel Bevel Gears



## B4

Length of bore I	Face width J	Holding surface dia. K	Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No.
			Bending strength	Surface durability	Bending strength	Surface durability			
16 17	9	27.37 17.05	3.22 2.23	0.46 0.31	0.33 0.23	0.047 0.032	0.05~0.15	0.12 0.063	<b>SUB1.5-3020</b> <b>SUB1.5-2030</b>
23 22	11	37.56 21.34	7.22 5.01	1.08 0.72	0.74 0.51	0.11 0.074	0.06~0.16	0.26 0.16	<b>SUB2-3020</b> <b>SUB2-2030</b>
30 28	15	45.61 27.42	14.9 10.3	2.28 1.52	1.52 1.05	0.23 0.15	0.07~0.17	0.54 0.28	<b>SUB2.5-3020</b> <b>SUB2.5-2030</b>
31 37	17	57.14 34.71	24.8 17.2	3.87 2.58	2.53 1.76	0.39 0.26	0.08~0.18	0.94 0.55	<b>SUB3-3020</b> <b>SUB3-2030</b>
22 24	10	39.64 17.28	5.23 2.64	0.79 0.40	0.53 0.27	0.081 0.040	0.05~0.15	0.27 0.088	<b>SUB1.5-4020</b> <b>SUB1.5-2040</b>
27 32	15	48.46 20.92	13.4 6.72	2.07 1.04	1.36 0.69	0.21 0.11	0.06~0.16	0.61 0.19	<b>SUB2-4020</b> <b>SUB2-2040</b>
35 41	20	60.28 24.56	27.1 13.6	4.29 2.15	2.76 1.39	0.44 0.22	0.07~0.17	1.21 0.40	<b>SUB2.5-4020</b> <b>SUB2.5-2040</b>
38 47	22	73.81 29.61	44.4 22.4	7.19 3.60	4.53 2.28	0.73 0.37	0.08~0.18	1.86 0.69	<b>SUB3-4020</b> <b>SUB3-2040</b>
17 22.5	10	46.58 14.75	5.70 1.97	0.72 0.24	0.58 0.20	0.074 0.025	0.05~0.15	0.25 0.041	<b>SUB1.5-4515</b> <b>SUB1.5-1545</b>
26 29	15	59.04 19.13	14.6 5.03	1.90 0.63	1.49 0.51	0.19 0.065	0.06~0.16	0.80 0.095	<b>SUB2-4515</b> <b>SUB2-1545</b>
35 37	20	72.84 20.51	29.6 10.2	3.94 1.31	3.02 1.04	0.40 0.13	0.07~0.17	1.36 0.19	<b>SUB2.5-4515</b> <b>SUB2.5-1545</b>
35 43	23	88.18 22.53	49.9 17.2	6.77 2.26	5.09 1.76	0.69 0.23	0.08~0.18	2.32 0.34	<b>SUB3-4515</b> <b>SUB3-1545</b>

[Caution on Secondary Operations]

① Please read "Caution on Performing Secondary Operations" (Page 452) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.

Spur  
GearsHelical  
GearsInternal  
Gears

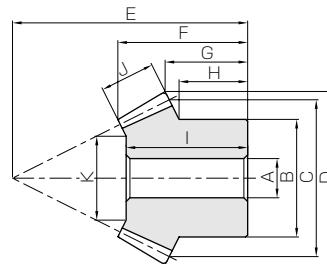
Racks

CP Racks  
& PinionsMiter  
GearsBevel  
GearsScrew  
GearsWorm  
Gear PairBevel  
GearboxesOther  
Products



Specifications	
Precision grade	JIS B 1704 grade 4 *
Gear teeth	Gleason
Pressure angle	20°
Material	MC901
Heat treatment	—
Tooth hardness	115 ~ 120HRR

\* The precision grade of this product is equivalent to the value shown in the table.



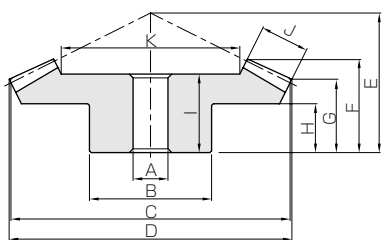
B3

Catalog No.	Gear ratio	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Mounting distance	Total length	Crown to back length	Hub width	
					A	B	C	D	E	F	G	H	
PB1.5-3020 PB1.5-2030	1.5	m1.5	30	B4	10	30	45	46.24	28	18.53	13.93	8	
			20	B3	8	25	30	33.13	33	18.63	11.54	8.83	
PB2-3020 PB2-2030		m2	30	B4	10	35	60	61.65	40	26.87	21.24	15	
			20	B3	10	35	40	44.18	45	25.06	16.39	13.33	
PB2.5-3020 PB2.5-2030		m2.5	30	B4	15	45	75	77.07	50	34.22	26.55	18	
			20	B3	12	40	50	55.22	55	31.06	19.24	14.16	
PB3-3020 PB3-2030		m3	30	B4	15	60	90	92.48	55	35.56	26.86	17	
			20	B3	15	50	60	66.27	70	40.48	27.09	21.66	
PB1-4020 PB1-2040		2	m1	40	B4	8	25	40	40.59	22	15.07	12.59	8
				20	B3	6	16	20	22.41	28	13.78	8.6	7
PB1.25-4020 PB1.25-2040	m1.25		40	B4	10	32	50	50.73	27	18.54	15.23	10	
			20	B3	8	22	25	28.01	36	18.66	11.75	10.25	
PB1.5-4020 PB1.5-2040	m1.5		40	B4	10	38	60	60.88	35	25.01	20.88	15	
			20	B3	8	25	30	33.61	46	25.54	16.9	14.75	
PB2-4020 PB2-2040	m2		40	B4	12	40	80	81.17	45	32.37	26.17	18	
			20	B3	12	32	40	44.81	60	34.16	21.2	18	
PB2.5-4020 PB2.5-2040	m2.5		40	B4	15	50	100	101.47	55	39.73	31.47	20	
			20	B3	12	40	50	56.01	75	43.78	26.5	22.5	
PB3-4020 PB3-2040	m3		40	B4	20	60	120	121.76	65	45.85	36.76	24	
			20	B3	16	50	60	67.22	90	50.81	31.8	27.5	
PB1.5-4515 PB1.5-1545	3		m1.5	45	B4	10	40	67.5	68.06	28	20.44	17.59	11
				15	B3	8	18	22.5	26.54	47	23.20	13.92	12.5
PB2-4515 PB2-1545			m2	45	B4	12	60	90	90.75	40	30.4	26.12	17
				15	B3	10	24	30	35.35	60	29.8	15.89	14
PB2.5-4515 PB2.5-1545		m2.5	45	B4	15	60	112.5	113.43	50	38.35	32.65	22	
			15	B3	12	30	37.5	44.18	75	38.41	19.86	17.5	
PB3-4515 PB3-1545		m3	45	B4	20	80	135	136.12	55	40.74	34.18	20	
			15	B3	15	38	45	53.02	90	45.17	23.84	21.33	

[Caution on Product Characteristics]

- ① Significant variations in temperature or humidity can cause dimensional changes in plastic gears (MC Nylon gears), including bore size (H8 when produced), tooth diameter, and backlash. Please see the section "Design of Plastic Gears" in the technical reference (Page 693).
- ② The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 451 for more details.
- ③ Dimensions of the outside diameter, the overall length and crown to back length are all theoretical values, and some differences will occur due to the corner chamfering of the gear tips.
- ④ Without lubrication, using plastic gears in pairs may generate heat and dilation. It is recommended to mate with steel gears.





## B4

Length of bore I	Face width J	Holding surface dia. K	Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No.
			Bending strength	Surface durability	Bending strength	Surface durability			
16 17	9	27.37 17.05	1.61 0.87	—	0.16 0.089	—	0~0.25	0.018 0.0093	<b>PB1.5-3020</b> <b>PB1.5-2030</b>
23 22	11	37.56 21.34	3.65 1.97	—	0.37 0.20	—	0~0.26	0.039 0.024	<b>PB2-3020</b> <b>PB2-2030</b>
30 28	15	45.61 27.42	7.46 4.04	—	0.76 0.41	—	0~0.27	0.081 0.042	<b>PB2.5-3020</b> <b>PB2.5-2030</b>
31 37	17	57.14 34.71	12.5 6.77	—	1.28 0.69	—	0~0.28	0.14 0.082	<b>PB3-3020</b> <b>PB3-2030</b>
12 12	6	26.58 9.17	0.74 0.28	—	0.075 0.028	—	0~0.23	0.010 0.0029	<b>PB1-4020</b> <b>PB1-2040</b>
16 17	8	33.61 13.22	1.50 0.56	—	0.15 0.058	—	0~0.24	0.021 0.0068	<b>PB1.25-4020</b> <b>PB1.25-2040</b>
22 24	10	39.64 17.28	2.66 1.00	—	0.27 0.10	—	0~0.25	0.039 0.013	<b>PB1.5-4020</b> <b>PB1.5-2040</b>
27 32	15	48.46 20.92	6.72 2.52	—	0.69 0.26	—	0~0.26	0.076 0.028	<b>PB2-4020</b> <b>PB2-2040</b>
35 41	20	60.28 24.56	13.5 5.08	—	1.38 0.52	—	0~0.27	0.16 0.060	<b>PB2.5-4020</b> <b>PB2.5-2040</b>
38 47	22	73.81 29.61	22.4 8.42	—	2.29 0.86	—	0~0.28	0.25 0.10	<b>PB3-4020</b> <b>PB3-2040</b>
17 22.5	10	46.58 14.75	3.18 0.68	—	0.32 0.070	—	0~0.25	0.040 0.0061	<b>PB1.5-4515</b> <b>PB1.5-1545</b>
26 29	15	59.04 19.13	8.07 1.73	—	0.82 0.18	—	0~0.26	0.12 0.014	<b>PB2-4515</b> <b>PB2-1545</b>
35 37	20	72.84 20.51	16.3 3.50	—	1.66 0.36	—	0~0.27	0.20 0.028	<b>PB2.5-4515</b> <b>PB2.5-1545</b>
35 43	23	88.18 22.54	27.6 5.92	—	2.81 0.60	—	0~0.28	0.35 0.050	<b>PB3-4515</b> <b>PB3-1545</b>

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 452) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Plastic gears are susceptible to the effects of temperature and moisture. Dimensional changes may occur while performing secondary operations and during post-machining operations.

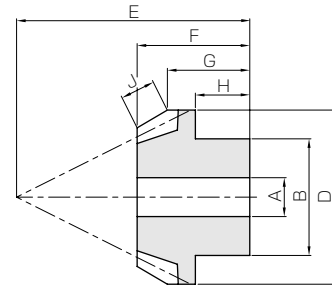
Spur  
GearsHelical  
GearsInternal  
Gears

Racks

CP Racks  
& PinionsMiter  
GearsBevel  
GearsScrew  
GearsWorm  
Gear PairBevel  
GearboxesOther  
Products



Specifications	
Precision grade	JIS B 1704 grade 8
Gear teeth	Gleason
Pressure angle	20°
Material	Duracon (M90-44)
Heat treatment	—
Tooth hardness	110 ~ 120HRR



B1

Catalog No.	Gear ratio	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Mounting distance	Total length	Crown to back length
					AH7	B	C	D	E	F	G
<b>DB0.5-4020</b>	2	<b>m0.5</b>	40	B9	4	12	20	20.29	12	8.33	7.29
<b>DB0.5-2040</b>			20	B1	3	8	10	11.2	16	8.46	6.3
<b>DB0.8-4020</b>		<b>m0.8</b>	40	B9	5	15	32	32.47	18	11.91	10.47
<b>DB0.8-2040</b>			20	B1	4	12	16	17.92	24	11.5	8.48
<b>DB1-4020</b>		<b>m1</b>	40	B9	6	18	40	40.59	22	14.45	12.58
<b>DB1-2040</b>			20	B1	5	15	20	22.4	30	14.49	10.6

[Caution on Product Characteristics]

- ① The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 451 for more details.
- ② The bore tolerance is generally -0.05 to -0.1 but may be + values at the central portion of the hole.
- ③ To find the dimensional tolerance of these gears, please see the Dimensional Tolerance Table.

Spur Gears  
Helical Gears  
Internal Gears  
Racks  
CP Racks & Pinions  
Miter Gears  
Bevel Gears  
Screw Gears  
Worm Gear Pair  
Bevel Gearboxes  
Other Products



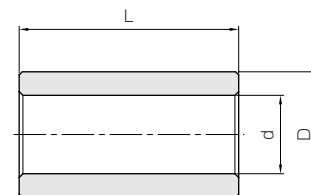
## BB Sintered Metal Bushings



### Sintered Metal Bushings



The table shows a series of standard metal bushings that can be pressed into standard Injection Molded Gears. They can be used as bearing metal on idler gears or to reduce the bore of the gears.



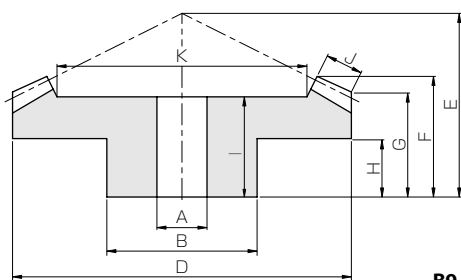
T8

Catalog No.	I.D. of bushing	O.D. of bushing	Length	Products that can use the bushing
	d <sup>+0.02</sup> / <sub>0</sub>	D <sup>+0.02</sup> / <sub>-0.01</sub>	L <sub>-0.3</sub>	
<b>BB30507</b>	3	5	7	DB0.8
<b>BB40612</b>	4	6	12	DB1

Material : Oil impregnated sintered bronze.



## Injection Molded Bevel Gears



B9

Hub width H	Length of bore I	Face width J	Holding surface dia. K	Allowable torque (N-m)	Allowable torque (kgf-m)	Backlash (mm)	Weight (kg)	Catalog No.
				Bending strength	Bending strength			
4	7	2.5	14.41	0.24	0.025	0.03~0.09	2.00	<b>DB0.5-4020</b> <b>DB0.5-2040</b>
4	—		—	0.092	0.0094		0.54	
6	10	3.5	24.17	0.91	0.093	0.03~0.11	6.26	<b>DB0.8-4020</b> <b>DB0.8-2040</b>
5	—		—	0.34	0.035		1.87	
7	12	4.5	29.94	1.59	0.16	0.03~0.13	11.9	<b>DB1-4020</b> <b>DB1-2040</b>
7	—		—	0.60	0.061		3.54	

[Caution on Secondary Operations] ① Avoid performing secondary operations as reworking material may expose air bubbles (voids).

#### ■ Dimensional tolerance table (Unit : mm)

Range	Tolerance
below 3 mm	± 0.20
3 up to 6 mm	± 0.25
6 up to 10 mm	± 0.30
10 up to 18 mm	± 0.35
18 up to 30 mm	± 0.40
30 mm up	± 0.50

Spur  
GearsHelical  
GearsInternal  
Gears

Racks

CP Racks  
& PinionsMiter  
GearsBevel  
GearsScrew  
GearsWorm  
Gear PairBevel  
GearboxesOther  
Products



Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks &amp; Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

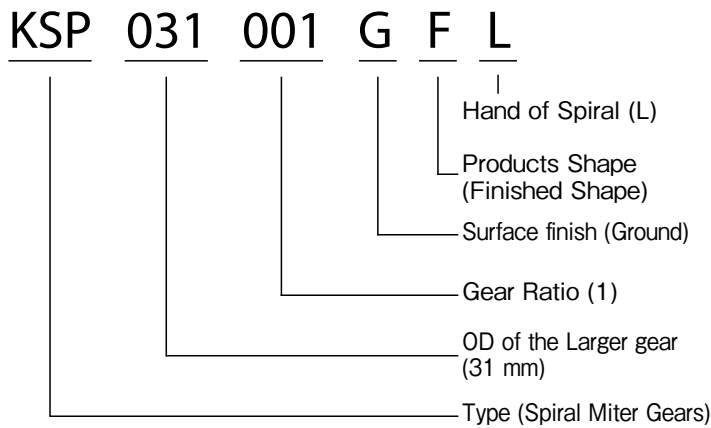
Bevel Gearboxes

Other Products



## ■ Catalog Number of NISSEI Spiral Bevel Gears

The catalog number systems of KSP Ground Spiral Miter Gears differs from other miter gears.



## ■ The Characteristics of KSP Spiral Bevel Gears

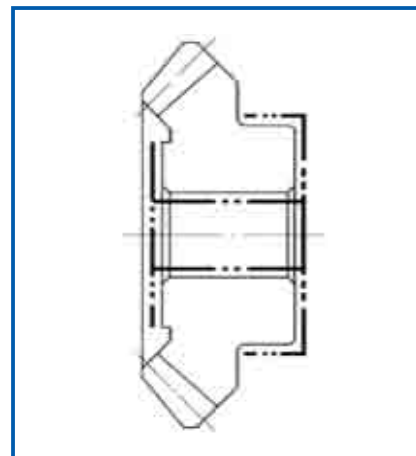
1. JIS Grade 0, high strength, high precision products
2. Superior performance with regard to high speed, low noise, and low vibration.
3. Module range from 1.5 to 6
4. Three gear ratios: 1, 1.5 and 2

## ■ Products Style

Type F - Finished Style

Type U - Hub masked to Allow Secondary Operations

※ The heavy lines in the figure below indicate the masked areas during carburizing.



**Notes about the Transmission Capability Table**

- The values given in the table are for a service factor of 1. Using the table on the right, please modify the value according to the actual conditions. Load torque compensation is calculated from the load torque at the output shaft x service factor (Sf).
- For speed increaser applications (where the gear is the driver and the pinion is driven), the torque on the pinion is the value in the table multiplied by the speed ratio.

NOTE 1: For speed ratio of 1/1.5, the torque on the pinion is 1/1.5 times the value given in the table.

**Service Factor Sf**

Impact from Prime Mover	Impact from Load Side of Machine		
	Uniform Load	Medium Impact Load	Heavy Impact Load
Uniform Load (Motor, Turbine, Hydraulic Motor)	1.0	1.25	1.75
Light Impact Load (Multicylinder Engine)	1.25	1.5	2.0
Medium Impact Load (Single Cylinder Engine)	1.5	1.75	2.25

**Transmission Capability Table (Speed Ratio: 1)**

Upper Transmission Capability (kw) Lower Torqu (N·m)

Model \ Rotation (rpm)	50	100	300	600	900	1200	1800	3000
KSP031001	0.035	0.068	0.195	0.375	0.548	0.716	1.04	1.65
	6.65	6.51	6.20	5.98	5.82	5.69	5.51	5.25
KSP040001	0.092	0.179	0.511	0.980	1.43	1.86	2.69	4.25
	17.6	17.2	16.3	15.6	15.2	14.8	14.3	13.5
KSP053001	0.211	0.412	1.17	2.23	3.25	4.22	6.08	9.55
	40.4	39.3	37.3	35.6	34.5	33.6	32.3	30.4
KSP066001	0.367	0.715	2.02	3.85	5.59	7.26	10.4	16.3
	70.2	68.3	64.4	61.4	59.3	57.8	55.4	52.0
KSP078001	0.577	1.12	3.16	6.00	8.68	11.2	16.1	25.1
	109.8	106.9	101.0	95.5	92.2	89.5	85.5	79.8
KSP092001	0.901	1.75	4.91	9.31	13.5	17.4	24.9	38.6
	172.6	166.7	156.9	148.1	143.2	138.3	132.4	122.6
KSP105001	1.44	2.78	7.80	14.7	21.2	27.4	39.1	60.3
	274.6	265.8	248.1	234.4	225.6	218.7	207.9	192.2
KSP132001	2.33	4.50	12.6	23.6	34.0	43.7	62.0	95.0
	445.2	430.5	400.1	376.6	360.9	348.1	329.5	302.0
KSP157001	3.68	7.10	19.7	37.0	53.0	68.1	96.2	146
	704.1	678.6	628.6	589.4	562.9	542.3	510.9	466.8
KSP184001	5.31	10.2	28.3	52.8	75.5	96.8	136	206
	1010	976.7	901.2	841.4	801.2	770.8	722.8	656.1

**Transmission Capability Table (Speed Ratio: 1.5)**

Upper Transmission Capability (kw) Lower Torqu (N·m)

Model \ Rotation (rpm)	50	100	300	600	900	1200	1800	3000
KSP0481.5	0.077	0.151	0.432	0.830	1.21	1.58	2.29	3.64
	22.2	21.6	20.6	19.8	19.3	18.9	18.2	17.4
KSP0611.5	0.159	0.309	0.882	1.69	2.46	3.21	4.64	7.33
	45.4	44.3	42.2	40.4	39.2	38.3	37.0	35.0
KSP0741.5	0.277	0.540	1.53	2.93	4.27	5.55	8.00	12.6
	79.4	77.4	73.4	70.1	68.0	66.3	63.7	60.1
KSP0901.5	0.466	0.908	2.57	4.90	7.12	9.24	13.3	20.8
	133.4	130.4	122.6	116.7	113.8	110.8	105.9	99.0
KSP1051.5	0.700	1.36	3.84	7.31	10.6	13.7	19.7	30.7
	201.0	195.2	183.4	174.6	168.7	163.8	156.9	147.1
KSP1241.5	1.03	2.00	5.63	10.7	15.5	20.0	28.6	44.5
	295.2	286.4	268.7	255.0	246.1	239.3	227.5	212.8
KSP1411.5	1.56	3.03	8.51	16.1	23.2	30.1	42.9	66.4
	448.2	434.4	406.0	384.4	370.7	358.9	341.3	317.7
KSP1631.5	2.27	4.39	12.3	23.2	33.4	43.1	61.4	94.6
	650.2	628.6	587.4	554.1	532.5	514.8	489.4	452.1
KSP1811.5	2.92	5.64	15.8	29.7	42.7	55.1	78.3	120
	836.5	809.0	754.1	710.0	680.6	658.0	623.7	574.7

**Transmission Capability Table (Speed Ratio: 2)**

Upper Transmission Capability (kw) Lower Torqu (N·m)

Model \ Rotation (rpm)	50	100	300	600	900	1200	1800	3000
KSP039002	0.025	0.049	0.142	0.275	0.404	0.528	0.770	1.23
	9.63	9.45	9.07	8.76	8.57	8.41	8.17	7.83
KSP056002	0.075	0.147	0.423	0.814	1.19	1.55	2.26	3.59
	28.8	28.1	27.0	26.0	25.3	24.8	23.9	22.8
KSP075002	0.185	0.361	1.03	1.98	2.89	3.76	5.45	8.61
	70.7	69.0	65.7	63.1	61.3	59.9	57.9	54.8
KSP096002	0.364	0.710	2.02	3.86	5.62	7.31	10.5	16.6
	139.3	135.3	128.5	122.6	119.6	116.7	111.8	105.9
KSP119002	0.649	1.26	3.58	6.82	9.90	12.9	18.5	29.0
	248.1	241.2	227.5	217.7	209.9	205.0	196.1	184.4
KSP145002	1.07	2.08	5.87	11.2	16.2	21.0	30.1	46.9
	408.9	397.2	373.6	356.0	343.2	333.4	319.7	298.1
KSP172002	1.78	3.45	9.72	18.4	26.6	34.5	49.3	76.5
	680.6	660.0	618.8	587.4	565.8	549.2	523.7	487.4

Spur Gears  
Helical Gears  
Internal Gears  
Racks  
CP Racks & Pinions  
Miter Gears  
Bevel Gears  
Screw Gears  
Worm Gear Pair  
Bevel Gearboxes  
Other Products

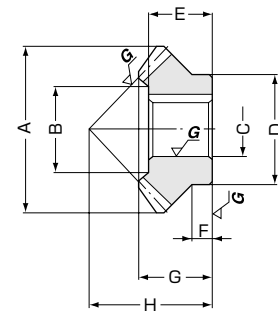


# KSP Nissei Ground Spiral Miter Gears

Module 1.5 ~ 6



Specifications	
Precision grade	JIS B 1704 grade 0
Gear teeth	Gleason
Pressure angle	20°
Helix angle	35°
Material	SCM415 *
Heat treatment	Overall carburizing
Tooth hardness	60 ~ 63HRC * *



A

\* Module 3.5 and larger are made of SCM420.  
\* \* Tooth Hardness for module 2 and 2.5 is between 80 to 83 HRA.

Catalog No.	Gear ratio	Module	No. of teeth	Direction of spiral	Pitch dia.	Face width	Shape	Pitch dia.	Holding surface dia.	Bore	Hub dia.	Length of bore
								A	B	CH7	D	E
KSP031001GF L KSP031001GF R	1	m1.5	20	L R	30	7	A	30.5	16.2	12	22	13
KSP040001GF L KSP040001GF R		m2	20	L R	40	9	B	40	22.5	14	31	14
KSP053001GF L KSP053001GF R		m2.5	21	L R	52.5	12	B	53	31	19	38	20
KSP066001GF L KSP066001GF R		m3	21	L R	63	15	B	65	33.6	23	47	25
KSP078001GF L KSP078001GF R		m3.5	22	L R	77	18	B	78	43.1	27	54	27
KSP092001GF L KSP092001GF R		m4	22	L R	88	21	B	91	48.6	30	63	32
KSP105001GF L KSP105001GF R		m4.5	23	L R	103.5	25	C	105	50	32	70	35
KSP132001GF L KSP132001GF R		m5	26	L R	130	29	C	132	64	36	82	41
KSP157001GF L KSP157001GF R		m5.5	28	L R	154	34	C	157	76	40	92	47
KSP184001GF L KSP184001GF R		m6	30	L R	180	38	C	184	84	48	101	51

(Caution on Product Characteristics) ① The allowable torque is calculated by converting the output torque (600 rpm) on page 485 to kgf/m, according to assumed usage conditions.  
② These gears produce axial thrust forces. See page 452 for more details.

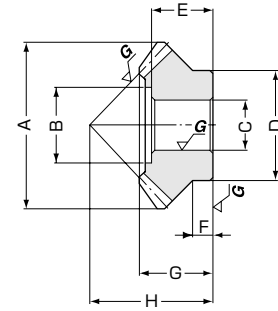


# KSP Nissei Ground Spiral Miter Gears

Module 1.5 ~ 6



Specifications	
Precision grade	JIS B 1704 grade 0
Gear teeth	Gleason
Pressure angle	20°
Helix angle	35°
Material	SCM415 *
Heat treatment	Carburizing (bore & hubs are masked)
Tooth hardness	60 ~ 63HRC * *



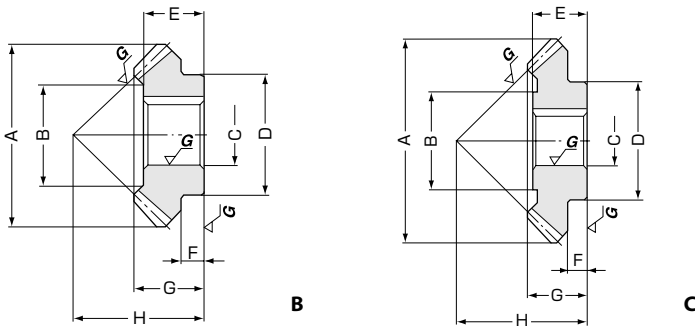
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\* Module 3.5 and larger are made of SCM420.  
\* \* Tooth Hardness for module 2 and 2.5 is between 80 to 83 HRA.

Catalog No.	Gear ratio	Module	No. of teeth	Direction of spiral	Pitch dia.	Face width	Shape	Pitch dia.	Holding surface dia.	Bore	Hub dia.	Length of bore
								A	B	CH7	D	E
KSP031001GU L KSP031001GU R	1	m1.5	20	L R	30	7	A	30.5	16.5	10	22	13
KSP040001GU L KSP040001GU R		m2	20	L R	40	9	B	40	22.5	12	31	14
KSP053001GU L KSP053001GU R		m2.5	21	L R	52.5	12	B	53	31	14	38	20
KSP066001GU L KSP066001GU R		m3	21	L R	63	15	B	65	33.5	16	47	25
KSP078001GU L KSP078001GU R		m3.5	22	L R	77	18	B	78	43	20	54	27
KSP092001GU L KSP092001GU R		m4	22	L R	88	21	B	91	49	22	63	32
KSP105001GU L KSP105001GU R		m4.5	23	L R	103.5	25	C	105	50	26	70	35
KSP132001GU L KSP132001GU R		m5	26	L R	130	29	C	132	64	30	82	41
KSP157001GU L KSP157001GU R		m5.5	28	L R	154	34	C	157	76	32	92	47
KSP184001GU L KSP184001GU R		m6	30	L R	180	38	C	184	84	40	101	51

(Caution on Product Characteristics) ① The allowable torque is calculated by converting the output torque (600 rpm) on page 485 to kgf/m, according to assumed usage conditions.  
② These gears produce axial thrust forces. See page 452 for more details.

Ground Spiral Miter Gears

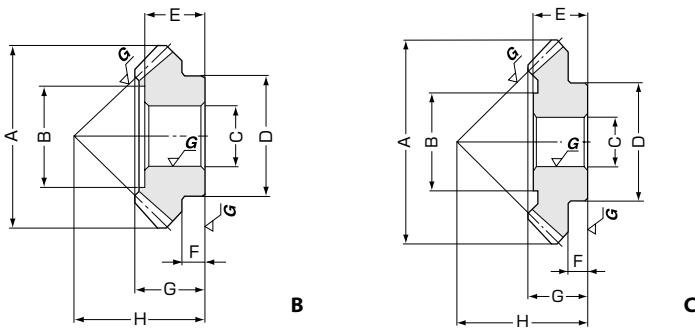


Hub width F	Total length G	Mounting distance H	Keyway	Allowable torque (kgf-m)	Backlash (mm)	Weight (kg)	Catalog No.
6	15	25	4 x 1.8	0.61	0 ~0.05	0.04	KSP031001GF L KSP031001GF R
7	16.5	30	5 x 2.3	1.59	0 ~0.05	0.08	KSP040001GF L KSP040001GF R
8	22.8	40	6 x 2.8	3.63	0.05~0.10	0.18	KSP053001GF L KSP053001GF R
13	29.5	50	7 x 3	6.26	0.05~0.10	0.34	KSP066001GF L KSP066001GF R
12	32	57	8 x 3.3	9.74	0.05~0.10	0.54	KSP078001GF L KSP078001GF R
14	38	66	8 x 3.3	15.1	0.05~0.10	0.88	KSP092001GF L KSP092001GF R
14	39	72	10 x 3.3	23.9	0.05~0.10	1.25	KSP105001GF L KSP105001GF R
14	45	88	10 x 3.3	38.4	0.05~0.10	2.39	KSP132001GF L KSP132001GF R
20	53.5	105	12 x 3.3	60.1	0.05~0.10	3.71	KSP157001GF L KSP157001GF R
17	56.5	118	14 x 3.8	85.8	0.05~0.10	5.55	KSP184001GF L KSP184001GF R

[Caution on Secondary Operations]

① No secondary operations can be performed on these precision finished gears due to the applied carburizing process.

Ground Spiral Miter Gears



Hub width F	Total length G	Mounting distance H	Machinable max. bore	Allowable torque (kgf-m)	Backlash (mm)	Weight (kg)	Catalog No.
6	15	25	12	0.61	0 ~0.05	0.04	KSP031001GU L KSP031001GU R
7	16.5	30	16	1.59	0 ~0.05	0.09	KSP040001GU L KSP040001GU R
8	22.8	40	22	3.63	0.05~0.10	0.21	KSP053001GU L KSP053001GU R
13	29.5	50	25	6.26	0.05~0.10	0.39	KSP066001GU L KSP066001GU R
12	32	57	32	9.74	0.05~0.10	0.59	KSP078001GU L KSP078001GU R
14	38	66	38	15.1	0.05~0.10	0.96	KSP092001GU L KSP092001GU R
14	39	72	40	23.9	0.05~0.10	1.33	KSP105001GU L KSP105001GU R
14	45	88	48	38.4	0.05~0.10	2.49	KSP132001GU L KSP132001GU R
20	53.5	105	55	60.1	0.05~0.10	3.90	KSP157001GU L KSP157001GU R
17	56.5	118	62	85.8	0.05~0.10	5.79	KSP184001GU L KSP184001GU R

[Caution on Secondary Operations]

① Please read "Caution on Performing Secondary Operations" (Page 452) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.



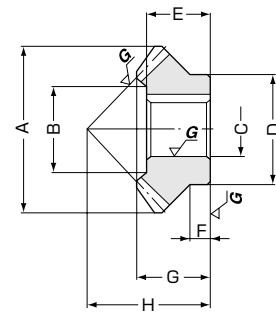
# KSP Nissei Ground Spiral Bevel Gears

Module 2 ~ 5



Specifications	
Precision grade	JIS B 1704 grade 0
Gear teeth	Gleason
Pressure angle	20°
Helix angle	35°
Material	SCM415 *
Heat treatment	Overall carburizing
Tooth hardness	60 ~ 63HRC * *

\* Module 3.5 and larger are made of SCM420.  
 \*\* Tooth Hardness for module 2 and 2.5 is between 80 to 83 HRA.



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Catalog No.	Gear ratio	Module	No. of teeth	Direction of spiral	Pitch dia.	Face width	Shape	Pitch dia.	Holding surface dia.	Bore	Hub dia.	Length of bore
								A	B	C <sub>H7</sub>	D	E
KSP0481.5GF P KSP0481.5GF G		m2	16	L	32	9	A	34	17.5	12	24	13
			24	R	48	B	48	30.4	15	30	17	
KSP0611.5GF P KSP0611.5GF G		m2.25	18	L	40.5	12	A	42	22.4	15	30	17
			27	R	60.75	B	61	36.3	20	40	20	
KSP0741.5GF P KSP0741.5GF G		m2.75	18	L	49.5	15	A	52	28.8	20	40	20
			27	R	74.25	B	74	44.5	25	50	25	
KSP0901.5GF P KSP0901.5GF G		m3	20	L	60	18	B	63	34.1	22	44	24
			30	R	90	B	90	54.7	27	56	29	
KSP1051.5GF P KSP1051.5GF G		m3.5	20	L	70	21	B	74	37.8	25	50	25
			30	R	105	C	105	53	30	63	32	
KSP1241.5GF P KSP1241.5GF G		m3.75	22	L	82.5	24	B	87	46.6	27	56	29
			33	R	123.75	C	124	64	33	69	35	
KSP1411.5GF P KSP1411.5GF G		m4.25	22	L	93.5	28	B	99	52.9	30	63	32
			33	R	140.25	C	141	68	36	73	41	
KSP1631.5GF P KSP1631.5GF G		m4.5	24	L	108	32	B	113	64.6	33	69	35
			36	R	162	C	163	76	40	82	47	
KSP1811.5GF P KSP1811.5GF G		m5	24	L	120	35	B	126	71.8	36	73	41
			36	R	180	C	181	86	45	90	48	

[Caution on Product Characteristics]

- The allowable torque is calculated by converting the output torque (600 rpm) on page 485 to kgf/m, according to assumed usage conditions.
- These gears produce axial thrust forces. See page 452 for more details.



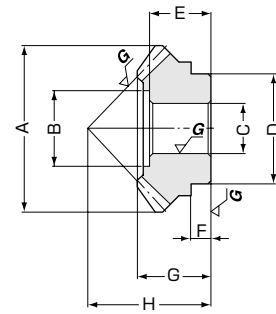
# KSP Nissei Ground Spiral Bevel Gears

Module 2 ~ 5



Specifications	
Precision grade	JIS B 1704 grade 0
Gear teeth	Gleason
Pressure angle	20°
Helix angle	35°
Material	SCM415 *
Heat treatment	Carburizing (bore & hubs are masked)
Tooth hardness	60 ~ 63HRC * *

\* Module 3.5 and larger are made of SCM420.  
 \*\* Tooth Hardness for module 2 and 2.5 is between 80 to 83 HRA.



A'

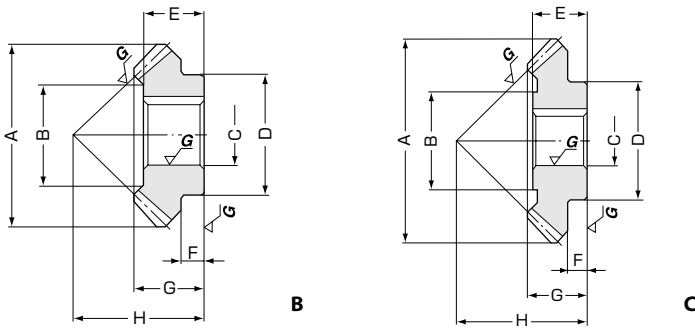
Catalog No.	Gear ratio	Module	No. of teeth	Direction of spiral	Pitch dia.	Face width	Shape	Pitch dia.	Holding surface dia.	Bore	Hub dia.	Length of bore
								A	B	C <sub>H7</sub>	D	E
KSP0481.5GU P KSP0481.5GU G		m2	16	L	32	9	A'	34	17.5	10	24	13
			24	R	48	B	48	30	12	30	17	
KSP0611.5GU P KSP0611.5GU G		m2.25	18	L	40.5	12	A'	42	22	12	30	17
			27	R	60.75	B	61	36	14	40	20	
KSP0741.5GU P KSP0741.5GU G		m2.75	18	L	49.5	15	A'	52	27	14	40	20
			27	R	74.25	B	74	44.5	20	50	25	
KSP0901.5GU P KSP0901.5GU G		m3	20	L	60	18	B	63	34	16	44	24
			30	R	90	B	90	54.5	20	56	29	
KSP1051.5GU P KSP1051.5GU G		m3.5	20	L	70	21	B	74	38	20	50	25
			30	R	105	C	105	53	22	63	32	
KSP1241.5GU P KSP1241.5GU G		m3.75	22	L	82.5	24	B	87	46.5	20	56	29
			33	R	123.75	C	124	64	26	69	35	
KSP1411.5GU P KSP1411.5GU G		m4.25	22	L	93.5	28	B	99	53	22	63	32
			33	R	140.25	C	141	68	30	73	41	
KSP1631.5GU P KSP1631.5GU G		m4.5	24	L	108	32	B	113	64.5	26	69	35
			36	R	162	C	163	76	32	82	47	
KSP1811.5GU P KSP1811.5GU G		m5	24	L	120	35	B	126	71.5	30	73	41
			36	R	180	C	181	86	38	90	48	

[Caution on Product Characteristics]

- The allowable torque is calculated by converting the output torque (600 rpm) on page 485 to kgf/m, according to assumed usage conditions.
- These gears produce axial thrust forces. See page 452 for more details.



Ground Spiral Bevel Gears

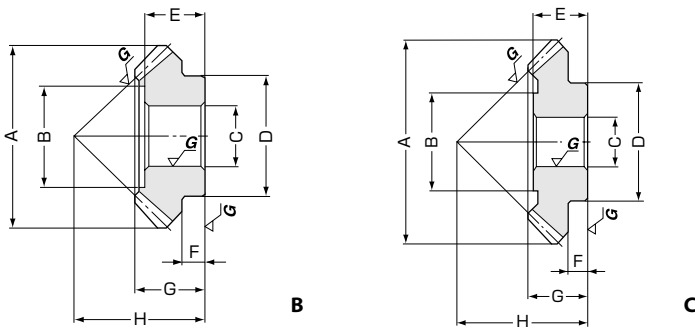


Hub width	Total length	Mounting distance	Keyway	Allowable torque (kgf-m)	Backlash (mm)	Weight (kg)	Catalog No.
F	G	H					
4.3 7	14.5 19	31 30	4 x 1.8 5 x 2.3	2.02	0 ~0.05	0.05 0.13	KSP0481.5GF P KSP0481.5GF G
5.1 10	19 23.5	39 37	5 x 2.3 6 x 2.8	4.12	0.05~0.10	0.09 0.25	KSP0611.5GF P KSP0611.5GF G
5.7 12	22 29	46 45	6 x 2.8 7 x 3	7.15	0.05~0.10	0.17 0.45	KSP0741.5GF P KSP0741.5GF G
8 13	26.5 33	56 53	6 x 2.8 8 x 3.3	11.9	0.05~0.10	0.29 0.79	KSP0901.5GF P KSP0901.5GF G
7 13	28.5 34	63 57	7 x 3 8 x 3.3	17.8	0.05~0.10	0.43 1.09	KSP1051.5GF P KSP1051.5GF G
7 14	33 36.5	74 64	8 x 3.3 10 x 3.3	26.0	0.05~0.10	0.76 1.59	KSP1241.5GF P KSP1241.5GF G
7 17	36 43.5	82 74	8 x 3.3 10 x 3.3	39.2	0.05~0.10	1.07 2.35	KSP1411.5GF P KSP1411.5GF G
7 19	38.5 49.5	92 85	10 x 3.3 12 x 3.3	56.5	0.05~0.10	1.50 3.70	KSP1631.5GF P KSP1631.5GF G
10 19	45.5 50.5	105 90	10 x 3.3 14 x 3.8	72.4	0.05~0.10	2.12 4.65	KSP1811.5GF P KSP1811.5GF G

[Caution on Secondary Operations] ① No secondary operations can be performed on these precision finished gears due to the applied carburizing process.

Spur Gears  
Helical Gears  
Internal Gears  
Racks  
CP Racks & Pinions  
Miter Gears

Ground Spiral Bevel Gears



Hub width	Total length	Mounting distance	Machinable max. bore	Allowable torque (kgf-m)	Backlash (mm)	Weight (kg)	Catalog No.
F	G	H					
4.5 7	14.5 19	31 30	— 20	2.02	0 ~0.05	0.05 0.14	KSP0481.5GU P KSP0481.5GU G
5.5 10	19 23.5	39 37	16 27	4.12	0.05~0.10	0.10 0.28	KSP0611.5GU P KSP0611.5GU G
5.6 12	22 29	46 45	20 35	7.15	0.05~0.10	0.20 0.49	KSP0741.5GU P KSP0741.5GU G
8 13	26.5 33	56 53	25 42	11.9	0.05~0.10	0.34 0.84	KSP0901.5GU P KSP0901.5GU G
7 13	28.5 34	63 57	28 42	17.8	0.05~0.10	0.47 1.18	KSP1051.5GU P KSP1051.5GU G
7 14	33 36.5	74 64	36 48	26.0	0.05~0.10	0.80 1.71	KSP1241.5GU P KSP1241.5GU G
7 17	36 43.5	82 74	42 50	39.2	0.05~0.10	1.15 2.46	KSP1411.5GU P KSP1411.5GU G
7 19	38.5 49.5	92 85	48 55	56.5	0.05~0.10	1.64 3.84	KSP1631.5GU P KSP1631.5GU G
10 19	45.5 50.5	105 90	55 60	72.4	0.05~0.10	2.21 4.85	KSP1811.5GU P KSP1811.5GU G

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 452) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.

Bevel Gears  
Screw Gears  
Worm Gear Pair  
Bevel Gearboxes  
Other Products



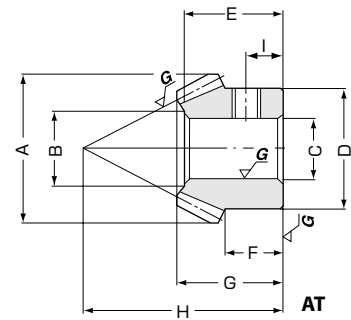
# KSP Nissei Ground Spiral Bevel Gears

Module 1.5 ~ 4.5



Specifications	
Precision grade	JIS B 1704 grade 0
Gear teeth	Gleason
Pressure angle	20°
Helix angle	35°
Material	SCM415 *
Heat treatment	Overall carburizing
Tooth hardness	60 ~ 63HRC * *

\* Module 3.5 and larger are made of SCM420.  
\* \* Tooth Hardness for module 2 and 2.5 is between 80 to 83 HRA.



Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Catalog No.	Gear ratio	Module	No. of teeth	Direction of spiral	Pitch dia.	Face width	Shape	Pitch dia.	Holding surface dia.	Bore	Hub dia.	Length of bore
								A	B	C <sub>H7</sub>	D	E
KSP039002GC P KSP039002GF G	2	m1.5	13	L	19.5	7	AT	21	10.2	8	16	14
			26	R	39	B	38.5	24.1	12	24	13	
KSP056002GF P KSP056002GF G	2	m2	14	L	28	10	B	30	15.3	10	20	12
			28	R	56	B	56	35.6	16	30	18	
KSP075002GF P KSP075002GF G	2	m2.5	15	L	37.5	14	B	40	16.9	14	30	17
			30	R	75	C	75	36	22	44	24	
KSP096002GF P KSP096002GF G	2	m3	16	L	48	18	B	53	23.5	17	36	19
			32	R	96	C	96	46	27	56	29	
KSP119002GF P KSP119002GF G	2	m3.5	17	L	59.5	22	A	65	31.1	22	44	25
			34	R	119	C	119	54	33	63	34	
KSP145002GF P KSP145002GF G	2	m4	18	L	72	27	A	78	31.3	26	54	28
			36	R	144	C	145	60	36	73	39	
KSP172002GF P KSP172002GF G	2	m4.5	19	L	85.5	32	A	93	44.4	33	69	34
			38	R	171	C	172	70	42	79	46	

- [Caution on Product Characteristics] ① The allowable torque is calculated by converting the output torque (600 rpm) on page 485 to kgf/m, according to assumed usage conditions.  
② These gears produce axial thrust forces. See page 452 for more details.



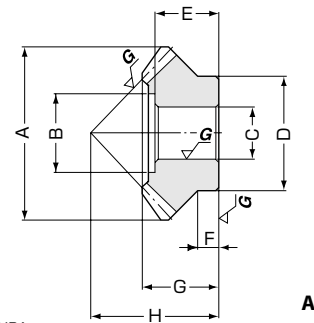
# KSP Nissei Ground Spiral Bevel Gears

Module 1.5 ~ 4.5



Specifications	
Precision grade	JIS B 1704 grade 0
Gear teeth	Gleason
Pressure angle	20°
Helix angle	35°
Material	SCM415 *
Heat treatment	Carburizing (bore & hubs are masked)
Tooth hardness	60 ~ 63HRC * *

\* Module 3.5 and larger are made of SCM420.  
\* \* Tooth Hardness for module 2 and 2.5 is between 80 to 83 HRA.



Bevel Gears

Screw Gears

Worm Gear Pair

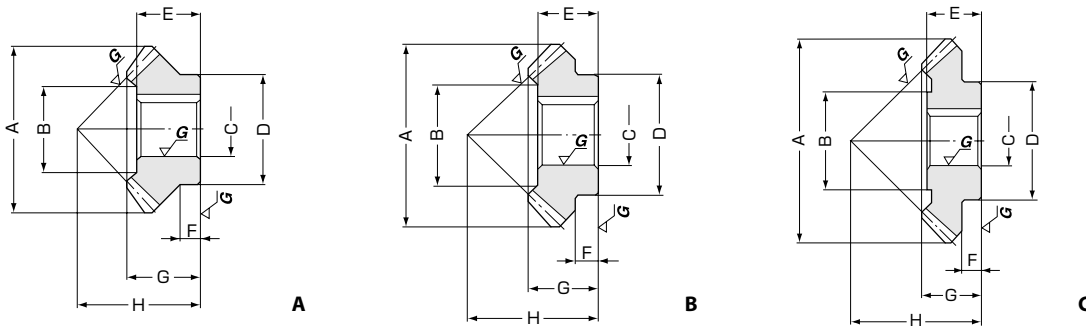
Bevel Gearboxes

Other Products

Catalog No.	Gear ratio	Module	No. of teeth	Direction of spiral	Pitch dia.	Face width	Shape	Pitch dia.	Holding surface dia.	Bore	Hub dia.	Length of bore
								A	B	C <sub>H7</sub>	D	E
KSP039002GU P KSP039002GU G	2	m1.5	13	L	19.5	7	A	21	10.2	8	16	14
			26	R	39	B	38.5	24	10	24	13	
KSP056002GU P KSP056002GU G	2	m2	14	L	28	10	B	30	15.3	8	20	12
			28	R	56	B	56	35.5	12	30	18	
KSP075002GU P KSP075002GU G	2	m2.5	15	L	37.5	14	A'	40	20	12	30	17
			30	R	75	C	75	36	16	44	24	
KSP096002GU P KSP096002GU G	2	m3	16	L	48	18	B	53	23.5	12	36	19
			32	R	96	C	96	46	20	56	29	
KSP119002GU P KSP119002GU G	2	m3.5	17	L	59.5	22	A	65	34	16	44	25
			34	R	119	C	119	54	26	63	34	
KSP145002GU P KSP145002GU G	2	m4	18	L	72	27	A	78	38	20	54	28
			36	R	144	C	145	60	30	73	39	
KSP172002GU P KSP172002GU G	2	m4.5	19	L	85.5	32	A	93	48	26	69	34
			38	R	171	C	172	70	36	79	46	

- [Caution on Product Characteristics] ① The allowable torque is calculated by converting the output torque (600 rpm) on page 485 to kgf/m, according to assumed usage conditions.  
② These gears produce axial thrust forces. See page 452 for more details.

Ground Spiral Bevel Gears

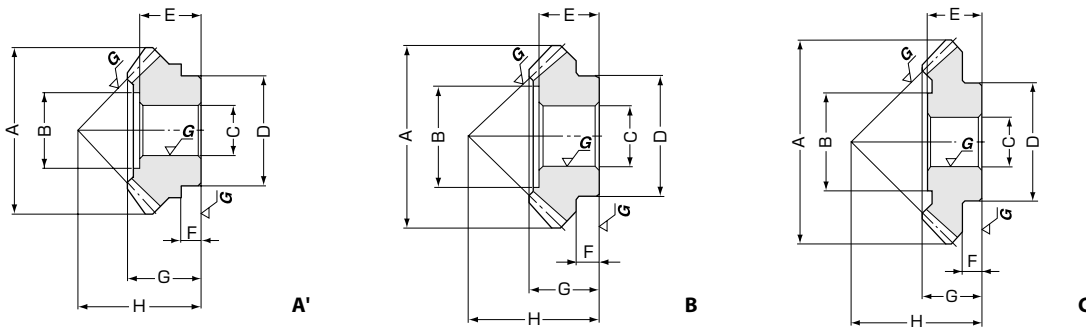


Hub width F	Total length G	Mounting distance H	Keyway (Screw)	Allowable torque (kgf-m)	Backlash (mm)	Weight (kg)	Catalog No.
7.6 7	14.5 15	28 22	(2-M4, l=5) 4 x 1.8	0.89	0 ~0.05	0.02 0.06	KSP039002GC P KSP039002GF G
2.5 8	13 20.5	32 30	3 x 1.4 5 x 2.3	2.65	0 ~0.05	0.03 0.18	KSP056002GF P KSP056002GF G
4.6 11	19.5 25.5	44 38	5 x 2.3 6 x 2.8	6.43	0.05~0.10	0.09 0.41	KSP075002GF P KSP075002GF G
2.5 12	21.5 31	53 47	5 x 2.3 8 x 3.3	12.5	0.05~0.10	0.18 0.85	KSP096002GF P KSP096002GF G
3.6 15	27.5 35.5	67 55	6 x 2.8 10 x 3.3	22.2	0.05~0.10	0.33 1.37	KSP119002GF P KSP119002GF G
3.5 16	33 40.5	80 64	8 x 3.3 10 x 3.3	36.3	0.05~0.10	0.57 2.34	KSP145002GF P KSP145002GF G
4.4 20	38 47	94 75	10 x 3.3 12 x 3.3	59.9	0.05~0.10	0.91 3.60	KSP172002GF P KSP172002GF G

[Caution on Secondary Operations] ① No secondary operations can be performed on these precision finished gears due to the applied carburizing process.

Spur Gears  
Helical Gears  
Internal Gears  
Racks  
CP Racks & Pinions

Ground Spiral Bevel Gears



Hub width F	Total length G	Mounting distance H	Machinable max. bore	Allowable torque (kgf-m)	Backlash (mm)	Weight (kg)	Catalog No.
7.6 7	14.5 15	28 22	— 20	0.89	0 ~0.05	0.02 0.07	KSP039002GU P KSP039002GU G
2.5 8	13 20.5	32 30	10 20	2.65	0 ~0.05	0.04 0.19	KSP056002GU P KSP056002GU G
4.5 11	19.5 25.5	44 38	14 25	6.43	0.05~0.10	0.10 0.44	KSP075002GU P KSP075002GU G
2.5 12	21.5 31	53 47	19 32	12.5	0.05~0.10	0.20 0.91	KSP096002GU P KSP096002GU G
3.6 15	27.5 35.5	67 55	25 40	22.2	0.05~0.10	0.36 1.45	KSP119002GU P KSP119002GU G
3.5 16	33 40.5	80 64	30 42	36.3	0.05~0.10	0.65 2.44	KSP145002GU P KSP145002GU G
4.4 20	38 47	94 75	38 50	59.9	0.05~0.10	0.97 3.80	KSP172002GU P KSP172002GU G

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 452) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK system for quick modification of KHK stock gears is also available.

Miter Gears  
Bevel Gears  
Screw Gears  
Worm Gear Pair  
Bevel Gearboxes  
Other Products



Spur  
Gears

Helical  
Gears

Internal  
Gears

Racks

CP Racks  
& Pinions

Miter  
Gears

Bevel  
Gears

Screw  
Gears

Worm  
Gear Pair

Bevel  
Gearboxes

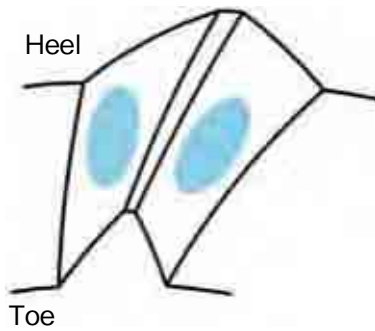
Other  
Products

## Adjusting Tooth Contact

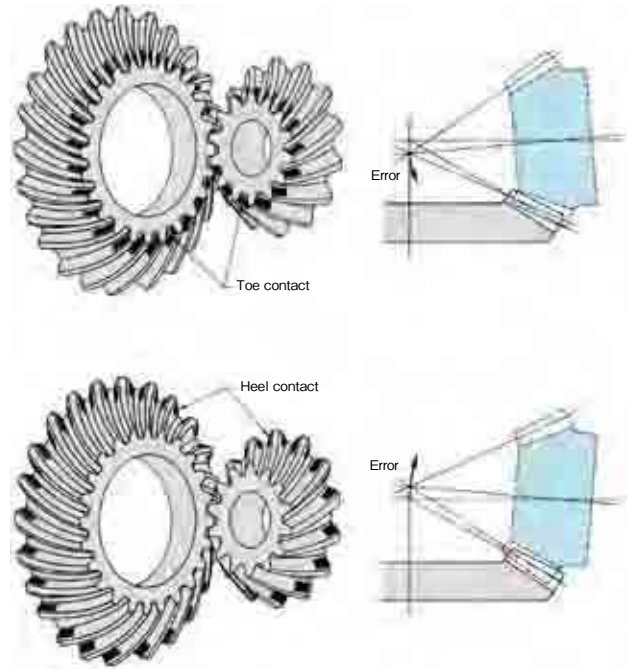
### < Centering tooth contact >

- (1) When assembled correctly, the contact will occur in the middle of the tooth flank.
- (2) The contact area along the tooth face should be in the center of the tooth, but somewhat closer to the toe is ideal.

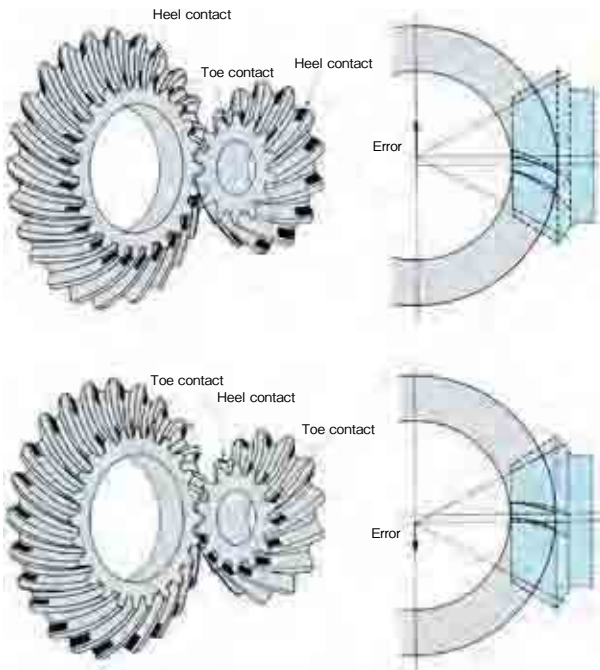
When the gears are assembled in to the gearbox and the backlash is adjusted, adjust the gearbox to obtain the tooth contact as shown below. Inaccurate assembly will lead to irregular noise and uneven wear,



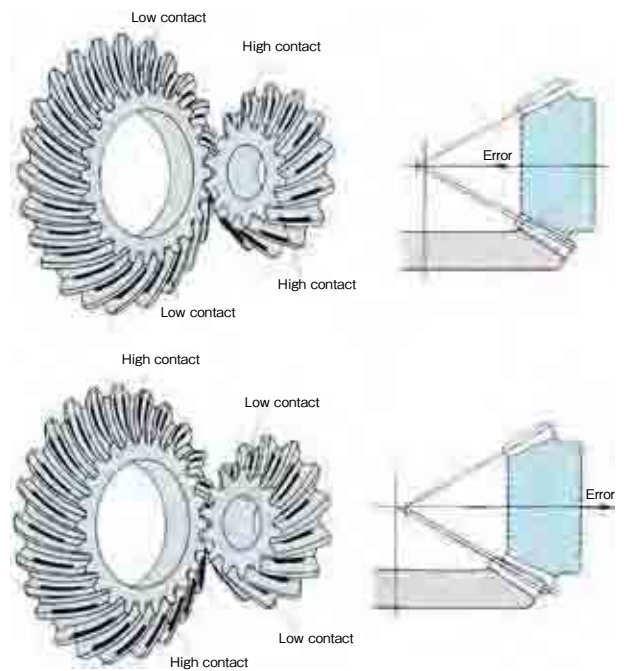
### (1) When there is an angular error of the shafts



### (2) When the pinion shaft is offset



### (3) When the mounting distance of the pinion is incorrect



**SN**  
Steel Screw Gears

m1 ~ 4    Page 496

RoHS

**SUN**  
Stainless Steel Screw Gears

Newly added

m1 ~ 3    Page 500

RoHS

**AN**  
Aluminum-Bronze Screw Gears

m1 ~ 4    Page 502

RoHS

**PN**  
Plastic Screw Gears

m1.5 ~ 3    Page 504

RoHS



# Screw Gears

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

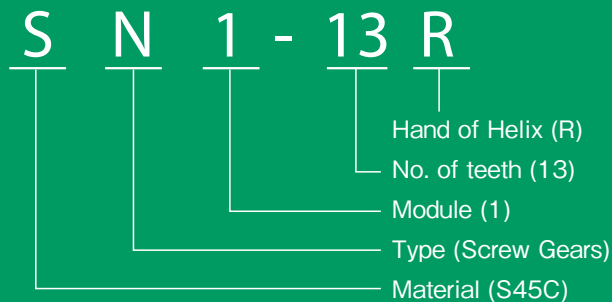
Bevel Gearboxes

Other Products

## Catalog Number of KHK Stock Gears

The Catalog Number for KHK stock gears is based on the simple formula listed below. Please order KHK gears by specifying the Catalog Numbers.

(Example) Screw Gears

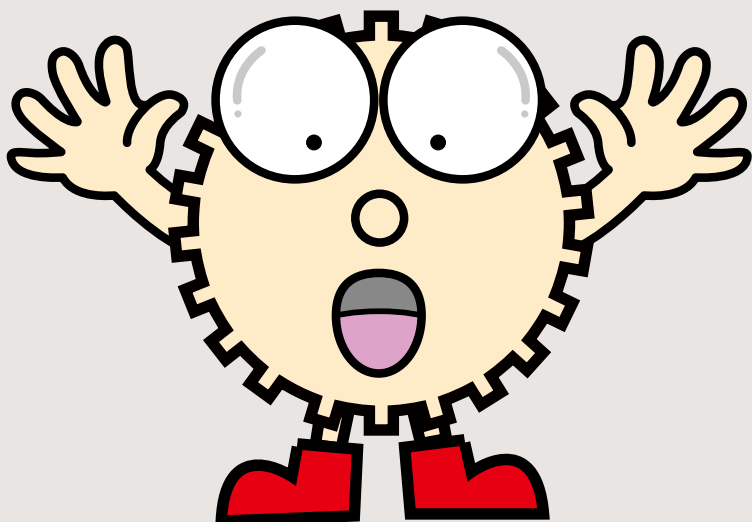


### Material

S    S45C  
SU   SUS303  
A    CAC702  
P    MC901

### Type

N    Screw Gears



### Feature Icons

- RoHS Compliant Product
- Re-machinable Product
- Finished Product
- Heat Treated Product
- Ground Gear
- Stainless Product
- Resin Product
- Copper Alloy Product
- Injection Molded Product
- Black Oxide coated Product



## Characteristics



KHK stock screw gears come in four materials, S45C, SUS303, CAC702 (formerly A BC2) and MC nylon, in modules 1 ~ 4 and numbers of teeth from 10 to 30.

Catalog No.	Module	Material	Heat Treatment	Tooth Surface Finish	Precision JIS B 1702-1:1998	Secondary Operations	Features
<b>SN</b>	1 ~ 4	S45C	—	Cut	N9	○	Popular screw gears. Additionally, gear tooth induction hardening secondary operations can be performed.
<b>SUN</b>	1 ~ 3	SUS303	—	Cut	N9	○	Suitable for food machinery due to SUS303's rust resistant qualities.
<b>AN</b>	1 ~ 4	CAC702 (A & BC2)	—	Cut	N9	○	Aluminum bronze made products and have excellent wear resistance.
<b>PN</b>	1.5 ~ 3	MC901	—	Cut	N9	○	Light-weight products made of MC Nylon and can be used without lubrication.

○ Possible △ Partly possible × Not possible

## Selection Hints

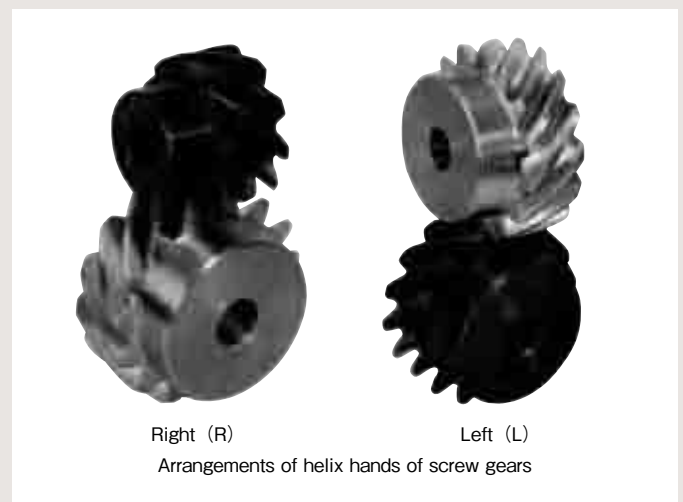


Please select the most suitable products by carefully considering the characteristics of items and contents of the product tables. It is also important to read all applicable "CAUTION" notes shown below before the final selection. Since screw gears come in right- or left-hand helix, make sure to include the letter "R" or "L" in the catalog number when you order.

### 1. Caution in Selecting the Mating Gears

Screw gears are used for offset shafts. Whether the shafts are paralleled offset or skewed offset depends on the helix hands of the mating gears.

Direction of shaft	Arrangement of helix hands
Skewed shafts	RH-RH or LH-LH
Parallel shafts	RH-LH



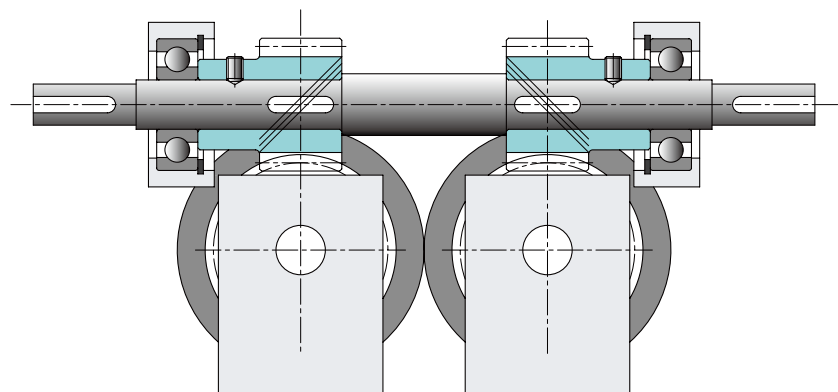
### Trusted quality achieved by years of experience.

Efficient production by lapping cutting processes.



Gear cutting by a Hobbing Machine

### Application Example



Feed by rollers \* (It rotates 2 rollers by one input shaft.)

\* The illustration above is a design example, not a design for machinery or a device in actual use.

## Application Hints



### 2. Caution in Selecting Gears Based on Gear Strength

The allowable surface strength listed in the product pages were derived using the Niemann formula as reference values (for the case of skewed offset shafts).

There is paucity of data on the strength of screw gears. The values of constant  $K_0$  used in the calculations, which depend on the material of the mating gears, are our estimates. The mathematic expression below shows the Niemann formula to determine allowable tangential force  $F_t$  (kgf) and allowable torque  $T$  (kgf, m) on a basic circle.

$$F_t = 1.43d_1^2 f_z K_s$$

$$T = \frac{F_t d_1}{2000}$$

Where

$d_1$  : standard pitch diameter of pinion (mm)

$f_z$  : coefficient based on no. of teeth combination

$K_s$  : coefficient based on materials and sliding

$$K_s = K_0 \frac{2}{2 + V_s}$$

Where

$K_0$  : coefficient based on material selection

$V_s$  : sliding speed (m/s)

$$V_s = \frac{\pi n d_1}{60000 \cos \beta}$$

Where

$n$  : rotation (rpm)

$\beta$  : helix angle ( $45^\circ$ )

### Value of $f_z$

$Z_2 \backslash Z_1$	10	13	15	20	26	30
10	1.538					
13	2.005	1.538				
15	2.279	1.786	1.538			
20	2.963	2.329	2.053	1.538		
26	3.695	2.963	2.588	2.005	1.538	
30	4.161	3.350	2.963	2.279	1.786	1.538

### $K_0$ values depending on material combination

Catalog No.	Mating gear	$K_0$	The maximum allowable sliding speed m/s	No. of teeth of mating gears	Rotation
<b>SN</b>	SN	0.0030	2.5	Same no. of teeth	100rpm
<b>SUN</b>	SN	0.0030 <small>Note 1</small>	2.5 <small>Note 1</small>		
<b>AN</b>	SN	0.0050	5		
<b>PN</b>	SN	0.0030 <small>Note 1</small> (0.0021)	2.5 <small>Note 1</small> (1.0)		

**(NOTE 1)**  $K_0$  values and the maximum allowable sliding speed of SUN PN products are set by KHK. Screw gears are basically used with lubrication. In case of using PN products without lubrication, the parenthetical values shown in the table are applied.

In order to use KHK stock screw gears safely, read the Application Hints carefully before proceeding. Also, please refer to the "Application Hints" in the technical information section on KHK stock spur gears (Page 36) when performing secondary operations.

### 1. Points of Caution in Assembling

- ① KHK stock screw gears are designed to give the proper backlash when assembled using the center distance given by the formula below with a tolerance of H7 to H8. The amount of backlash is given in the product table for each gear.

$$a = \frac{d_1 + d_2}{2}$$

Where

$a$  : Center distance

$d_1$  : Pitch diameter of pinion

$d_2$  : Pitch diameter of gear

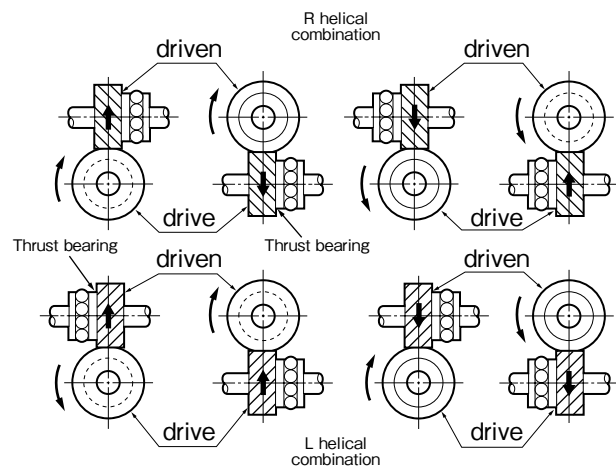
- ② Overall length tolerance of Screw Gears

Total Length (mm)	Tolerance
up to 30	0 - 0.10
30 up to 100	0 - 0.15

**(CAUTION)** PN Plastic Screw Gears are excluded.

- ③ Due to the helix of screw gears, they produce axial thrust forces. The bearings must be selected properly to be able to handle these thrust forces. The directions of thrust change with the hand of helix and the direction of rotation as illustrated below.

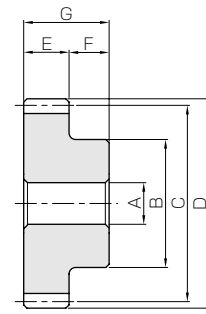
### Direction of rotation and thrust force



**(CAUTION)** For parallel shaft applications, see the Application Hints for KHK Helical Gears. (Page 351).



Specifications	
Precision grade	JIS grade N9 (JIS B1702-1: 1998) JIS grade 5 (JIS B1702: 1976)
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Helix angle	45°
Material	S45C
Heat treatment	—



S1

Catalog No.	Module	No. of teeth	Direction of helix	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length
					A <sub>H7</sub>	B	C	D	E	F	G
SN1-13R SN1-13L	m1	13	R L	S1	6	15	18.38	20.38	10	10	20
SN1-15R SN1-15L		15	R L	S1	6	18	21.21	23.21	10	10	20
SN1-20R SN1-20L		20	R L	S1	8	25	28.28	30.28	10	10	20
SN1-26R SN1-26L		26	R L	S1	10	30	36.77	38.77	10	10	20
SN1-30R SN1-30L		30	R L	S1	10	35	42.43	44.43	10	10	20
SN1.5-10R SN1.5-10L	m1.5	10	R L	S1	8	16	21.21	24.21	15	10	25
SN1.5-13R SN1.5-13L		13	R L	S1	10	23	27.58	30.58	15	10	25
SN1.5-15R SN1.5-15L		15	R L	S1	10	25	31.82	34.82	15	10	25
SN1.5-20R SN1.5-20L		20	R L	S1	12	30	42.43	45.43	15	10	25
SN1.5-26R SN1.5-26L		26	R L	S1	12	40	55.15	58.15	15	10	25
SN1.5-30R SN1.5-30L	30	R L	S1	12	45	63.64	66.64	15	10	25	
SN2-10R SN2-10L	m2	10	R L	S1	12	22	28.28	32.28	20	15	35
SN2-13R SN2-13L		13	R L	S1	12	30	36.77	40.77	20	15	35
SN2-15R SN2-15L		15	R L	S1	12	35	42.43	46.43	20	15	35
SN2-20R SN2-20L		20	R L	S1	15	45	56.57	60.57	20	15	35
SN2-26R SN2-26L		26	R L	S1	20	60	73.54	77.54	20	15	35
SN2-30R SN2-30L	30	R L	S1	20	65	84.85	88.85	20	15	35	

[Caution on Product Characteristics]

- ① When mating screw gears made of the same material they may cause abrasion and scoring. It is recommended to mate Screw Gears composed of different materials.
- ② The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 495 for more details.
- ③ The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.
- ④ For offset shaft applications, match a RH with a RH, or LH with a LH, to make a set of screw gears. For parallel shaft applications, mesh opposite hands (RH and LH) of helical gear sets. See page 494 for more details.
- ⑤ If the bore diameter is less than  $\phi 4$ , then the bore tolerance class is H8. If the bore diameter is  $\phi 5$  or  $\phi 6$ , and the hole length (total length) exceeds 3 times the diameter, then the class is also H8.



Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No.
Bending strength	Surface durability	Bending strength	Surface durability			
—	0.19	—	0.019	0.08~0.18	0.030	<b>SN1-13R</b> <b>SN1-13L</b>
—	0.29	—	0.029	0.08~0.18	0.043	<b>SN1-15R</b> <b>SN1-15L</b>
—	0.66	—	0.068	0.08~0.18	0.080	<b>SN1-20R</b> <b>SN1-20L</b>
—	1.42	—	0.14	0.10~0.22	0.13	<b>SN1-26R</b> <b>SN1-26L</b>
—	2.14	—	0.22	0.10~0.22	0.17	<b>SN1-30R</b> <b>SN1-30L</b>
—	0.29	—	0.029	0.08~0.20	0.048	<b>SN1.5-10R</b> <b>SN1.5-10L</b>
—	0.62	—	0.063	0.10~0.22	0.088	<b>SN1.5-13R</b> <b>SN1.5-13L</b>
—	0.93	—	0.095	0.10~0.22	0.12	<b>SN1.5-15R</b> <b>SN1.5-15L</b>
—	2.14	—	0.22	0.10~0.22	0.20	<b>SN1.5-20R</b> <b>SN1.5-20L</b>
—	4.51	—	0.46	0.12~0.26	0.36	<b>SN1.5-26R</b> <b>SN1.5-26L</b>
—	6.75	—	0.69	0.12~0.26	0.48	<b>SN1.5-30R</b> <b>SN1.5-30L</b>
—	0.66	—	0.068	0.10~0.22	0.11	<b>SN2-10R</b> <b>SN2-10L</b>
—	1.42	—	0.14	0.12~0.26	0.22	<b>SN2-13R</b> <b>SN2-13L</b>
—	2.14	—	0.22	0.12~0.26	0.30	<b>SN2-15R</b> <b>SN2-15L</b>
—	4.84	—	0.49	0.12~0.26	0.53	<b>SN2-20R</b> <b>SN2-20L</b>
—	10.1	—	1.03	0.14~0.30	0.91	<b>SN2-26R</b> <b>SN2-26L</b>
—	15.0	—	1.53	0.14~0.30	1.19	<b>SN2-30R</b> <b>SN2-30L</b>

[Caution on Secondary Operations] ① Please read “Caution on Performing Secondary Operations” (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK’s system for quick modification of KHK stock gears is also available.

② Avoid performing secondary operations that narrow the tooth width, as it affects precision and strength.

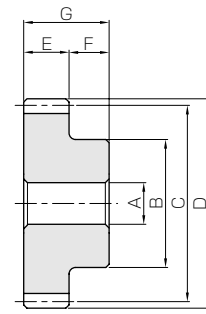
Spur  
GearsHelical  
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Gears

Racks

CP Racks  
& PinionsMiter  
GearsBevel  
GearsScrew  
GearsWorm  
Gear PairBevel  
GearboxesOther  
Products



Specifications	
Precision grade	JIS grade N9 (JIS B1702-1: 1998) JIS grade 5 (JIS B1702: 1976)
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Helix angle	45°
Material	S45C
Heat treatment	—



S1

Catalog No.	Module	No. of teeth	Direction of helix	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length
					A <sub>H7</sub>	B	C	D	E	F	G
<b>SN2.5-10R</b> <b>SN2.5-10L</b>	<b>m2.5</b>	10	R L	S1	12	26	35.36	40.36	22	16	38
<b>SN2.5-13R</b> <b>SN2.5-13L</b>		13	R L	S1	15	35	45.96	50.96	22	16	38
<b>SN2.5-15R</b> <b>SN2.5-15L</b>		15	R L	S1	15	40	53.03	58.03	22	16	38
<b>SN2.5-20R</b> <b>SN2.5-20L</b>		20	R L	S1	20	60	70.71	75.71	22	16	38
<b>SN2.5-26R</b> <b>SN2.5-26L</b>		26	R L	S1	20	70	91.92	96.92	22	16	38
<b>SN2.5-30R</b> <b>SN2.5-30L</b>		30	R L	S1	20	80	106.07	111.07	22	16	38
<b>SN3-10R</b> <b>SN3-10L</b>	<b>m3</b>	10	R L	S1	15	34	42.43	48.43	25	18	43
<b>SN3-13R</b> <b>SN3-13L</b>		13	R L	S1	20	45	55.15	61.15	25	18	43
<b>SN3-15R</b> <b>SN3-15L</b>		15	R L	S1	20	50	63.64	69.64	25	18	43
<b>SN3-20R</b> <b>SN3-20L</b>		20	R L	S1	20	60	84.85	90.85	25	18	43
<b>SN3-26R</b> <b>SN3-26L</b>		26	R L	S1	20	80	110.31	116.31	25	18	43
<b>SN3-30R</b> <b>SN3-30L</b>		30	R L	S1	20	90	127.28	133.28	25	18	43
<b>SN4-10R</b> <b>SN4-10L</b>	<b>m4</b>	10	R L	S1	20	45	56.57	64.57	30	20	50
<b>SN4-13R</b> <b>SN4-13L</b>		13	R L	S1	20	60	73.54	81.54	30	20	50
<b>SN4-15R</b> <b>SN4-15L</b>		15	R L	S1	20	70	84.85	92.85	30	20	50
<b>SN4-20R</b> <b>SN4-20L</b>		20	R L	S1	20	90	113.14	121.14	30	20	50
<b>SN4-26R</b> <b>SN4-26L</b>		26	R L	S1	20	100	147.08	155.08	30	20	50
<b>SN4-30R</b> <b>SN4-30L</b>		30	R L	S1	20	110	169.71	177.71	30	20	50

[Caution on Product Characteristics]

- ① When mating screw gears made of the same material they may cause abrasion and scoring. It is recommended to mate Screw Gears composed of different materials.
- ② The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 495 for more details.
- ③ The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.
- ④ For offset shaft applications, match a RH with a RH, or LH with a LH, to make a set of screw gears. For parallel shaft applications, mesh opposite hands (RH and LH) of helical gear sets. See page 494 for more details.

Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No.
Bending strength	Surface durability	Bending strength	Surface durability			
—	1.27	—	0.13	0.12~0.24	0.20	SN2.5-10R SN2.5-10L
—	2.68	—	0.27	0.14~0.28	0.35	SN2.5-13R SN2.5-13L
—	4.03	—	0.41	0.14~0.28	0.49	SN2.5-15R SN2.5-15L
—	9.07	—	0.92	0.14~0.28	0.94	SN2.5-20R SN2.5-20L
—	18.8	—	1.91	0.16~0.34	1.54	SN2.5-26R SN2.5-26L
—	27.7	—	2.83	0.16~0.34	2.06	SN2.5-30R SN2.5-30L
—	2.14	—	0.22	0.12~0.26	0.35	SN3-10R SN3-10L
—	4.51	—	0.46	0.14~0.32	0.59	SN3-13R SN3-13L
—	6.75	—	0.69	0.14~0.32	0.80	SN3-15R SN3-15L
—	15.0	—	1.53	0.14~0.32	1.40	SN3-20R SN3-20L
—	30.8	—	3.14	0.18~0.38	2.48	SN3-26R SN3-26L
—	45.4	—	4.62	0.18~0.38	3.29	SN3-30R SN3-30L
—	4.84	—	0.49	0.16~0.34	0.72	SN4-10R SN4-10L
—	10.1	—	1.03	0.18~0.38	1.32	SN4-13R SN4-13L
—	15.0	—	1.53	0.18~0.38	1.81	SN4-15R SN4-15L
—	33.0	—	3.37	0.18~0.38	3.24	SN4-20R SN4-20L
—	66.7	—	6.80	0.20~0.44	5.11	SN4-26R SN4-26L
—	97.1	—	9.90	0.20~0.44	6.70	SN4-30R SN4-30L

- [Caution on Secondary Operations] ① Please read “Caution on Performing Secondary Operations” (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Avoid performing secondary operations that narrow the tooth width, as it affects precision and strength.

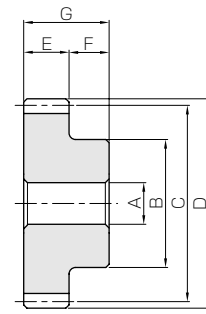
Spur  
GearsHelical  
GearsInternal  
Gears

Racks

CP Racks  
& PinionsMiter  
GearsBevel  
GearsScrew  
GearsWorm  
Gear PairBevel  
GearboxesOther  
Products



Specifications	
Precision grade	JIS grade N9 (JIS B1702-1: 1998) JIS grade 5 (JIS B1702: 1976)
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Helix angle	45°
Material	SUS303
Heat treatment	—



S1

Catalog No. <small>New items indicated in blue letters</small>	Module	No. of teeth	Direction of helix	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length
					A <sub>H7</sub>	B	C	D	E	F	G
<b>SUN1-13R</b> <b>SUN1-13L</b>	<b>m1</b>	13	R L	S1	6	15	18.38	20.38	10	10	20
<b>SUN1-15R</b> <b>SUN1-15L</b>		15	R L	S1	6	18	21.21	23.21	10	10	20
<b>SUN1.5-10R</b> <b>SUN1.5-10L</b>	<b>m1.5</b>	10	R L	S1	8	16	21.21	24.21	15	10	25
<b>SUN1.5-13R</b> <b>SUN1.5-13L</b>		13	R L	S1	10	23	27.58	30.58	15	10	25
<b>SUN1.5-15R</b> <b>SUN1.5-15L</b>		15	R L	S1	10	25	31.82	34.82	15	10	25
<b>SUN1.5-20R</b> <b>SUN1.5-20L</b>		20	R L	S1	12	30	42.43	45.43	15	10	25
<b>SUN2-10R</b> <b>SUN2-10L</b>	<b>m2</b>	10	R L	S1	12	22	28.28	32.28	20	15	35
<b>SUN2-13R</b> <b>SUN2-13L</b>		13	R L	S1	12	30	36.77	40.77	20	15	35
<b>SUN2-15R</b> <b>SUN2-15L</b>		15	R L	S1	12	35	42.43	46.43	20	15	35
<b>SUN2-20R</b> <b>SUN2-20L</b>		20	R L	S1	15	45	56.57	60.57	20	15	35
<b>SUN2.5-10R</b> <b>SUN2.5-10L</b>	<b>m2.5</b>	10	R L	S1	12	26	35.36	40.36	22	16	38
<b>SUN2.5-13R</b> <b>SUN2.5-13L</b>		13	R L	S1	15	35	45.96	50.96	22	16	38
<b>SUN2.5-15R</b> <b>SUN2.5-15L</b>		15	R L	S1	15	40	53.03	58.03	22	16	38
<b>SUN2.5-20R</b> <b>SUN2.5-20L</b>		20	R L	S1	20	60	70.71	75.71	22	16	38
<b>SUN3-10R</b> <b>SUN3-10L</b>	<b>m3</b>	10	R L	S1	15	34	42.43	48.43	25	18	43
<b>SUN3-13R</b> <b>SUN3-13L</b>		13	R L	S1	20	45	55.15	61.15	25	18	43
<b>SUN3-15R</b> <b>SUN3-15L</b>		15	R L	S1	20	50	63.64	69.64	25	18	43
<b>SUN3-20R</b> <b>SUN3-20L</b>		20	R L	S1	20	60	84.85	90.85	25	18	43

[Caution on Product Characteristics]

- ① When mating screw gears made of the same material they may cause abrasion and scoring. It is recommended to mate Screw Gears composed of different materials.
- ② The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 495 for more details.
- ③ The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.
- ④ For offset shaft applications, match a RH with a RH, or LH with a LH, to make a set of screw gears. For parallel shaft applications, mesh opposite hands (RH and LH) of helical gear sets. See page 494 for more details.
- ⑤ If the bore diameter is less than  $\phi 4$ , then the bore tolerance class is H8. If the bore diameter is  $\phi 5$  or  $\phi 6$ , and the hole length (total length) exceeds 3 times the diameter, then the class is also H8.

Newly added

Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No. New items indicated in blue letters
Bending strength	Surface durability	Bending strength	Surface durability			
—	0.19	—	0.019	0.08~0.18	0.030	SUN1-13R SUN1-13L
—	0.29	—	0.029	0.08~0.18	0.043	SUN1-15R SUN1-15L
—	0.29	—	0.029	0.08~0.20	0.047	SUN1.5-10R SUN1.5-10L
—	0.62	—	0.063	0.10~0.22	0.087	SUN1.5-13R SUN1.5-13L
—	0.93	—	0.095	0.10~0.22	0.12	SUN1.5-15R SUN1.5-15L
—	2.14	—	0.22	0.10~0.22	0.20	SUN1.5-20R SUN1.5-20L
—	0.66	—	0.068	0.10~0.22	0.11	SUN2-10R SUN2-10L
—	1.42	—	0.14	0.12~0.26	0.22	SUN2-13R SUN2-13L
—	2.14	—	0.22	0.12~0.26	0.30	SUN2-15R SUN2-15L
—	4.84	—	0.49	0.12~0.26	0.53	SUN2-20R SUN2-20L
—	1.27	—	0.13	0.12~0.24	0.20	SUN2.5-10R SUN2.5-10L
—	2.68	—	0.27	0.14~0.28	0.35	SUN2.5-13R SUN2.5-13L
—	4.03	—	0.41	0.14~0.28	0.48	SUN2.5-15R SUN2.5-15L
—	9.07	—	0.92	0.14~0.28	0.93	SUN2.5-20R SUN2.5-20L
—	2.14	—	0.22	0.12~0.26	0.34	SUN3-10R SUN3-10L
—	4.51	—	0.46	0.14~0.32	0.58	SUN3-13R SUN3-13L
—	6.75	—	0.69	0.14~0.32	0.79	SUN3-15R SUN3-15L
—	15.04	—	1.53	0.14~0.32	1.39	SUN3-20R SUN3-20L

- [Caution on Secondary Operations] ① Please read “Caution on Performing Secondary Operations” (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Avoid performing secondary operations that narrow the tooth width, as it affects precision and strength.

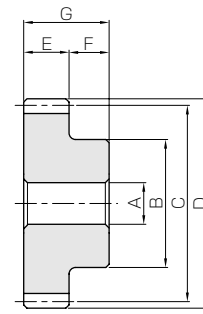
Spur  
GearsHelical  
GearsInternal  
Gears

Racks

CP Racks  
& PinionsMiter  
GearsBevel  
GearsScrew  
GearsWorm  
Gear PairBevel  
GearboxesOther  
Products



Specifications	
Precision grade	JIS grade N9 (JIS B1702-1: 1998) JIS grade 5 (JIS B1702: 1976)
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Helix angle	45°
Material	CAC702 (formerly JIS A8BC2)
Heat treatment	—



S1

Catalog No.	Module	No. of teeth	Direction of helix	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length
					A <sub>H7</sub>	B	C	D	E	F	G
<b>AN1-13R</b> <b>AN1-13L</b>	<b>m1</b>	13	R L	S1	6	15	18.38	20.38	10	10	20
<b>AN1-15R</b> <b>AN1-15L</b>		15	R L	S1	6	18	21.21	23.21	10	10	20
<b>AN1.5-10R</b> <b>AN1.5-10L</b>	<b>m1.5</b>	10	R L	S1	8	16	21.21	24.21	15	10	25
<b>AN1.5-13R</b> <b>AN1.5-13L</b>		13	R L	S1	10	23	27.58	30.58	15	10	25
<b>AN1.5-15R</b> <b>AN1.5-15L</b>		15	R L	S1	10	25	31.82	34.82	15	10	25
<b>AN2-10R</b> <b>AN2-10L</b>	<b>m2</b>	10	R L	S1	12	22	28.28	32.28	20	15	35
<b>AN2-13R</b> <b>AN2-13L</b>		13	R L	S1	12	30	36.77	40.77	20	15	35
<b>AN2-15R</b> <b>AN2-15L</b>		15	R L	S1	12	35	42.43	46.43	20	15	35
<b>AN2.5-10R</b> <b>AN2.5-10L</b>	<b>m2.5</b>	10	R L	S1	12	26	35.36	40.36	22	16	38
<b>AN2.5-13R</b> <b>AN2.5-13L</b>		13	R L	S1	15	35	45.96	50.96	22	16	38
<b>AN2.5-15R</b> <b>AN2.5-15L</b>		15	R L	S1	15	40	53.03	58.03	22	16	38
<b>AN3-10R</b> <b>AN3-10L</b>	<b>m3</b>	10	R L	S1	15	34	42.43	48.43	25	18	43
<b>AN3-13R</b> <b>AN3-13L</b>		13	R L	S1	20	45	55.15	61.15	25	18	43
<b>AN3-15R</b> <b>AN3-15L</b>		15	R L	S1	20	50	63.64	69.64	25	18	43
<b>AN4-10R</b> <b>AN4-10L</b>	<b>m4</b>	10	R L	S1	20	45	56.57	64.57	30	20	50
<b>AN4-13R</b> <b>AN4-13L</b>		13	R L	S1	20	60	73.54	81.54	30	20	50
<b>AN4-15R</b> <b>AN4-15L</b>		15	R L	S1	20	70	84.85	92.85	30	20	50

[Caution on Product Characteristics]

- ① When mating screw gears made of the same material they may cause abrasion and scoring. It is recommended to mate Screw Gears composed of different materials.
- ② The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 495 for more details.
- ③ The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.
- ④ For offset shaft applications, match a RH with a RH, or LH with a LH, to make a set of screw gears. For parallel shaft applications, mesh opposite hands (RH and LH) of helical gear sets. See page 494 for more details.
- ⑤ If the bore diameter is less than  $\phi 4$ , then the bore tolerance class is H8. If the bore diameter is  $\phi 5$  or  $\phi 6$ , and the hole length (total length) exceeds 3 times the diameter, then the class is also H8.

## Aluminum-Bronze Screw Gears

Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No.
Bending strength	Surface durability	Bending strength	Surface durability			
—	0.31	—	0.032	0.08~0.18	0.029	AN1-13R AN1-13L
—	0.48	—	0.049	0.08~0.18	0.042	AN1-15R AN1-15L
—	0.48	—	0.049	0.08~0.20	0.046	AN1.5-10R AN1.5-10L
—	1.03	—	0.10	0.10~0.22	0.085	AN1.5-13R AN1.5-13L
—	1.55	—	0.16	0.10~0.22	0.11	AN1.5-15R AN1.5-15L
—	1.10	—	0.11	0.10~0.22	0.11	AN2-10R AN2-10L
—	2.36	—	0.24	0.12~0.26	0.21	AN2-13R AN2-13L
—	3.56	—	0.36	0.12~0.26	0.29	AN2-15R AN2-15L
—	2.11	—	0.22	0.12~0.24	0.20	AN2.5-10R AN2.5-10L
—	4.47	—	0.46	0.14~0.28	0.34	AN2.5-13R AN2.5-13L
—	6.72	—	0.69	0.14~0.28	0.47	AN2.5-15R AN2.5-15L
—	3.56	—	0.36	0.12~0.26	0.34	AN3-10R AN3-10L
—	7.51	—	0.77	0.14~0.32	0.57	AN3-13R AN3-13L
—	11.3	—	1.15	0.14~0.32	0.77	AN3-15R AN3-15L
—	8.07	—	0.82	0.16~0.34	0.70	AN4-10R AN4-10L
—	16.9	—	1.72	0.18~0.38	1.28	AN4-13R AN4-13L
—	25.1	—	2.56	0.18~0.38	1.75	AN4-15R AN4-15L

[Caution on Secondary Operations] ① Please read “Caution on Performing Secondary Operations” (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK’s system for quick modification of KHK stock gears is also available.

② Avoid performing secondary operations that narrow the tooth width, as it affects precision and strength.

Spur  
GearsHelical  
GearsInternal  
Gears

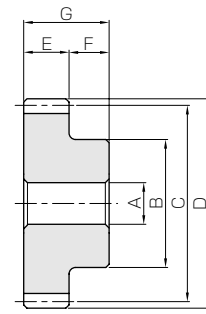
Racks

CP Racks  
& PinionsMiter  
GearsBevel  
GearsScrew  
GearsWorm  
Gear PairBevel  
GearboxesOther  
Products



Specifications	
Precision grade	JIS grade N9 (JIS B1702-1: 1998) * JIS grade 5 (JIS B1702: 1976)
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Helix angle	45°
Material	MC901
Heat treatment	—

\* The precision grade of this product is equivalent to the value shown in the table.



S1

Catalog No.	Module	No. of teeth	Direction of helix	Shape	Bore		Pitch dia.	Outside dia.	Face width	Hub width	Total length
					A	B					
<b>PN1.5-10R</b> <b>PN1.5-10L</b>	<b>m1.5</b>	10	R L	S1	6	16	21.21	24.21	15	10	25
<b>PN1.5-13R</b> <b>PN1.5-13L</b>		13	R L	S1	8	23	27.58	30.58	15	10	25
<b>PN1.5-15R</b> <b>PN1.5-15L</b>		15	R L	S1	8	25	31.82	34.82	15	10	25
<b>PN1.5-20R</b> <b>PN1.5-20L</b>		20	R L	S1	10	30	42.43	45.43	15	10	25
<b>PN2-10R</b> <b>PN2-10L</b>	<b>m2</b>	10	R L	S1	10	22	28.28	32.28	20	15	35
<b>PN2-13R</b> <b>PN2-13L</b>		13	R L	S1	10	30	36.77	40.77	20	15	35
<b>PN2-15R</b> <b>PN2-15L</b>		15	R L	S1	10	35	42.43	46.43	20	15	35
<b>PN2-20R</b> <b>PN2-20L</b>		20	R L	S1	12	45	56.57	60.57	20	15	35
<b>PN2.5-10R</b> <b>PN2.5-10L</b>	<b>m2.5</b>	10	R L	S1	10	26	35.36	40.36	22	16	38
<b>PN2.5-13R</b> <b>PN2.5-13L</b>		13	R L	S1	12	35	45.96	50.96	22	16	38
<b>PN2.5-15R</b> <b>PN2.5-15L</b>		15	R L	S1	12	40	53.03	58.03	22	16	38
<b>PN2.5-20R</b> <b>PN2.5-20L</b>		20	R L	S1	12	60	70.71	75.71	22	16	38
<b>PN3-10R</b> <b>PN3-10L</b>	<b>m3</b>	10	R L	S1	12	34	42.43	48.43	25	18	43
<b>PN3-13R</b> <b>PN3-13L</b>		13	R L	S1	15	45	55.15	61.15	25	18	43
<b>PN3-15R</b> <b>PN3-15L</b>		15	R L	S1	15	50	63.64	69.64	25	18	43
<b>PN3-20R</b> <b>PN3-20L</b>		20	R L	S1	15	60	84.85	90.85	25	18	43

[Caution on Product Characteristics]

- ① Significant variations in temperature or humidity can cause dimensional changes in plastic gears (MC Nylon gears), for bore size (H8 when produced), teeth diameter, and backlash. Please see the section "Design of Plastic Gears" in the technical reference (Page 693).
- ② When mating screw gears made of the same material they may cause abrasion and scoring. It is recommended to mate Screw Gears composed of different materials.
- ③ The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 495 for more details.
- ④ The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.
- ⑤ For offset shaft applications, match a RH with a RH, or LH with a LH, to make a set of screw gears. For parallel shaft applications, mesh opposite hands (RH and LH) of helical gear sets. See page 494 for more details.



Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No.
Bending strength	Surface durability	Bending strength	Surface durability			
—	0.29	—	0.029	0~0.38	0.0077	PN1.5-10R PN1.5-10L
—	0.62	—	0.063	0~0.38	0.014	PN1.5-13R PN1.5-13L
—	0.93	—	0.095	0~0.38	0.018	PN1.5-15R PN1.5-15L
—	2.14	—	0.22	0~0.38	0.031	PN1.5-20R PN1.5-20L
—	0.66	—	0.068	0~0.42	0.018	PN2-10R PN2-10L
—	1.42	—	0.14	0~0.42	0.034	PN2-13R PN2-13L
—	2.14	—	0.22	0~0.42	0.046	PN2-15R PN2-15L
—	4.84	—	0.49	0~0.44	0.081	PN2-20R PN2-20L
—	1.27	—	0.13	0~0.44	0.031	PN2.5-10R PN2.5-10L
—	2.68	—	0.27	0~0.44	0.055	PN2.5-13R PN2.5-13L
—	4.03	—	0.41	0~0.46	0.075	PN2.5-15R PN2.5-15L
—	9.07	—	0.92	0~0.46	0.15	PN2.5-20R PN2.5-20L
—	2.14	—	0.22	0~0.52	0.054	PN3-10R PN3-10L
—	4.51	—	0.46	0~0.54	0.094	PN3-13R PN3-13L
—	6.75	—	0.69	0~0.54	0.12	PN3-15R PN3-15L
—	15.0	—	1.53	0~0.54	0.21	PN3-20R PN3-20L

[Caution on Secondary Operations]

- ① Please read “Caution on Performing Secondary Operations” (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK’s system for quick modification of KHK stock gears is also available.
- ② Avoid performing secondary operations that narrow the tooth width, as it affects precision and strength.
- ③ Plastic gears are susceptible to the effects of temperature and moisture. Dimensional changes may occur while performing secondary operations and during post-machining operations.

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks &amp; Pinions

Miter Gears

Bevel Gears

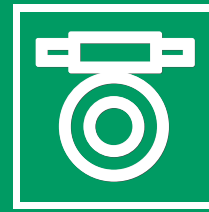
Screw Gears

Worm Gear Pair

Bevel Gearboxes

Other Products





# Worm Gear Pair

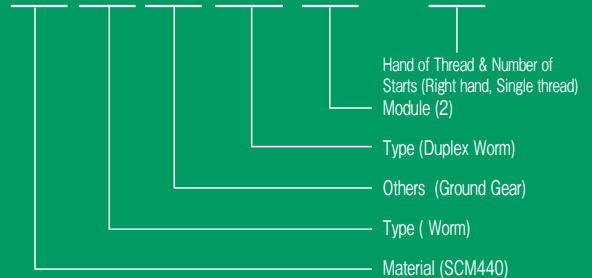
## Catalog Number of KHK Stock Gears

The Catalog Number for KHK stock gears is based on the simple formula listed below. Please order KHK gears by specifying the Catalog Numbers.

(Example) Worm Gear Pair

Worms

**K W G DL 2 - R1**



### Material

K SCM440  
S S45C  
SU SUS303

### Type

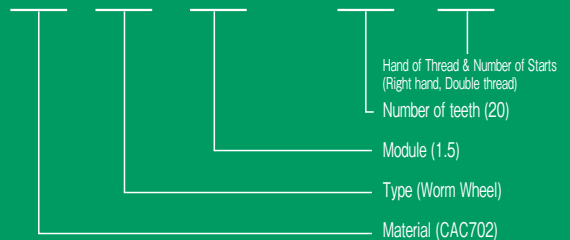
W Worms  
DL Duplex Worms

### Other Information

G Ground Gears  
S Worm Shafts

### Worm Wheels

**A G 1.5 - 20 R2**



### Material

A CAC702(\*AlBC2)  
B CAC502(\*PBC2)  
C FC200  
D Polyacetal  
P MC901

### Type

G Worm Wheels  
GDL Duplex Worm Wheels

\* ( ) indicates old JIS designation

<b>KWGD L · KWGDLS</b> Duplex Worms  m1.5 ~ 4 Page 516 RoHS, H, G, B	<b>AGDL</b> Duplex Worm Wheels  Reduction Ratio 20 ~ 60 m1.5 ~ 4 Page 516 RoHS, H, CAC	<b>KWG</b> Ground Worm Shafts  m0.5 ~ 6 Page 522 RoHS, H, G, B
<b>AG</b> Worm Wheels  Reduction Ratio 10 ~ 60 m0.5 ~ 1.5 Page 522 RoHS, H, CAC	<b>AGF</b> Worm Wheels  Reduction Ratio 10 ~ 60 m2 ~ 6 Page 526 RoHS, H, CAC	<b>SWG</b> Ground Worms  J Series Newly added m1 ~ 6 Page 532 RoHS, H, G, B
<b>AG</b> Worm Wheels  Reduction Ratio 10 ~ 60 m1 ~ 6 Page 532 RoHS, H, CAC	<b>SW</b> Steel Worms  J Series Newly added m0.5 ~ 6 Page 540 RoHS, H, B	<b>BG</b> Bronze Worm Wheels  Reduction Ratio 10 ~ 60 m0.5 ~ 6 Page 540 RoHS, H, CAC
<b>CG</b> Gray Iron Worm Wheels  Reduction Ratio 10 ~ 120 m1 ~ 6 Page 542 RoHS, H	<b>SUW</b> Stainless Steel Worms  J Series Newly added m0.5 ~ 3 Page 556 RoHS, H, SUS	<b>DG</b> Plastic Worm Wheels  Reduction Ratio 10 ~ 60 m0.5, 0.8 Page 556 RoHS, H, EP
<b>PG</b> Plastic Worm Wheels  Reduction Ratio 10 ~ 50 m1 ~ 3 Page 558 RoHS, H, EP		

### Feature Icons

RoHS Compliant Product	Stainless Product
Re-machinable Product	Resin Product
Finished Product	Copper Alloy Product
Heat Treated Product	Injection Molded Product
Ground Gear	Black Oxide coated Products

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

Bevel Gearboxes

Other Products

Bevel Gearboxes

Other Products



# Worm Gear Pair

## Characteristics



The simplest way to obtain a large speed reduction with high torque in a compact space is with worm gear drives. KHK stock worms and worm wheels are available in modules 0.5 to 6 and in speed ratios of 1/10 to 1/120, made in a variety of materials and styles. We also offer stock duplex worms and worm wheels with which you can obtain a very low backlash, high rotational precision system. The following table lists the main features for easy selection.

Type	Catalog No.	Module	No. of threads or reduction ratio	Material ( ) JIS	Heat treatment	Tooth surface finish	Precision KHK W 001 KHK W 002 NOTE 2	Features	
Duplex Worms & Worm Wheels	Worm	<b>KWGDL</b>	2 ~ 4	Single thread	SCM440	Thermal refined, gear teeth induction hardened	Ground	1	High-precision duplex worms with superior strength. A range of backlash values can be obtained by moving the worm axially.
	Worm	<b>KWGDLs</b>	1.5 ~ 4	Single thread	SCM440	Thermal refined, gear teeth induction hardened	Ground	1	Duplex worms with a shaft, excellent in accuracy and strength. A range of backlash values can be obtained by moving the worm axially.
	Worm Wheel	<b>AGDL</b>	1.5 ~ 4	20 ~ 60	CAC702 (A $\ell$ BC2)	—	Cut	1	Duplex worm wheels made of aluminum bronze, excellent in wear-resistance. The pitch accuracy is first grade.
Worms & Worm Wheels	Worm	<b>KWG</b>	0.5 ~ 6	Single thread - Double thread	SCM440	Thermal refined, gear teeth induction hardened	Ground	2	Grounded finished worms with a shaft, including tooth surface quenching treatment. Allows compact design due to having small reference diameters.
	Worm Wheel	<b>AG</b> NOTE 1	0.5 ~ 1.5	10 ~ 60	CAC702 (A $\ell$ BC2)	—	Cut	2	Made of aluminum bronze, have excellent wear-resistance. Wide selection is available for this item.
	Worm Wheel	<b>AGF</b> NOTE 1	2 ~ 6	10 ~ 60	CAC702 (A $\ell$ BC2)	—	Cut	2	Made of aluminum bronze, have excellent wear-resistance. Allows compact design.
	Worm	<b>SWG</b>	1 ~ 6	Single thread - Triple thread	S45C	Gear teeth induction hardened	Ground	2	Reasonably priced ground worms. Ready-to-use finished products from the J Series, are also available.
	Worm Wheel	<b>AG</b> NOTE 1	1 ~ 6	10 ~ 60	CAC702 (A $\ell$ BC2)	—	Cut	2	Made of aluminum bronze, have excellent wear-resistance. Wide selection is available for this item.
	Worm	<b>SW</b>	0.5 ~ 6	Single thread - Double thread	S45C	—	Cut (Thread rolled)	4	Economical, commonly used worms that have broad utility. Ready-to-use finished products from the J Series are also available.
	Worm	<b>SUW</b>	0.5 ~ 3	Single thread - Double thread	SUS303	—	Cut	4	Rust-resistant worms made of stainless steel suitable for mating with DS or PG worm wheels. Finished products for the J Series are also available.
	Worm Wheel	<b>BG</b>	0.5 ~ 6	10 ~ 60	CAC502 (PBC2)	—	Cut	4	Phosphorous bronze worm wheels have excellent wear resistance. Interchangeable with CG Worm Wheels, and enhances strength.
	Worm Wheel	<b>CG</b>	1 ~ 6	10 ~ 120	FC200	—	Cut	4	Economical, commonly used worm wheels that have broad utility. Available with a large selection of modules and number of teeth.
	Worm Wheel	<b>DG</b>	0.5 ~ 0.8	10 ~ 60	Polyacetal	—	Cut	5	Fine pitch worm wheels made of polyacetal, a stable plastic material.
	Worm Wheel	<b>PG</b>	1 ~ 3	10 ~ 50	MC901	—	Cut	5	Light weight and strong MC Nylon worm wheels. Suitable for use in food machinery, and can be used without lubricant.

(NOTE 1) The material of cast hubs for AGF and AG worm wheels is FC200(Cast Iron). AG worm wheels mate primarily with SWG worms. But, for Modules 0.8 or smaller, AG worm wheels mate with KWG worms.

(NOTE 2) KHK stock worms and worm wheels are produced to KHK's own precision grades. See the "Precision of Worms and Worm Wheels" in the "Selection Hints" section.

## Our precision gear cutting technology enables acceleration and noise reduction

Setting the proper tooth contact and the backlash is essential for using worm gears. Use KHK stock worm gears for safe, reliable use.



Worm Grinding Machine by Klingelnberg



Worm gear testing machine by Klingelnberg

## 1. Efficiency of Worm Gear Pair

The efficiency of power transmission varies somewhat with the conditions of assembly and lubricant, but is generally 30-90% (excludes losses from bearings and churning of lubricants). The efficiency of KHK stock worm gear pair is given below as a reference. To learn more about strength calculation, please refer to the technical information contained in the "Surface Durability of Cylindrical Worm Gearing" section on page 688.

### ■ Efficiency of KWGDLS/AGDL Worm Gear Pair (%)

(rpm = Rotation of worm)

Catalog No. \ Worm rpm	100	300	600	900	1200	1800
<b>KWGD1.5-R1</b>	35	42	47	51	53	57
<b>KWGD2-R1</b>	38	45	51	55	56	61
<b>KWGD2.5-R1</b>	40	48	54	57	60	63
<b>KWGD3-R1</b>	41	49	55	58	62	65
<b>KWGD3.5-R1</b>	42	50	56	61	62	65
<b>KWGD4-R1</b>	42	51	56	61	63	67

### ■ Efficiency of KWG/AG, AGF Worm Gear Pair (%)

(rpm = Rotation of worm)

Catalog No. \ Worm rpm	100	300	600	900	1200	1800
<b>KWG0.5-R1</b>	30	34	38	41	43	46
<b>KWG0.8-R1</b>	35	40	44	47	49	53
<b>KWG1-R1</b>	34	40	45	48	51	54
<b>KWG1.5-R1</b>	35	42	47	51	53	57
<b>KWG2-R1</b>	45	51	56	60	62	65
<b>KWG2.5-R1</b>	44	51	57	61	62	67
<b>KWG3-R1</b>	44	52	58	61	64	67
<b>KWG4-R1</b>	50	58	64	66	70	72
<b>KWG5-R1</b>	51	60	66	69	71	73
<b>KWG6-R1</b>	53	61	66	70	72	75
<b>KWG0.5-R2</b>	46	50	54	58	60	63
<b>KWG0.8-R2</b>	51	56	61	64	66	69
<b>KWG1-R2</b>	51	56	62	64	67	70
<b>KWG1.5-R2</b>	52	59	64	67	69	73
<b>KWG2-R2</b>	61	67	71	74	76	78
<b>KWG2.5-R2</b>	60	67	72	75	76	80
<b>KWG3-R2</b>	61	68	73	75	78	80
<b>KWG4-R2</b>	66	73	77	79	82	84

### ■ Efficiency of SW, SUM / CG, BG, PG Worm Gear Pair (%)

The efficiency is approximately as follows, depending on the assembly, loading, lubrication and rotational speed.

Catalog No.	Thread	Efficiency (%)
<b>SW/SUW</b>	Single thread	40 ~ 50%
	Double thread	50 ~ 60%

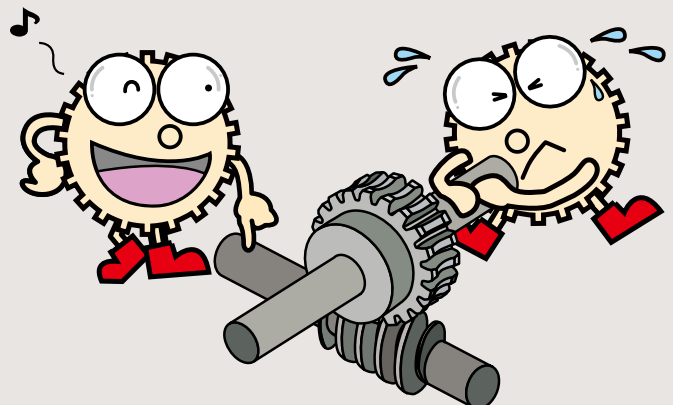
### ■ Efficiency of SWG/AG Worm Gear Pair (%)

(rpm = Rotation of worm)

Catalog No. \ Worm rpm	100	300	600	900	1200	1800
<b>SWG1-R1</b>	34	40	45	48	51	54
<b>SWG1.5-R1</b>	35	42	47	51	53	57
<b>SWG2-R1</b>	38	45	51	55	56	61
<b>SWG2.5-R1</b>	40	48	54	57	60	63
<b>SWG3-R1</b>	41	49	55	58	62	65
<b>SWG4-R1</b>	42	51	56	61	63	67
<b>SWG5-R1</b>	46	54	60	64	66	70
<b>SWG6-R1</b>	48	57	64	66	68	73
<b>SWG1-R2</b>	51	56	62	64	67	70
<b>SWG1.5-R2</b>	52	59	64	67	69	73
<b>SWG2-R2</b>	55	62	67	70	72	75
<b>SWG2.5-R2</b>	57	64	69	72	75	77
<b>SWG3-R2</b>	58	66	71	73	76	78
<b>SWG4-R2</b>	59	67	72	75	77	80
<b>SWG5-R2</b>	62	70	75	78	79	82
<b>SWG6-R2</b>	65	72	77	80	81	84
<b>SWG3-R3</b>	67	74	78	80	82	84
<b>SWG4-R3</b>	68	75	79	82	83	86

## 2. Self-Locking Feature of Worm Gear Pair

Self-locking is defined as the inability of worm wheels to drive the worms. Factors affecting the self-locking feature include the materials of the worm and worm wheel, lead angle, precision of manufacture, types of bearings, lubricant, etc. Thus, it is not dependent simply on the lead angle. But, in general, self-locking will occur when the lead angle in a single thread worm is less than 4°. For systems requiring fail-safe prevention of back drive, we recommend other braking mechanisms or one-way clutches.





# Worm Gear Pair

## Selection Hints



Please select the most suitable products by carefully considering the characteristics of items and contents of the product tables. It is also important to read all applicable "CAUTION" notes shown below before the final selection. Use of catalog numbers when ordering will simplify and expedite the processing of your order.

### 1. Caution in Selecting the Mating Gears

Worms and worm wheels have either right-hand or left-hand helix. The same hand worms and worm wheels comprise sets. However, the number of threads and whether they use normal module or axial module system must also be matched. The table below shows available combinations of KHK stock worms and worm wheels.

#### Mating Worm Wheels Selection Chart

Worm	Mating Worm Wheel NOTE 1	Helix/ Thread	KWGDL KWGDLS			KWG			SWG			SW				SUW	
			R1	R1	R2	R1	R2	R3	R1	R2	L1	L2	R1	R2			
AGDL		R1	○														
AG0.5~1.5		R1		○													
AGF		R2			○												
AG		R1				○											
		R2					○										
		R3						○									
BG		R1							○							○	
		R2								○							
		L1									○						
CG		R1									○					○	
		R2										○					
		L1											○				
PG		R1										○				○	
		R2												○			
DG		R1													○	○	
		R2														○	

(NOTE 1) Select the same module for both members.

### 2. Caution in Selecting Gears Based on Gear Strength

The gear strength values shown in the product pages were computed by assuming a certain application environment as shown below. Therefore, they should be used as reference only. We recommend that each user computes their own values by applying the actual usage conditions.

#### Calculation assumptions for Surface Durability

#### Calculation assumptions for Bending Strength

Item	Catalog No.	KWGDLS · KWGDLS/AGDL KWG/AGF, SWG/AG	SW/BG	SW/CG	SUW/PG	SUW/DG
Formula NOTE 2		Formula of worm gear's strength (JGMA405-01)			The Lewis formula	
Rotations of worm		600rpm	100rpm		Allowable bending stress (kgf/mm <sup>2</sup> )	
Lubricant		Lubricant for gears with proper viscosity and with anti-pressure additives				
Lubrication		Oil bath				
Starting condition		Starting torque less than 200% of rated torque. Less than 2 starts per hour				
Durability		26000 hours				
Impact from motor		Uniform load				
Impact from load		Uniform load				
Allowable stress factor Sclim		0.67	0.70	0.42	1.15 (40°C with No Lubrication)	NOTE 3 1 (40°C with No Lubrication)

(NOTE 2) The gear strength formula is based on JGMA (Japanese Gear Manufacturer's Association) specifications and "MC Nylon Technical Data" by Nippon Polyenco Limited. The units for the rotational speed (rpm) and the stress (kgf/mm<sup>2</sup>) are adjusted to the units needed in the formula.

(NOTE 3) Allowable bending stress of DG worm wheel is the value we estimated.

### The Maximum Allowable Sliding Speed Due to Heat

The maximum allowable sliding speed for each series of worm wheels is given on the right. Select the appropriate part by calculating the sliding speed.

Sliding speed  $v_s$  (m/s)

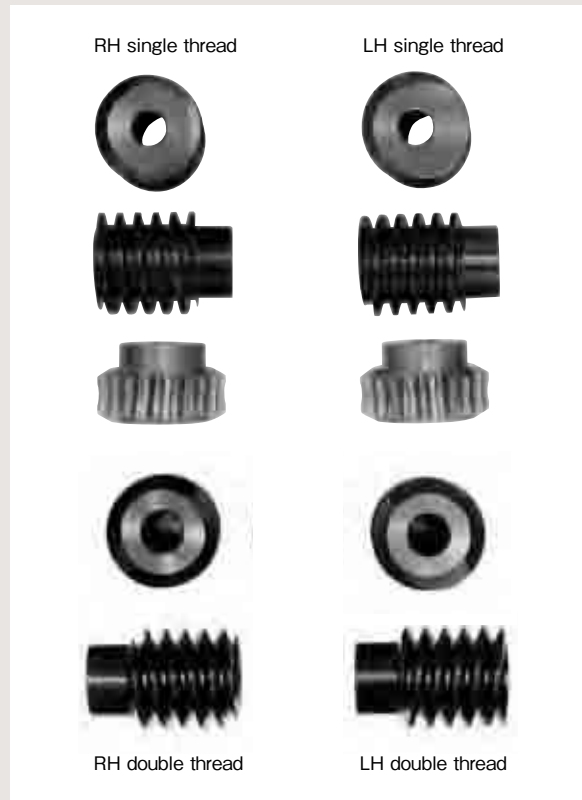
$$v_s = \frac{dn}{19100 \cos \gamma}$$

$d$  : Worm pitch dia.  
 $n$  : Worm speed (rpm)  
 $\gamma$  : Worm nominal lead angle

Catalog No.	Max. Sliding Speed (m/s)
AGDL	* 15
AGF	* 15
AG	* 15
BG	* 10
CG	* 2.5
PG	1 (no lubrication)

\* JGMA405-01

### The Helixes of Worms and Worm Wheels



### 3. Selecting Worms and Worm Wheels by Precision

The precision standards of KHK stock worms and worm wheels are established by us. The table below indicates the tolerance ranges for our products.

#### ① Precision of worms (KHK W 001)

KHK established allowable profile and lead errors of worms with precision grades 1 to 4, by using the JIS Standard as reference. Lead errors are measured over one full revolution.

#### ■ Precision Grades of Worms (KHK W 001) (Unit: $\mu\text{m}$ )

Grade	Error	Module				
		over <i>m</i> 0.4 up to 1	over <i>m</i> 1 up to 1.6	over <i>m</i> 1.6 up to 2.5	over <i>m</i> 2.5 up to 4	over <i>m</i> 4 up to 6
1	Tooth profile error	8	12	16	20	25
	Lead error	7	9	11	13	16
2	Tooth profile error	12	16	20	24	29
	Lead error	15	18	21	25	28
3	Tooth profile error	16	23	30	37	50
	Lead error	20	23	27	33	37
4	Tooth profile error	20	30	40	50	70
	Lead error	30	32	38	46	52

#### ② Precision of worm wheels (KHK W 002)

We have established standard grades 1 to 5 of worm wheels using the JIS Standard as reference. The allowable values of Single Pitch Error and Runout Error are defined for each module size and pitch diameter.

#### ■ Precision Grades of Worm Wheels (KHK W 002)

Unit :  $\mu\text{m}$

Grade	Error	Over <i>m</i> 0.4 up to 1		Over <i>m</i> 1 up to 1.6			Over <i>m</i> 1.6 up to 2.5			Over <i>m</i> 2.5 up to 4			Over <i>m</i> 4 up to 6													
		Pitch diameter (mm)																								
		6 up to 12	12 up to 25	25 up to 50	50 up to 100	100 up to 200	12 up to 25	25 up to 50	50 up to 100	100 up to 200	200 up to 400	25 up to 50	50 up to 100	100 up to 200	200 up to 400	400 up to 800										
1	Single pitch error	5	6	7	7	9	6	7	8	9	10	7	7	8	9	11	8	9	10	11	13	9	10	11	13	14
	Total composite error	21	24	26	30	34	25	28	31	35	41	27	30	33	37	43	33	36	40	46	53	37	40	45	50	57
2	Single pitch error	8	8	9	10	12	9	10	11	12	14	9	10	12	13	15	11	13	14	16	18	13	14	16	18	20
	Total composite error	30	33	37	42	48	35	39	44	50	57	38	42	46	52	60	46	51	57	64	74	52	57	63	71	80
3	Single pitch error	11	12	13	15	17	12	14	16	18	20	13	15	16	19	21	16	18	20	23	26	19	20	22	25	29
	Total composite error	43	47	53	60	68	50	55	62	71	81	53	59	66	74	85	65	72	81	91	105	74	81	90	100	115
4	Single pitch error	15	17	19	21	24	18	19	22	25	29	19	21	23	26	30	23	25	28	32	37	26	28	32	35	40
	Total composite error	60	66	74	83	95	70	77	87	99	115	75	83	92	105	120	91	100	115	130	145	105	115	125	140	160
5	Single pitch error	21	24	26	30	34	25	28	31	35	41	27	30	33	37	43	33	36	40	46	53	37	40	45	50	57
	Total composite error	86	94	105	120	135	100	110	125	140	165	105	120	130	150	170	130	145	160	185	210	150	160	180	200	230

#### ③ Overall Length Tolerance of Worms

#### ■ Overall Length Tolerance of Worms

Series	Total length(mm)	Tolerance
KWGDL	Uniform	0 - 0.10
		0 - 0.15
SWG SW SUW	Less than 100	0 - 0.15
	Over 100	0 - 0.20
KWGDLS KWG	Uniform	Normal tolerance

#### ■ Overall Length Tolerance of Worms Wheels

Total length(mm)	Tolerance
below 30	0 - 0.10
over 30 up to 100	0 - 0.15
over 100	0 - 0.20

**[CAUTION]** PG Plastic Wheels are excluded.



# Worm Gear Pair

## Application Hints

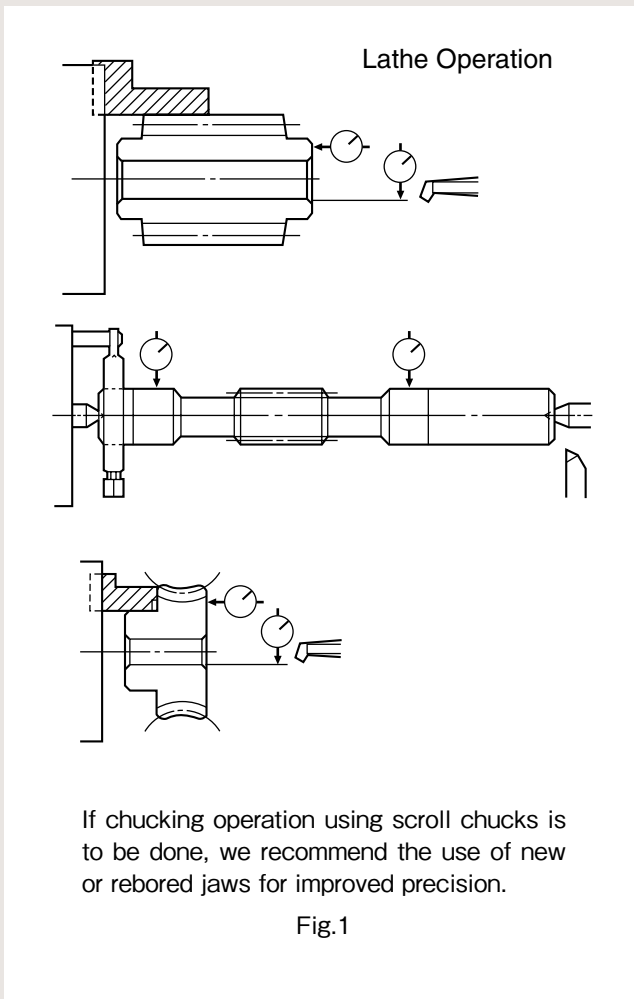


In order to use KHK stock worms and worm wheels safely, carefully read the Application Hints before proceeding. If there are questions or you require clarifications, please contact our technical department or your nearest distributor.

KHK Co., Ltd.  
TEL.048-254-1744 FAX.048-254-1765  
E-mail export@khkgears.co.jp

### 1. Caution on Performing Secondary Operations

- ① If you are reboring, it is important to pay special attention to locating the center in order to avoid runout. (Fig.1) The reference datum for gear cutting or grinding is the bore. (For worm shafts, it is ground portion of the shaft.) Therefore, use the bore or shaft for locating the center. If it is too difficult to do for small bores, the alternative is to use one spot on the bore and the runout of the side surface.



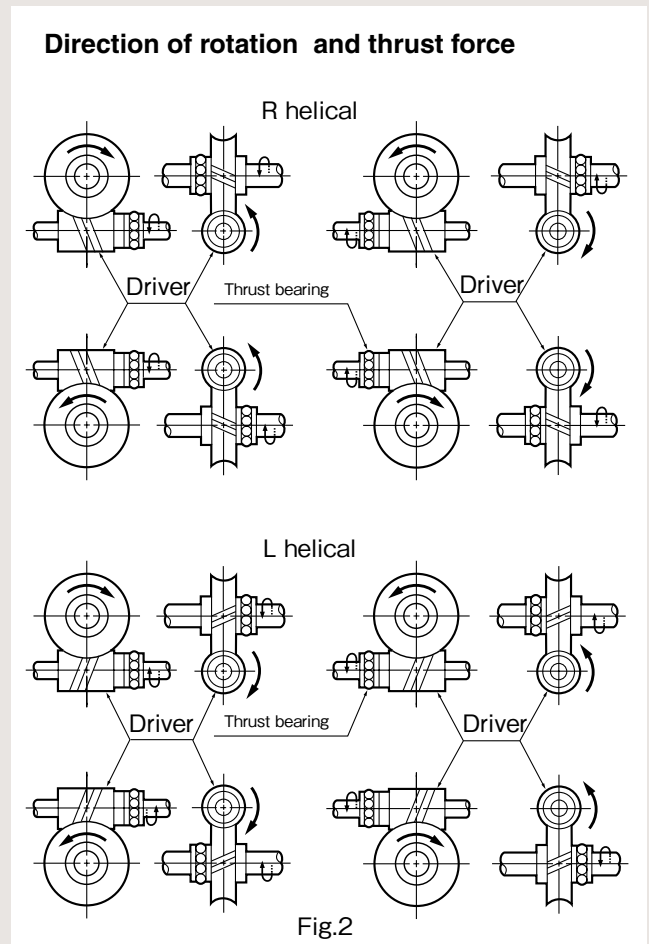
- ② To open up the bore to its maximum, calculate the bore size so that the tooth strength is weaker than the strength of the remaining material. For machining the maximum bore diameter, it should be designed so that the thickness between hub diameter (or root diameter) to bore diameter has more strength than the gear strength. As a guide, the maximum machined bore diameter should be within 60 % to 70 % of the hub diameter (or root diameter).

When the keyway is processed, it should be 50 % to 60 % . In the case FC material is used, it should be lower by 10% or more.

- ③ Since worm wheels are molded products, they may have air bubbles inside the material. In case you find air bubbles inside when performing secondary operations, and if the bubbles are found to be troublesome, please contact your KHK distributor.

### 2. Points of Caution in Assembling

- ① KHK stock worms and worm wheels are designed such that when assembled according to the specified mounting distance with a tolerance of H7 to H8, the backlash shown in the product tables is obtained. Do not attempt to eliminate backlash by pushing worms into worm wheels or operate with the worm shifted in the direction along the tooth.
- ② Because of the helix of the gear teeth, worms and worm wheels produce axial thrust forces. The directions of thrust depend on the hand of the helix and the direction of rotation. This is illustrated below in Fig.2. The bearings must be selected properly to be able to handle these thrust forces. See the "Gear Forces" section in the technical reference for more details (Page 699).



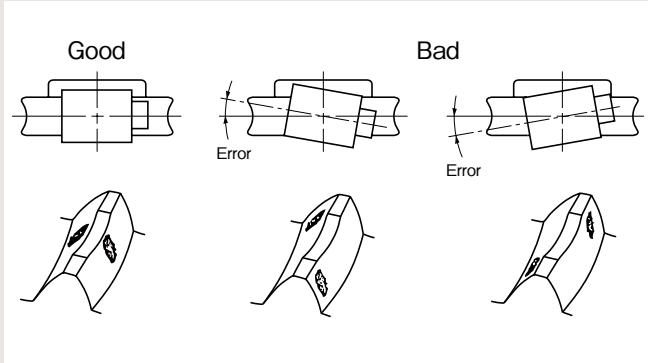
- ③ Because large thrust forces act on worms, if they are not secured to the shaft firmly, they tend to shift. Use of step shafts, set screws, dowel pins, etc., are recommended. Also, check for loosening of bearings due to thrust forces.



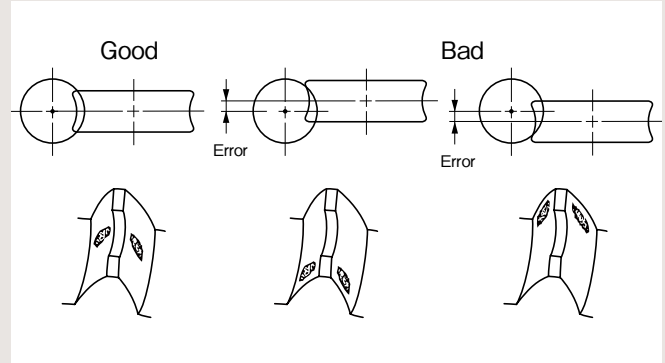
## 3. Verifying the orientation of assembly

How well the worms and worm wheels are assembled has large effects on the friction of the unit. The tooth contact at the time of assembly must be checked for correctness as shown below. See the "Tooth Contact of a Worm Gear Pair" section in the technical reference for more details (Page 659).

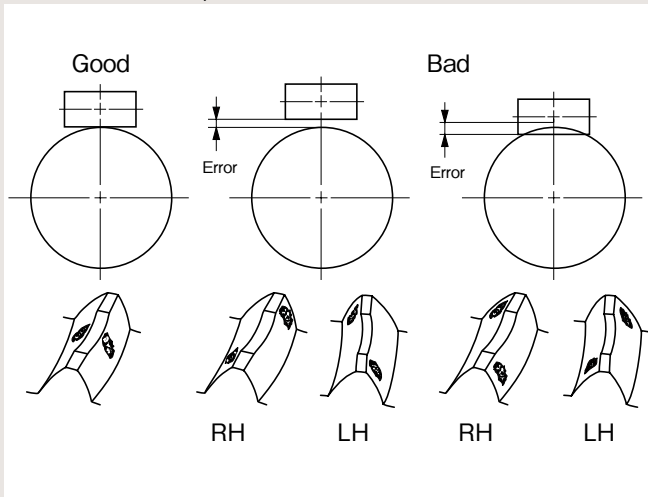
- Verify that the worm axis is perpendicular to the worm wheel axis.



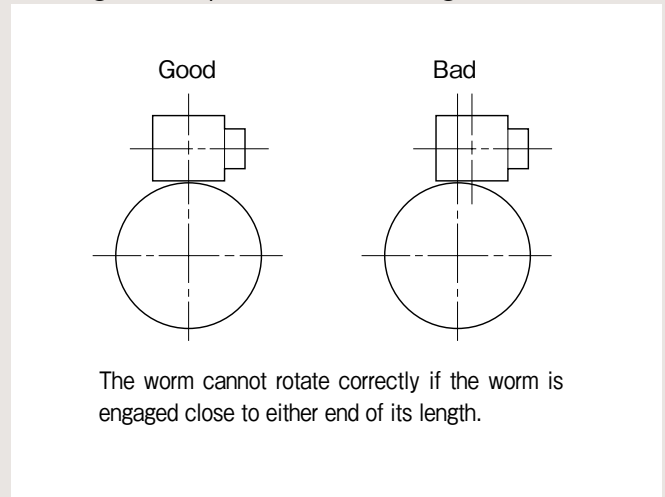
- Check that the worm axis is in the center of the worm wheel face width.



- Check the mounting distance (allowable mounting distance H7 ~ H8).



- Confirm that the center of the worm wheel goes through the midpoint of the worm length.



## Application Examples



SW Worms and CG Worm Wheels used in a rotating comb device



SW Worms and BG Worm Wheels used in adjusting a cloth feeding device



## ■ Description of duplex worm gears

The usual method of adjusting the backlash of a worm gear assembly is to modify the center distance. Once assembled, such adjustment requires a major rework of the gearbox housing. The use of duplex worm gears allows the backlash adjustment to be made by axially shifting the worm. This simplifies greatly the assembly and maintenance operations. Because of the unique characteristics of the product, please take time to study its construction and proper use.

## ■ Backlash adjustment mechanism and method of adjustment

The dual-lead worm is formed to give a difference between the right tooth surface and left tooth surface so that it provides a unique tooth profile in which the tooth thickness varies continuously, corresponding with the lead difference. (Fig.1)

The worm gear is also formed in its right and left tooth surface.

When such a worm and worm gear are set up at a constant assembly distance and the worm is moved in the axial direction, the tooth thickness of the worm in mesh with the worm gear changes making backlash adjustment possible.



An arrow marking on the outer circumference of the hub of the KHK duplex worm indicates the direction of assembly as well as acts as a guide for the backlash adjustment.

When the worm is held with arrow mark pointing right, the tooth thickness is thinner on the right and thicker on the left. Therefore, moving the worm to the right causes the thicker teeth to come into actual engagement with the worm gear, thereby reducing the backlash. (Fig.2)

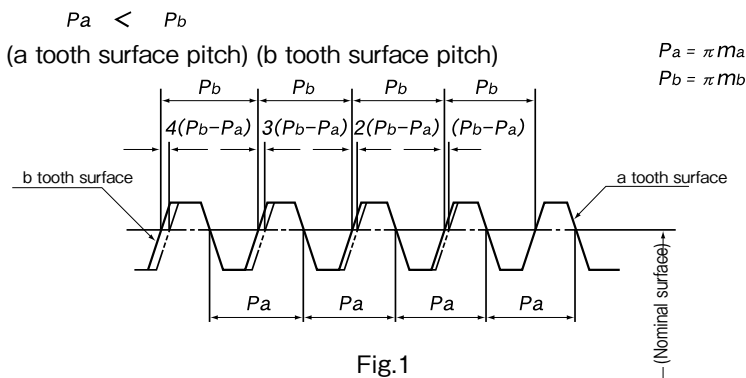


Fig. 1

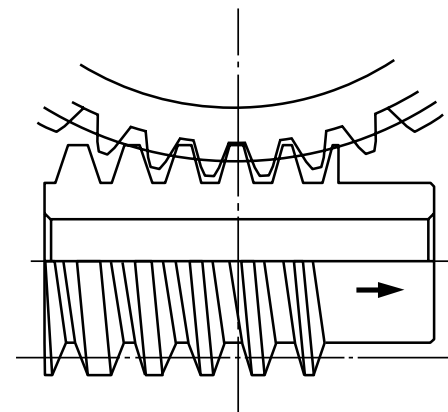
**(CAUTION)** The amount of change in backlash ( $\Delta j$  mm) in relation to the axial movement of the duplex worm shaft ( $V$  mm) can be calculated from the formula below.

$$\Delta j = 2V \frac{m_b - m_a}{m_a + m_b}$$

Where

$m_a$  = Nominal Axial Module - (0.01 × Nominal Axial Module)

$m_b$  = Nominal Axial Module + (0.01 × Nominal Axial Module)



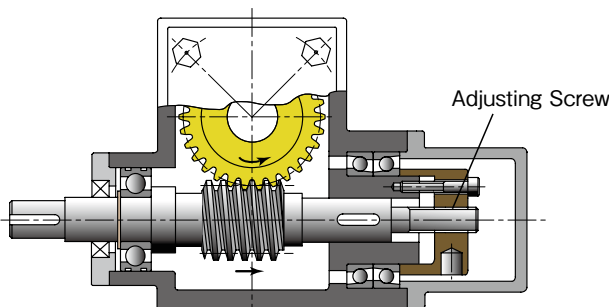
Reference tooth

Moving the worm in the direction of the arrow causes the backlash to decrease.

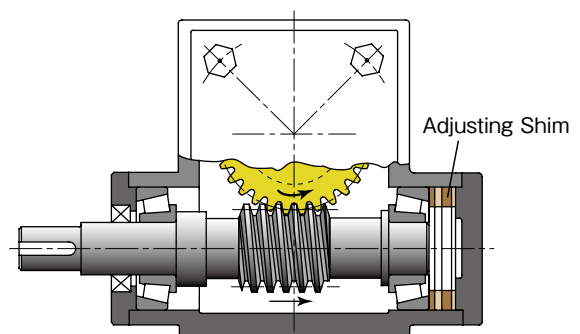
Fig. 2

**(CAUTION)** The KHK duplex worm is designed so that, for all modules, the backlash reduces by 0.02 mm when the worm is shifted 1 mm.

## ■ Application Examples



Adjustment by using Screws \*



Adjustment by using Shims \*

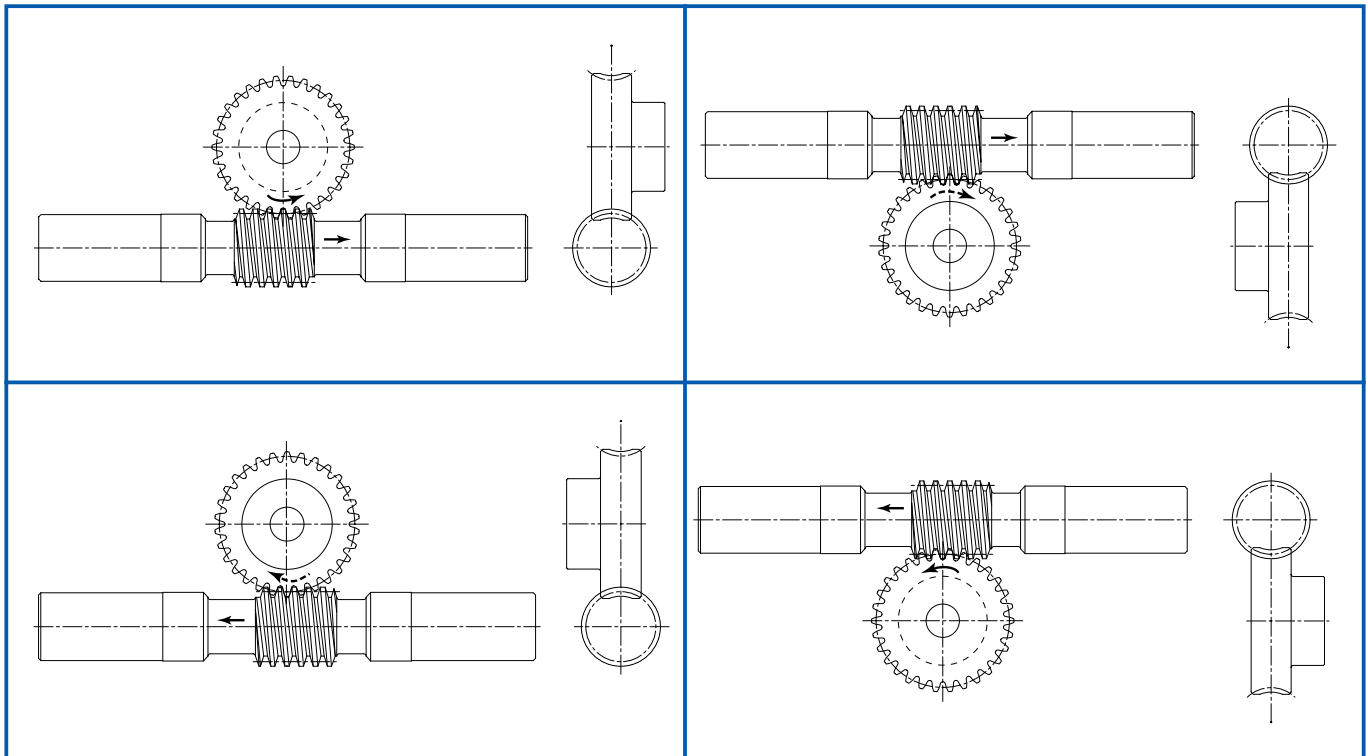
\* The illustration above is a design example, not a design for machinery or a device in actual use.

## Point of caution during assembly

KHK duplex worm gears differs in module between the right and left tooth surface and, therefore, you must orient the worm and worm wheel properly. Please carefully verify the following two aspects before proceeding with assembly.

### 1. Verifying the orientation of assembly

An arrow indicating the orientation of assembly is stamped on both the duplex worm and worm wheel. When assembling the worm and worm wheel, check the worm wheel of the arrow mark on the front such that the direction of arrow mark on the worm coincides with that on the worm wheel. Should the assembly be incorrect, the center distance "a" will become larger than the normal distance, resulting in difficulty of assembly and improper gear engagement. (Fig.3)



Arrow mark indicates the correct orientation of two gears when assembled. As shown, the two arrows must point in the same direction.

Fig. 3

### 2. Verifying the reference position

A V-groove ( $60^\circ$ , 0.3 mm deep line) on tip peripheral of the duplex worm tooth marks the reference tooth. The gear set is designated to have a backlash of nearly zero ( $\pm 0.045$ ) when the reference tooth is positioned in alignment with the center of rotation of the worm wheel with the center distance set at the value "a". (Fig.4)

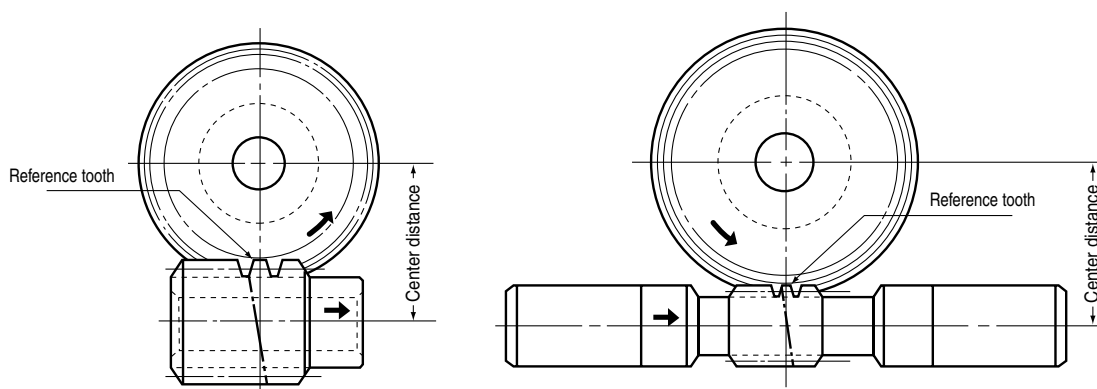


Fig. 4



Spur  
Gears

Helical  
Gears

Internal  
Gears

Racks

CP Racks  
& Pinions

Miter  
Gears

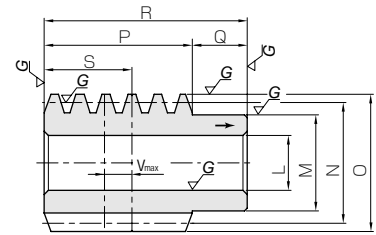
Bevel  
Gears

Screw  
Gears

Worm  
Gear Pair



Specifications	
Precision grade	KHK W 001 grade 1
Reference section of gear	Axial
Gear teeth	Standard full depth
Normal pressure angle	17° 30'
Material	SCM440
Heat treatment	Thermal refined, tooth surface induction hardened
Tooth hardness	45 ~ 55HRC



W4

Catalog No.	Nominal axial module	Number of start	Nominal lead angle	Hand of tread	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length
						L <sub>H7</sub>	M	N	O	P	Q	R
<b>KWGD2-R1</b>	<b>m2</b>	1	3°41'	R	W4	14	25	31	35	36	14	50

Catalog No.	Nominal axial module	Number of start	Nominal lead angle	Hand of tread	Shape	Total length	Shaft length (L)	Neck length (L)	Face width	Neck length (R)	Shaft length (R)	Pitch dia.
						J	K	L	M	N	O	P
<b>KWGDLS1.5-R1</b>	<b>m1.5</b>	1	3°26'	R	W6	190	66	12	28	18	66	25
<b>KWGDLS2-R1</b>	<b>m2</b>	1	3°41'	R	W6	220	75	13	36	21	75	31

- [Caution on Product Characteristics]
- When the center distance is moved to reduce the backlash, the V max is the maximum amount of distance that you may shift without causing problems with the gear mesh. The V max is not a recommended value to use for adjustment when assembling.
  - For W6 Shaped Gears, the tolerances of the shaft diameter are set to S +0.2 and +0.1 (+0.40 and +0.35 for the ground area).
  - These worms produce axial thrust forces. See page 512 for more details.



Miter  
Gears

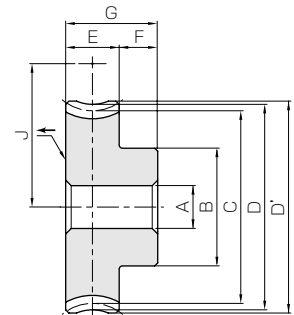
Bevel  
Gears

Screw  
Gears

Worm  
Gear Pair



Specifications	
Precision grade	KHK W 002 grade 1
Reference section of gear	Rotating plane
Gear teeth	Standard full depth
Normal pressure angle	17° 30'
Material	CAC702 (formerly JIS A&BC2)
Heat treatment	—
Tooth hardness	—



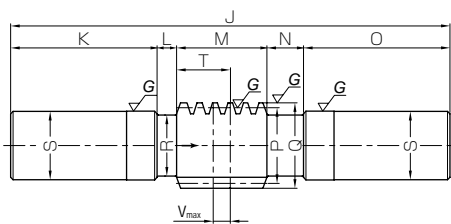
H1

Catalog No.	Reduction ratio	Nominal axial module	No. of teeth	Helix angle	Hand of tread	Shape	Bore	Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width	Hub width
							A <sub>H7</sub>	B	C	D	D'	E	F
<b>AGDL1.5-20R1</b>	20	<b>m1.5</b>	20	3°26'	R	H1	8	22	30	33	34.5	14	10
<b>AGDL1.5-30R1</b>	30		30	3°26'	R	H1	10	30	45	48	49.5	14	10
<b>AGDL1.5-36R1</b>	36		36	3°26'	R	H1	10	35	54	57	58.5	14	10
<b>AGDL1.5-40R1</b>	40		40	3°26'	R	H1	12	35	60	63	64.5	14	10
<b>AGDL1.5-50R1</b>	50		50	3°26'	R	H1	12	45	75	78	79.5	14	10
<b>AGDL1.5-60R1</b>	60		60	3°26'	R	H1	12	50	90	93	94.5	14	10
<b>AGDL2-20R1</b>	20	<b>m2</b>	20	3°41'	R	H1	12	33	40	44	46	18	15
<b>AGDL2-30R1</b>	30		30	3°41'	R	H1	15	40	60	64	66	18	15
<b>AGDL2-36R1</b>	36		36	3°41'	R	H1	15	45	72	76	78	18	15
<b>AGDL2-40R1</b>	40		40	3°41'	R	H1	15	45	80	84	86	18	15
<b>AGDL2-50R1</b>	50		50	3°41'	R	H1	15	50	100	104	106	18	15
<b>AGDL2-60R1</b>	60		60	3°41'	R	H1	15	60	120	124	126	18	15

- [Caution on Product Characteristics]
- The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 510 for more details.
  - Duplex worms and worm wheels must be mated in a predetermined orientation, which is indicated by the arrows. Therefore, the arrow on the wheel does not indicate the mounting direction, but the rotating direction. Please refer to the Application Hints on page 515.



Duplex Worms



W6

Position of reference tooth	Max. allowable shift	Weight (kg)	Catalog No.
S	Vmax		
22	8	0.21	<b>KWGDL2-R1</b>

Outside dia.	Neck dia.	Shaft dia.	Position of reference tooth	Max. allowable shift	Weight (kg)	Catalog No.
Q	R	S	T	Vmax		
28	21	26	17	6	0.74	<b>KWGDL1.5-R1</b>
35	24	30	22	8	1.17	<b>KWGDL2-R1</b>

- [Caution on Secondary Operations]
- ① Please read "Caution on Performing Secondary Operations" (Page 512) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
  - ② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 1 to 2 mm).

AGDL

Duplex Worm Wheels



NOTE 1. Allowable torques for worm rotation (rpm)

Total length	Web thickness	Web O.D.	Mounting distance	Allowable torque (N·m) NOTE 1							Backlash (mm)	Weight (kg)	Catalog No.
				30 rpm	100 rpm	300 rpm	600 rpm	900 rpm	1200 rpm	1800 rpm			
24	—	—	27.5	9.84	8.18	6.40	5.30	4.68	4.25	3.68	0±0.045	0.10	<b>AGDL1.5-20R1</b>
24	—	—	35	20.8	17.5	13.9	11.7	10.4	9.40	8.28	0±0.045	0.22	<b>AGDL1.5-30R1</b>
24	—	—	39.5	29.3	24.6	19.8	16.8	14.9	13.5	11.9	0±0.045	0.32	<b>AGDL1.5-36R1</b>
24	—	—	42.5	35.6	30.0	24.2	20.6	18.3	16.6	14.6	0±0.045	0.37	<b>AGDL1.5-40R1</b>
24	—	—	50	53.8	45.4	36.9	31.6	28.3	25.8	22.6	0±0.045	0.59	<b>AGDL1.5-50R1</b>
24	—	—	57.5	75.3	63.8	51.9	44.7	40.4	36.7	32.4	0±0.045	0.83	<b>AGDL1.5-60R1</b>
33	—	—	35.5	21.0	17.5	13.6	11.2	9.84	8.94	7.75	0±0.045	0.26	<b>AGDL2-20R1</b>
33	—	—	45.5	44.3	37.3	29.6	24.8	21.9	19.8	17.4	0±0.045	0.51	<b>AGDL2-30R1</b>
33	—	—	51.5	62.3	52.6	42.0	35.5	31.3	28.4	25.0	0±0.045	0.73	<b>AGDL2-36R1</b>
33	—	—	55.5	75.8	64.0	51.4	43.6	38.5	34.9	30.7	0±0.045	0.86	<b>AGDL2-40R1</b>
33	—	—	65.5	115	96.8	78.4	66.9	59.5	54.2	47.6	0±0.045	1.30	<b>AGDL2-50R1</b>
33	—	—	75.5	160	136	110	94.6	84.9	77.2	68.1	0±0.045	1.88	<b>AGDL2-60R1</b>

- [Caution on Secondary Operations]
- ① Please read "Caution on Performing Secondary Operations" (Page 512) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.





Spur  
Gears

Helical  
Gears

Internal  
Gears

Racks

CP Racks  
& Pinions

Miter  
Gears

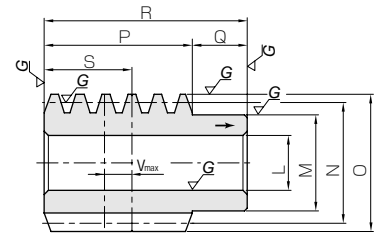
Bevel  
Gears

Screw  
Gears

Worm  
Gear Pair



Specifications	
Precision grade	KHK W 001 grade 1
Reference section of gear	Axial
Gear teeth	Standard full depth
Normal pressure angle	17° 30'
Material	SCM440
Heat treatment	Thermal refined, tooth surface induction hardened
Tooth hardness	45 ~ 55HRC



W4

Catalog No.	Nominal axial module	Number of start	Nominal lead angle	Hand of tread	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length
						L <sub>H7</sub>	M	N	O	P	Q	R
KWGD2.5-R1	m2.5	1	3°52'	R	W4	18	30	37	42	48	17	65
KWGD3-R1	m3	1	3°54'	R	W4	20	35	44	50	54	20	74

Catalog No.	Nominal axial module	Number of start	Nominal lead angle	Hand of tread	Shape	Total length	Shaft length (L)	Neck length (L)	Face width	Neck length (R)	Shaft length (R)	Pitch dia.
						J	K	L	M	N	O	P
KWGDLS2.5-R1	m2.5	1	3°52'	R	W6	260	85	16	48	26	85	37
KWGDLS3-R1	m3	1	3°54'	R	W6	300	100	18	54	28	100	44

- [Caution on Product Characteristics]
- When the center distance is moved to reduce the backlash, the V max is the maximum amount of distance that you may shift without causing problems with the gear mesh. The V max is not a recommended value to use for adjustment when assembling.
  - For W6 Shaped Gears, the tolerances of the shaft diameter are set to S +0.2 and +0.1 (+0.40 and +0.35 for the ground area).
  - These worms produce axial thrust forces. See page 512 for more details.



AGDL  
Duplex Worms Wheels



Miter  
Gears

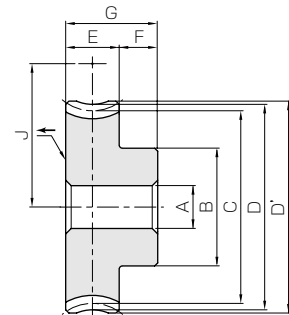
Bevel  
Gears

Screw  
Gears

Worm  
Gear Pair



Specifications	
Precision grade	KHK W 002 grade 1
Reference section of gear	Rotating plane
Gear teeth	Standard full depth
Normal pressure angle	17° 30'
Material	CAC702 (formerly JIS A & BC2)
Heat treatment	—
Tooth hardness	—



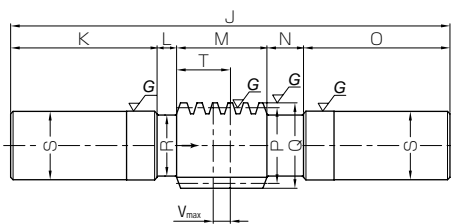
H1

Catalog No.	Reduction ratio	Nominal axial module	No. of teeth	Helix angle	Hand of tread	Shape	Bore	Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width	Hub width
							A <sub>H7</sub>	B	C	D	D'	E	F
AGDL2.5-20R1	20	m2.5	20	3°52'	R	H1	15	40	50	55	57.5	22	15
AGDL2.5-30R1	30		30	3°52'	R	H1	15	40	75	80	82.5	22	15
AGDL2.5-36R1	36		36	3°52'	R	H1	15	45	90	95	97.5	22	15
AGDL2.5-40R1	40		40	3°52'	R	HB	15	45	100	105	107.5	22	15
AGDL2.5-50R1	50		50	3°52'	R	HB	15	60	125	130	132.5	22	15
AGDL2.5-60R1	60		60	3°52'	R	HB	15	80	150	155	157.5	22	15
AGDL3-20R1	20	m3	20	3°54'	R	H1	20	50	60	66	69	28	17
AGDL3-30R1	30		30	3°54'	R	H1	20	55	90	96	99	28	17
AGDL3-36R1	36		36	3°54'	R	H1	20	60	108	114	117	28	17
AGDL3-40R1	40		40	3°54'	R	HB	20	60	120	126	129	28	17
AGDL3-50R1	50		50	3°54'	R	HB	20	70	150	156	159	28	17
AGDL3-60R1	60		60	3°54'	R	HB	20	80	180	186	189	28	17

- [Caution on Product Characteristics]
- The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 510 for more details.
  - Duplex worms and worm wheels must be mated in a predetermined orientation, which is indicated by the arrows. Therefore, the arrow on the wheel does not indicate the mounting direction, but the rotating direction. Please refer to the Application Hints on page 515.



Duplex Worms



W6

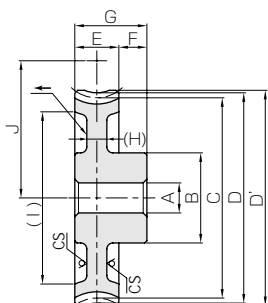
Position of reference tooth	Max. allowable shift	Weight (kg)	Catalog No.
S	Vmax		
29	10	0.37	<b>KWGDL2.5-R1</b>
32	10	0.61	<b>KWGDL3-R1</b>

Outside dia.	Neck dia.	Shaft dia.	Position of reference tooth	Max. allowable shift	Weight (kg)	Catalog No.
Q	R	S	T	Vmax		
42	30	36	29	10	2.00	<b>KWGDL5.5-R1</b>
50	34	40	32	10	2.95	<b>KWGDL6-R1</b>

- [Caution on Secondary Operations]
- ① Please read "Caution on Performing Secondary Operations" (Page 512) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
  - ② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 1 to 2 mm).

AGDL

Duplex Worm Wheels



HB

\* CS has a sand mold casting finish.

NOTE 1. Allowable torques for worm rotation (rpm)



Total length	Web thickness	Web O.D.	Mounting distance	Allowable torque (N·m) NOTE 1							Backlash (mm)	Weight (kg)	Catalog No.
				30 rpm	100 rpm	300 rpm	600 rpm	900 rpm	1200 rpm	1800 rpm			
37	—	—	43.5	38.1	31.4	24.5	20.1	17.6	16.0	13.8	0±0.045	0.45	<b>AGDL2.5-20R1</b>
37	—	—	56	80.5	67.1	53.1	44.5	39.1	35.5	30.9	0±0.045	0.88	<b>AGDL2.5-30R1</b>
37	—	—	63.5	113	94.5	75.5	63.8	56.0	51.0	44.3	0±0.045	1.25	<b>AGDL2.5-36R1</b>
37	(10)	(86)	68.5	138	115	92.4	78.3	68.8	62.7	54.4	0±0.045	1.14	<b>AGDL2.5-40R1</b>
37	(12)	(108)	81	208	174	141	120	106	97.3	84.3	0±0.045	1.93	<b>AGDL2.5-50R1</b>
37	(12)	(133)	93.5	291	245	198	170	152	139	121	0±0.045	2.90	<b>AGDL2.5-60R1</b>
45	—	—	52	65.0	53.3	41.5	33.8	29.5	26.9	22.8	0±0.045	0.81	<b>AGDL3-20R1</b>
45	—	—	67	137	114	90.0	74.7	65.5	59.5	51.2	0±0.045	1.65	<b>AGDL3-30R1</b>
45	—	—	76	193	160	128	107	93.8	85.6	73.4	0±0.045	2.32	<b>AGDL3-36R1</b>
45	(14)	(106)	82	235	195	157	131	115	105	90.1	0±0.045	2.19	<b>AGDL3-40R1</b>
45	(14)	(134)	97	355	295	239	202	178	163	140	0±0.045	3.26	<b>AGDL3-50R1</b>
45	(14)	(164)	112	497	415	336	285	254	233	200	0±0.045	4.48	<b>AGDL3-60R1</b>

- [Caution on Secondary Operations]
- ① Please read "Caution on Performing Secondary Operations" (Page 512) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.





Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

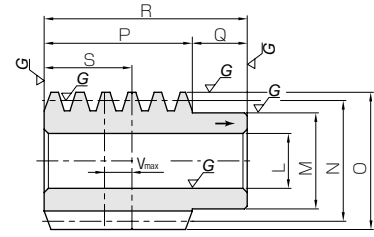
Bevel Gears

Screw Gears

Worm Gear Pair



Specifications	
Precision grade	KHK W 001 grade 1
Reference section of gear	Axial
Gear teeth	Standard full depth
Normal pressure angle	17° 30'
Material	SCM440
Heat treatment	Thermal refined, tooth surface induction hardened
Tooth hardness	45 ~ 55HRC



**W4**

Catalog No.	Nominal axial module	Number of start	Nominal lead angle	Hand of tread	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length
						L <sub>H7</sub>	M	N	O	P	Q	R
<b>KWGD3.5-R1</b>	<b>m3.5</b>	1	3°47'	R	W4	24	44	53	60	62	23	85
<b>KWGD4-R1</b>	<b>m4</b>	1	3°41'	R	W4	28	50	62	70	74	26	100

Catalog No.	Nominal axial module	Number of start	Nominal lead angle	Hand of tread	Shape	Total length	Shaft length (L)	Neck length (L)	Face width	Neck length (R)	Shaft length (R)	Pitch dia.
						J	K	L	M	N	O	P
<b>KWGDLS3.5-R1</b>	<b>m3.5</b>	1	3°47'	R	W6	330	110	18	62	30	110	53
<b>KWGDLS4-R1</b>	<b>m4</b>	1	3°41'	R	W6	360	120	16	74	30	120	62

- [Caution on Product Characteristics]
- ① When the center distance is moved to reduce the backlash, the V max is the maximum amount of distance that you may shift without causing problems with the gear mesh. The V max is not a recommended value to use for adjustment when assembling.
  - ② For W6 Shaped Gears, the tolerances of the shaft diameter are set to S +0.2 and +0.1 (+0.40 and +0.35 for the ground area).
  - ③ These worms produce axial thrust forces. See page 512 for more details.



Miter Gears

Bevel Gears

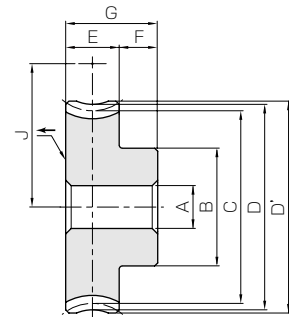
Screw Gears

Worm Gear Pair



Specifications	
Precision grade	KHK W 002 grade 1
Reference section of gear	Rotating plane
Gear teeth	Standard full depth
Normal pressure angle	17° 30'
Material	CAC702 (formerly JIS A&BC2) *
Heat treatment	—
Tooth hardness	—

\* H5 shape have a hub made from S45C cast iron.



**H1**

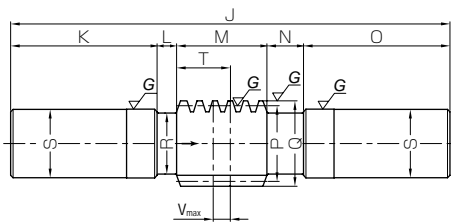
Catalog No.	Reduction ratio	Nominal axial module	No. of teeth	Helix angle	Hand of tread	Shape	Bore	Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width	Hub width
							A <sub>H7</sub>	B	C	D	D'	E	F
<b>AGDL3.5-20R1</b>	20	<b>m3.5</b>	20	3°47'	R	H1	20	55	70	77	80.5	32	18
<b>AGDL3.5-30R1</b>	30		30	3°47'	R	H1	20	60	105	112	115.5	32	18
<b>AGDL3.5-36R1</b>	36		36	3°47'	R	H1	20	70	126	133	136.5	32	18
<b>AGDL3.5-40R1</b>	40		40	3°47'	R	HB	20	70	140	147	150.5	32	18
<b>AGDL3.5-50R1</b>	50		50	3°47'	R	HB	20	80	175	182	185.5	32	18
<b>AGDL3.5-60R1</b>	60		60	3°47'	R	HB	20	90	210	217	220.5	32	18
<b>AGDL4-20R1</b>	20	<b>m4</b>	20	3°41'	R	H1	20	60	80	88	92	35	20
<b>AGDL4-30R1</b>	30		30	3°41'	R	HB	20	65	120	128	132	35	20
<b>AGDL4-36R1</b>	36		36	3°41'	R	HB	20	75	144	152	156	35	20
<b>AGDL4-40R1</b>	40		40	3°41'	R	HB	20	75	160	168	172	35	20
<b>AGDL4-50R1</b>	50		50	3°41'	R	HB	20	90	200	208	212	35	20
<b>AGDL4-60R1</b>	60		60	3°41'	R	H5	30	120	240	248	252	35	20

- [Caution on Product Characteristics]
- ① The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 510 for more details.
  - ② Duplex worms and worm wheels must be mated in a predetermined orientation, which is indicated by the arrows. Therefore, the arrow on the wheel does not indicate the mounting direction, but the rotating direction. Please refer to the Application Hints on page 515.





Duplex Worms



W6

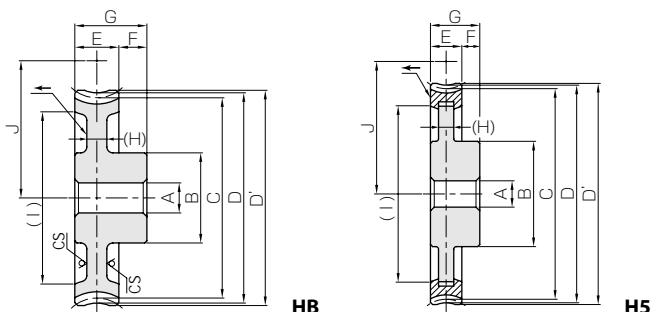
Position of reference tooth	Max. allowable shift	Weight (kg)	Catalog No.
S	Vmax		
37	12	1.05	<b>KWGDL3.5-R1</b>
44	14	1.67	<b>KWGDL4-R1</b>

Outside dia.	Neck dia.	Shaft dia.	Position of reference tooth	Max. allowable shift	Weight (kg)	Catalog No.
Q	R	S	T	Vmax		
60	42	48	37	12	4.72	<b>KWGDLs3.5-R1</b>
70	50	56	44	14	7.10	<b>KWGDLs4-R1</b>

- [Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 512) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 1 to 2 mm).

AGDL

Duplex Worm Wheels



\* CS has a sand mold casting finish.

NOTE 1. Allowable torques for worm rotation (rpm)



Total length	Web thickness	Web O.D.	Mounting distance	Allowable torque (N·m) NOTE 1							Backlash (mm)	Weight (kg)	Catalog No.
				30 rpm	100 rpm	300 rpm	600 rpm	900 rpm	1200 rpm	1800 rpm			
50	—	—	61.5	98.5	80.4	62.5	50.4	44.2	40.0	33.7	0±0.045	1.24	<b>AGDL3.5-20R1</b>
50	—	—	79	208	172	136	111	98.1	88.3	75.7	0±0.045	2.51	<b>AGDL3.5-30R1</b>
50	—	—	89.5	293	242	193	160	141	127	109	0±0.045	3.61	<b>AGDL3.5-36R1</b>
50	(15)	(124)	96.5	356	295	236	196	173	156	133	0±0.045	3.34	<b>AGDL3.5-40R1</b>
50	(16)	(155)	114	538	446	360	301	267	243	207	0±0.045	5.02	<b>AGDL3.5-50R1</b>
50	(16)	(189)	131.5	753	627	506	425	381	345	296	0±0.045	6.87	<b>AGDL3.5-60R1</b>
55	—	—	71	134	109	84.8	67.9	59.7	53.4	44.8	0±0.045	1.76	<b>AGDL4-20R1</b>
55	(17)	(99)	91	284	234	184	150	132	118	101	0±0.045	3.01	<b>AGDL4-30R1</b>
55	(17)	(121)	103	400	329	262	215	190	170	144	0±0.045	4.18	<b>AGDL4-36R1</b>
55	(17)	(137)	111	486	400	320	264	233	208	177	0±0.045	4.78	<b>AGDL4-40R1</b>
55	(17)	(177)	131	735	605	488	405	361	324	275	0±0.045	7.07	<b>AGDL4-50R1</b>
55	(17)	(200)	151	1030	851	687	572	515	461	393	0±0.045	11.5	<b>AGDL4-60R1</b>

- [Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 512) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.



Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks &amp; Pinions

Miter Gears

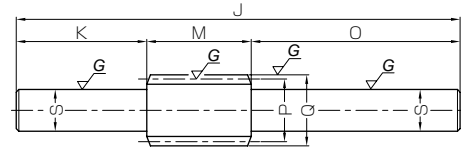
Bevel Gears

Screw Gears

Worm Gear Pair



Specifications	
Precision grade	KHK W 001 grade 2
Reference section of gear	Axial
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	SCM440
Heat treatment	Thermal refined, tooth surface induction hardened
Tooth hardness	45 ~ 55HRC



W5

Catalog No.	Axial module	Number of start	Lead angle	Hand of tread	Shape	Total length	Shaft length (L)	Neck length (L)	Face width	Neck length (R)	Shaft length (R)	Pitch dia.
						J	K	L	M	N	O	P
KWG0.5-R1	m0.5	1	3°11'	R	W5	65	19	—	12	—	34	9
KWG0.5-R2		2	6°20'	R	W5	65	19	—	12	—	34	9
KWG0.8-R1	m0.8	1	3°49'	R	W5	85	25	—	20	—	40	12
KWG0.8-R2		2	7°36'	R	W5	85	25	—	20	—	40	12

[Caution on Product Characteristics] ① These worms produce axial thrust forces. See page 512 for more details.



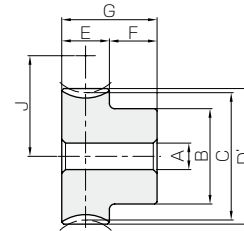
Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

Specifications	
Precision grade	KHK W 002 grade 2
Reference section of gear	Rotating plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	CAC702 (formerly JIS A&BC2)
Heat treatment	—
Tooth hardness	—



HA

Catalog No.	Reduction ratio	Transverse module	No. of teeth	Number of start	Helix angle	Hand of tread	Shape	Bore	Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width
								A <sub>H7</sub>	B	C	D	D'	E
AG0.5-20R1	20	m0.5	20	1	3°11'	R	HA	4	9	10	—	11	5
AG0.5-20R2	10		20	2	6°20'	R	HA	4	9	10	—	11	5
AG0.5-30R1	30		30	1	3°11'	R	HA	4	12	15	—	16	5
AG0.5-30R2	15		30	2	6°20'	R	HA	4	12	15	—	16	5
AG0.5-40R1	40		40	1	3°11'	R	HA	5	15	20	—	21	5
AG0.5-50R1	50		50	1	3°11'	R	HA	5	20	25	—	26	5
AG0.5-60R1	60	60	1	3°11'	R	HA	5	25	30	—	31	5	
AG0.8-20R1	20	m0.8	20	1	3°49'	R	HA	5	12	16	—	17.6	8
AG0.8-20R2	10		20	2	7°36'	R	HA	5	12	16	—	17.6	8
AG0.8-30R1	30		30	1	3°49'	R	HA	5	18	24	—	25.6	8
AG0.8-30R2	15		30	2	7°36'	R	HA	5	18	24	—	25.6	8
AG0.8-40R1	40		40	1	3°49'	R	HA	6	20	32	—	33.6	8
AG0.8-50R1	50		50	1	3°49'	R	HA	8	25	40	—	41.6	8
AG0.8-60R1	60	60	1	3°49'	R	HA	8	25	48	—	49.6	8	

[Caution on Product Characteristics] ① The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 510 for more details.

Outside dia.	Neck dia.	Shaft dia.	Weight (kg)	Catalog No.
Q	R	S <sub>H7</sub>		
10	—	6	0.018	<b>KWG0.5-R1</b>
10	—	6	0.018	<b>KWG0.5-R2</b>
13.6	—	8	0.043	<b>KWG0.8-R1</b>
13.6	—	8	0.043	<b>KWG0.8-R2</b>

- [Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 512) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 1 to 2 mm). Use carbide tools for the modification of the shaft area near the bottom land.

AGDL

## Worm Wheels



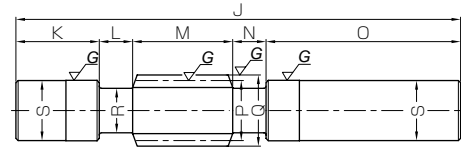
NOTE 1. Allowable torques for worm rotation (rpm)

Hub width	Total length	Web thickness	Web O.D.	Mounting distance	Allowable torque (N·m) NOTE 1							Backlash (mm)	Weight (kg)	Catalog No.
					30 <sub>rpm</sub>	100 <sub>rpm</sub>	300 <sub>rpm</sub>	600 <sub>rpm</sub>	900 <sub>rpm</sub>	1200 <sub>rpm</sub>	1800 <sub>rpm</sub>			
F	G	(H)	(I)	J										
7	12	—	—	9.5	0.52	0.44	0.36	0.30	0.26	0.24	0.21	0.02~0.14	0.0056	<b>AG0.5-20R1</b>
7	12	—	—	9.5	0.51	0.42	0.33	0.27	0.24	0.22	0.19	0.02~0.14	0.0056	<b>AG0.5-20R2</b>
7	12	—	—	12	1.09	0.94	0.77	0.65	0.58	0.53	0.48	0.02~0.14	0.012	<b>AG0.5-30R1</b>
7	12	—	—	12	1.09	0.92	0.73	0.60	0.54	0.49	0.43	0.02~0.14	0.012	<b>AG0.5-30R2</b>
7	12	—	—	14.5	1.86	1.60	1.34	1.15	1.02	0.94	0.84	0.02~0.14	0.020	<b>AG0.5-40R1</b>
7	12	—	—	17	2.82	2.42	2.05	1.77	1.58	1.46	1.30	0.02~0.14	0.035	<b>AG0.5-50R1</b>
7	12	—	—	19.5	3.94	3.41	2.89	2.50	2.26	2.08	1.87	0.02~0.14	0.053	<b>AG0.5-60R1</b>
8	16	—	—	14	1.78	1.50	1.21	1.00	0.88	0.82	0.71	0.06~0.17	0.018	<b>AG0.8-20R1</b>
8	16	—	—	14	1.76	1.44	1.11	0.91	0.80	0.74	0.63	0.06~0.17	0.018	<b>AG0.8-20R2</b>
8	16	—	—	18	3.77	3.21	2.62	2.20	1.96	1.81	1.61	0.06~0.17	0.043	<b>AG0.8-30R1</b>
8	16	—	—	18	3.75	3.14	2.46	2.02	1.80	1.65	1.45	0.06~0.17	0.043	<b>AG0.8-30R2</b>
8	16	—	—	22	6.45	5.49	4.55	3.87	3.46	3.19	2.83	0.06~0.17	0.068	<b>AG0.8-40R1</b>
8	16	—	—	26	9.75	8.31	6.94	5.94	5.34	4.96	4.38	0.06~0.17	0.10	<b>AG0.8-50R1</b>
8	16	—	—	30	13.6	11.7	9.77	8.39	7.63	7.05	6.27	0.06~0.17	0.14	<b>AG0.8-60R1</b>

- [Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 512) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.



Specifications	
Precision grade	KHK W 001 grade 2
Reference section of gear	Axial
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	SCM440
Heat treatment	Thermal refined, tooth surface induction hardened
Tooth hardness	45 ~ 55HRC



W6

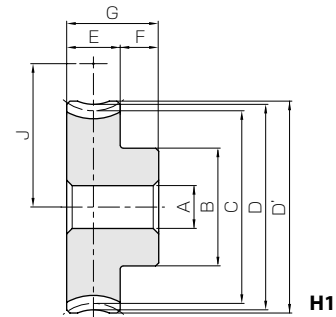
Catalog No.	Axial module	Number of start	Lead angle	Hand of tread	Shape	Total length	Shaft length (L)	Neck length (L)	Face width	Neck length (R)	Shaft length (R)	Pitch dia.
						J	K	L	M	N	O	P
<b>KWG1-R1</b>	<b>m1</b>	1	3°35'	R	W6	140	35	10	30	10	55	16
<b>KWG1-R2</b>		2	7°08'	R	W6	140	35	10	30	10	55	16
<b>KWG1.5-R1</b>	<b>m1.5</b>	1	3°26'	R	W6	190	50	15	40	15	70	25
<b>KWG1.5-R2</b>		2	6°51'	R	W6	190	50	15	40	15	70	25

[Caution on Product Characteristics]

- ① For W6 Shaped Gears, the tolerances of the shaft diameter are set to S +0.2 and +0.1 (+0.40 and +0.35 for the ground area).
- ② These worms produce axial thrust forces. See page 512 for more details.



Specifications	
Precision grade	KHK W 002 grade 2
Reference section of gear	Rotating plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	CAC702 (formerly JIS A&BC2)
Heat treatment	—
Tooth hardness	—



Catalog No.	Reduction ratio	Transverse module	No. of teeth	Number of start	Helix angle	Hand of tread	Shape	Bore	Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width
								A <sub>H7</sub>	B	C	D	D'	E
<b>AG1-20R1</b>	20	<b>m1</b>	20	1	3°35'	R	H1	6	16	20	22	23	10
<b>AG1-20R2</b>	10		20	2	7°08'	R	H1	6	16	20	22	23	10
<b>AG1-30R1</b>	30		30	1	3°35'	R	H1	6	20	30	32	33	10
<b>AG1-30R2</b>	15		30	2	7°08'	R	H1	6	20	30	32	33	10
<b>AG1-40R1</b>	40		40	1	3°35'	R	H1	8	26	40	42	43	10
<b>AG1-50R1</b>	50		50	1	3°35'	R	H1	8	30	50	52	53	10
<b>AG1-60R1</b>	60	60	1	3°35'	R	H1	10	35	60	62	63	10	
<b>AG1.5-20R1</b>	20	<b>m1.5</b>	20	1	3°26'	R	H1	8	22	30	33	34.5	14
<b>AG1.5-20R2</b>	10		20	2	6°51'	R	H1	8	22	30	33	34.5	14
<b>AG1.5-30R1</b>	30		30	1	3°26'	R	H1	10	30	45	48	49.5	14
<b>AG1.5-30R2</b>	15		30	2	6°51'	R	H1	10	30	45	48	49.5	14
<b>AG1.5-40R1</b>	40		40	1	3°26'	R	H1	12	35	60	63	64.5	14
<b>AG1.5-50R1</b>	50		50	1	3°26'	R	H1	12	45	75	78	79.5	14
<b>AG1.5-60R1</b>	60	60	1	3°26'	R	H1	12	50	90	93	94.5	14	

[Caution on Product Characteristics]

- ① The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 510 for more details.

Outside dia.	Neck dia.	Shaft dia.	Weight (kg)	Catalog No.
Q	R	S		
18	13	18	0.25	<b>KWG1-R1</b>
18	13	18	0.25	<b>KWG1-R2</b>
28	21	26	0.74	<b>KWG1.5-R1</b>
28	21	26	0.74	<b>KWG1.5-R2</b>

- [Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 512) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 1 to 2 mm). Use carbide tools for the modification of the shaft area near the bottom land.

AG

## Worm Wheels



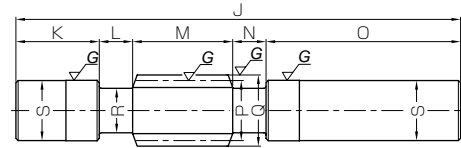
NOTE 1. Allowable torques for worm rotation (rpm)

Hub width	Total length	Web thickness	Web O.D.	Mounting distance	Allowable torque (N·m) NOTE 1							Backlash (mm)	Weight (kg)	Catalog No.
					30 <sub>rpm</sub>	100 <sub>rpm</sub>	300 <sub>rpm</sub>	600 <sub>rpm</sub>	900 <sub>rpm</sub>	1200 <sub>rpm</sub>	1800 <sub>rpm</sub>			
F	G	(H)	(I)	J										
10	20	—	—	18	3.35	2.79	2.23	1.83	1.63	1.50	1.30	0.08~0.19	0.038	<b>AG1-20R1</b>
10	20	—	—	18	3.31	2.69	2.06	1.68	1.48	1.35	1.15	0.08~0.19	0.038	<b>AG1-20R2</b>
10	20	—	—	23	7.08	5.98	4.84	4.05	3.63	3.31	2.92	0.08~0.19	0.078	<b>AG1-30R1</b>
10	20	—	—	23	7.03	5.84	4.56	3.72	3.33	3.03	2.63	0.08~0.19	0.078	<b>AG1-30R2</b>
10	20	—	—	28	12.1	10.2	8.43	7.12	6.38	5.86	5.13	0.08~0.19	0.13	<b>AG1-40R1</b>
10	20	—	—	33	18.3	15.5	12.9	10.9	9.87	9.09	7.95	0.08~0.19	0.20	<b>AG1-50R1</b>
10	20	—	—	38	25.6	21.8	18.1	15.4	14.1	12.9	11.4	0.08~0.19	0.29	<b>AG1-60R1</b>
10	24	—	—	27.5	9.84	8.18	6.40	5.30	4.68	4.25	3.68	0.10~0.21	0.10	<b>AG1.5-20R1</b>
10	24	—	—	27.5	9.72	7.87	5.92	4.87	4.25	3.83	3.27	0.10~0.21	0.10	<b>AG1.5-20R2</b>
10	24	—	—	35	20.8	17.5	13.9	11.7	10.4	9.40	8.28	0.10~0.21	0.22	<b>AG1.5-30R1</b>
10	24	—	—	35	20.7	17.1	13.1	10.8	9.56	8.58	7.46	0.10~0.21	0.22	<b>AG1.5-30R2</b>
10	24	—	—	42.5	35.6	30.0	24.2	20.6	18.3	16.6	14.6	0.10~0.21	0.37	<b>AG1.5-40R1</b>
10	24	—	—	50	53.8	45.4	36.9	31.6	28.3	25.8	22.6	0.10~0.21	0.59	<b>AG1.5-50R1</b>
10	24	—	—	57.5	75.3	63.8	51.9	44.7	40.4	36.7	32.4	0.10~0.21	0.83	<b>AG1.5-60R1</b>

- [Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 512) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.



Specifications	
Precision grade	KHK W 001 grade 2
Reference section of gear	Axial
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	SCM440
Heat treatment	Thermal refined, tooth surface induction hardened
Tooth hardness	45 ~ 55HRC



W6

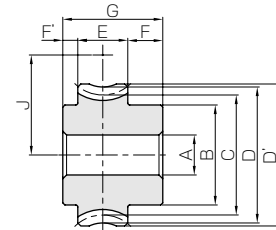
Catalog No.	Axial module	Number of start	Lead angle	Hand of tread	Shape	Total length	Shaft length (L)	Neck length (L)	Face width	Neck length (R)	Shaft length (R)	Pitch dia.
						J	K	L	M	N	O	P
<b>KWG2-R1</b>	<b>m2</b>	1	5°12'	R	W6	200	35	25	40	25	75	22
<b>KWG2-R2</b>		2	10°18'	R	W6	200	35	25	40	25	75	22
<b>KWG2.5-R1</b>	<b>m2.5</b>	1	4°46'	R	W6	250	50	27	46	27	100	30
<b>KWG2.5-R2</b>		2	9°28'	R	W6	250	50	27	46	27	100	30

[Caution on Product Characteristics]

- ① For W6 Shaped Gears, the tolerances of the shaft diameter are set to S +0.2 and +0.1 (+0.40 and +0.35 for the ground area).
- ② These worms produce axial thrust forces. See page 512 for more details.



Specifications	
Precision grade	KHK W 002 grade 2
Reference section of gear	Rotating plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	CAC702 (formerly JIS A&BC2) *
Heat treatment	—
Tooth hardness	—



\* H8, H9 shape have a hub made from FC200 cast iron.

H6

Catalog No.	Reduction ratio	Transverse module	No. of teeth	Number of start	Profile shift coefficient	Helix angle	Hand of tread	Shape	Bore	Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width	Hub width(R)
									AH7	B	C	D	D'	E	F
<b>AGF2-20R1</b>	20	<b>m2</b>	20	1	-0.5	5°12'	R	H6	12	32	40	42	44	18	12
<b>AGF2-20R2</b>	10		20	2	-0.5	10°18'	R	H6	12	32	40	42	44	18	12
<b>AGF2-25R1</b>	25		25	1	-0.5	5°12'	R	H6	12	35	50	52	54	18	12
<b>AGF2-30R1</b>	30		30	1	-0.5	5°12'	R	H6	12	38	60	62	64	18	12
<b>AGF2-30R2</b>	15		30	2	-0.5	10°18'	R	H6	12	38	60	62	64	18	12
<b>AGF2-36R1</b>	36		36	1	0	5°12'	R	H6	12	40	72	76	78	18	12
<b>AGF2-40R1</b>	40	40	1	-0.5	5°12'	R	H8	12	45	80	82	84	18	12	
<b>AGF2-48R1</b>	48	48	1	+0.5	5°12'	R	H9	12	50	96	102	104	18	12	
<b>AGF2-50R1</b>	50	50	1	-0.5	5°12'	R	H9	12	50	100	102	104	18	12	
<b>AGF2-60R1</b>	60	60	1	-0.5	5°12'	R	H9	12	50	120	122	124	18	12	
<b>AGF2.5-20R1</b>	20	<b>m2.5</b>	20	1	0	4°46'	R	H6	12	35	50	55	57.5	20	15
<b>AGF2.5-20R2</b>	10		20	2	0	9°28'	R	H6	12	35	50	55	57.5	20	15
<b>AGF2.5-25R1</b>	25		25	1	0	4°46'	R	H6	12	40	62.5	67.5	70	20	15
<b>AGF2.5-30R1</b>	30		30	1	0	4°46'	R	H6	12	40	75	80	82.5	20	15
<b>AGF2.5-30R2</b>	15		30	2	0	9°28'	R	H6	12	40	75	80	82.5	20	15
<b>AGF2.5-36R1</b>	36		36	1	0	4°46'	R	H8	12	45	90	95	97.5	20	15
<b>AGF2.5-40R1</b>	40	40	1	0	4°46'	R	H9	12	45	100	105	107.5	20	15	
<b>AGF2.5-48R1</b>	48	48	1	0	4°46'	R	H9	12	50	120	125	127.5	20	15	
<b>AGF2.5-50R1</b>	50	50	1	0	4°46'	R	H9	12	55	125	130	132.5	20	15	
<b>AGF2.5-60R1</b>	60	60	1	0	4°46'	R	H9	12	60	150	155	157.5	20	15	

[Caution on Product Characteristics]

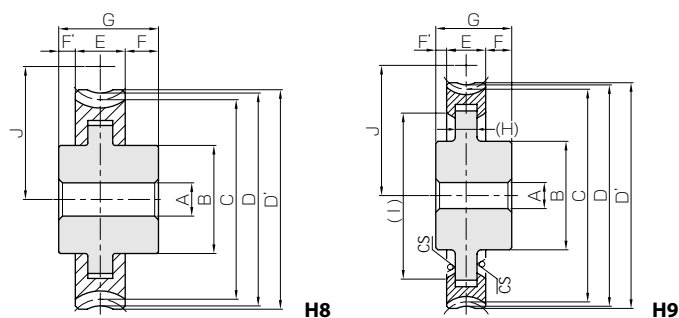
- ① The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 510 for more details.
- ② There may be space in the casting between the two materials, but it will not affect the joint strength.

Outside dia.	Neck dia.	Shaft dia.	Weight (kg)	Catalog No.
Q	R	S		
26	17	25	0.64	<b>KWG2-R1</b>
26	17	25	0.64	<b>KWG2-R2</b>
35	23	30	1.27	<b>KWG2.5-R1</b>
35	23	30	1.27	<b>KWG2.5-R2</b>

- [Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 512) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 1 to 2 mm). Use carbide tools for the modification of the shaft area near the bottom land.

AG

Worm Wheels



\* CS has a sand mold casting finish.

NOTE 1. Allowable torques for worm rotation (rpm)

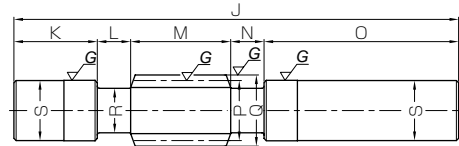


Hub width	Total length	Web thickness	Web O.D.	Mounting distance	Allowable torque (N·m) NOTE 1							Backlash (mm)	Weight (kg)	Catalog No.
					30 rpm	100 rpm	300 rpm	600 rpm	900 rpm	1200 rpm	1800 rpm			
F	G	(H)	(I)	J										
5	35	—	—	30	19.4	16.1	12.8	10.5	9.30	8.49	7.31	0.11~0.24	0.25	<b>AGF2-20R1</b>
5	35	—	—	30	19.9	16.1	12.2	9.99	8.75	7.92	6.74	0.11~0.24	0.25	<b>AGF2-20R2</b>
5	35	—	—	35	29.4	24.5	19.6	16.3	14.4	13.2	11.4	0.11~0.24	0.37	<b>AGF2-25R1</b>
5	35	—	—	40	41.1	34.5	27.7	23.2	20.7	18.8	16.4	0.11~0.24	0.51	<b>AGF2-30R1</b>
5	35	—	—	40	42.3	35.0	27.0	22.1	19.9	17.7	15.4	0.11~0.24	0.51	<b>AGF2-30R2</b>
5	35	—	—	47	57.8	48.6	39.3	33.2	29.6	27.0	23.6	0.11~0.24	0.73	<b>AGF2-36R1</b>
5	35	—	—	50	70.3	59.2	48.1	40.7	36.4	33.2	28.9	0.11~0.24	0.85	<b>AGF2-40R1</b>
5	35	(10)	(76)	60	98.5	83.0	68.0	57.9	51.9	47.5	41.3	0.11~0.24	1.14	<b>AGF2-48R1</b>
5	35	(12)	(81)	60	106	89.5	73.4	62.5	56.2	51.5	44.9	0.11~0.24	1.14	<b>AGF2-50R1</b>
5	35	(12)	(96)	70	149	126	103	88.4	80.3	73.3	64.2	0.11~0.24	1.51	<b>AGF2-60R1</b>
5	40	—	—	40	35.1	29.0	22.6	18.6	16.3	14.8	12.8	0.14~0.27	0.44	<b>AGF2.5-20R1</b>
5	40	—	—	40	34.6	27.9	20.9	17.1	14.8	13.4	11.3	0.14~0.27	0.44	<b>AGF2.5-20R2</b>
5	40	—	—	46.25	53.0	43.9	34.8	28.9	25.3	23.0	20.0	0.14~0.27	0.66	<b>AGF2.5-25R1</b>
5	40	—	—	52.5	74.1	62.0	49.1	41.2	36.7	32.8	28.7	0.14~0.27	0.87	<b>AGF2.5-30R1</b>
5	40	—	—	52.5	73.6	60.6	46.2	37.8	33.2	29.9	25.8	0.14~0.27	0.87	<b>AGF2.5-30R2</b>
5	40	—	—	60	104	87.4	69.8	59.0	51.8	47.1	41.2	0.14~0.27	1.19	<b>AGF2.5-36R1</b>
5	40	(12)	(80)	65	127	106	85.4	72.4	63.7	57.9	50.5	0.14~0.27	1.23	<b>AGF2.5-40R1</b>
5	40	(13)	(97)	75	178	149	121	103	90.8	83.1	72.2	0.14~0.27	1.72	<b>AGF2.5-48R1</b>
5	40	(13)	(100)	77.5	192	161	130	111	98.4	90.0	78.3	0.14~0.27	1.92	<b>AGF2.5-50R1</b>
5	40	(13)	(125)	90	268	226	183	157	141	128	112	0.14~0.27	2.59	<b>AGF2.5-60R1</b>

- [Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 512) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② The tooth and the hub areas, fastened by casting, are designed to have higher hardness than other parts of the gear. However, please avoid areas other than the hub. Also, the strength may decrease if secondary operations are performed.



Specifications	
Precision grade	KHK W 001 grade 2
Reference section of gear	Axial
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	SCM440
Heat treatment	Thermal refined, tooth surface induction hardened
Tooth hardness	45 ~ 55HRC



W6

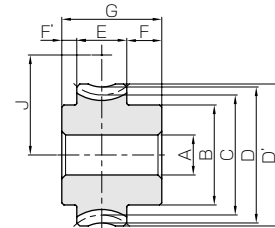
Catalog No.	Axial module	Number of start	Lead angle	Hand of tread	Shape	Total length	Shaft length (L)	Neck length (L)	Face width	Neck length (R)	Shaft length (R)	Pitch dia.
						J	K	L	M	N	O	P
<b>KWG3-R1</b>	<b>m3</b>	1	4°31'	R	W6	300	55	30	60	30	125	38
<b>KWG3-R2</b>		2	8°58'	R	W6	300	55	30	60	30	125	38
<b>KWG4-R1</b>	<b>m4</b>	1	5°43'	R	W6	360	70	32.5	75	32.5	150	40
<b>KWG4-R2</b>		2	11°19'	R	W6	360	70	32.5	75	32.5	150	40

[Caution on Product Characteristics]

- ① For W6 Shaped Gears, the tolerances of the shaft diameter are set to S +0.2 and +0.1 (+0.40 and +0.35 for the ground area).
- ② These worms produce axial thrust forces. See page 512 for more details.



Specifications	
Precision grade	KHK W 002 grade 2
Reference section of gear	Rotating plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	CAC702 (formerly JIS A&BC2) *
Heat treatment	—
Tooth hardness	—



H6

\* H8, H9 shape have a hub made from FC200 cast iron.

Catalog No.	Reduction ratio	Transverse module	No. of teeth	Number of start	Profile shift coefficient	Helix angle	Hand of tread	Shape	Bore	Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width	Hub width(R)
									AH7	B	C	D	D'	E	F
<b>AGF3-20R1</b>	20	<b>m3</b>	20	1	+0.333	4°31'	R	H6	20	50	60	68	71	25	17.5
<b>AGF3-20R2</b>	10		20	2	+0.333	8°58'	R	H6	20	50	60	68	71	25	17.5
<b>AGF3-25R1</b>	25		25	1	0	4°31'	R	H6	20	55	75	81	84	25	17.5
<b>AGF3-30R1</b>	30		30	1	+0.333	4°31'	R	H8	20	55	90	98	101	25	17.5
<b>AGF3-30R2</b>	15		30	2	+0.333	8°58'	R	H8	20	55	90	98	101	25	17.5
<b>AGF3-36R1</b>	36		36	1	+0.333	4°31'	R	H8	20	60	108	116	119	25	17.5
<b>AGF3-40R1</b>	40		40	1	+0.333	4°31'	R	H9	20	65	120	128	131	25	17.5
<b>AGF3-48R1</b>	48		48	1	+0.333	4°31'	R	H9	20	70	144	152	155	25	17.5
<b>AGF3-50R1</b>	50		50	1	+0.333	4°31'	R	H9	20	75	150	158	161	25	17.5
<b>AGF3-60R1</b>	60		60	1	+0.333	4°31'	R	H9	20	80	180	188	191	25	17.5
<b>AGF4-20R1</b>	20	<b>m4</b>	20	1	0	5°43'	R	H6	20	60	80	88	92	30	20
<b>AGF4-20R2</b>	10		20	2	0	11°19'	R	H6	20	60	80	88	92	30	20
<b>AGF4-25R1</b>	25		25	1	0	5°43'	R	H6	20	65	100	108	112	30	20
<b>AGF4-30R1</b>	30		30	1	0	5°43'	R	H8	20	65	120	128	132	30	20
<b>AGF4-30R2</b>	15		30	2	0	11°19'	R	H8	20	65	120	128	132	30	20
<b>AGF4-36R1</b>	36		36	1	0	5°43'	R	H9	20	70	144	152	156	30	20
<b>AGF4-40R1</b>	40		40	1	0	5°43'	R	H9	20	80	160	168	172	30	20
<b>AGF4-48R1</b>	48		48	1	0	5°43'	R	H9	20	90	192	200	204	30	20
<b>AGF4-50R1</b>	50		50	1	0	5°43'	R	H9	20	90	200	208	212	30	20
<b>AGF4-60R1</b>	60		60	1	0	5°43'	R	H0	160	—	240	248	252	30	7

[Caution on Product Characteristics]

- ① The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 510 for more details.
- ② There may be space in the casting between the two materials, but it will not affect the joint strength.



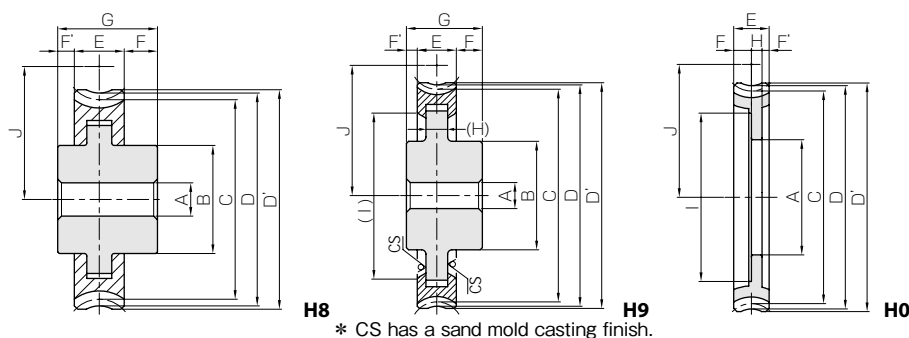
Ground Worm Shafts

Outside dia.	Neck dia.	Shaft dia.	Weight (kg)	Catalog No.
Q	R	S		
44	30	40	2.66	<b>KWG3-R1</b>
44	30	40	2.66	<b>KWG3-R2</b>
48	29	45	3.85	<b>KWG4-R1</b>
48	29	45	3.85	<b>KWG4-R2</b>

- [Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 512) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 1 to 2 mm). Use carbide tools for the modification of the shaft area near the bottom land.

AGF

Worm Wheels



\* CS has a sand mold casting finish.



NOTE 1. Allowable torques for worm rotation (rpm)

Hub width	Total length	Web thickness	Web O.D.	Mounting distance	Allowable torque (N·m) NOTE 1								Backlash (mm)	Weight (kg)	Catalog No.
					F	G	(H)	(I)	J	30 rpm	100 rpm	300 rpm			
7.5	50	—	—	50	59.7	49.1	38.3	31.5	27.5	25.1	21.5	0.16~0.29	0.88	<b>AGF3-20R1</b>	
7.5	50	—	—	50	60.2	48.2	36.1	29.5	25.4	23.0	19.4	0.16~0.29	0.88	<b>AGF3-20R2</b>	
7.5	50	—	—	56.5	90.2	74.3	58.8	48.9	42.6	39.0	33.5	0.16~0.29	1.24	<b>AGF3-25R1</b>	
7.5	50	—	—	65	126	105	83.1	69.6	61.0	55.4	48.2	0.16~0.29	1.63	<b>AGF3-30R1</b>	
7.5	50	—	—	65	128	105	79.8	65.2	57.2	51.6	44.3	0.16~0.29	1.63	<b>AGF3-30R2</b>	
7.5	50	—	—	74	178	148	118	99.7	87.5	79.4	69.1	0.16~0.29	2.25	<b>AGF3-36R1</b>	
7.5	50	(16)	(95)	80	216	180	145	122	108	98.0	84.9	0.16~0.29	2.52	<b>AGF3-40R1</b>	
7.5	50	(15)	(120)	92	303	252	204	174	153	141	121	0.16~0.29	3.28	<b>AGF3-48R1</b>	
7.5	50	(15)	(125)	95	326	272	220	188	166	152	132	0.16~0.29	3.62	<b>AGF3-50R1</b>	
7.5	50	(15)	(155)	110	457	383	310	265	237	217	188	0.16~0.29	4.76	<b>AGF3-60R1</b>	
10	60	—	—	60	123	101	78.8	64.6	56.3	51.5	43.8	0.19~0.32	1.77	<b>AGF4-20R1</b>	
10	60	—	—	60	127	101	76.0	61.9	53.2	48.3	40.5	0.19~0.32	1.77	<b>AGF4-20R2</b>	
10	60	—	—	70	186	153	121	100	87.3	79.9	68.5	0.19~0.32	2.56	<b>AGF4-25R1</b>	
10	60	—	—	80	260	216	171	143	125	114	98.4	0.19~0.32	3.28	<b>AGF4-30R1</b>	
10	60	—	—	80	270	220	168	137	120	108	92.2	0.19~0.32	3.28	<b>AGF4-30R2</b>	
10	60	(20)	(113)	92	366	304	243	204	179	164	141	0.19~0.32	4.10	<b>AGF4-36R1</b>	
10	60	(23)	(128)	100	445	370	297	251	220	201	173	0.19~0.32	5.25	<b>AGF4-40R1</b>	
10	60	(20)	(160)	116	624	519	420	356	314	288	248	0.19~0.32	6.95	<b>AGF4-48R1</b>	
10	60	(20)	(168)	120	673	560	454	385	340	312	269	0.19~0.32	7.35	<b>AGF4-50R1</b>	
15	30	8	204	140	941	788	638	544	486	444	385	0.19~0.32	3.60	<b>AGF4-60R1</b>	

- [Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 512) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② The tooth and the hub areas, fastened by casting, are designed to have higher hardness than other parts of the gear. However, please avoid areas other than the hub. Also, the strength may decrease if secondary operations are performed.

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

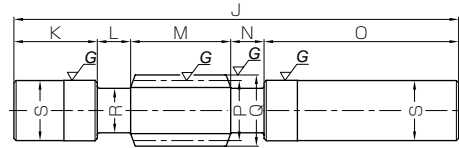
Worm Gear Pair

Bevel Gearboxes

Other Products



Specifications	
Precision grade	KHK W 001 grade 2
Reference section of gear	Axial
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	SCM440
Heat treatment	Thermal refined, tooth surface induction hardened
Tooth hardness	45 ~ 55HRC



W6

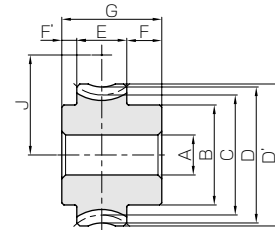
Catalog No.	Axial module	Number of start	Lead angle	Hand of tread	Shape	Total length	Shaft length (L)	Neck length (L)	Face width	Neck length (R)	Shaft length (R)	Pitch dia.
						J	K	L	M	N	O	P
<b>KWG5-R1</b>	<b>m5</b>	1	5°43'	R	W6	400	75	30	90	30	175	50
<b>KWG6-R1</b>	<b>m6</b>	1	5°43'	R	W6	400	60	40	100	40	160	60

[Caution on Product Characteristics]

- ① For W6 Shaped Gears, the tolerances of the shaft diameter are set to S +0.2 and +0.1 (+0.40 and +0.35 for the ground area).
- ② These worms produce axial thrust forces. See page 512 for more details.



Specifications	
Precision grade	KHK W 002 grade 2
Reference section of gear	Rotating plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	CAC702 (formerly JIS A&BC2) *
Heat treatment	—
Tooth hardness	—



\* H8, H9 shape have a hub made from FC200 cast iron.

H6

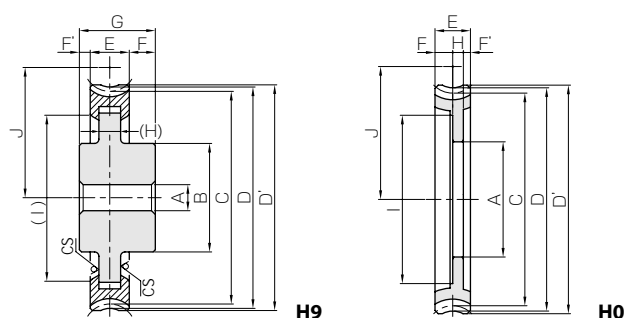
Catalog No.	Reduction ratio	Transverse module	No. of teeth	Number of start	Profile shift coefficient	Helix angle	Hand of tread	Shape	Bore	Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width	Hub width(R)
									AH7	B	C	D	D'	E	F
<b>AGF5-20R1</b>	20	<b>m5</b>	20	1	0	5°43'	R	H6	22	75	100	110	115	35	23
<b>AGF5-25R1</b>	25		25	1	0	5°43'	R	H6	22	75	125	135	140	35	23
<b>AGF5-30R1</b>	30		30	1	0	5°43'	R	H9	22	75	150	160	165	35	23
<b>AGF5-36R1</b>	36		36	1	0	5°43'	R	H9	22	90	180	190	195	35	23
<b>AGF5-40R1</b>	40		40	1	0	5°43'	R	H9	22	110	200	210	215	35	23
<b>AGF5-48R1</b>	48		48	1	0	5°43'	R	H0	140	—	240	250	255	35	7.5
<b>AGF5-50R1</b>	50	50	1	0	5°43'	R	H0	150	—	250	260	265	35	7.5	
<b>AGF5-60R1</b>	60	60	1	0	5°43'	R	H0	200	—	300	310	315	35	7.5	
<b>AGF6-20R1</b>	20	<b>m6</b>	20	1	0	5°43'	R	H6	25	85	120	132	138	40	23
<b>AGF6-25R1</b>	25		25	1	0	5°43'	R	H6	25	90	150	162	168	40	23
<b>AGF6-30R1</b>	30		30	1	0	5°43'	R	H9	25	100	180	192	198	40	23
<b>AGF6-36R1</b>	36		36	1	0	5°43'	R	H9	25	110	216	228	234	40	23
<b>AGF6-40R1</b>	40		40	1	0	5°43'	R	H0	130	—	240	252	258	40	8
<b>AGF6-48R1</b>	48		48	1	0	5°43'	R	H0	180	—	288	300	306	40	8
<b>AGF6-50R1</b>	50	50	1	0	5°43'	R	H0	190	—	300	312	318	40	8	
<b>AGF6-60R1</b>	60	60	1	0	5°43'	R	H0	250	—	360	372	378	40	8	

[Caution on Product Characteristics]

- ① The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 510 for more details.
- ② There may be space in the casting between the two materials, but it will not affect the joint strength.

Outside dia.	Neck dia.	Shaft dia.	Weight (kg)	Catalog No.
Q	R	S		
60	36	50	5.75	<b>KWG5-R1</b>
72	44	60	8.09	<b>KWG6-R1</b>

- [Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 512) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 1 to 2 mm). Use carbide tools for the modification of the shaft area near the bottom land.



\* CS has a sand mold casting finish.

NOTE 1. Allowable torques for worm rotation (rpm)



Hub width (L)	Total length	Web thickness	Web O.D.	Mounting distance	Allowable torque (N·m) NOTE 1							Backlash (mm)	Weight (kg)	Catalog No.
					30 <sub>rpm</sub>	100 <sub>rpm</sub>	300 <sub>rpm</sub>	600 <sub>rpm</sub>	900 <sub>rpm</sub>	1200 <sub>rpm</sub>	1800 <sub>rpm</sub>			
F'	G	(H)	(I)	J										
12	70	—	—	75	211	172	134	108	95.0	86.2	72.7	0.22~0.35	3.26	<b>AGF5-20R1</b>
12	70	—	—	87.5	319	261	206	168	147	134	114	0.22~0.35	4.48	<b>AGF5-25R1</b>
12	70	(25)	(115)	100	446	369	291	239	211	191	164	0.22~0.35	5.37	<b>AGF5-30R1</b>
12	70	(25)	(140)	115	627	519	414	343	302	274	234	0.22~0.35	7.70	<b>AGF5-36R1</b>
12	70	(26)	(162)	125	763	632	506	421	371	337	288	0.22~0.35	9.97	<b>AGF5-40R1</b>
17.5	35	10	195	145	1070	886	715	598	530	483	411	0.22~0.35	5.04	<b>AGF5-48R1</b>
17.5	35	10	205	150	1150	956	772	646	574	523	446	0.22~0.35	5.28	<b>AGF5-50R1</b>
17.5	35	10	255	175	1610	1340	1090	913	820	744	639	0.22~0.35	6.48	<b>AGF5-60R1</b>
12	75	—	—	90	329	268	208	167	146	131	110	0.24~0.37	4.95	<b>AGF6-20R1</b>
12	75	—	—	105	497	405	319	259	227	204	173	0.24~0.37	7.14	<b>AGF6-25R1</b>
12	75	(30)	(135)	120	696	572	451	368	325	290	248	0.24~0.37	9.21	<b>AGF6-30R1</b>
12	75	(30)	(172)	138	978	806	641	528	466	417	355	0.24~0.37	12.5	<b>AGF6-36R1</b>
20	40	12	190	150	1190	981	784	648	572	513	436	0.24~0.37	6.20	<b>AGF6-40R1</b>
20	40	12	240	174	1670	1380	1110	920	816	735	628	0.24~0.37	7.58	<b>AGF6-48R1</b>
20	40	12	250	180	1800	1480	1200	994	885	796	676	0.24~0.37	8.00	<b>AGF6-50R1</b>
20	40	12	310	210	2520	2090	1680	1410	1260	1130	969	0.24~0.37	10.0	<b>AGF6-60R1</b>

- [Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 512) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② The tooth and the hub areas, fastened by casting, are designed to have higher hardness than other parts of the gear. However, please avoid areas other than the hub. Also, the strength may decrease if secondary operations are performed.

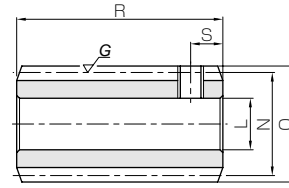


# SWG Ground Worms

Module 1、1.5



Specifications	
Precision grade	KHK W 001 grade 2 *
Reference section of gear	Axial
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	S45C
Heat treatment	Teeth induction hardened
Tooth hardness	45 ~ 55HRC



W2

\* The precision grade of J Series products is equivalent to the value shown in the table.

Catalog No. ● : J Series (Available-on-request)	Axial module	Number of start	Lead angle	Hand of tread	Shape	Bore		Pitch dia.	Outside dia.	Face width	Hub width (R)	Hub width (L)
						L <sub>H7</sub>	M					
<b>SWG1-R1</b> <b>SWG1-R2</b>	<b>m1</b>	1	3°35'	R	W2	8	—	16	18	—	—	—
		2	7°08'	R	W2	8	—	16	18	—	—	—
<b>SWG1.5-R1</b> ● <b>SWG1.5-R1J10</b>	<b>m1.5</b>	1	3°26'	R	W1 W1K	10 10	20	25	28	30	10	—
<b>SWG1.5-R2</b> ● <b>SWG1.5-R2J10</b>		2	6°51'	R	W1 W1K	10 10	20	25	28	30	10	—

[Caution on Product Characteristics] ① For W2-shaped products, a set screw is included. When setting up the mating wheel, make sure no friction occurs within the set screw.

② These worms produce axial thrust forces. See page 512 for more details.

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 512) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.

② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 1 to 2 mm).

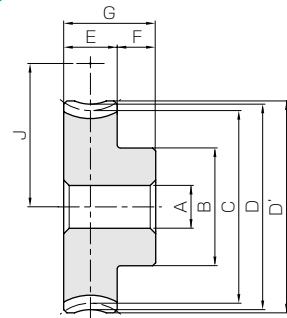


# AG Worm Wheels

Module 1、1.5

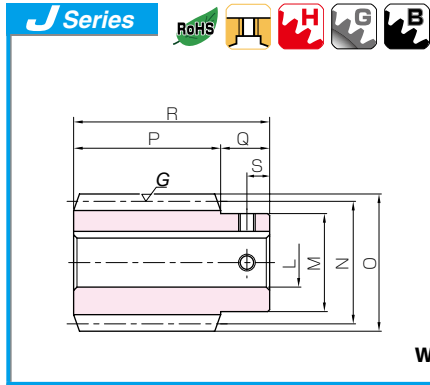


Specifications	
Precision grade	KHK W 002 grade 2
Reference section of gear	Rotating plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	CAC702 (formerly JIS A&BC2)
Heat treatment	—
Tooth hardness	—



Catalog No.	Reduction ratio	Transverse module	No. of teeth	Number of start	Helix angle	Hand of tread	Shape	Bore		Pitch dia.	Throat dia.	Outside dia.	Face width
								A <sub>H7</sub>	B				
<b>AG1-20R1</b>	20	<b>m1</b>	20	1	3°35'	R	H1	6	16	20	22	23	10
<b>AG1-20R2</b>	10		20	2	7°08'	R	H1	6	16	20	22	23	10
<b>AG1-30R1</b>	30		30	1	3°35'	R	H1	6	20	30	32	33	10
<b>AG1-30R2</b>	15		30	2	7°08'	R	H1	6	20	30	32	33	10
<b>AG1-40R1</b>	40		40	1	3°35'	R	H1	8	26	40	42	43	10
<b>AG1-50R1</b>	50		50	1	3°35'	R	H1	8	30	50	52	53	10
<b>AG1-60R1</b>	60	60	1	3°35'	R	H1	10	35	60	62	63	10	
<b>AG1.5-20R1</b>	20	<b>m1.5</b>	20	1	3°26'	R	H1	8	22	30	33	34.5	14
<b>AG1.5-20R2</b>	10		20	2	6°51'	R	H1	8	22	30	33	34.5	14
<b>AG1.5-30R1</b>	30		30	1	3°26'	R	H1	10	30	45	48	49.5	14
<b>AG1.5-30R2</b>	15		30	2	6°51'	R	H1	10	30	45	48	49.5	14
<b>AG1.5-40R1</b>	40		40	1	3°26'	R	H1	12	35	60	63	64.5	14
<b>AG1.5-50R1</b>	50		50	1	3°26'	R	H1	12	45	75	78	79.5	14
<b>AG1.5-60R1</b>	60	60	1	3°26'	R	H1	12	50	90	93	94.5	14	

[Caution on Product Characteristics] ① The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 510 for more details.



Ground Worms

Newly added



Total length R	Keyway Width×Depth	Set screw		Weight (kg)	Catalog No. ● : J Series (Available-on-request)
		Size	S		
32	—	M4	5	0.037	<b>SWG1-R1</b>
32	—	M4	5	0.037	<b>SWG1-R2</b>
40	4 x 1.8	M4	5	0.12 0.11	<b>SWG1.5-R1</b> ● <b>SWG1.5-R1J10</b>
40	4 x 1.8	M4	5	0.12 0.11	<b>SWG1.5-R2</b> ● <b>SWG1.5-R2J10</b>

- [Caution on J series]
- ① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
  - ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
  - ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
  - ④ Areas of products which have been re-worked will not be black oxide coated.
  - ⑤ For products having a tapped hole, a set screw is included.

Spur Gears  
Helical Gears  
Internal Gears  
Racks  
CP Racks & Pinions

AG

Worm Wheels



NOTE 1. Allowable torques for worm rotation (rpm)

Hub width F	Total length G	Web thickness (H)	Web O.D. (I)	Mounting distance J	Allowable torque (N·m) NOTE 1							Backlash (mm)	Weight (kg)	Catalog No.
					30 rpm	100 rpm	300 rpm	600 rpm	900 rpm	1200 rpm	1800 rpm			
10	20	—	—	18	3.35	2.79	2.23	1.83	1.63	1.50	1.30	0.08~0.19	0.038	<b>AG1-20R1</b>
10	20	—	—	18	3.31	2.69	2.06	1.68	1.48	1.35	1.15	0.08~0.19	0.038	<b>AG1-20R2</b>
10	20	—	—	23	7.08	5.98	4.84	4.05	3.63	3.31	2.92	0.08~0.19	0.078	<b>AG1-30R1</b>
10	20	—	—	23	7.03	5.84	4.56	3.72	3.33	3.03	2.63	0.08~0.19	0.078	<b>AG1-30R2</b>
10	20	—	—	28	12.1	10.2	8.43	7.12	6.38	5.86	5.13	0.08~0.19	0.13	<b>AG1-40R1</b>
10	20	—	—	33	18.3	15.5	12.9	10.9	9.87	9.09	7.95	0.08~0.19	0.20	<b>AG1-50R1</b>
10	20	—	—	38	25.6	21.8	18.1	15.4	14.1	12.9	11.4	0.08~0.19	0.29	<b>AG1-60R1</b>
10	24	—	—	27.5	9.84	8.18	6.40	5.30	4.68	4.25	3.68	0.10~0.21	0.10	<b>AG1.5-20R1</b>
10	24	—	—	27.5	9.72	7.87	5.92	4.87	4.25	3.83	3.27	0.10~0.21	0.10	<b>AG1.5-20R2</b>
10	24	—	—	35	20.8	17.5	13.9	11.7	10.4	9.40	8.28	0.10~0.21	0.22	<b>AG1.5-30R1</b>
10	24	—	—	35	20.7	17.1	13.1	10.8	9.56	8.58	7.46	0.10~0.21	0.22	<b>AG1.5-30R2</b>
10	24	—	—	42.5	35.6	30.0	24.2	20.6	18.3	16.6	14.6	0.10~0.21	0.37	<b>AG1.5-40R1</b>
10	24	—	—	50	53.8	45.4	36.9	31.6	28.3	25.8	22.6	0.10~0.21	0.59	<b>AG1.5-50R1</b>
10	24	—	—	57.5	75.3	63.8	51.9	44.7	40.4	36.7	32.4	0.10~0.21	0.83	<b>AG1.5-60R1</b>

- [Caution on Secondary Operations]
- ① Please read "Caution on Performing Secondary Operations" (Page 512) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.

Miter Gears  
Bevel Gears  
Screw Gears  
Worm Gear Pair

Other Products  
Bevel Gearboxes

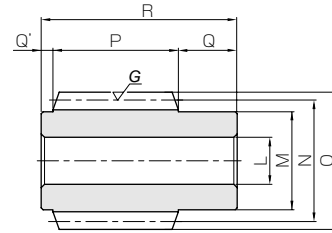


# SWG Ground Worms

Module 2, 2.5



Specifications	
Precision grade	KHK W 001 grade 2 *
Reference section of gear	Axial
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	S45C
Heat treatment	Teeth induction hardened
Tooth hardness	45 ~ 55HRC



W3

\* The precision grade of J Series products is equivalent to the value shown in the table.

Catalog No. ● : J Series (Available-on-request)	Axial module	Number of start	Lead angle	Hand of thread	Shape	Bore		Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width (R)	Hub width (L)
						L <sub>H7</sub>	M						
<b>SWG2-R1</b> ● SWG2-R1J12 ● SWG2-R1J14	m2	1	3°41'	R	W3 W3K W3K	12	25	31	35	32	15	3	
14													
<b>SWG2-R2</b> ● SWG2-R2J12 ● SWG2-R2J14	m2	2	7°21'	R	W3 W3K W3K	12	25	31	35	32	15	3	
14													
<b>SWG2.5-R1</b> ● SWG2.5-R1J15 ● SWG2.5-R1J16	m2.5	1	3°52'	R	W3 W3K W3K	15	30	37	42	45	17	3	
16													
<b>SWG2.5-R2</b> ● SWG2.5-R2J15 ● SWG2.5-R2J16	m2.5	2	7°42'	R	W3 W3K W3K	15	30	37	42	45	17	3	
16													

[Caution on Product Characteristics] ① These worms produce axial thrust forces. See page 512 for more details.

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 512) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.  
② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 1 to 2 mm).

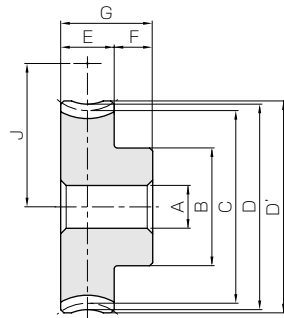


# AG Worm Wheels

Module 2, 2.5



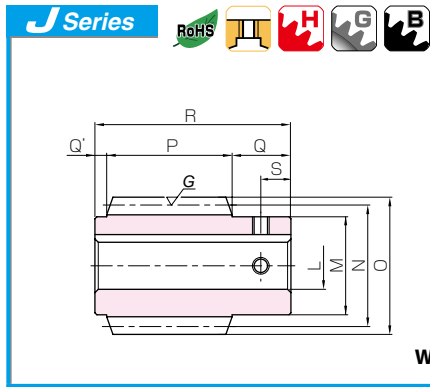
Specifications	
Precision grade	KHK W 002 grade 2
Reference section of gear	Rotating plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	CAC702 (formerly JIS A&BC2) *
Heat treatment	—
Tooth hardness	—



\* H8, H9 shape have a hub made from FC200 cast iron.

Catalog No.	Reduction ratio	Transverse module	No. of teeth	Number of start	Helix angle	Hand of thread	Shape	Bore		Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width				
								A <sub>H7</sub>	B									
<b>AG2-20R1</b>	20	m2	20	1	3°41'	R	H1	12	33	33	40	44	46	18				
<b>AG2-20R2</b>	10		20	2	7°21'	R	H1	12	33									
<b>AG2-30R1</b>	30		30	1	3°41'	R	H4	12	40						60	64	66	18
<b>AG2-30R2</b>	15		30	2	7°21'	R	H4	12	40						60	64	66	18
<b>AG2-40R1</b>	40		40	1	3°41'	R	H4	12	45						80	84	86	18
<b>AG2-50R1</b>	50		50	1	3°41'	R	H5	12	50						100	104	106	18
<b>AG2-60R1</b>	60	60	1	3°41'	R	H5	12	55	120	124	126	18						
<b>AG2.5-20R1</b>	20	m2.5	20	1	3°52'	R	H1	12	35	35	50	55	57.5	20				
<b>AG2.5-20R2</b>	10		20	2	7°42'	R	H1	12	35						50	55	57.5	20
<b>AG2.5-30R1</b>	30		30	1	3°52'	R	H4	12	40						75	80	82.5	20
<b>AG2.5-30R2</b>	15		30	2	7°42'	R	H4	12	40						75	80	82.5	20
<b>AG2.5-40R1</b>	40		40	1	3°52'	R	H5	15	45						100	105	107.5	20
<b>AG2.5-50R1</b>	50		50	1	3°52'	R	H5	15	55						125	130	132.5	20
<b>AG2.5-60R1</b>	60	60	1	3°52'	R	H5	15	60	150	155	157.5	20						

[Caution on Product Characteristics] ① The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 510 for more details.  
② There may be space in the casting between the two materials, but it will not affect the joint strength.



Ground Worms

Newly added



W3K

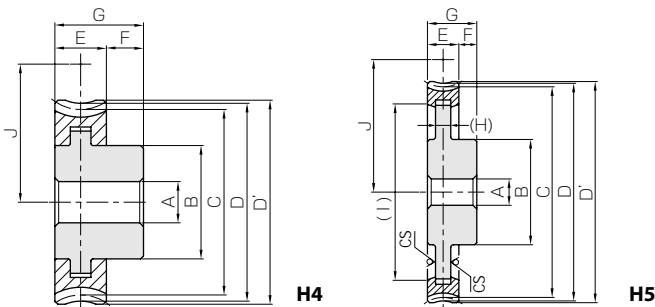
Total length R	Keyway Width×Depth	Set screw		Weight (kg)	Catalog No. ● : J Series (Available-on-request)
		Size	S		
50	—	—	—	0.21	<b>SWG2-R1</b>
	4 x 1.8	M4	7.5	0.21	● <b>SWG2-R1J12</b>
	5 x 2.3	M4	7.5	0.19	● <b>SWG2-R1J14</b>
50	—	—	—	0.21	<b>SWG2-R2</b>
	4 x 1.8	M4	7.5	0.21	● <b>SWG2-R2J12</b>
	5 x 2.3	M4	7.5	0.19	● <b>SWG2-R2J14</b>
65	—	—	—	0.40	<b>SWG2.5-R1</b>
	5 x 2.3	M4	8.5	0.39	● <b>SWG2.5-R1J15</b>
	5 x 2.3	M4	8.5	0.38	● <b>SWG2.5-R1J16</b>
65	—	—	—	0.40	<b>SWG2.5-R2</b>
	5 x 2.3	M4	8.5	0.39	● <b>SWG2.5-R2J15</b>
	5 x 2.3	M4	8.5	0.38	● <b>SWG2.5-R2J16</b>

[Caution on J series]

- ① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ Areas of products which have been re-worked will not be black oxide coated.
- ⑤ For products having a tapped hole, a set screw is included.

AG

Worm Wheels



NOTE 1. Allowable torques for worm rotation (rpm)



Hub width F	Total length G	Web thickness (H)	Web O.D. (I)	Mounting distance J	Allowable torque (N·m) NOTE 1							Backlash (mm)	Weight (kg)	Catalog No.
					30 rpm	100 rpm	300 rpm	600 rpm	900 rpm	1200 rpm	1800 rpm			
15	33	—	—	35.5	21.0	17.5	13.6	11.2	9.84	8.94	7.75	0.11~0.24	0.26	<b>AG2-20R1</b>
15	33	—	—	35.5	20.7	16.8	12.6	10.3	8.93	8.05	6.89	0.11~0.24	0.26	<b>AG2-20R2</b>
15	33	—	—	45.5	44.3	37.3	29.6	24.8	21.9	19.8	17.4	0.11~0.24	0.51	<b>AG2-30R1</b>
15	33	—	—	45.5	44.0	36.5	27.8	22.8	20.1	18.0	15.7	0.11~0.24	0.51	<b>AG2-30R2</b>
15	33	—	—	55.5	75.8	64.0	51.4	43.6	38.5	34.9	30.7	0.11~0.24	0.85	<b>AG2-40R1</b>
15	33	(8)	(83)	65.5	115	96.8	78.4	66.9	59.5	54.2	47.6	0.11~0.24	1.05	<b>AG2-50R1</b>
15	33	(11)	(100)	75.5	160	136	110	94.6	84.9	77.2	68.1	0.11~0.24	1.52	<b>AG2-60R1</b>
14	34	—	—	43.5	34.6	28.5	22.3	18.3	16.0	14.6	12.5	0.14~0.27	0.39	<b>AG2.5-20R1</b>
14	34	—	—	43.5	34.2	27.4	20.6	16.8	14.5	13.1	11.1	0.14~0.27	0.39	<b>AG2.5-20R2</b>
14	34	—	—	56	73.2	61.0	48.3	40.5	35.5	32.2	28.1	0.14~0.27	0.79	<b>AG2.5-30R1</b>
14	34	—	—	56	72.7	59.6	45.5	37.2	32.6	29.4	25.3	0.14~0.27	0.79	<b>AG2.5-30R2</b>
14	34	(11)	(81)	68.5	125	105	84.0	71.2	62.5	57.0	49.5	0.14~0.27	1.11	<b>AG2.5-40R1</b>
14	34	(12)	(106)	81	189	158	128	109	96.7	88.5	76.7	0.14~0.27	1.70	<b>AG2.5-50R1</b>
14	34	(12)	(130)	93.5	265	222	180	154	138	126	110	0.14~0.27	2.32	<b>AG2.5-60R1</b>

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 512) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② The tooth and the hub areas, fastened by casting, are designed to have higher hardness than other parts of the gear. However, please avoid areas other than the hub. Also, the strength may decrease if secondary operations are performed.

To find information on new products, see Page 6 and 7.

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

Bevel Gearboxes

Other Products

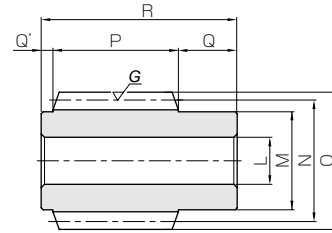


# SWG Ground Worms

Module 3, 4



Specifications	
Precision grade	KHK W 001 grade 2 *
Reference section of gear	Axial
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	S45C
Heat treatment	Teeth induction hardened
Tooth hardness	45 ~ 55HRC



W3

\* The precision grade of J Series products is equivalent to the value shown in the table.

Catalog No. ● : J Series (Available-on-request)	Axial module	Number of start	Lead angle	Hand of tread	Shape	Bore		Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width (R)	Hub width (L)
						L <sub>H7</sub>	M						
<b>SWG3-R1</b> ● <b>SWG3-R1J18</b> ● <b>SWG3-R1J19</b> ● <b>SWG3-R1J20</b>	m3	1	3°54'	R	W3 W3K W3K W3K	16 18 19 20	35	44	50	50	20	4	
<b>SWG3-R2</b> ● <b>SWG3-R2J18</b> ● <b>SWG3-R2J19</b> ● <b>SWG3-R2J20</b>		2	7°46'	R	W3 W3K W3K W3K	16 18 19 20	35	44	50	50	20	4	
<b>SWG3-R3</b> ● <b>SWG3-R3J18</b> ● <b>SWG3-R3J19</b> ● <b>SWG3-R3J20</b>		3	11°34'	R	W3 W3K W3K W3K	16 18 19 20	35	44	50	50	20	4	
<b>SWG4-R1</b> <b>SWG4-R2</b> <b>SWG4-R3</b>	m4	1	3°41'	R	W3	22	50	62	70	70	25	5	
		2	7°21'	R	W3	22	50	62	70	70	25	5	
		3	10°57'	R	W3	22	50	62	70	70	25	5	

[Caution on Product Characteristics] ① These worms produce axial thrust forces. See page 512 for more details.

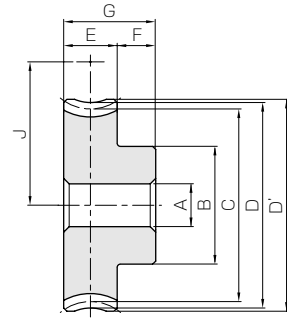


# AG Worm Wheels

Module 3, 4



Specifications	
Precision grade	KHK W 002 grade 2
Reference section of gear	Rotating plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	CAC702 (formerly JIS A&BC2) *
Heat treatment	—
Tooth hardness	—



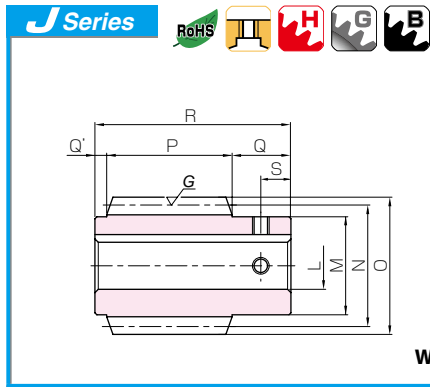
\* H8, H9 shape have a hub made from FC200 cast iron.

Catalog No.	Reduction ratio	Transverse module	No. of teeth	Number of start	Helix angle	Hand of tread	Shape	Bore	Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width
								A <sub>H7</sub>	B	C	D	D'	E
<b>AG3-20R1</b>	20	m3	20	1	3°54'	R	H1	20	50	60	66	69	25
<b>AG3-20R2</b>	10		20	2	7°46'	R	H1	20	50	60	66	69	25
<b>AG3-30R1</b>	30		30	1	3°54'	R	H4	20	55	90	96	99	25
<b>AG3-30R2</b>	15		30	2	7°46'	R	H4	20	55	90	96	99	25
<b>AG3-30R3</b>	10		30	3	11°34'	R	H4	20	55	90	96	99	25
<b>AG3-40R1</b>	40		40	1	3°54'	R	H5	20	65	120	126	129	25
<b>AG3-45R3</b>	15	45	3	11°34'	R	H5	20	70	135	141	144	25	
<b>AG3-50R1</b>	50	50	1	3°54'	R	H5	20	75	150	156	159	25	
<b>AG3-60R1</b>	60	60	1	3°54'	R	H5	20	85	180	186	189	25	
<b>AG4-20R1</b>	20	m4	20	1	3°41'	R	H1	20	60	80	88	92	30
<b>AG4-20R2</b>	10		20	2	7°21'	R	H1	20	60	80	88	92	30
<b>AG4-30R1</b>	30		30	1	3°41'	R	H4	20	65	120	128	132	30
<b>AG4-30R2</b>	15		30	2	7°21'	R	H4	20	65	120	128	132	30
<b>AG4-30R3</b>	10		30	3	10°57'	R	H4	20	65	120	128	132	30
<b>AG4-40R1</b>	40		40	1	3°41'	R	H5	20	80	160	168	172	30
<b>AG4-45R3</b>	15	45	3	10°57'	R	H5	20	90	180	188	192	30	
<b>AG4-50R1</b>	50	50	1	3°41'	R	H5	20	90	200	208	212	30	
<b>AG4-60R1</b>	60	60	1	3°41'	R	H5	20	100	240	248	252	30	

[Caution on Product Characteristics] ① The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 510 for more details.

② There may be space in the casting between the two materials, but it will not affect the joint strength.





Ground Worms

Newly added



W3K

Total length R	Keyway Width×Depth	Set screw		Weight (kg)	Catalog No. ● : J Series (Available-on-request)
		Size	S		
74	—	—	—	0.66	<b>SWG3-R1</b>
	6 x 2.8	M5	10	0.62	● <b>SWG3-R1J18</b>
	6 x 2.8	M5	10	0.60	● <b>SWG3-R1J19</b>
	6 x 2.8	M5	10	0.58	● <b>SWG3-R1J20</b>
74	—	—	—	0.66	<b>SWG3-R2</b>
	6 x 2.8	M5	10	0.62	● <b>SWG3-R2J18</b>
	6 x 2.8	M5	10	0.60	● <b>SWG3-R2J19</b>
	6 x 2.8	M5	10	0.58	● <b>SWG3-R2J20</b>
74	—	—	—	0.66	<b>SWG3-R3</b>
	6 x 2.8	M5	10	0.62	● <b>SWG3-R3J18</b>
	6 x 2.8	M5	10	0.60	● <b>SWG3-R3J19</b>
	6 x 2.8	M5	10	0.58	● <b>SWG3-R3J20</b>
100	—	—	—	1.82	<b>SWG4-R1</b>
100	—	—	—	1.82	<b>SWG4-R2</b>
100	—	—	—	1.82	<b>SWG4-R3</b>

[Caution on J series]

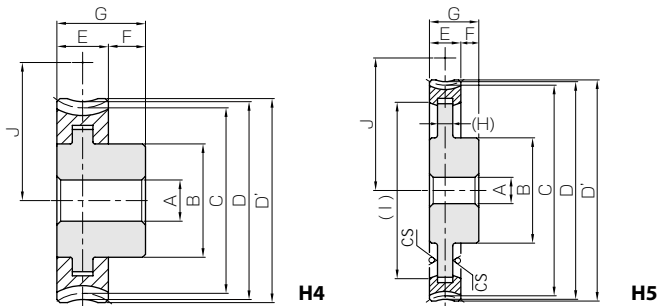
- ① As available-on-request products, requires a lead-time for shipping within **3 working-days (excludes the day ordered), after placing an order.** Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is **1 to 20 units.** For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ Areas of products which have been re-worked will not be black oxide coated.
- ⑤ For products having a tapped hole, a set screw is included.

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 512) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 1 to 2 mm).

AG

Worm Wheels



NOTE 1. Allowable torques for worm rotation (rpm)



Hub width F	Total length G	Web thickness (H)	Web O.D. (I)	Mounting distance J	Allowable torque (N·m) NOTE 1							Backlash (mm)	Weight (kg)	Catalog No.
					30 rpm	100 rpm	300 rpm	600 rpm	900 rpm	1200 rpm	1800 rpm			
18	43	—	—	52	59.5	48.8	38.0	30.9	27.0	24.7	20.9	0.16~0.29	0.75	<b>AG3-20R1</b>
18	43	—	—	52	58.7	46.9	35.1	28.4	24.5	22.2	18.5	0.16~0.29	0.75	<b>AG3-20R2</b>
18	43	—	—	67	126	104.3	82.4	68.4	59.9	54.5	46.9	0.16~0.29	1.46	<b>AG3-30R1</b>
18	43	—	—	67	125	102	77.6	62.8	55.1	49.7	42.2	0.16~0.29	1.46	<b>AG3-30R2</b>
18	43	—	—	67	129	103	77.1	62.4	53.8	48.7	40.6	0.16~0.29	1.46	<b>AG3-30R3</b>
18	43	(10)	(103)	82	215	179	143	120	106	96.4	82.5	0.16~0.29	2.03	<b>AG3-40R1</b>
18	43	(11)	(120)	89.5	274	224	171	138	121	109	92.6	0.16~0.29	2.44	<b>AG3-45R3</b>
18	43	(15)	(130)	97	325	270	219	185	163	150	128	0.16~0.29	3.22	<b>AG3-50R1</b>
18	43	(15)	(155)	112	455	380	308	261	233	213	183	0.16~0.29	4.52	<b>AG3-60R1</b>
20	50	—	—	71	115	93.6	72.7	58.2	51.1	45.7	38.4	0.19~0.32	1.53	<b>AG4-20R1</b>
20	50	—	—	71	114	90.0	67.2	53.5	46.4	41.2	34.1	0.19~0.32	1.53	<b>AG4-20R2</b>
20	50	—	—	91	244	200	158	129	114	101	86.3	0.19~0.32	3.00	<b>AG4-30R1</b>
20	50	—	—	91	242	196	148	118	104	92.2	77.6	0.19~0.32	3.00	<b>AG4-30R2</b>
20	50	—	—	91	250	198	147	117	102	90.2	74.7	0.19~0.32	3.00	<b>AG4-30R3</b>
20	50	(15)	(133)	111	417	343	274	226	200	179	152	0.19~0.32	4.32	<b>AG4-40R1</b>
20	50	(16)	(153)	121	531	430	326	259	229	202	170	0.19~0.32	5.44	<b>AG4-45R3</b>
20	50	(16)	(173)	131	630	519	418	347	309	277	236	0.19~0.32	6.25	<b>AG4-50R1</b>
20	50	(17)	(210)	151	881	730	589	491	441	395	337	0.19~0.32	8.74	<b>AG4-60R1</b>

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 512) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② The tooth and the hub areas, fastened by casting, are designed to have higher hardness than other parts of the gear. However, please avoid areas other than the hub. Also, the strength may decrease if secondary operations are performed.

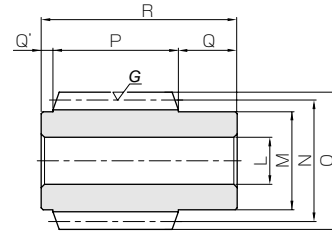


# SWG Ground Worms

Module 5, 6



Specifications	
Precision grade	KHK W 001 grade 2
Reference section of gear	Axial
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	S45C
Heat treatment	Teeth induction hardened
Tooth hardness	45 ~ 55HRC



W3

Catalog No.	Axial module	Number of start	Lead angle	Hand of tread	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width (R)	Hub width (L)
						L <sub>H7</sub>	M	N	O	P	Q	Q'
SWG5-R1	m5	1	4°05'	R	W3	25	56	70	80	85	30	5
SWG5-R2		2	8°08'	R	W3	25	56	70	80	85	30	5
SWG6-R1	m6	1	4°17'	R	W3	30	63	80	92	100	35	5
SWG6-R2		2	8°32'	R	W3	30	63	80	92	100	35	5

[Caution on Product Characteristics] ① These worms produce axial thrust forces. See page 512 for more details.

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears



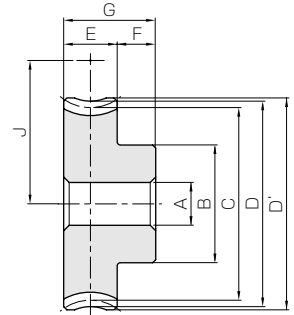
# AG Worm Wheels

Module 5, 6



Specifications	
Precision grade	KHK W 002 grade 2
Reference section of gear	Rotating plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	CAC702 (formerly JIS A&BC2) *
Heat treatment	—
Tooth hardness	—

\* H8, H9 shape have a hub made from FC200 cast iron.



H1

Catalog No.	Reduction ratio	Transverse module	No. of teeth	Number of start	Helix angle	Hand of tread	Shape	Bore	Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width
								A <sub>H7</sub>	B	C	D	D'	E
AG5-20R1	20	m5	20	1	4°05'	R	H4	22	75	100	110	115	35
AG5-20R2	10		20	2	8°08'	R	H4	22	75	100	110	115	35
AG5-30R1	30		30	1	4°05'	R	H5	22	75	150	160	165	35
AG5-30R2	15		30	2	8°08'	R	H5	22	75	150	160	165	35
AG5-40R1	40		40	1	4°05'	R	H5	22	110	200	210	215	35
AG5-50R1	50		50	1	4°05'	R	H5	22	120	250	260	265	35
AG5-60R1	60	60	1	4°05'	R	H5	22	130	300	310	315	35	
AG6-20R1	20	m6	20	1	4°17'	R	H4	25	85	120	132	138	40
AG6-20R2	10		20	2	8°32'	R	H4	25	85	120	132	138	40
AG6-30R1	30		30	1	4°17'	R	H5	25	100	180	192	198	40
AG6-30R2	15		30	2	8°32'	R	H5	25	100	180	192	198	40
AG6-40R1	40		40	1	4°17'	R	H5	25	120	240	252	258	40
AG6-50R1	50		50	1	4°17'	R	H5	25	130	300	312	318	40
AG6-60R1	60	60	1	4°17'	R	H5	25	150	360	372	378	40	

[Caution on Product Characteristics] ① The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 510 for more details.

② There may be space in the casting between the two materials, but it will not affect the joint strength.

Bevel Gearboxes

Other Products

Worm Gear Pair

Screw Gears

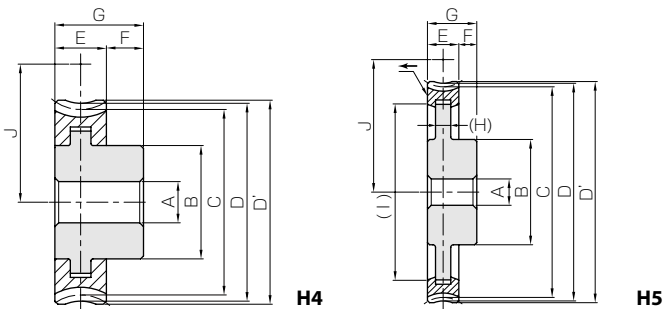
Bevel Gears

Total length R	Set screw		Weight (kg)	Catalog No.
	Size	S		
120	—	—	2.78	<b>SWG5-R1</b>
120	—	—	2.78	<b>SWG5-R2</b>
140	—	—	4.15	<b>SWG6-R1</b>
140	—	—	4.15	<b>SWG6-R2</b>

- [Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 512) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.  
 ② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 1 to 2 mm).

AG

Worm Wheels



NOTE 1. Allowable torques for worm rotation (rpm)

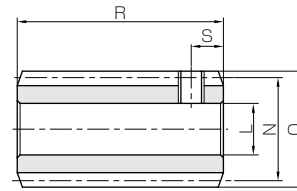


Hub width F	Total length G	Web thickness (H)	Web O.D. (I)	Mounting distance J	Allowable torque (N·m) NOTE 1							Backlash (mm)	Weight (kg)	Catalog No.
					30 rpm	100 rpm	300 rpm	600 rpm	900 rpm	1200 rpm	1800 rpm			
25	60	—	—	85	202	163	127	101	88.4	79.0	65.5	0.22~0.35	2.79	<b>AG5-20R1</b>
25	60	—	—	85	200	157	117	93.2	80.2	71.1	58.1	0.22~0.35	2.79	<b>AG5-20R2</b>
25	60	(21)	(120)	110	427	348	275	224	196	175	147	0.22~0.35	4.75	<b>AG5-30R1</b>
25	60	(21)	(120)	110	425	340	259	206	180	159	132	0.22~0.35	4.75	<b>AG5-30R2</b>
25	60	(23)	(168)	135	731	597	478	394	346	309	259	0.22~0.35	8.84	<b>AG5-40R1</b>
25	60	(23)	(215)	160	1110	903	729	605	534	479	402	0.22~0.35	12.7	<b>AG5-50R1</b>
25	60	(24)	(260)	185	1550	1270	1030	855	763	682	575	0.22~0.35	17.6	<b>AG5-60R1</b>
30	70	—	—	100	315	252	196	157	135	121	99.6	0.24~0.37	4.53	<b>AG6-20R1</b>
30	70	—	—	100	314	244	182	145	124	110	89.3	0.24~0.37	4.53	<b>AG6-20R2</b>
30	70	(26)	(142)	130	666	538	424	346	300	267	224	0.24~0.37	8.52	<b>AG6-30R1</b>
30	70	(26)	(142)	130	668	532	403	321	278	246	203	0.24~0.37	8.52	<b>AG6-30R2</b>
30	70	(28)	(200)	160	1140	923	738	609	528	472	394	0.24~0.37	14.2	<b>AG6-40R1</b>
30	70	(30)	(258)	190	1720	1400	1130	935	816	733	611	0.24~0.37	21.0	<b>AG6-50R1</b>
30	70	(30)	(312)	220	2410	1960	1580	1320	1170	1040	875	0.24~0.37	29.7	<b>AG6-60R1</b>

- [Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 512) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.  
 ② The tooth and the hub areas, fastened by casting, are designed to have higher hardness than other parts of the gear. However, please avoid areas other than the hub. Also, the strength may decrease if secondary operations are performed.



Specifications	
Precision grade	KHK W 001 grade 4
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB



**W2**

Catalog No.	Normal module	Number of start	Lead angle	Hand of tread	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width (R)	Hub width (L)
						L <sub>H8</sub>	M	N	O	P	Q	Q'
<b>SW0.5-R1</b>	<b>m0.5</b>	1	2°36'	R	W2	5	—	11	12	—	—	—
<b>SW0.5-R2</b>		2	5°13'	R	W2	5	—	11	12	—	—	—
<b>SW0.8-R1</b>	<b>m0.8</b>	1	3°17'	R	W2	6	—	14	15.6	—	—	—
<b>SW0.8-R2</b>		2	6°34'	R	W2	6	—	14	15.6	—	—	—

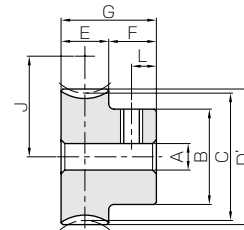
[Caution on Product Characteristics]

- For W2-shaped products, a set screw is included. When setting up the mating wheel, make sure no friction occurs within the set screw.
- These worms produce axial thrust forces. See page 512 for more details.

**BG Bronze Worm Wheels**



Specifications	
Precision grade	KHK W 002 grade 4
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	CAC502 (formerly JIS PBC2)
Heat treatment	—
Tooth hardness	—



**HAT**

Catalog No.	Reduction ratio	Normal module	No. of teeth	Number of start	Helix angle	Hand of tread	Shape	Bore	Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width
								A <sub>H7</sub>	B	C	D	D'	E
<b>BG0.5-20R1</b>	20	<b>m0.5</b>	20	1	2°36'	R	HAT	4	9	10.01	—	11	5
<b>BG0.5-20R2</b>	10		20	2	5°13'	R	HAT	4	9	10.04	—	11	5
<b>BG0.5-30R1</b>	30		30	1	2°36'	R	HAT	4	12	15.02	—	16	5
<b>BG0.5-30R2</b>	15		30	2	5°13'	R	HAT	4	12	15.06	—	16	5
<b>BG0.5-40R1</b>	40		40	1	2°36'	R	HAT	5	15	20.02	—	21	5
<b>BG0.5-50R1</b>	50		50	1	2°36'	R	HAT	5	20	25.03	—	26	5
<b>BG0.5-60R1</b>	60	60	1	2°36'	R	HAT	5	25	30.03	—	31	5	

Catalog No.	Reduction ratio	Normal module	No. of teeth	Number of start	Helix angle	Hand of tread	Shape	Bore	Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width
								A <sub>H7</sub>	B	C	D	D'	E
<b>BG0.8-20R1</b>	20	<b>m0.8</b>	20	1	3°17'	R	HA	5	12	16.03	—	17.6	9
<b>BG0.8-20R2</b>	10		20	2	6°34'	R	HA	5	12	16.11	—	17.6	9
<b>BG0.8-30R1</b>	30		30	1	3°17'	R	HA	5	18	24.04	—	25.6	9
<b>BG0.8-30R2</b>	15		30	2	6°34'	R	HA	5	18	24.16	—	25.6	9
<b>BG0.8-40R1</b>	40		40	1	3°17'	R	HA	6	20	32.05	—	33.6	9
<b>BG0.8-50R1</b>	50		50	1	3°17'	R	HA	8	25	40.06	—	41.6	9
<b>BG0.8-60R1</b>	60	60	1	3°17'	R	HA	8	25	48.08	—	49.6	9	

[Caution on Product Characteristics]

- Worm Wheels are profile shifted to create the proper center distance.
- For products with a tapped hole, a set screw is included.
- The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 510 for more details.
- If bore size is less than  $\phi 4$ , the diameter tolerance is H8. If bore size is  $\phi 5$  or  $\phi 6$ , and the hole length exceeds 3 times the diameter, the tolerance is also H8.

Total length R	Set screw		Weight (kg)	Catalog No.
	Size	S		
18	M3	3	0.010	<b>SW0.5-R1</b>
18	M3	3	0.010	<b>SW0.5-R2</b>
30	M4	5	0.029	<b>SW0.8-R1</b>
30	M4	5	0.029	<b>SW0.8-R2</b>

- [Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 512) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Gear tooth hardening of the worm reduces the precision (introduces errors in the lead and pressure angles). Avoid heat hardening as it will create bad tooth contact causing abrasion of the wheel.

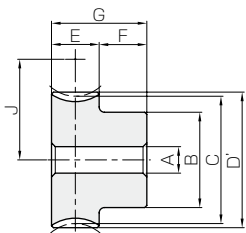
Spur  
GearsHelical  
GearsInternal  
Gears

Racks

CP Racks  
& Pinions

BG

## Bronze Worm Wheels



HA



NOTE 1. Allowable torques for worm rotation (rpm)

Hub width F	Total length G	Web thickness (H)	Web O.D. (I)	Mounting distance J	Allowable torque (N-m) NOTE 1						Backlash (mm)	Weight (kg)	Catalog No.
					30 <sub>rpm</sub>	100 <sub>rpm</sub>	300 <sub>rpm</sub>	600 <sub>rpm</sub>	900 <sub>rpm</sub>	1200 <sub>rpm</sub>			
7	12	10.5	M3	3.5	0.27	0.23	0.19	0.15	0.14	0.13	0~0.16	0.0061	<b>BG0.5-20R1</b>
7	12	10.5	M3	3.5	0.28	0.23	0.18	0.15	0.13	0.12	0~0.16	0.0061	<b>BG0.5-20R2</b>
7	12	13	M3	3.5	0.58	0.50	0.41	0.34	0.30	0.28	0~0.16	0.014	<b>BG0.5-30R1</b>
7	12	13	M3	3.5	0.59	0.49	0.39	0.32	0.29	0.26	0~0.16	0.014	<b>BG0.5-30R2</b>
7	12	15.5	M4	3.5	0.99	0.85	0.71	0.60	0.54	0.50	0~0.16	0.023	<b>BG0.5-40R1</b>
7	12	18	M4	3.5	1.50	1.28	1.08	0.92	0.83	0.77	0~0.16	0.039	<b>BG0.5-50R1</b>
7	12	20.5	M4	3.5	2.10	1.80	1.52	1.31	1.19	1.09	0~0.16	0.059	<b>BG0.5-60R1</b>

NOTE 1. Allowable torques for worm rotation (rpm)

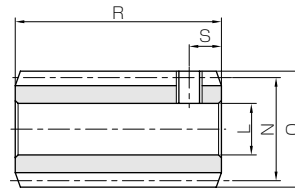
Hub width F	Total length G	Mounting distance J	Allowable torque (N-m) NOTE 1						Backlash (mm)	Weight (kg)	Catalog No.
			30 <sub>rpm</sub>	100 <sub>rpm</sub>	300 <sub>rpm</sub>	600 <sub>rpm</sub>	900 <sub>rpm</sub>	1200 <sub>rpm</sub>			
9	18	15	1.05	0.88	0.71	0.58	0.52	0.48	0.04~0.22	0.023	<b>BG0.8-20R1</b>
9	18	15	1.06	0.86	0.66	0.54	0.48	0.44	0.04~0.22	0.023	<b>BG0.8-20R2</b>
9	18	19	2.23	1.89	1.53	1.29	1.15	1.06	0.04~0.22	0.055	<b>BG0.8-30R1</b>
9	18	19	2.24	1.87	1.46	1.20	1.07	0.98	0.04~0.22	0.055	<b>BG0.8-30R2</b>
9	18	23	3.81	3.24	2.67	2.26	2.02	1.87	0.04~0.22	0.087	<b>BG0.8-40R1</b>
9	18	27	5.76	4.90	4.07	3.47	3.13	2.90	0.04~0.22	0.13	<b>BG0.8-50R1</b>
9	18	31	8.06	6.88	5.73	4.90	4.46	4.12	0.04~0.22	0.18	<b>BG0.8-60R1</b>

- [Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 512) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.

Miter  
GearsBevel  
GearsScrew  
GearsWorm  
Gear PairBevel  
GearboxesOther  
Products



Specifications	
Precision grade	KHK W 001 grade 4
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB



W2

Catalog No.	Normal module	Number of start	Lead angle	Hand of tread	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width (R)	Hub width (L)
						L <sub>H7</sub>	M	N	O	P	Q	Q'
<b>SW1-R1</b>	<b>m1</b>	1	3°35'	R	W2	6	—	16	18	—	—	—
<b>SW1-R2</b>		2	7°11'	R	W2	6	—	16	18	—	—	—
<b>SW1.25-R1</b>	<b>m1.25</b>	1	3°25'	R	W2	8	—	21	23.5	—	—	—
<b>SW1.25-R2</b>		2	6°50'	R	W2	8	—	21	23.5	—	—	—

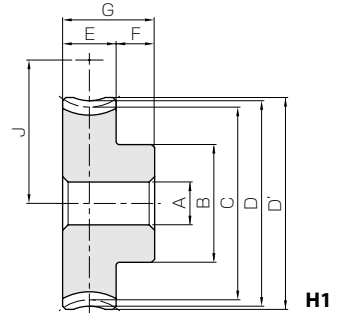
[Caution on Product Characteristics]

- For W2-shaped products, a set screw is included. When setting up the mating wheel, make sure no friction occurs within the set screw.
- These worms produce axial thrust forces. See page 512 for more details.
- If bore size is less than  $\phi$  4, the diameter tolerance is H8. If bore size is  $\phi$  5 or  $\phi$  6, and the hole length exceeds 3 times the diameter, the tolerance is also H8.

**BG · CG Bronze Worm Wheels & Gray Iron Worm Wheels**



Specifications		
Catalog No.	BG	CG
Precision grade	KHK W 002 grade 4	KHK W 002 grade 4
Reference section of gear	Normal plane	Normal plane
Gear teeth	Standard full depth	Standard full depth
Normal pressure angle	20°	20°
Material	CAC502 (formerly JIS PBC2)	FC200
Heat treatment	—	—
Tooth ardness	—	—



Catalog No.	Reduction ratio	Normal module	No. of teeth	Number of start	Helix angle	Hand of tread	Shape	Bore	Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width
								A <sub>H7</sub>	B	C	D	D'	E
<b>BG1-20R1</b>	20	<b>m1</b>	20	1	3°35'	R	H1	6	16	20.05	22	23	10
<b>BG1-20R2</b>	10		20	2	7°11'	R	H1	6	16	20.16	22	23	10
<b>BG1-30R1</b>	30		30	1	3°35'	R	H1	6	20	30.07	32	33	10
<b>BG1-30R2</b>	15		30	2	7°11'	R	H1	6	20	30.24	32	33	10
<b>BG1-40R1</b>	40		40	1	3°35'	R	H1	8	26	40.08	42	43	10
<b>BG1-50R1</b>	50		50	1	3°35'	R	H1	8	30	50.1	52	53	10
<b>BG1.25-20R1</b>	20	<b>m1.25</b>	20	1	3°25'	R	H1	6	20	25.04	27.5	28.75	11
<b>BG1.25-20R2</b>	10		20	2	6°50'	R	H1	6	20	25.18	27.5	28.75	11
<b>BG1.25-30R1</b>	30		30	1	3°25'	R	H1	6	25	37.57	40	41.25	11
<b>BG1.25-30R2</b>	15		30	2	6°50'	R	H1	6	25	37.77	40	41.25	11
<b>BG1.25-40R1</b>	40		40	1	3°25'	R	H1	8	30	50.09	52.5	53.75	11
<b>BG1.25-50R1</b>	50		50	1	3°25'	R	H1	8	40	62.61	65	66.25	11

Catalog No.	Reduction ratio	Normal module	No. of teeth	Number of start	Helix angle	Hand of tread	Shape	Bore	Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width
								A <sub>H7</sub>	B	C	D	D'	E
<b>CG1-60R1</b>	60	<b>m1</b>	60	1	3°35'	R	HB	10	30	60.12	62	63	10
<b>CG1-80R1</b>	80		80	1	3°35'	R	HB	10	35	80.16	82	83	10
<b>CG1-100R1</b>	100		100	1	3°35'	R	H2	10	40	100.2	102	103	10
<b>CG1-120R1</b>	120		120	1	3°35'	R	H2	10	40	120.24	122	123	10

[Caution on Product Characteristics]

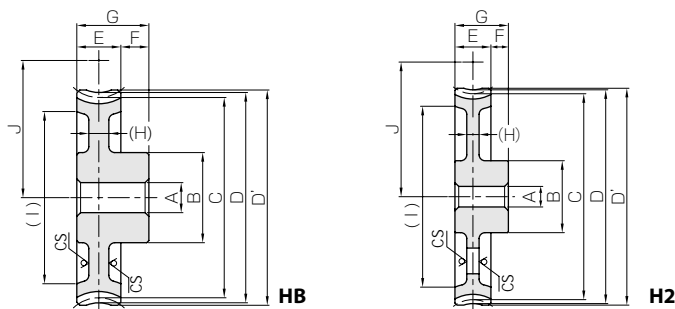
- Worm Wheels are profile shifted to create the proper center distance.
- H2 Shape Worm Gears have elongated casting holes in the web (H).
- The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 510 for more details.
- If bore size is less than  $\phi$  4, the diameter tolerance is H8. If bore size is  $\phi$  5 or  $\phi$  6, and the hole length exceeds 3 times the diameter, the tolerance is also H8.

Total length R	Set screw		Weight (kg)	Catalog No.
	Size	S		
32	M4	5	0.043	<b>SW1-R1</b>
32	M4	5	0.043	<b>SW1-R2</b>
37	M5	5	0.085	<b>SW1.25-R1</b>
37	M5	5	0.085	<b>SW1.25-R2</b>

- [Caution on Secondary Operations]
- ① Please read "Caution on Performing Secondary Operations" (Page 512) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
  - ② Gear tooth hardening of the worm reduces the precision (introduces errors in the lead and pressure angles). Avoid heat hardening as it will create bad tooth contact causing abrasion of the wheel.

BG · CG

Bronze Worm Wheels & Gray Iron Worm Wheels



\* CS has a sand mold casting finish.

NOTE 1. Allowable torques for worm rotation (rpm)



Hub width F	Total length G	Mounting distance J	Allowable torque (N·m) NOTE 1						Backlash (mm)	Weight (kg)	Catalog No.
			30 <sub>rpm</sub>	100 <sub>rpm</sub>	300 <sub>rpm</sub>	600 <sub>rpm</sub>	900 <sub>rpm</sub>	1200 <sub>rpm</sub>			
10	20	18	1.89	1.58	1.26	1.04	0.92	0.85	0.06~0.24	0.043	<b>BG1-20R1</b>
10	20	18	1.90	1.54	1.18	0.97	0.85	0.78	0.06~0.24	0.043	<b>BG1-20R2</b>
10	20	23	4.00	3.38	2.74	2.29	2.05	1.87	0.06~0.24	0.089	<b>BG1-30R1</b>
10	20	23	4.03	3.35	2.62	2.14	1.91	1.74	0.06~0.24	0.089	<b>BG1-30R2</b>
10	20	28	6.85	5.79	4.76	4.03	3.61	3.31	0.06~0.24	0.15	<b>BG1-40R1</b>
10	20	33	10.3	8.76	7.27	6.18	5.58	5.14	0.06~0.24	0.23	<b>BG1-50R1</b>
9	20	23	3.19	2.65	2.10	1.72	1.53	1.40	0.08~0.26	0.070	<b>BG1.25-20R1</b>
9	20	23	3.19	2.58	1.96	1.60	1.40	1.27	0.08~0.26	0.070	<b>BG1.25-20R2</b>
9	20	29.25	6.75	5.67	4.56	3.81	3.40	3.09	0.08~0.26	0.15	<b>BG1.25-30R1</b>
9	20	29.25	6.77	5.60	4.33	3.54	3.16	2.85	0.08~0.26	0.15	<b>BG1.25-30R2</b>
9	20	35.5	11.5	9.71	7.92	6.70	5.98	5.47	0.08~0.26	0.24	<b>BG1.25-40R1</b>
9	20	41.75	17.4	14.7	12.1	10.3	9.25	8.49	0.08~0.26	0.40	<b>BG1.25-50R1</b>

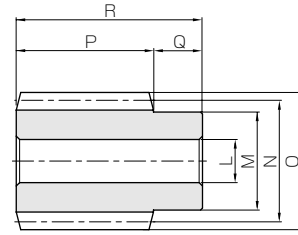
NOTE 1. Allowable torques for worm rotation (rpm)

Hub width F	Total length G	Web thickness (H)	Web O.D. (I)	Mounting distance J	Allowable torque (N·m) NOTE 1						Backlash (mm)	Weight (kg)	Catalog No.
					30 <sub>rpm</sub>	100 <sub>rpm</sub>	300 <sub>rpm</sub>	600 <sub>rpm</sub>	900 <sub>rpm</sub>	1200 <sub>rpm</sub>			
10	20	(6)	(51)	38	8.69	7.39	6.14	5.24	4.78	4.39	0.06~0.24	0.21	<b>CG1-60R1</b>
10	20	(6)	(70)	48	14.7	12.6	10.5	9.11	8.30	7.72	0.06~0.24	0.35	<b>CG1-80R1</b>
10	20	(6)	(91)	58	21.9	19.0	16.0	13.9	12.7	11.9	0.06~0.24	0.47	<b>CG1-100R1</b>
10	20	(6)	(111)	68	30.5	26.7	22.5	19.6	18.0	16.7	0.06~0.24	0.63	<b>CG1-120R1</b>

- [Caution on Secondary Operations]
- ① Please read "Caution on Performing Secondary Operations" (Page 512) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.



Specifications	
Precision grade	KHK W 001 grade 4 *
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB



W1

\* The precision grade of J Series products is equivalent to the value shown in the table.

Catalog No. ● : J Series (Available-on-request)	Normal module	Number of start	Lead angle	Hand of tread	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width (R)	Hub width (L)
						L <sub>H7</sub>	M	N	O	P	Q	Q'
<b>SW1.5-R1</b> ● <b>SW1.5-R1J8</b> ● <b>SW1.5-R1J10</b>	<b>m1.5</b>	1	3°26'	R	W1 W1T W1K	8 8 10	20	25	28	30	10	—
<b>SW1.5-R2</b> ● <b>SW1.5-R2J8</b> ● <b>SW1.5-R2J10</b>		2	6°54'	R	W1 W1T W1K	8 8 10	20	25	28	30	10	—

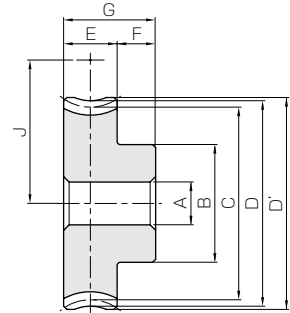
[Caution on Product Characteristics] ① These worms produce axial thrust forces. See page 512 for more details.

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 512) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.  
② Gear tooth hardening of the worm reduces the precision (introduces errors in the lead and pressure angles). Avoid heat hardening as it will create bad tooth contact causing abrasion of the wheel.

**BG · CG Bronze Worm Wheels & Gray Iron Worm Wheels**



Specifications		
Catalog No.	BG	CG
Precision grade	KHK W 002 grade 4	KHK W 002 grade 4
Reference section of gear	Normal plane	Normal plane
Gear teeth	Standard full depth	Standard full depth
Normal pressure angle	20°	20°
Material	CAC502 (formerly JIS PBC2)	FC200
Heat treatment	—	—
Tooth ardness	—	—



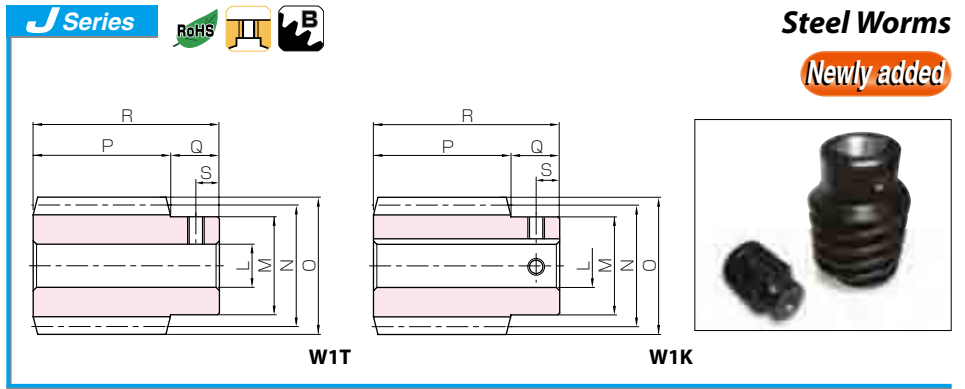
H1

Catalog No.	Reduction ratio	Normal module	No. of teeth	Number of start	Helix angle	Hand of tread	Shape	Bore	Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width
								A <sub>H7</sub>	B	C	D	D'	E
<b>BG1.5-20R1</b>	20	<b>m1.5</b>	20	1	3°26'	R	H1	8	22	30.05	33	34.5	12
<b>BG1.5-20R2</b>	10		20	2	6°54'	R	H1	8	22	30.22	33	34.5	12
<b>BG1.5-30R1</b>	30		30	1	3°26'	R	H1	10	30	45.08	48	49.5	12
<b>BG1.5-30R2</b>	15		30	2	6°54'	R	H1	10	30	45.33	48	49.5	12
<b>BG1.5-40R1</b>	40		40	1	3°26'	R	H1	12	30	60.11	63	64.5	12
<b>BG1.5-50R1</b>	50		50	1	3°26'	R	H1	12	40	75.13	78	79.5	14

Catalog No.	Reduction ratio	Normal module	No. of teeth	Number of start	Helix angle	Hand of tread	Shape	Bore	Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width
								A <sub>H7</sub>	B	C	D	D'	E
<b>CG1.5-30R1</b>	30	<b>m1.5</b>	30	1	3°26'	R	H1	10	30	45.08	48	49.5	12
<b>CG1.5-40R1</b>	40		40	1	3°26'	R	H1	12	30	60.11	63	64.5	12
<b>CG1.5-50R1</b>	50		50	1	3°26'	R	H1	12	40	75.13	78	79.5	14
<b>CG1.5-60R1</b>	60		60	1	3°26'	R	H1	12	40	90.16	93	94.5	14
<b>CG1.5-80R1</b>	80		80	1	3°26'	R	H2	15	50	120.22	123	124.5	14
<b>CG1.5-100R1</b>	100		100	1	3°26'	R	H2	15	50	150.27	153	154.5	14

[Caution on Product Characteristics] ① Worm Wheels are profile shifted to create the proper center distance.  
② H2 Shape Worm Gears have elongated casting holes in the web (H).  
③ The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 510 for more details.



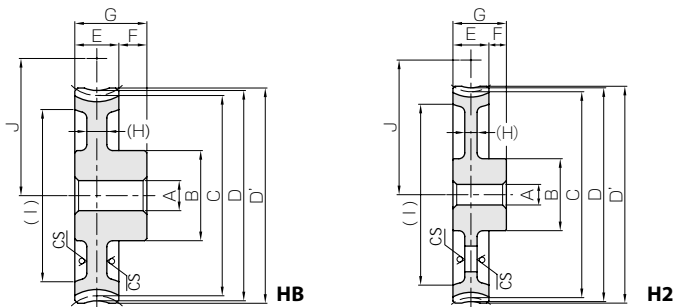


Total length R	Keyway Width×Depth	Set screw		Weight (kg)	Catalog No. ● : J Series (Available-on-request)
		Size	S		
40	—	—	—	0.12	<b>SW1.5-R1</b>
	—	M5	5	0.12	● <b>SW1.5-R1J8</b>
	4 x 1.8	M4	5	0.11	● <b>SW1.5-R1J10</b>
40	—	—	—	0.12	<b>SW1.5-R2</b>
	—	M5	5	0.12	● <b>SW1.5-R2J8</b>
	4 x 1.8	M4	5	0.11	● <b>SW1.5-R2J10</b>

- [Caution on J series]
- ① As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
  - ② Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
  - ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
  - ④ Areas of products which have been re-worked will not be black oxide coated.
  - ⑤ For products having a tapped hole, a set screw is included.

BG · CG

Bronze Worm Wheels & Gray Iron Worm Wheels



\* CS has a sand mold casting finish.

NOTE 1. Allowable torques for worm rotation (rpm)

Hub width F	Total length G	Mounting distance J	Allowable torque (N·m) NOTE 1						Backlash (mm)	Weight (kg)	Catalog No.
			30 rpm	100 rpm	300 rpm	600 rpm	900 rpm	1200 rpm			
10	22	27.5	4.76	3.96	3.10	2.56	2.27	2.06	0.08~0.26	0.10	<b>BG1.5-20R1</b> <b>BG1.5-20R2</b> <b>BG1.5-30R1</b> <b>BG1.5-30R2</b> <b>BG1.5-40R1</b> <b>BG1.5-50R1</b>
10	22	27.5	4.75	3.85	2.89	2.38	2.08	1.87	0.08~0.26	0.10	
10	22	35	10.1	8.47	6.72	5.67	5.03	4.55	0.08~0.26	0.22	
10	22	35	10.1	8.37	6.40	5.26	4.67	4.20	0.08~0.26	0.22	
10	22	42.5	17.2	14.5	11.7	9.96	8.86	8.04	0.08~0.26	0.35	
10	24	50	30.4	25.6	20.8	17.8	16.0	14.6	0.08~0.26	0.65	

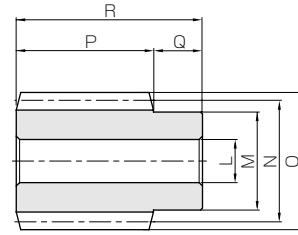
NOTE 1. Allowable torques for worm rotation (rpm)

Hub width F	Total length G	Web thickness (H)	Web O.D. (I)	Mounting distance J	Allowable torque (N·m) NOTE 1						Backlash (mm)	Weight (kg)	Catalog No.
					30 rpm	100 rpm	300 rpm	600 rpm	900 rpm	1200 rpm			
10	22	—	—	35	6.04	5.08	4.03	3.40	3.02	2.73	0.08~0.26	0.18	<b>CG1.5-30R1</b> <b>CG1.5-40R1</b> <b>CG1.5-50R1</b> <b>CG1.5-60R1</b> <b>CG1.5-80R1</b> <b>CG1.5-100R1</b>
10	22	—	—	42.5	10.3	8.71	7.01	5.98	5.31	4.83	0.08~0.26	0.28	
10	24	(6)	(62)	50	18.2	15.4	12.5	10.7	9.59	8.74	0.08~0.26	0.43	
10	24	(4)	(79)	57.5	25.5	21.6	17.6	15.1	13.7	12.4	0.08~0.26	0.47	
10	24	(9)	(112)	72.5	43.1	36.8	30.1	26.3	23.8	21.9	0.08~0.26	0.94	
10	24	(7)	(138)	87.5	64.4	55.6	45.8	40.1	36.4	33.6	0.08~0.26	1.21	

- [Caution on Secondary Operations]
- ① Please read "Caution on Performing Secondary Operations" (Page 512) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.



Specifications	
Precision grade	KHK W 001 grade 4 *
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	14° 30'
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB



W1

\* The precision grade of J Series products is equivalent to the value shown in the table.

Catalog No. ● J Series (Available-on-request)	Normal module	Number of start	Lead angle	Hand of tread	Shape	Bore		Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width (R)	Hub width (L)
						L <sub>H7</sub>	M						
<b>SW2-R1</b> ● SW2-R1J12 ● SW2-R1J14	m2	1	3°42'	R	W1	12	25	31	35	32	14	—	
W1K W1K					12 14								
<b>SW2-R2</b> ● SW2-R2J12 ● SW2-R2J14		2	7°25'	R	W1	12	25	31	35	32	14	—	
W1K W1K					12 14								
<b>SW2-L1</b> ● SW2-L1J12 ● SW2-L1J14	m2	1	3°42'	L	W1	12	25	31	35	32	14	—	
W1K W1K					12 14								
<b>SW2-L2</b> ● SW2-L2J12 ● SW2-L2J14		2	7°25'	L	W1	12	25	31	35	32	14	—	
W1K W1K					12 14								

[Caution on Product Characteristics]

① These worms produce axial thrust forces. See page 512 for more details.

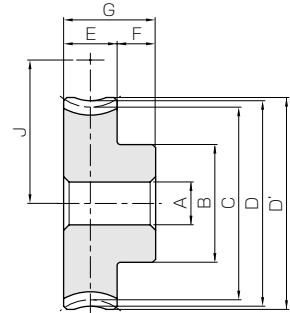
[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 512) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Gear tooth hardening of the worm reduces the precision (introduces errors in the lead and pressure angles). Avoid heat hardening as it will create bad tooth contact causing abrasion of the wheel.

## BG · CG Bronze Worm Wheels & Gray Iron Worm Wheels



Specifications		
Catalog No.	BG	CG
Precision grade	KHK W 002 grade 4	KHK W 002 grade 4
Reference section of gear	Normal plane	Normal plane
Gear teeth	Standard full depth	Standard full depth
Normal pressure angle	14° 30'	14° 30'
Material	CAC502 (formerly JIS PBC2)	FC200
Heat treatment	—	—
Tooth hardness	—	—



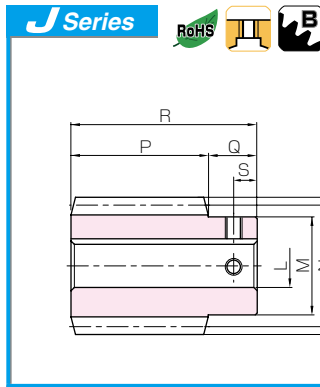
H1

Catalog No.	Reduction ratio	Normal module	No. of teeth	Number of start	Helix angle	Hand of tread	Shape	Bore		Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width
								A <sub>H7</sub>	B					
<b>BG2-20R1</b>	20	m2	20	1	3°42'	R	H1	12	33	33	40.08	44	46	22
<b>BG2-20R2</b>	10		20	2	7°25'	R	H1	12	33					
<b>BG2-20L1</b>	20		20	1	3°42'	L	H1	12	33	40	40.08	44	46	22
<b>BG2-20L2</b>	10		20	2	7°25'	L	H1	12	33					

Catalog No.	Reduction ratio	Normal module	No. of teeth	Number of start	Helix angle	Hand of tread	Shape	Bore		Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width	
								A <sub>H7</sub>	B						
<b>CG2-20R1</b>	20	m2	20	1	3°42'	R	H1	12	33	33	40.08	44	46	22	
<b>CG2-20R2</b>	10		20	2	7°25'	R	H1	12	33						40.34
<b>CG2-30R1</b>	30		30	1	3°42'	R	H1	12	40	40	60.13	64	66	22	
<b>CG2-30R2</b>	15		30	2	7°25'	R	H1	12	40						60.51
<b>CG2-40R1</b>	40		40	1	3°42'	R	H1	12	45	45	80.17	84	86	22	
<b>CG2-50R1</b>	50		50	1	3°42'	R	HB	12	48						100.21
<b>CG2-50R2</b>	25		50	2	7°25'	R	HB	12	48	100	100.84	104	106	22	
<b>CG2-60R1</b>	60		60	1	3°42'	R	HB	12	60						120.25
<b>CG2-20L1</b>	20		m2	20	1	3°42'	L	H1	12	33	33	40.08	44	46	22
<b>CG2-20L2</b>	10			20	2	7°25'	L	H1	12	33					
<b>CG2-30L1</b>	30			30	1	3°42'	L	H1	12	40	40	60.13	64	66	22
<b>CG2-30L2</b>	15			30	2	7°25'	L	H1	12	40					
<b>CG2-40L1</b>	40	40		1	3°42'	L	H1	12	45	45	80.17	84	86	22	
<b>CG2-50L1</b>	50	50		1	3°42'	L	HB	12	48						100.21
<b>CG2-50L2</b>	25	50		2	7°25'	L	HB	12	48	100	100.84	104	106	22	
<b>CG2-60L1</b>	60	60		1	3°42'	L	HB	12	60						120.25

[Caution on Product Characteristics]

- ① Worm Wheels are profile shifted to create the proper center distance.
- ② The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 510 for more details.



Steel Worms

Newly added



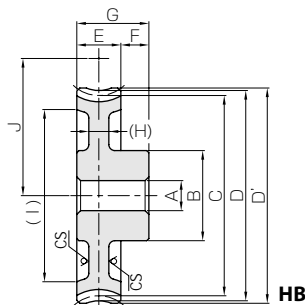
W1K

Total length R	Keyway Width×Depth	Set screw		Weight (kg)	Catalog No. ● : J Series (Available-on-request)
		Size	S		
46	—	—	—	0.20	<b>SW2-R1</b>
	4 x 1.8	M4	7	0.20	● <b>SW2-R1J12</b>
	5 x 2.3	M4	7	0.18	● <b>SW2-R1J14</b>
46	—	—	—	0.20	<b>SW2-R2</b>
	4 x 1.8	M4	7	0.20	● <b>SW2-R2J12</b>
	5 x 2.3	M4	7	0.18	● <b>SW2-R2J14</b>
46	—	—	—	0.20	<b>SW2-L1</b>
	4 x 1.8	M4	7	0.20	● <b>SW2-L1J12</b>
	5 x 2.3	M4	7	0.18	● <b>SW2-L1J14</b>
46	—	—	—	0.20	<b>SW2-L2</b>
	4 x 1.8	M4	7	0.20	● <b>SW2-L2J12</b>
	5 x 2.3	M4	7	0.18	● <b>SW2-L2J14</b>

- [Caution on J series]
- As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
  - Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
  - Keyways are made according to JIS B1301 standards, Js 9 tolerance.
  - Areas of products which have been re-worked will not be black oxide coated.
  - For products having a tapped hole, a set screw is included.

BG · CG

Bronze Worm Wheels & Gray Iron Worm Wheels



\* CS has a sand mold casting finish.

NOTE 1. Allowable torques for worm rotation (rpm)

Hub width F	Total length G	Mounting distance J	Allowable torque (N·m) NOTE 1						Backlash (mm)	Weight (kg)	Catalog No.
			30 rpm	100 rpm	300 rpm	600 rpm	900 rpm	1200 rpm			
13	35	35.5	12.3	10.2	8.00	6.59	5.78	5.25	0.10~0.28	0.33	<b>BG2-20R1</b>
13	35	35.5	12.3	10.0	7.51	6.15	5.32	4.80	0.10~0.28	0.33	<b>BG2-20R2</b>
13	35	35.5	12.3	10.2	8.00	6.59	5.78	5.25	0.10~0.28	0.33	<b>BG2-20L1</b>
13	35	35.5	12.3	10.0	7.51	6.15	5.32	4.80	0.10~0.28	0.33	<b>BG2-20L2</b>

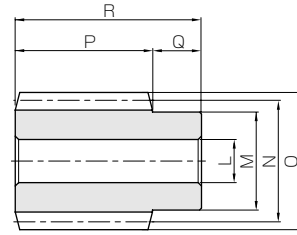
NOTE 1. Allowable torques for worm rotation (rpm)

Hub width F	Total length G	Web thickness (H)	Web O.D. (I)	Mounting distance J	Allowable torque (N·m) NOTE 1						Backlash (mm)	Weight (kg)	Catalog No.
					30 rpm	100 rpm	300 rpm	600 rpm	900 rpm	1200 rpm			
13	35	—	—	35.5	7.38	6.15	4.80	3.95	3.47	3.15	0.10~0.28	0.27	<b>CG2-20R1</b>
13	35	—	—	35.5	7.40	6.00	4.51	3.69	3.19	2.88	0.10~0.28	0.27	<b>CG2-20R2</b>
13	35	—	—	45.5	15.6	13.1	10.4	8.74	7.70	6.96	0.10~0.28	0.57	<b>CG2-30R1</b>
13	35	—	—	45.5	15.7	13.1	9.96	8.15	7.18	6.45	0.10~0.28	0.57	<b>CG2-30R2</b>
13	35	—	—	55.5	26.7	22.5	18.1	15.4	13.55	12.3	0.10~0.28	0.96	<b>CG2-40R1</b>
13	35	(7)	(88)	65.5	40.3	34.1	27.6	23.6	21.0	19.1	0.10~0.28	1.01	<b>CG2-50R1</b>
13	35	(7)	(88)	65.5	40.7	34.0	26.9	22.4	19.6	17.8	0.10~0.28	1.01	<b>CG2-50R2</b>
13	35	(7)	(108)	75.5	56.4	47.9	38.9	33.3	29.9	27.2	0.10~0.28	1.44	<b>CG2-60R1</b>
13	35	—	—	35.5	7.38	6.15	4.80	3.95	3.47	3.15	0.10~0.28	0.27	<b>CG2-20L1</b>
13	35	—	—	35.5	7.40	6.00	4.51	3.69	3.19	2.88	0.10~0.28	0.27	<b>CG2-20L2</b>
13	35	—	—	45.5	15.6	13.1	10.4	8.74	7.70	6.96	0.10~0.28	0.57	<b>CG2-30L1</b>
13	35	—	—	45.5	15.7	13.1	9.96	8.15	7.18	6.45	0.10~0.28	0.57	<b>CG2-30L2</b>
13	35	—	—	55.5	26.7	22.5	18.1	15.4	13.55	12.3	0.10~0.28	0.96	<b>CG2-40L1</b>
13	35	(7)	(88)	65.5	40.3	34.1	27.6	23.6	21.0	19.1	0.10~0.28	1.01	<b>CG2-50L1</b>
13	35	(7)	(88)	65.5	40.7	34.0	26.9	22.4	19.6	17.8	0.10~0.28	1.01	<b>CG2-50L2</b>
13	35	(7)	(108)	75.5	56.4	47.9	38.9	33.3	29.9	27.2	0.10~0.28	1.44	<b>CG2-60L1</b>

- [Caution on Secondary Operations]
- Please read "Caution on Performing Secondary Operations" (Page 512) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.



Specifications	
Precision grade	KHK W 001 grade 4 *
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB



W1

\* The precision grade of J Series products is equivalent to the value shown in the table.

Catalog No. ● J Series (Available-on-request)	Normal module	Number of start	Lead angle	Hand of tread	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width (R)	Hub width (L)
						L <sub>H7</sub>	M	N	O	P	Q	Q'
SW2.5-R1 ● SW2.5-R1J15 ● SW2.5-R1J16	m2.5	1	3°52'	R	W1 W1K W1K	15 15 16	30	37	42	45	18	—
		2	7°46'	R	W1 W1K W1K	15 15 16	30	37	42	45	18	—
1		3°52'	L	W1 W1K W1K	15 15 16	30	37	42	45	18	—	
2		7°46'	L	W1 W1K W1K	15 15 16	30	37	42	45	18	—	

[Caution on Product Characteristics]

① These worms produce axial thrust forces. See page 512 for more details.

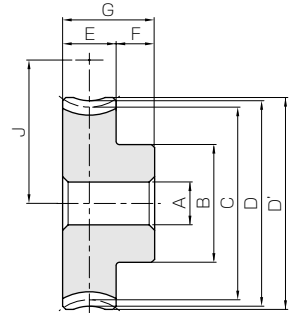
[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 512) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Gear tooth hardening of the worm reduces the precision (introduces errors in the lead and pressure angles). Avoid heat hardening as it will create bad tooth contact causing abrasion of the wheel.

**BG · CG Bronze Worm Wheels & Gray Iron Worm Wheels**



Specifications		
Catalog No.	BG	CG
Precision grade	KHK W 002 grade 4	KHK W 002 grade 4
Reference section of gear	Normal plane	Normal plane
Gear teeth	Standard full depth	Standard full depth
Normal pressure angle	20°	20°
Material	CAC502 (formerly JIS PBC2)	FC200
Heat treatment	—	—
Tooth hardness	—	—



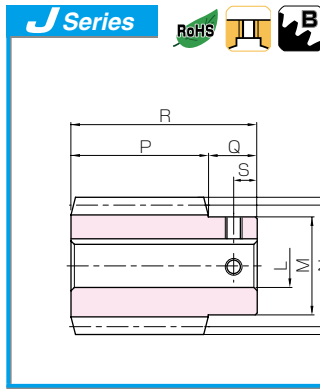
H1

Catalog No.	Reduction ratio	Normal module	No. of teeth	Number of start	Helix angle	Hand of tread	Shape	Bore	Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width
								A <sub>H7</sub>	B	C	D	D'	E
BG2.5-20R1	20	m2.5	20	1	3°52'	R	H1	12	35	50.11	55	57.5	22
BG2.5-20R2	10		20	2	7°46'	R	H1	12	35	50.46	55	57.5	22
BG2.5-20L1	20		20	1	3°52'	L	H1	12	35	50.11	55	57.5	22
BG2.5-20L2	10		20	2	7°46'	L	H1	12	35	50.46	55	57.5	22

Catalog No.	Reduction ratio	Normal module	No. of teeth	Number of start	Helix angle	Hand of tread	Shape	Bore	Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width
								A <sub>H7</sub>	B	C	D	D'	E
CG2.5-20R1	20	m2.5	20	1	3°52'	R	H1	12	35	50.11	55	57.5	22
CG2.5-20R2	10		20	2	7°46'	R	H1	12	35	50.46	55	57.5	22
CG2.5-30R1	30		30	1	3°52'	R	HB	12	40	75.17	80	82.5	22
CG2.5-30R2	15		30	2	7°46'	R	HB	12	40	75.68	80	82.5	22
CG2.5-40R1	40		40	1	3°52'	R	HB	15	45	100.23	105	107.5	22
CG2.5-50R1	50		50	1	3°52'	R	HB	15	50	125.29	130	132.5	22
CG2.5-50R2	25		50	2	7°46'	R	HB	15	50	126.16	130	132.5	22
CG2.5-60R1	60		60	1	3°52'	R	HB	15	55	150.34	155	157.5	22
CG2.5-20L1	20		20	1	3°52'	L	H1	12	35	50.11	55	57.5	22
CG2.5-20L2	10		20	2	7°46'	L	H1	12	35	50.46	55	57.5	22
CG2.5-30L1	30		30	1	3°52'	L	HB	12	40	75.17	80	82.5	22
CG2.5-30L2	15		30	2	7°46'	L	HB	12	40	75.68	80	82.5	22
CG2.5-40L1	40		40	1	3°52'	L	HB	15	45	100.23	105	107.5	22
CG2.5-50L1	50		50	1	3°52'	L	HB	15	50	125.29	130	132.5	22
CG2.5-50L2	25		50	2	7°46'	L	HB	15	50	126.16	130	132.5	22
CG2.5-60L1	60		60	1	3°52'	L	HB	15	55	150.34	155	157.5	22

[Caution on Product Characteristics]

- ① Worm Wheels are profile shifted to create the proper center distance.
- ② The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 510 for more details.



Steel Worms

Newly added



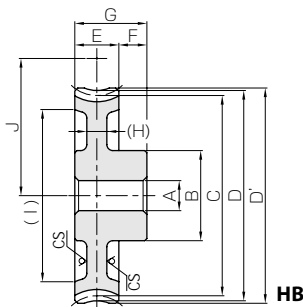
W1K

Total length R	Keyway Width×Depth	Set screw		Weight (kg)	Catalog No. ● : J Series (Available-on-request)
		Size	S		
63	5 x 2.3 5 x 2.3	—	—	0.39	<b>SW2.5-R1</b>
		M4	9	0.39	● <b>SW2.5-R1J15</b>
		M4	9	0.37	● <b>SW2.5-R1J16</b>
63	5 x 2.3 5 x 2.3	—	—	0.39	<b>SW2.5-R2</b>
		M4	9	0.39	● <b>SW2.5-R2J15</b>
		M4	9	0.37	● <b>SW2.5-R2J16</b>
63	5 x 2.3 5 x 2.3	—	—	0.39	<b>SW2.5-L1</b>
		M4	9	0.39	● <b>SW2.5-L1J15</b>
		M4	9	0.37	● <b>SW2.5-L1J16</b>
63	5 x 2.3 5 x 2.3	—	—	0.39	<b>SW2.5-L2</b>
		M4	9	0.39	● <b>SW2.5-L2J15</b>
		M4	9	0.37	● <b>SW2.5-L2J16</b>

- [Caution on J series]
- As available-on-request products, requires a lead-time for shipping within 3 working-days (excludes the day ordered), after placing an order. Please allow additional shipping time to get to your local distributor.
  - Number of products we can process for one order is 1 to 20 units. For quantities of 21 or more pieces, we need to quote price and lead time.
  - Keyways are made according to JIS B1301 standards, Js 9 tolerance.
  - Areas of products which have been re-worked will not be black oxide coated.
  - For products having a tapped hole, a set screw is included.

BG · CG

Bronze Worm Wheels & Gray Iron Worm Wheels



\* CS has a sand mold casting finish.

NOTE 1. Allowable torques for worm rotation (rpm)

Hub width F	Total length G	Mounting distance J	Allowable torque (N·m) NOTE 1						Backlash (mm)	Weight (kg)	Catalog No.
			30 <sub>rpm</sub>	100 <sub>rpm</sub>	300 <sub>rpm</sub>	600 <sub>rpm</sub>	900 <sub>rpm</sub>	1200 <sub>rpm</sub>			
14	36	43.5	21.5	17.7	13.8	11.4	9.94	9.07	0.13~0.31	0.49	<b>BG2.5-20R1</b>
14	36	43.5	21.5	17.3	13.0	10.6	9.14	8.27	0.13~0.31	0.49	<b>BG2.5-20R2</b>
14	36	43.5	21.5	17.7	13.8	11.4	9.94	9.07	0.13~0.31	0.49	<b>BG2.5-20L1</b>
14	36	43.5	21.5	17.3	13.0	10.6	9.14	8.27	0.13~0.31	0.49	<b>BG2.5-20L2</b>

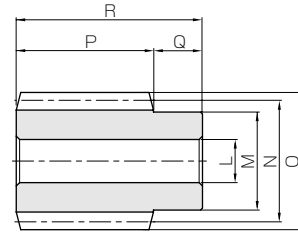
NOTE 1. Allowable torques for worm rotation (rpm)

Hub width F	Total length G	Web thickness (H)	Web O.D. (I)	Mounting distance J	Allowable torque (N·m) NOTE 1						Backlash (mm)	Weight (kg)	Catalog No.
					30 <sub>rpm</sub>	100 <sub>rpm</sub>	300 <sub>rpm</sub>	600 <sub>rpm</sub>	900 <sub>rpm</sub>	1200 <sub>rpm</sub>			
14	36	—	—	43.5	12.9	10.6	8.30	6.83	5.97	5.44	0.13~0.31	0.40	<b>CG2.5-20R1</b>
14	36	—	—	43.5	12.9	10.4	7.78	6.36	5.49	4.96	0.13~0.31	0.40	<b>CG2.5-20R2</b>
14	36	(10)	(60)	56	27.3	22.8	18.0	15.1	13.2	12.0	0.13~0.31	0.70	<b>CG2.5-30R1</b>
14	36	(10)	(60)	56	27.5	22.5	17.2	14.1	12.3	11.1	0.13~0.31	0.70	<b>CG2.5-30R2</b>
14	36	(9)	(86)	68.5	46.7	39.0	31.3	26.5	23.3	21.2	0.13~0.31	1.02	<b>CG2.5-40R1</b>
14	36	(9)	(110)	81	70.6	59.0	47.8	40.7	36.1	33.0	0.13~0.31	1.46	<b>CG2.5-50R1</b>
14	36	(9)	(110)	81	71.1	58.6	46.4	38.6	33.6	30.7	0.13~0.31	1.46	<b>CG2.5-50R2</b>
14	36	(9)	(136)	93.5	98.8	82.9	67.3	57.6	51.5	47.0	0.13~0.31	1.93	<b>CG2.5-60R1</b>
14	36	—	—	43.5	12.9	10.6	8.30	6.83	5.97	5.44	0.13~0.31	0.40	<b>CG2.5-20L1</b>
14	36	—	—	43.5	12.9	10.4	7.78	6.36	5.49	4.96	0.13~0.31	0.40	<b>CG2.5-20L2</b>
14	36	(10)	(60)	56	27.3	22.8	18.0	15.1	13.2	12.0	0.13~0.31	0.70	<b>CG2.5-30L1</b>
14	36	(10)	(60)	56	27.5	22.5	17.2	14.1	12.3	11.1	0.13~0.31	0.70	<b>CG2.5-30L2</b>
14	36	(9)	(86)	68.5	46.7	39.0	31.3	26.5	23.3	21.2	0.13~0.31	1.02	<b>CG2.5-40L1</b>
14	36	(9)	(110)	81	70.6	59.0	47.8	40.7	36.1	33.0	0.13~0.31	1.46	<b>CG2.5-50L1</b>
14	36	(9)	(110)	81	71.1	58.6	46.4	38.6	33.6	30.7	0.13~0.31	1.46	<b>CG2.5-50L2</b>
14	36	(9)	(136)	93.5	98.8	82.9	67.3	57.6	51.5	47.0	0.13~0.31	1.93	<b>CG2.5-60L1</b>

- [Caution on Secondary Operations]
- Please read "Caution on Performing Secondary Operations" (Page 512) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.



Specifications	
Precision grade	KHK W 001 grade 4 *
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	14° 30'
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB



W1

\* The precision grade of J Series products is equivalent to the value shown in the table.

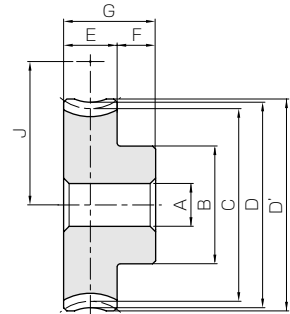
Catalog No. ● : J Series (Available-on-request)	Normal module	Number of start	Lead angle	Hand of tread	Shape	Bore		Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width (R)	Hub width (L)
						LH7	M						
<b>SW3-R1</b> ● SW3-R1J18 ● SW3-R1J19 ● SW3-R1J20	<b>m3</b>	1	3°55'	R	W1	16	35	44	50	50	20	—	
W1K					18								
W1K		19											
W1K		20											
<b>SW3-R2</b> ● SW3-R2J18 ● SW3-R2J19 ● SW3-R2J20	<b>m3</b>	2	7°50'	R	W1	16	35	44	50	50	20	—	
W1K					18								
W1K		19											
W1K		20											
<b>SW3-L1</b> ● SW3-L1J18 ● SW3-L1J19 ● SW3-L1J20	<b>m3</b>	1	3°55'	L	W1	16	35	44	50	50	20	—	
W1K					18								
W1K		19											
W1K		20											
<b>SW3-L2</b> ● SW3-L2J18 ● SW3-L2J19 ● SW3-L2J20	<b>m3</b>	2	7°50'	L	W1	16	35	44	50	50	20	—	
W1K					18								
W1K		19											
W1K		20											

[Caution on Product Characteristics] ① These worms produce axial thrust forces. See page 512 for more details.

**BG · CG Bronze Worm Wheels & Gray Iron Worm Wheels**



Specifications		
Catalog No.	BG	CG
Precision grade	KHK W 002 grade 4	KHK W 002 grade 4
Reference section of gear	Normal plane	Normal plane
Gear teeth	Standard full depth	Standard full depth
Normal pressure angle	14° 30'	14° 30'
Material	CAC502 (formerly JIS PBC2)	FC200
Heat treatment	—	—
Tooth hardness	—	—



H1

Catalog No.	Reduction ratio	Normal module	No. of teeth	Number of start	Helix angle	Hand of tread	Shape	Bore		Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width
								A <sub>H7</sub>	B					
<b>BG3-20R1</b>	20	<b>m3</b>	20	1	3°55'	R	H1	20	50	60.14	66	69	28	
<b>BG3-20R2</b>	10		20	2	7°50'	R	H1	20	50					60.57
<b>BG3-20L1</b>	20		20	1	3°55'	L	H1	20	50	60.14	66	69	28	
<b>BG3-20L2</b>	10		20	2	7°50'	L	H1	20	50	60.57	66	69	28	

Catalog No.	Reduction ratio	Normal module	No. of teeth	Number of start	Helix angle	Hand of tread	Shape	Bore		Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width
								A <sub>H7</sub>	B					
<b>CG3-20R1</b>	20	<b>m3</b>	20	1	3°55'	R	H1	20	50	60.14	66	69	28	
<b>CG3-20R2</b>	10		20	2	7°50'	R	H1	20	50					60.57
<b>CG3-30R1</b>	30		30	1	3°55'	R	H1	20	55	90.21	96	99	28	
<b>CG3-30R2</b>	15		30	2	7°50'	R	H1	20	55	90.85	96	99	28	
<b>CG3-40R1</b>	40		40	1	3°55'	R	HB	20	55	120.28	126	129	30	
<b>CG3-50R1</b>	50		50	1	3°55'	R	HB	20	63	150.35	156	159	30	
<b>CG3-50R2</b>	25		50	2	7°50'	R	HB	20	63	151.41	156	159	30	
<b>CG3-60R1</b>	60		60	1	3°55'	R	HB	20	70	180.42	186	189	30	
<b>CG3-20L1</b>	20		20	1	3°55'	L	H1	20	50	60.14	66	69	28	
<b>CG3-20L2</b>	10		20	2	7°50'	L	H1	20	50	60.57	66	69	28	
<b>CG3-30L1</b>	30		30	1	3°55'	L	H1	20	55	90.21	96	99	28	
<b>CG3-30L2</b>	15		30	2	7°50'	L	H1	20	55	90.85	96	99	28	
<b>CG3-40L1</b>	40	40	1	3°55'	L	HB	20	55	120.28	126	129	30		
<b>CG3-50L1</b>	50	50	1	3°55'	L	HB	20	63	150.35	156	159	30		
<b>CG3-50L2</b>	25	50	2	7°50'	L	HB	20	63	151.41	156	159	30		
<b>CG3-60L1</b>	60	60	1	3°55'	L	HB	20	70	180.42	186	189	30		

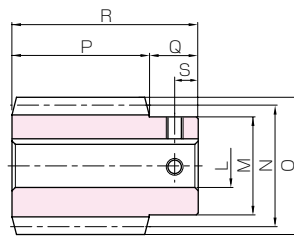
[Caution on Product Characteristics] ① Worm Wheels are profile shifted to create the proper center distance.

② The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 510 for more details.

J Series

Steel Worms

Newly added



W1K



Total length	Keyway	Set screw		Weight (kg)	Catalog No. ● : J Series (Available-on-request)
R	Width×Depth	Size	S		
70	—	—	—	0.64	<b>SW3-R1</b>
	6 x 2.8	M5	10	0.60	● <b>SW3-R1J18</b>
	6 x 2.8	M5	10	0.58	● <b>SW3-R1J19</b>
70	6 x 2.8	M5	10	0.56	● <b>SW3-R1J20</b>
	—	—	—	0.64	<b>SW3-R2</b>
	6 x 2.8	M5	10	0.60	● <b>SW3-R2J18</b>
70	6 x 2.8	M5	10	0.58	● <b>SW3-R2J19</b>
	6 x 2.8	M5	10	0.56	● <b>SW3-R2J20</b>
	—	—	—	0.64	<b>SW3-L1</b>
70	6 x 2.8	M5	10	0.60	● <b>SW3-L1J18</b>
	6 x 2.8	M5	10	0.58	● <b>SW3-L1J19</b>
	6 x 2.8	M5	10	0.56	● <b>SW3-L1J20</b>
—	—	—	0.64	<b>SW3-L2</b>	
70	6 x 2.8	M5	10	0.60	● <b>SW3-L2J18</b>
	6 x 2.8	M5	10	0.58	● <b>SW3-L2J19</b>
	6 x 2.8	M5	10	0.56	● <b>SW3-L2J20</b>

[Caution on J series]

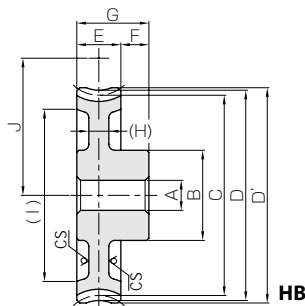
- ① As available-on-request products, requires a lead-time for shipping within **3 working-days (excludes the day ordered), after placing an order.** Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is **1 to 20 units.** For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ Areas of products which have been re-worked will not be black oxide coated.
- ⑤ For products having a tapped hole, a set screw is included.

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 512) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Gear tooth hardening of the worm reduces the precision (introduces errors in the lead and pressure angles). Avoid heat hardening as it will create bad tooth contact causing abrasion of the wheel.

BG · CG

Bronze Worm Wheels & Gray Iron Worm Wheels



\* CS has a sand mold casting finish.

NOTE 1. Allowable torques for worm rotation (rpm)

Hub width	Total length	Mounting distance	Allowable torque (N·m) NOTE 1						Backlash (mm)	Weight (kg)	Catalog No.
			30 rpm	100 rpm	300 rpm	600 rpm	900 rpm	1200 rpm			
15	43	52	36.8	30.1	23.5	19.1	16.7	15.2	0.15~0.33	0.89	<b>BG3-20R1</b>
15	43	52	37.0	29.5	22.1	17.9	15.4	14.0	0.15~0.33	0.89	<b>BG3-20R2</b>
15	43	52	36.8	30.1	23.5	19.1	16.7	15.2	0.15~0.33	0.89	<b>BG3-20L1</b>
15	43	52	37.0	29.5	22.1	17.9	15.4	14.0	0.15~0.33	0.89	<b>BG3-20L2</b>



NOTE 1. Allowable torques for worm rotation (rpm)

Hub width	Total length	Web thickness	Web O.D.	Mounting distance	Allowable torque (N·m) NOTE 1					Backlash (mm)	Weight (kg)	Catalog No.
					30 rpm	100 rpm	300 rpm	600 rpm	900 rpm			
15	43	—	—	52	22.1	18.1	14.1	11.5	10.0	0.15~0.33	0.73	<b>CG3-20R1</b>
15	43	—	—	52	22.2	17.7	13.3	10.7	9.24	0.15~0.33	0.73	<b>CG3-20R2</b>
15	43	—	—	67	46.6	38.7	30.6	25.4	22.2	0.15~0.33	1.50	<b>CG3-30R1</b>
15	43	—	—	67	47.2	38.5	29.3	23.7	20.8	0.15~0.33	1.50	<b>CG3-30R2</b>
15	45	(9)	(107)	82	79.8	66.3	53.2	44.6	39.1	0.15~0.33	1.79	<b>CG3-40R1</b>
15	45	(9)	(138)	97	121	100	81.1	68.4	60.5	0.15~0.33	2.50	<b>CG3-50R1</b>
15	45	(9)	(138)	97	122	100	79.1	65.1	56.7	0.15~0.33	2.50	<b>CG3-50R2</b>
15	45	(9)	(166)	112	169	141	114	96.7	86.3	0.15~0.33	3.40	<b>CG3-60R1</b>
15	43	—	—	52	22.1	18.1	14.1	11.5	10.0	0.15~0.33	0.73	<b>CG3-20L1</b>
15	43	—	—	52	22.2	17.7	13.3	10.7	9.24	0.15~0.33	0.73	<b>CG3-20L2</b>
15	43	—	—	67	46.6	38.7	30.6	25.4	22.2	0.15~0.33	1.50	<b>CG3-30L1</b>
15	43	—	—	67	47.2	38.5	29.3	23.7	20.8	0.15~0.33	1.50	<b>CG3-30L2</b>
15	45	(9)	(107)	82	79.8	66.3	53.2	44.6	39.1	0.15~0.33	1.79	<b>CG3-40L1</b>
15	45	(9)	(138)	97	121	100	81.1	68.4	60.5	0.15~0.33	2.50	<b>CG3-50L1</b>
15	45	(9)	(138)	97	122	100	79.1	65.1	56.7	0.15~0.33	2.50	<b>CG3-50L2</b>
15	45	(9)	(166)	112	169	141	114	96.7	86.3	0.15~0.33	3.40	<b>CG3-60L1</b>

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 512) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

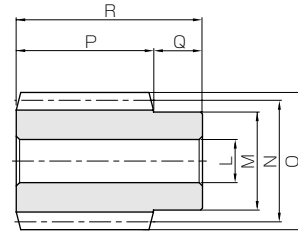
Worm Gear Pair

Bevel Gearboxes

Other Products



Specifications	
Precision grade	KHK W 001 grade 4
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	14° 30'
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB



W1

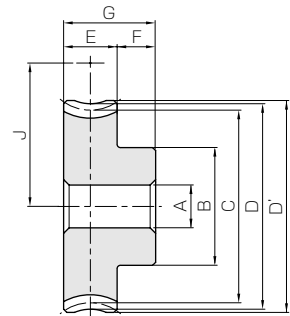
Catalog No.	Normal module	Number of start	Lead angle	Hand of tread	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width (R)	Hub width (L)
						L <sub>H7</sub>	M	N	O	P	Q	Q'
<b>SW4-R1</b>	<b>m4</b>	1	3°42'	R	W1	22	50	62	70	70	25	—
<b>SW4-R2</b>		2	7°25'	R	W1	22	50	62	70	70	25	—
<b>SW4-L1</b>	<b>m4</b>	1	3°42'	L	W1	22	50	62	70	70	25	—
<b>SW4-L2</b>		2	7°25'	L	W1	22	50	62	70	70	25	—

[Caution on Product Characteristics] ① These worms produce axial thrust forces. See page 512 for more details.

**BG · CG Bronze Worm Wheels & Gray Iron Worm Wheels**



Specifications	
Catalog No.	BG CG
Precision grade	KHK W 002 grade 4 KHK W 002 grade 4
Reference section of gear	Normal plane Normal plane
Gear teeth	Standard full depth Standard full depth
Normal pressure angle	14° 30' 14° 30'
Material	CAC502 (formerly JIS PBC2) FC200
Heat treatment	— —
Tooth ardness	— —



H1

Catalog No.	Reduction ratio	Normal module	No. of teeth	Number of start	Helix angle	Hand of tread	Shape	Bore	Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width
								A <sub>H7</sub>	B	C	D	D'	E
<b>BG4-20R1</b>	20 10	<b>m4</b>	20	1	3°42'	R	H1	20	60	80.17	88	90	35
<b>BG4-20R2</b>			20	2	7°25'	R	H1	20	60	80.67	88	90	35
<b>BG4-20L1</b>	20 10		20	1	3°42'	L	H1	20	60	80.17	88	90	35
<b>BG4-20L2</b>			20	2	7°25'	L	H1	20	60	80.67	88	90	35

Catalog No.	Reduction ratio	Normal module	No. of teeth	Number of start	Helix angle	Hand of tread	Shape	Bore	Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width	
								A <sub>H7</sub>	B	C	D	D'	E	
<b>CG4-20R1</b>	20 10	<b>m4</b>	20	1	3°42'	R	H1	20	60	80.17	88	90	35	
<b>CG4-20R2</b>			20	2	7°25'	R	H1	20	60	80.67	88	90	35	
<b>CG4-30R1</b>	30 15		30	1	3°42'	R	HB	20	60	120.25	128	130	35	
<b>CG4-30R2</b>			30	2	7°25'	R	HB	20	60	121.01	128	130	35	
<b>CG4-40R1</b>	40		40	1	3°42'	R	HB	20	70	160.33	168	171	35	
<b>CG4-50R1</b>	50 25 60		50	1	3°42'	R	H2	20	70	200.42	208	211	35	
<b>CG4-50R2</b>			50	2	7°25'	R	H2	20	70	201.69	208	211	35	
<b>CG4-60R1</b>			60	1	3°42'	R	H2	20	80	240.5	248	251	35	
<b>CG4-20L1</b>	20 10		<b>m4</b>	20	1	3°42'	L	H1	20	60	80.17	88	90	35
<b>CG4-20L2</b>				20	2	7°25'	L	H1	20	60	80.67	88	90	35
<b>CG4-30L1</b>	30 15			30	1	3°42'	L	HB	20	60	120.25	128	130	35
<b>CG4-30L2</b>				30	2	7°25'	L	HB	20	60	120.01	128	130	35
<b>CG4-40L1</b>	40	40		1	3°42'	L	HB	20	70	160.33	168	171	35	
<b>CG4-50L1</b>	50 25 60	50		1	3°42'	L	H2	20	70	200.42	208	211	35	
<b>CG4-50L2</b>		50		2	7°25'	L	H2	20	70	201.69	208	211	35	
<b>CG4-60L1</b>		60		1	3°42'	L	H2	20	80	240.5	248	251	35	

[Caution on Product Characteristics] ① Worm Wheels are profile shifted to create the proper center distance.  
 ② H2 Shape Worm Gears have elongated casting holes in the web (H).  
 ③ The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 510 for more details.

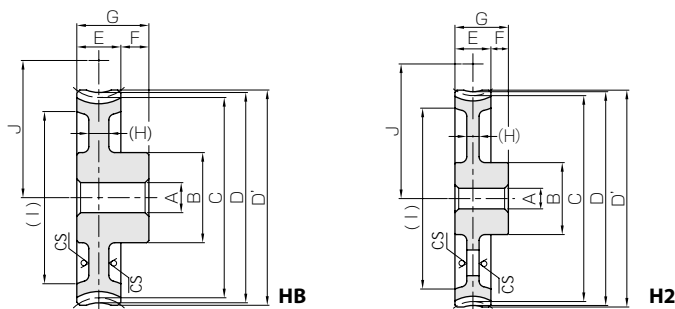


Total length R	Set screw		Weight (kg)	Catalog No.
	Size	S		
95	—	—	1.76	<b>SW4-R1</b>
95	—	—	1.76	<b>SW4-R2</b>
95	—	—	1.76	<b>SW4-L1</b>
95	—	—	1.76	<b>SW4-L2</b>

- [Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 512) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Gear tooth hardening of the worm reduces the precision (introduces errors in the lead and pressure angles). Avoid heat hardening as it will create bad tooth contact causing abrasion of the wheel.

BG · CG

Bronze Worm Wheels & Gray Iron Worm Wheels



\* CS has a sand mold casting finish.

NOTE 1. Allowable torques for worm rotation (rpm)

Hub width F	Total length G	Mounting distance J	Allowable torque (N·m) NOTE 1						Backlash (mm)	Weight (kg)	Catalog No.
			30 <sub>rpm</sub>	100 <sub>rpm</sub>	300 <sub>rpm</sub>	600 <sub>rpm</sub>	900 <sub>rpm</sub>	1200 <sub>rpm</sub>			
17	52	71	75.9	61.7	47.9	38.4	33.7	30.1	0.17~0.37	1.91	<b>BG4-20R1</b>
17	52	71	75.9	60.0	44.8	35.7	30.9	27.5	0.17~0.37	1.91	<b>BG4-20R2</b>
17	52	71	75.9	61.7	47.9	38.4	33.7	30.1	0.17~0.37	1.91	<b>BG4-20L1</b>
17	52	71	75.9	60.0	44.8	35.7	30.9	27.5	0.17~0.37	1.91	<b>BG4-20L2</b>

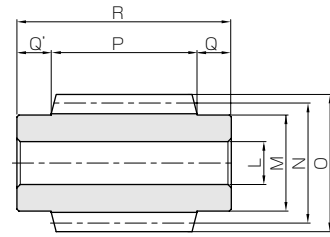
NOTE 1. Allowable torques for worm rotation (rpm)

Hub width F	Total length G	Web thickness (H)	Web O.D. (I)	Mounting distance J	Allowable torque (N·m) NOTE 1				Backlash (mm)	Weight (kg)	Catalog No.
					30 <sub>rpm</sub>	100 <sub>rpm</sub>	300 <sub>rpm</sub>	600 <sub>rpm</sub>			
17	52	—	—	71	45.6	37.0	28.7	23.0	0.17~0.37	1.56	<b>CG4-20R1</b>
17	52	—	—	71	45.5	36.0	26.9	21.4	0.17~0.37	1.56	<b>CG4-20R2</b>
17	52	(12)	(96)	91	96.3	79.1	62.3	50.9	0.17~0.37	2.52	<b>CG4-30R1</b>
17	52	(12)	(96)	91	96.8	78.3	59.4	47.3	0.17~0.37	2.52	<b>CG4-30R2</b>
17	52	(11)	(136)	111	165	136	108	89.4	0.17~0.37	3.81	<b>CG4-40R1</b>
17	52	(12)	(176)	131	249	205	165	137	0.17~0.37	4.78	<b>CG4-50R1</b>
17	52	(12)	(176)	131	250	204	160	130	0.17~0.37	4.78	<b>CG4-50R2</b>
17	52	(12)	(218)	151	348	288	233	194	0.17~0.37	6.36	<b>CG4-60R1</b>
17	52	—	—	71	45.6	37.0	28.7	23.0	0.17~0.37	1.56	<b>CG4-20L1</b>
17	52	—	—	71	45.5	36.0	26.9	21.4	0.17~0.37	1.56	<b>CG4-20L2</b>
17	52	(12)	(96)	91	96.3	79.1	62.3	50.9	0.17~0.37	2.52	<b>CG4-30L1</b>
17	52	(12)	(96)	91	96.8	78.3	59.4	47.3	0.17~0.37	2.52	<b>CG4-30L2</b>
17	52	(11)	(136)	111	165	136	108	89.4	0.17~0.37	3.81	<b>CG4-40L1</b>
17	52	(12)	(176)	131	249	205	165	137	0.17~0.37	4.78	<b>CG4-50L1</b>
17	52	(12)	(176)	131	250	204	160	130	0.17~0.37	4.78	<b>CG4-50L2</b>
17	52	(12)	(218)	151	348	288	233	194	0.17~0.37	6.36	<b>CG4-60L1</b>

- [Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 512) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.



Specifications	
Precision grade	KHK W 001 grade 4
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	14° 30'
Material	S45C
Heat treatment	—
Tooth hardness	less than 194HB



W3

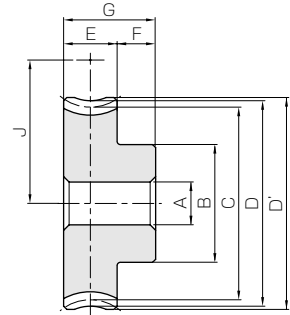
Catalog No.	Normal module	Number of start	Lead angle	Hand of tread	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width (R)	Hub width (L)
						L <sub>H7</sub>	M	N	O	P	Q	Q'
<b>SW5-R1</b>	<b>m5</b>	1	4°06'	R	W3	25	56	70	80	85	20	20
<b>SW5-R2</b>		2	8°13'	R	W3	25	56	70	80	85	20	20
<b>SW6-R1</b>	<b>m6</b>	1	4°18'	R	W3	30	64	80	92	100	25	25
<b>SW6-R2</b>		2	8°38'	R	W3	30	64	80	92	100	25	25

[Caution on Product Characteristics] ① These worms produce axial thrust forces. See page 512 for more details.

**BG · CG Bronze Worm Wheels & Gray Iron Worm Wheels**



Specifications		
Catalog No.	BG	CG
Precision grade	KHK W 002 grade 4	KHK W 002 grade 4
Reference section of gear	Normal plane	Normal plane
Gear teeth	Standard full depth	Standard full depth
Normal pressure angle	14° 30'	14° 30'
Material	CAC502 (formerly JIS PBC2)	FC200
Heat treatment	—	—
Tooth ardness	—	—



H1

Catalog No.	Reduction ratio	Normal module	No. of teeth	Number of start	Helix angle	Hand of tread	Shape	Bore	Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width
								A <sub>H7</sub>	B	C	D	D'	E
<b>BG5-20R1</b>	20/10	<b>m5</b>	20	1	4°06'	R	H1	22	75	100.26	110	113	45
<b>BG5-20R2</b>			20	2	8°13'	R	H1	22	75	101.04	110	113	45
<b>BG6-20R1</b>	20/10	<b>m6</b>	20	1	4°18'	R	H1	25	100	120.34	132	136	52
<b>BG6-20R2</b>			20	2	8°38'	R	H1	25	100	121.38	132	136	52

Catalog No.	Reduction ratio	Normal module	No. of teeth	Number of start	Helix angle	Hand of tread	Shape	Bore	Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width	
								A <sub>H7</sub>	B	C	D	D'	E	
<b>CG5-20R1</b>	20/10	<b>m5</b>	20	1	4°06'	R	H1	22	75	100.26	110	113	45	
<b>CG5-20R2</b>			20	2	8°13'	R	H1	22	75	101.04	110	113	45	
<b>CG5-30R1</b>			30	1	4°06'	R	HB	22	75	150.38	160	163	45	
<b>CG5-30R2</b>			15	30	2	8°13'	R	HB	22	75	151.56	160	163	45
<b>CG5-40R1</b>			40	40	1	4°06'	R	H2	22	90	200.51	210	213	45
<b>CG5-50R1</b>	50/25	<b>m5</b>	50	1	4°06'	R	H2	22	90	250.61	260	263	45	
<b>CG5-50R2</b>			50	2	8°13'	R	H2	22	90	252.59	260	263	45	
<b>CG5-60R1</b>			60	60	1	4°06'	R	H2	22	100	300.77	310	313	45
<b>CG6-20R1</b>	20/10	<b>m6</b>	20	1	4°18'	R	H1	25	100	120.34	132	136	52	
<b>CG6-20R2</b>			20	2	8°38'	R	H1	25	100	121.38	132	136	52	
<b>CG6-30R1</b>			30	1	4°18'	R	HB	25	100	180.51	192	196	52	
<b>CG6-30R2</b>			15	30	2	8°38'	R	HB	25	100	182.06	192	196	52
<b>CG6-40R1</b>			40	40	1	4°18'	R	H2	25	100	240.68	252	256	52
<b>CG6-50R1</b>	50/25	<b>m6</b>	50	1	4°18'	R	H2	25	100	300.85	312	316	52	
<b>CG6-50R2</b>			50	2	8°38'	R	H2	25	100	303.44	312	316	52	
<b>CG6-60R1</b>			60	60	1	4°18'	R	H2	25	120	361.02	372	376	52

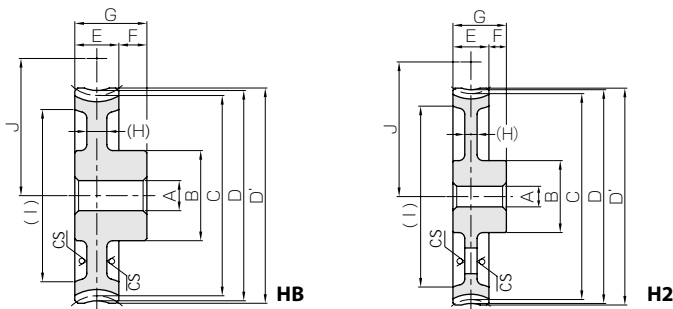
[Caution on Product Characteristics] ① Worm Wheels are profile shifted to create the proper center distance.  
 ② H2 Shape Worm Gears have elongated casting holes in the web (H).  
 ③ The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 510 for more details.

Total length R	Set screw		Weight (kg)	Catalog No.
	Size	S		
125	—	—	2.86	<b>SW5-R1</b>
125	—	—	2.86	<b>SW5-R2</b>
150	—	—	4.38	<b>SW6-R1</b>
150	—	—	4.38	<b>SW6-R2</b>

- [Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 512) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② Gear tooth hardening of the worm reduces the precision (introduces errors in the lead and pressure angles). Avoid heat hardening as it will create bad tooth contact causing abrasion of the wheel.

BG · CG

Bronze Worm Wheels & Gray Iron Worm Wheels



\* CS has a sand mold casting finish.

NOTE 1. Allowable torques for worm rotation (rpm)

Hub width F	Total length G	Mounting distance J	Allowable torque (N·m) NOTE 1						Backlash (mm)	Weight (kg)	Catalog No.
			30 <sub>rpm</sub>	100 <sub>rpm</sub>	300 <sub>rpm</sub>	600 <sub>rpm</sub>	900 <sub>rpm</sub>	1200 <sub>rpm</sub>			
20	65	85	146	117	91.2	73.0	63.7	56.9	0.20~0.40	3.89	<b>BG5-20R1</b>
20	65	85	146	115	85.8	68.4	58.8	52.2	0.20~0.40	3.89	<b>BG5-20R2</b>
20	72	100	232	185	144	115	99.2	88.8	0.22~0.42	6.60	<b>BG6-20R1</b>
20	72	100	235	183	136	109	92.3	82.0	0.22~0.42	6.60	<b>BG6-20R2</b>

NOTE 1. Allowable torques for worm rotation (rpm)

Hub width F	Total length G	Web thickness (H)	Web O.D. (I)	Mounting distance J	Allowable torque (N·m) NOTE 1				Backlash (mm)	Weight (kg)	Catalog No.
					30 <sub>rpm</sub>	100 <sub>rpm</sub>	300 <sub>rpm</sub>	600 <sub>rpm</sub>			
20	65	—	—	85	87.4	70.3	54.7	43.8	0.20~0.40	3.18	<b>CG5-20R1</b>
20	65	—	—	85	87.9	68.9	51.5	41.0	0.20~0.40	3.18	<b>CG5-20R2</b>
20	65	(13)	(127)	110	185	150	119	96.8	0.20~0.40	4.78	<b>CG5-30R1</b>
20	65	(13)	(127)	110	187	150	114	90.6	0.20~0.40	4.78	<b>CG5-30R2</b>
20	65	(16)	(172)	135	316	258	206	170	0.20~0.40	7.44	<b>CG5-40R1</b>
20	65	(16)	(223)	160	477	390	315	261	0.20~0.40	9.79	<b>CG5-50R1</b>
20	65	(16)	(223)	160	483	390	307	249	0.20~0.40	9.79	<b>CG5-50R2</b>
20	65	(13)	(276)	185	668	548	443	369	0.20~0.40	12.0	<b>CG5-60R1</b>
20	72	—	—	100	139	111	86.2	—	0.22~0.42	5.39	<b>CG6-20R1</b>
20	72	—	—	100	141	110	81.8	—	0.22~0.42	5.39	<b>CG6-20R2</b>
20	72	(15)	(155)	130	294	237	187	—	0.22~0.42	8.28	<b>CG6-30R1</b>
20	72	(15)	(155)	130	299	238	181	—	0.22~0.42	8.28	<b>CG6-30R2</b>
20	72	(15)	(213)	160	502	407	325	—	0.22~0.42	10.9	<b>CG6-40R1</b>
20	72	(16)	(275)	190	760	615	496	—	0.22~0.42	14.0	<b>CG6-50R1</b>
20	72	(16)	(275)	190	774	620	488	—	0.22~0.42	14.0	<b>CG6-50R2</b>
20	72	(17)	(336)	220	1060	865	698	—	0.22~0.42	19.8	<b>CG6-60R1</b>

- [Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 512) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.

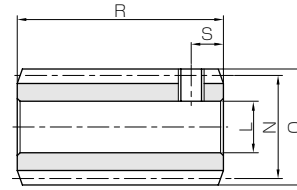


# SUW Stainless Steel Worms

Module 0.5、0.8



Specifications	
Precision grade	KHK W 001 grade 4
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	SUS303
Heat treatment	—
Tooth hardness	less than 187HB



W2

Catalog No.	Normal module	Number of start	Lead angle	Hand of tread	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length
						L <sub>H8</sub>	M	N	O	P	Q	R
SUW0.5-R1	m0.5	1	2°36'	R	W2	5	—	11	12	—	—	18
SUW0.5-R2		2	5°13'	R	W2	5	—	11	12	—	—	18
SUW0.8-R1	m0.8	1	3°17'	R	W2	6	—	14	15.6	—	—	30
SUW0.8-R2		2	6°34'	R	W2	6	—	14	15.6	—	—	30

[Caution on Product Characteristics]

- ① For W2-shaped products, a set screw is included. When setting up the mating wheel, make sure no friction occurs within the set screw.
- ② These worms produce axial thrust forces. See page 512 for more details.

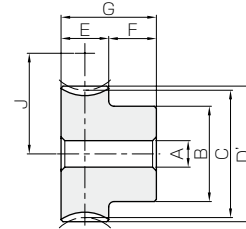


# DG Plastic Worm Wheels

Module 0.5、0.8



Specifications	
Precision grade	KHK W 002 grade 5
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	Polyacetal
Heat treatment	—
Tooth hardness	—



HA

Catalog No.	Reduction ratio	Normal module	No. of teeth	Number of start	Helix angle	Hand of tread	Shape	Bore	Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width
								A <sup>-0.05</sup> / <sub>0.10</sub>	B	C	D	D'	E
DG0.5-20R1	20	m0.5	20	1	2°36'	R	HA	4	9	10.01	—	11	5
DG0.5-20R2	10		20	2	5°13'	R	HA	4	9	10.04	—	11	5
DG0.5-30R1	30		30	1	2°36'	R	HA	4	12	15.02	—	16	5
DG0.5-30R2	15		30	2	5°13'	R	HA	4	12	15.06	—	16	5
DG0.5-40R1	40		40	1	2°36'	R	HA	5	15	20.02	—	21	5
DG0.5-50R1	50	m0.5	50	1	2°36'	R	HA	5	20	25.03	—	26	5
DG0.5-60R1	60		60	1	2°36'	R	HA	5	25	30.03	—	31	5
DG0.8-20R1	20	m0.8	20	1	3°17'	R	HA	5	12	16.03	—	17.6	9
DG0.8-20R2	10		20	2	6°34'	R	HA	5	12	16.11	—	17.6	9
DG0.8-30R1	30		30	1	3°17'	R	HA	5	18	24.04	—	25.6	9
DG0.8-30R2	15		30	2	6°34'	R	HA	5	18	24.16	—	25.6	9
DG0.8-40R1	40		40	1	3°17'	R	HA	6	20	32.05	—	33.6	9
DG0.8-50R1	50	m0.8	50	1	3°17'	R	HA	8	25	40.07	—	41.6	9
DG0.8-60R1	60		60	1	3°17'	R	HA	8	25	48.08	—	49.6	9

[Caution on Product Characteristics]

- ① Worm Wheels are profile shifted to create the proper center distance.
- ② The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 510 for more details.
- ③ Since the bore is finished with a minus tolerance, you can use a shaft with a force fit.

Stainless Steel Worms

Set Screw		Weight (kg)	Catalog No.
Size	S		
M3	3	0.010	<b>SUW0.5-R1</b>
M3	3	0.010	<b>SUW0.5-R2</b>
M4	5	0.029	<b>SUW0.8-R1</b>
M4	5	0.029	<b>SUW0.8-R2</b>

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 512) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

DG

Plastic Worm Wheels



Hub width	Total length	Mounting distance	Allowable torque (N·m)	Allowable torque (kgf·m)	Backlash	Weight	Catalog No.
F	G	J	Surface durability	Surface durability	(mm)	(kg)	
7	12	10.5	0.067	0.0068	0~0.16	1.01	<b>DG0.5-20R1</b>
7	12	10.5	0.067	0.0069	0~0.16	1.01	<b>DG0.5-20R2</b>
7	12	13	0.11	0.011	0~0.16	2.21	<b>DG0.5-30R1</b>
7	12	13	0.11	0.011	0~0.16	2.21	<b>DG0.5-30R2</b>
7	12	15.5	0.16	0.016	0~0.16	3.72	<b>DG0.5-40R1</b>
7	12	18	0.21	0.022	0~0.16	6.36	<b>DG0.5-50R1</b>
7	12	20.5	0.26	0.027	0~0.16	9.67	<b>DG0.5-60R1</b>
9	18	15	0.31	0.031	0.04~0.22	3.73	<b>DG0.8-20R1</b>
9	18	15	0.31	0.032	0.04~0.22	3.73	<b>DG0.8-20R2</b>
9	18	19	0.52	0.053	0.04~0.22	8.84	<b>DG0.8-30R1</b>
9	18	19	0.52	0.053	0.04~0.22	8.84	<b>DG0.8-30R2</b>
9	18	23	0.74	0.076	0.04~0.22	14.0	<b>DG0.8-40R1</b>
9	18	27	0.98	0.10	0.04~0.22	21.6	<b>DG0.8-50R1</b>
9	18	31	1.21	0.12	0.04~0.22	28.8	<b>DG0.8-60R1</b>

[Caution on Secondary Operations] ① Please read "Caution on Performing Secondary Operations" (Page 512) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.

Miter Gears

Bevel Gears

Screw Gears

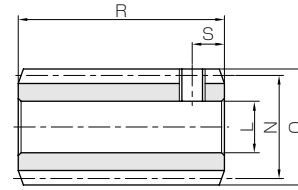
Worm Gear Pair

Bevel Gearboxes

Other Products



Specifications	
Precision grade	KHK W 001 grade 4 *
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	SUS303
Heat treatment	—
Tooth hardness	less than 187HB



W2

\* The precision grade of J Series products is equivalent to the value shown in the table.

Catalog No. ● : J Series (Available-on-request)	Normal module	Number of start	Lead angle	Hand of tread	Shape	Bore		Pitch dia.	Outside dia.	Face width	Hub width	Total length
						LH7	M					
SUW1-R1 SUW1-R2	m1	1	3°35'	R	W2	6	—	16	18	—	—	32
		2	7°11'	R	W2	6	—	16	18	—	—	32
SUW1.5-R1 ● SUW1.5-R1J8 ● SUW1.5-R1J10	m1.5	1	3°26'	R	W1 W1T W1K	8 8 10	20	25	28	30	10	40
SUW1.5-R2 ● SUW1.5-R2J8 ● SUW1.5-R2J10		2	6°54'	R	W1 W1T W1K	8 8 10	20	25	28	30	10	40

[Caution on Product Characteristics]

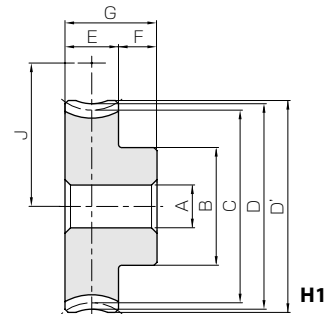
- For W2-shaped products, a set screw is included. When setting up the mating wheel, make sure no friction occurs within the set screw.
- These worms produce axial thrust forces. See page 512 for more details.
- If bore size is less than  $\phi 4$ , the tolerance is H8. If bore size is  $\phi 5$  or  $\phi 6$ , and the hole length exceeds 3 times the diameter, the tolerance is also H8.



# PG Plastic Worm Wheels



Specifications	
Precision grade	KHK W 002 grade 5 *
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Material	MC901 Nylon
Heat treatment	—
Tooth hardness	—

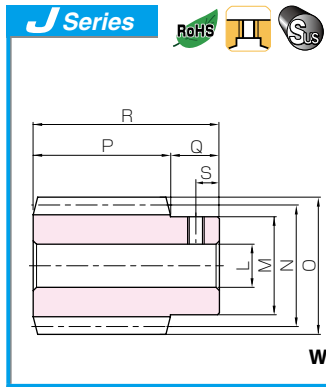


\* The precision grade of this product is equivalent to the value shown in the table.

Catalog No.	Reduction ratio	Normal module	No. of teeth	Number of start	Helix angle	Hand of tread	Shape	Bore		Pitch dia.	Throat dia.	Outside dia.	Face width
								A	B				
PG1-20R1	20	m1	20	1	3°35'	R	H1	6	16	20.04	22	23	10
PG1-20R2	10		20	2	7°11'	R	H1	6	16	20.16	22	23	10
PG1-30R1	30		30	1	3°35'	R	H1	6	20	30.06	32	33	10
PG1-40R1	40		40	1	3°35'	R	H1	8	26	40.08	42	43	10
PG1-50R1	50		50	1	3°35'	R	H1	8	30	50.1	52	53	10
PG1.5-20R1	20	m1.5	20	1	3°26'	R	H1	8	22	30.05	33	34.5	12
PG1.5-20R2	10		20	2	6°54'	R	H1	8	22	30.22	33	34.5	12

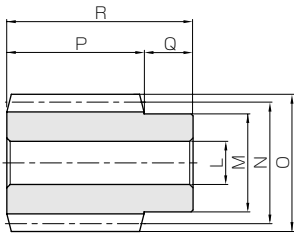
[Caution on Product Characteristics]

- Worm Wheels are profile shifted to create the proper center distance.
- Significant variations in temperature or humidity can cause dimensional changes in plastic gears (MC Nylon gears), for bore size (H8 when produced), teeth diameter, and backlash. Please see the section "Design of Plastic Gears" in the technical reference (Page 693).
- The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 510 for more details.

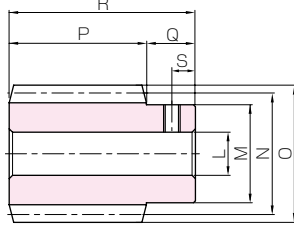


**Stainless Steel Worms**

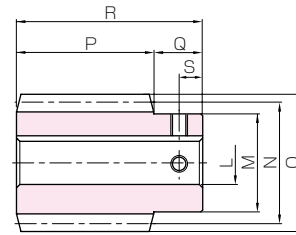
**Newly added**



W1



W1T



W1K



Keyway Width×Depth	Set screw		Weight (kg)	Catalog No. ● : J Series (Available-on-request)
	Size	S		
—	M4	5	0.042	<b>SUW1-R1</b>
—	M4	5	0.042	<b>SUW1-R2</b>
—	—	—	0.12	<b>SUW1.5-R1</b>
—	M5	5	0.12	● <b>SUW1.5-R1J8</b>
4 x 1.8	M4	5	0.11	● <b>SUW1.5-R1J10</b>
—	—	—	0.12	<b>SUW1.5-R2</b>
—	M5	5	0.12	● <b>SUW1.5-R2J8</b>
4 x 1.8	M4	5	0.11	● <b>SUW1.5-R2J10</b>

**[Caution on J series]**

- ① As available-on-request products, requires a lead-time for shipping within **3 working-days (excludes the day ordered), after placing an order.** Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is **1 to 20 units.** For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ For products having a tapped hole, a set screw is included.

[Caution on Secondary Operations]

① Please read “Caution on Performing Secondary Operations” (Page 512) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK’s system for quick modification of KHK stock gears is also available.

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

**PG**

**Plastic Worm Wheels**



Hub width F	Total length G	Mounting distance J	Allowable torque (N·m)		Backlash (mm)	Weight (kg)	Catalog No.
			Surface durability	Surface durability			
10	20	18	0.62	0.060	0~0.28	0.0058	<b>PG1-20R1</b>
10	20	18	0.62	0.060	0~0.28	0.0058	<b>PG1-20R2</b>
10	20	23	1.03	0.10	0~0.28	0.012	<b>PG1-30R1</b>
10	20	28	1.49	0.15	0~0.28	0.021	<b>PG1-40R1</b>
10	20	33	1.96	0.20	0~0.28	0.031	<b>PG1-50R1</b>
10	22	27.5	1.66	0.17	0~0.30	0.014	<b>PG1.5-20R1</b>
10	22	27.5	1.68	0.17	0~0.30	0.014	<b>PG1.5-20R2</b>

[Caution on Secondary Operations]

- ① Please read “Caution on Performing Secondary Operations” (Page 512) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK’s system for quick modification of KHK stock gears is also available.
- ② Plastic gears are susceptible to the effects of temperature and moisture. Dimensional changes may occur while performing secondary operations and during post-machining operations.

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

Bevel Gearboxes

Other Products

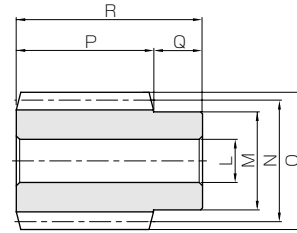


# SUW Stainless Steel Worms

Module 2、2.5、3



Specifications	
Precision grade	KHK W 001 grade 4 *
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	14° 30' *
Material	SUS303
Heat treatment	—
Tooth hardness	less than 187HB



W1

\* The precision grade of J Series products is equivalent to the value shown in the table.  
\* The pressure angle is at 20 degrees for module 2.5.

Catalog No. ● : J Series (Available-on-request)	Normal module	Number of start	Lead angle	Hand of tread	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length
						LH7	M	N	O	P	Q	R
SUW2-R1 ● SUW2-R1J12 ● SUW2-R1J14	m2	1	3°42'	R	W1	12	25	31	35	32	14	46
					W1K	12						
					W1K	14						
SUW2-R2 ● SUW2-R2J12 ● SUW2-R2J14	m2	2	7°25'	R	W1	12	25	31	35	32	14	46
					W1K	12						
					W1K	14						
SUW2.5-R1 ● SUW2.5-R1J15 ● SUW2.5-R1J16	m2.5	1	3°52'	R	W1	15	30	37	42	45	18	63
					W1K	15						
					W1K	16						
SUW2.5-R2 ● SUW2.5-R2J15 ● SUW2.5-R2J16	m2.5	2	7°46'	R	W1	15	30	37	42	45	18	63
					W1K	15						
					W1K	16						
SUW3-R1 ● SUW3-R1J18 ● SUW3-R1J19 ● SUW3-R1J20	m3	1	3°55'	R	W1	16	35	44	50	50	20	70
					W1K	18						
					W1K	19						
					W1K	20						
SUW3-R2 ● SUW3-R2J18 ● SUW3-R2J19 ● SUW3-R2J20	m3	2	7°50'	R	W1	16	35	44	50	50	20	70
					W1K	18						
					W1K	19						
					W1K	20						

[Caution on Product Characteristics] ① These worms produce axial thrust forces. See page 512 for more details.

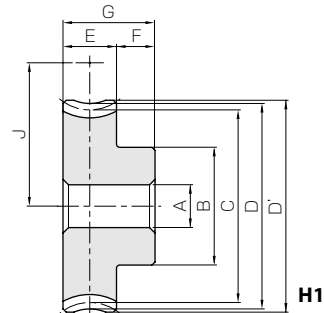


# PG Plastic Worm Wheels

Module 2、2.5、3



Specifications	
Precision grade	KHK W 002 grade 5
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	14° 30' *
Material	MC901 Nylon
Heat treatment	—
Tooth hardness	—

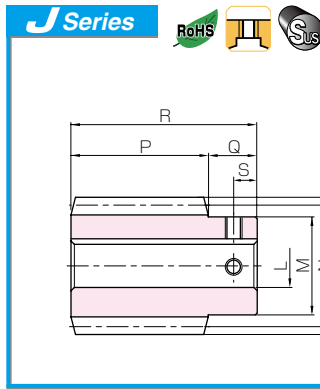


\* The pressure angle is at 20 degrees for module 2.5.

Catalog No.	Reduction ratio	Normal module	No. of teeth	Number of start	Helix angle	Hand of tread	Shape	Bore	Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width
								A	B	C	D	D'	E
PG2-20R1 PG2-20R2	20	m2	20	1	3°42'	R	H1	10	33	40.08	44	46	22
	10		20	2	7°25'	R	H1	10	33	40.34	44	46	22
PG2.5-20R1 PG2.5-20R2	20	m2.5	20	1	3°52'	R	H1	12	35	50.11	55	57.5	22
	10		20	2	7°46'	R	H1	12	35	50.46	55	57.5	22
PG3-20R1 PG3-20R2	20	m3	20	1	3°55'	R	H1	15	50	60.14	66	69	28
	10		20	2	7°50'	R	H1	15	50	60.57	66	69	28

[Caution on Product Characteristics] ① Worm Wheels are profile shifted to create the proper center distance.  
② Significant variations in temperature or humidity can cause dimensional changes in plastic gears (MC Nylon gears), for bore size (H8 when produced), teeth diameter, and backlash. Please see the section "Design of Plastic Gears" in the technical reference (Page 693).  
③ The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Usage above the value in brackets will exceed the maximum allowable sliding speed, if no lubrication is applied. So, lubrication is required. Please see page 510 for more details.





**Stainless Steel Worms**

**Newly added**



W1K

Keyway Width×Depth	Set screw		Weight (kg)	Catalog No. ● : J Series (Available-on-request)
	Size	S		
—	—	—	0.20	<b>SUW2-R1</b>
4 x 1.8	M4	7	0.20	● <b>SUW2-R1J12</b>
5 x 2.3	M4	7	0.18	● <b>SUW2-R1J14</b>
—	—	—	0.20	<b>SUW2-R2</b>
4 x 1.8	M4	7	0.20	● <b>SUW2-R2J12</b>
5 x 2.3	M4	7	0.18	● <b>SUW2-R2J14</b>
—	—	—	0.39	<b>SUW2.5-R1</b>
5 x 2.3	M4	9	0.38	● <b>SUW2.5-R1J15</b>
5 x 2.3	M4	9	0.37	● <b>SUW2.5-R1J16</b>
—	—	—	0.39	<b>SUW2.5-R2</b>
5 x 2.3	M4	9	0.38	● <b>SUW2.5-R2J15</b>
5 x 2.3	M4	9	0.37	● <b>SUW2.5-R2J16</b>
—	—	—	0.63	<b>SUW3-R1</b>
6 x 2.8	M5	10	0.59	● <b>SUW3-R1J18</b>
6 x 2.8	M5	10	0.58	● <b>SUW3-R1J19</b>
6 x 2.8	M5	10	0.56	● <b>SUW3-R1J20</b>
—	—	—	0.63	<b>SUW3-R2</b>
6 x 2.8	M5	10	0.59	● <b>SUW3-R2J18</b>
6 x 2.8	M5	10	0.58	● <b>SUW3-R2J19</b>
6 x 2.8	M5	10	0.56	● <b>SUW3-R2J20</b>

**[Caution on J series]**

- ① As available-on-request products, requires a lead-time for shipping within **3 working-days (excludes the day ordered), after placing an order.** Please allow additional shipping time to get to your local distributor.
- ② Number of products we can process for one order is **1 to 20 units.** For quantities of 21 or more pieces, we need to quote price and lead time.
- ③ Keyways are made according to JIS B1301 standards, Js 9 tolerance.
- ④ For products having a tapped hole, a set screw is included.

[Caution on Secondary Operations]

- ① Please read “Caution on Performing Secondary Operations” (Page 512) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK’s system for quick modification of KHK stock gears is also available.

- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

**PG**

**Plastic Worm Wheels**



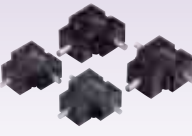
Hub width F	Total length G	Mounting distance J	Allowable torque (N·m)	Allowable torque (kgf·m)	Backlash (mm)	Weight (kg)	Catalog No.
			Surface durability	Surface durability			
13	35	35.5	4.78	0.49	0~0.33	0.046	<b>PG2-20R1</b>
13	35	35.5	4.82	0.49	0~0.33	0.046	<b>PG2-20R2</b>
14	36	43.5	(8.46)	0.86	0~0.36	0.066	<b>PG2.5-20R1</b>
14	36	43.5	(8.54)	0.87	0~0.36	0.066	<b>PG2.5-20R2</b>
15	43	52	(13.7)	1.40	0~0.38	0.13	<b>PG3-20R1</b>
15	43	52	(13.8)	1.41	0~0.38	0.13	<b>PG3-20R2</b>

[Caution on Secondary Operations]


- ① Please read “Caution on Performing Secondary Operations” (Page 512) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK’s system for quick modification of KHK stock gears is also available.
- ② Plastic gears are susceptible to the effects of temperature and moisture. Dimensional changes may occur while performing secondary operations and during post-machining operations.




**PBX**  
Miniature Bevel Gearboxes




Model L/ T    Page 564




**KBX**  
Bevel Gearboxes




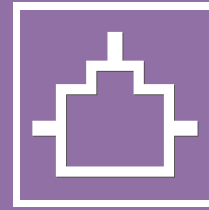
Model L/ T    Page 568



**CBX**  
Bevel Gearboxes



Model L/ T    Page 572

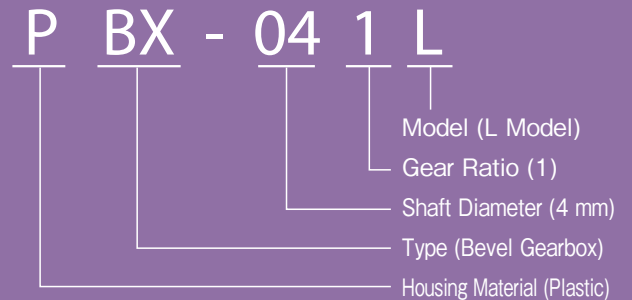
# Gear Boxes

- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

## Catalog Number of KHK Stock Gears

The Catalog Number for KHK stock gears is based on the simple formula listed below. Please order KHK gears by specifying the Catalog Numbers.

(Example) Gearboxes

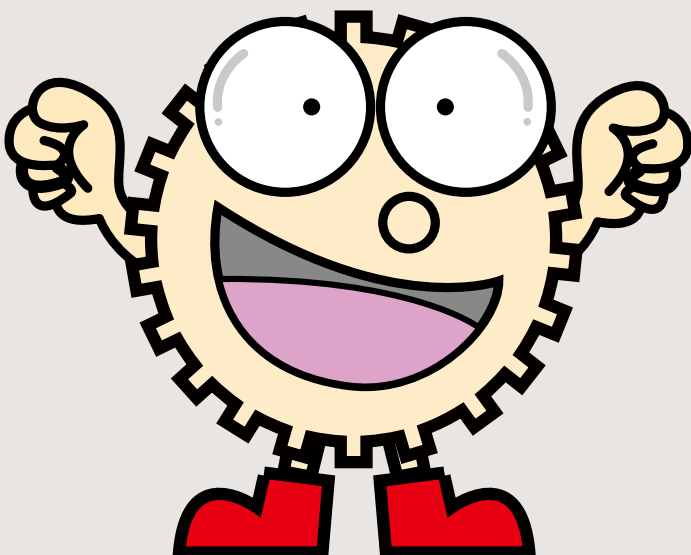


### Housing Material











- P    Plastic
- K    Light Metal Alloy
- C    FC250 Cast Iron

### Main body

- BX    Bevel Gearbox



### Feature Icons

- |  |  |
|--|--|
|  RoHS Compliant Product |  Stainless Product          |
|  Re-machinable Product  |  Resin Product              |
|  Finished Product       |  Copper Alloy Product       |
|  Heat Treated Product   |  Injection Molded Product   |
|  Ground Gear            |  Black Oxide coated Product |



## ■ Features

### ① Light weight and compact

Simple construction with plastic housing.  
Uses a plastic resin which has superior chemical and thermal resistance.

### ② Freedom of installing orientation

Unit has through holes and counter-bores allowing mounting on any orientation.

### ③ Maintenance free

Grease is applied to gears before shipping.

### ④ Speed ratio

1:1

## ■ Points to observe during use

#### 1. Environmental conditions

- Ambient temperature     $-10^{\circ}\text{C}$  to  $40^{\circ}\text{C}$
- Ambient humidity        80% or less
- Atmosphere                Well-ventilated, dust-free air not including corrosive gas and steam.
- Location                    Indoors

#### 2. Mounting Methods

- Bolt or screw the unit firmly on a flat surface free from variations.
- For screws, we recommend JIS Type 2 grooved screws.
- The dimensions of the mounting screws and the recommended tightening torques are given in the table below.
- No secondary operations such as adding bolt holes can be performed on the casing. There is a danger that the gearbox will break.

- When used in applications where oil contamination is undesirable such as in a food processing machines, please use preventive measures against oil leaks due to malfunction or the units wearing out.

#### 3. Connection with mating machinery

- Before connecting to the mating machinery, please verify the directions of the shaft rotation to avoid breakage of the equipment.
- Please use a flexible coupling to connect the gearbox shaft to a mating shaft.
- Make sure that the shafts of the gearbox and the mating machinery are lined up center to center.
- If the gearbox shaft does not have a step, care should be exercised when attaching a coupling so that it does not interfere with the housing.
- There is no keyway on the gearbox shaft. Use clamping type couplings to avoid slippage.

#### 4. Operating precautions

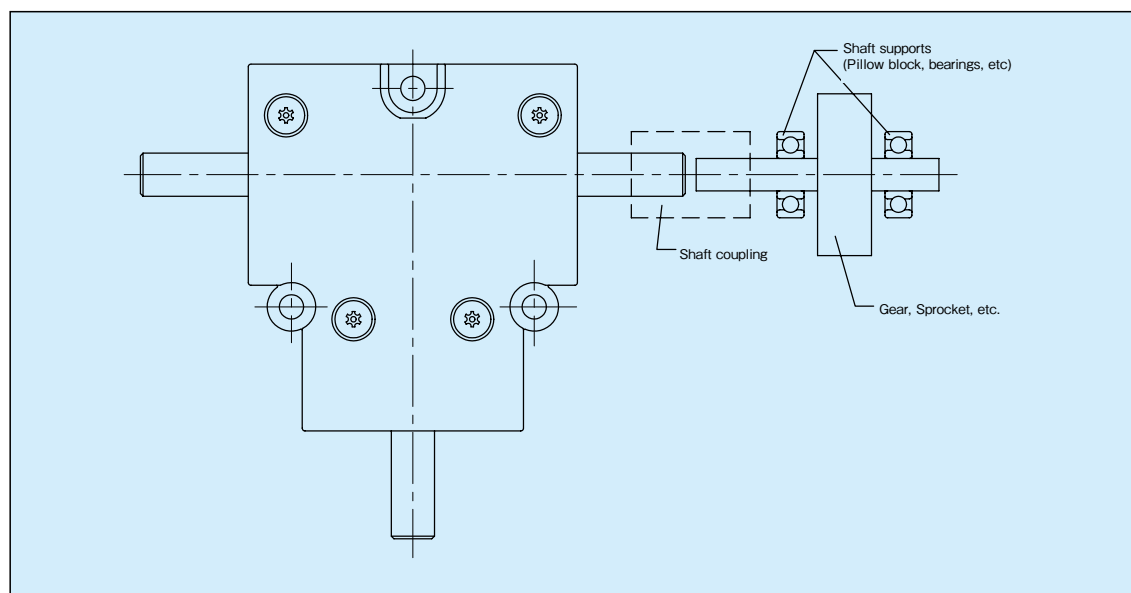
- Do not go near or touch rotating portions of the machine such as the shafts during operation. You may get caught and injure yourself.
- Stop the operation immediately when the noise level or the temperature rises abnormally. Do not restart until all of the causes are analyzed and proper repairs are made.
- Do not disassemble or modify these productions. You may destroy the unit.

## ■ Recommended tightening torques

Mode	Thru-hole		Tapped screw hole		
	Size	Tightening torque (N · m)	Nominal dia.	Effective length (mm)	Tightening torque (N · m)
PBX-04 Type	M3	0.3 ~ 0.6	3	7 ~ 11	0.4 ~ 0.8
PBX-06 Type	M3	0.4 ~ 0.8	3	9 ~ 13	0.5 ~ 1.0
PBX-08 Type	M4	0.5 ~ 1.0	4	9 ~ 14	0.5 ~ 1.0

## Selection Hints

- ① PBX series are economical bevel gearboxes. For applications requiring high precision, strength and/or speed, we recommend the use of KBX type bevel gearboxes.
- ② Please avoid overhang and thrust loads on the shafts. By supporting both ends of the shaft on which a gear or sprocket is mounted by means of pillow blocks or bearings as shown below, you can eliminate overhang loads.
- ③ These units are not suitable when you have sudden reversals of rotation or impact loads. Please consider KBX type bevel gearboxes in such applications.



## PBX Specification Chart

Type	Specifications	X-axis revolutions per minute (rpm)						
		50	100	200	250	300	400	500
PBX-041	X&Y-axis torque (N · cm) {kgf · cm}	9.8 {1.0}	9.8 {1.0}	9.6 {0.98}	9.5 {0.97}	9.4 {0.96}	9.3 {0.95}	9.1 {0.93}
	Efficiency (Reference values)	70%						
PBX-061	X&Y-axis torque (N · cm) {kgf · cm}	39.2 {4.0}	39.2 {4.0}	38.5 {3.93}	38.2 {3.90}	37.9 {3.87}	37.2 {3.80}	36.5 {3.72}
	Efficiency (Reference values)	80%						
PBX-081	X&Y-axis torque (N · cm) {kgf · cm}	78.4 {8.0}	78.4 {8.0}	77.0 {7.86}	76.5 {7.80}	75.7 {7.72}	74.4 {7.59}	73.1 {7.46}
	Efficiency (Reference values)	75%						

- [ CAUTION ]
- ① Be sure not to exceed the allowable values.
  - ② The values in the table are effective when the service factor is 1. When the units are used under other conditions, refer to the Selection Guide.



# PBX Miniature Bevel Gearboxes

L Type



Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

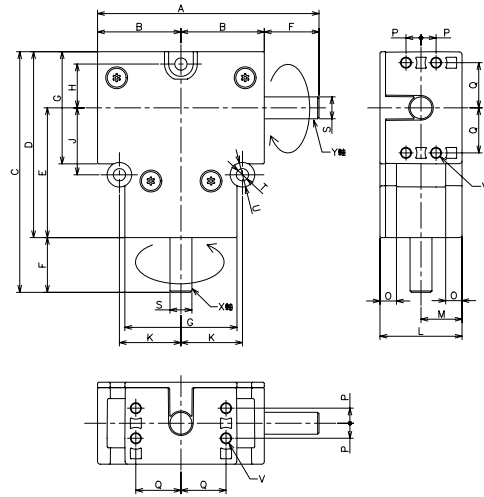
Bevel Gears

Screw Gears

Worm Gear Pair

Bevel Gearboxes

Other Products



Catalog No.	Speed Ratio	A	B	C	D	E	F	G	H	J	K	L	M	O	P	Q	S	T
<b>PBX-041L</b>	1:1	51	20.5	55	45	32	10	26	9.5	16	15	18	9	4.5	3	10	φ4	φ3.5
<b>PBX-061L</b>	1:1	70	27.5	73	58	41	15	34	13.5	20	19	26	13	4.5	4.5	14	φ6	φ3.5
<b>PBX-081L</b>	1:1	81	30.5	88	68	47.5	20	41	16	24.5	22.5	30	15	6	5.5	16.5	φ8	φ4.5



# PBX Miniature Bevel Gearboxes

T Type

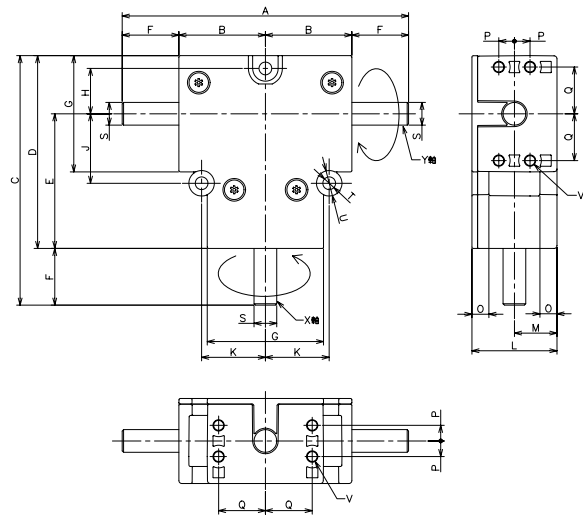


Screw Gears

Worm Gear Pair

Bevel Gearboxes

Other Products



Catalog No.	Speed Ratio	A	B	C	D	E	F	G	H	J	K	L	M	O	P	Q	S	T
<b>PBX-041T</b>	1:1	61	20.5	55	45	32	10	26	9.5	16	15	18	9	4.5	3	10	φ4	φ3.5
<b>PBX-061T</b>	1:1	85	27.5	73	58	41	15	34	13.5	20	19	26	13	4.5	4.5	14	φ6	φ3.5
<b>PBX-081T</b>	1:1	101	30.5	88	68	47.5	20	41	16	24.5	22.5	30	15	6	5.5	16.5	φ8	φ4.5

## Bevel Gearboxes

- [ Caution ]
- ① The arrow marks on the shafts are intended to show the relative direction of rotation. The units can be driven in the opposite direction as well.
  - ② In the standard unit, the X-axis rotates clockwise, and the Y-axis counterclockwise.
  - ③ The tolerance of shaft diameter is JIS h8.
  - ④ The shafts do not have keyways. Please use clamping type couplings to avoid slippage.
  - ⑤ The backlash at the X-axis (input shaft) is about 3 degrees.

U	V		Weight (g)	Catalog No.
	Diameter	Depth		
7	$\phi$ 2.5	11	45	<b>PBX-041L</b>
7	$\phi$ 2.5	13	120	<b>PBX-061L</b>
9	$\phi$ 3.3	14	200	<b>PBX-081L</b>

## PBX

## Miniature Bevel Gearboxes

- [ Caution ]
- ① The arrow marks on the shafts are intended to show the relative direction of rotation. The units can be driven in the opposite direction as well.
  - ② In the standard unit, the X-axis rotates clockwise, and the Y-axis counterclockwise.
  - ③ The tolerance of shaft diameter is JIS h8.
  - ④ The shafts do not have keyways. Please use clamping type couplings to avoid slippage.
  - ⑤ The backlash at the X-axis (input shaft) is about 3 degrees.

U	V		Weight (g)	Catalog No.
	Diameter	Depth		
7	$\phi$ 2.5	11	45	<b>PBX-041T</b>
7	$\phi$ 2.5	13	120	<b>PBX-061T</b>
9	$\phi$ 3.3	14	200	<b>PBX-081T</b>

Spur  
GearsHelical  
GearsInternal  
Gears

Racks

CP Racks  
& PinionsMiter  
GearsBevel  
GearsScrew  
GearsWorm  
Gear PairBevel  
GearboxesOther  
Products



Spur  
Gears

Helical  
Gears

Internal  
Gears

Racks

CP Racks  
& Pinions

Miter  
Gears

Bevel  
Gears

Screw  
Gears

Worm  
Gear Pair

Bevel  
Gearboxes

Other  
Products



## ■ Features

- ① **Compactness**  
Simplicity of design, enclosed in an aluminum die-cast casing.
- ② **Low noise and high efficiency**  
The spiral bevel gears are made of case-hardened alloy steel.
- ③ **Freedom of installing orientation**  
The unit can be installed easily in any orientation.
- ④ **Maintenance-free**  
High-grade grease is sealed in the casting before shipping.
- ⑤ **Selective speed ratio**  
Gear ratios of 1/1/ or 1/2 are available to meet most applications.

## ■ Lubrication

A standard volume of lubricant is sealed at the factory before shipping.

Model	Volume of lubricant	Lubrication	
KBX-10 Type	10g	Grease	The grease contains the Li Extreme Pressure additive NLGI-00
KBX-15 Type	30g		
KBX-20 Type	50g		

## ■ Points to observe during use

1. Environmental space suitable for installation
  - ① Ambient temperature    -10°C to 40°C
  - ② Ambient humidity        80% or less
  - ③ Atmosphere                Well-ventilated, dust-free air not including corrosive gas and steam.
  - ④ Location                    Indoors

2. Mounting methods
  - ① Bolt the unit firmly on a machined plain surface free from vibrations.
  - ② No secondary operations such as adding bolt holes can be performed on the casing. Also, do not disassemble or modify the units. There is a danger that the gearbox will break.
  - ③ When used in applications where oil contamination is undesirable such as in a food processing machines, please use preventive measures against oil leaks due to malfunction or the units wearing out.
3. Connections with mating machinery
  - ① Before connecting to the mating machinery, please verify the direction of the shaft rotation to avoid breakage of the equipment.
  - ② Take care not to cause interference with an oil seal or case surface when fitting a coupling, sprocket, pulley, gear, etc. to gearbox shafts, especially for models without steps on the shaft. We recommend an H7 tolerance for the bore.
  - ③ In the case of direct connection, alignment must be made accurately so that the gearbox shaft and the mating shaft are inline. We recommend flexible couplings.
  - ④ When using a chain, belt or gear drive, position the gearbox shaft and the mating shaft accurately parallel with each other so that a line connecting the center of one shaft to the center of the other shaft makes a right angle with the shafts.
4. Operating precautions
  - ① Do not get near or touch rotating portions of the machine such as the shafts during operations. You may get caught and injure yourself.
  - ② Stop the operation immediately when the noise level or the temperature rises abnormally. Do not restart until all of the causes are analyzed and proper repairs are made.
  - ③ Sudden reversal of the direction of rotation could affect the gearbox and mating machinery. Be sure to stop the unit before reversing the rotation.
  - ④ Be sure to keep the load torque and overhang load (O.H.L.) within the allowable range during operation.



**KBX Performance Chart**

Speed Ratio	Type	Specifications	X-axis revolutions per minute (rpm)												Allowable thrust load (N) [kgf]	
			50	100	200	300	400	600	900	1200	1500	1800	2500	3600	X-axis	Y-axis
1 : 1	KBX-101	Allowable Power (kW)	0.01	0.02	0.05	0.07	0.09	0.14	0.20	0.26	0.31	0.35	0.38	0.44	59 {6}	69 {7}
		X&Y-axis torque (N · m) [kgf · m]	2.35 {0.24}	2.35 {0.24}	2.25 {0.23}	2.25 {0.23}	2.16 {0.22}	2.16 {0.22}	2.06 {0.21}	2.06 {0.21}	1.96 {0.20}	1.86 {0.19}	1.47 {0.15}	1.18 {0.12}		
		X-axis O.H.L. (N) [kgf]	78 {8}	78 {8}	78 {8}	78 {8}	69 {7}	69 {7}	69 {7}	69 {7}	69 {7}	59 {6}	49 {5}	39 {4}		
		Y-axis O.H.L. (N) [kgf]	127 {13}	127 {13}	118 {12}	118 {12}	118 {12}	118 {12}	108 {11}	108 {11}	108 {11}	98 {10}	78 {8}	59 {6}		
		Efficiency (Reference values)	90%													
	KBX-151	Allowable Power (kW)	0.05	0.09	0.18	0.27	0.35	0.51	0.75	0.96	1.16	1.30	1.44	1.66	98 {10}	118 {12}
		X&Y-axis torque (N · m) [kgf · m]	8.82 {0.90}	8.82 {0.90}	8.62 {0.88}	8.53 {0.87}	8.33 {0.85}	8.13 {0.83}	7.94 {0.81}	7.64 {0.78}	7.35 {0.75}	6.86 {0.70}	5.49 {0.56}	4.41 {0.45}		
		X-axis O.H.L. (N) [kgf]	255 {26}	255 {26}	255 {26}	245 {25}	245 {25}	235 {24}	225 {23}	216 {22}	216 {22}	186 {19}	157 {16}	127 {13}		
		Y-axis O.H.L. (N) [kgf]	294 {30}	294 {30}	284 {29}	284 {29}	274 {28}	265 {27}	265 {27}	255 {26}	245 {25}	216 {22}	176 {18}	147 {15}		
		Efficiency (Reference values)	90%													
	KBX-201	Allowable Power (kW)	0.09	0.18	0.36	0.52	0.68	0.95	1.38	1.78	2.15	2.50	2.55	2.95	196 {20}	274 {28}
		X&Y-axis torque (N · m) [kgf · m]	17.6 {1.80}	17.6 {1.80}	17.2 {1.75}	16.7 {1.70}	16.2 {1.65}	15.2 {1.55}	14.7 {1.50}	14.2 {1.45}	13.7 {1.40}	13.2 {1.35}	9.80 {1.00}	7.84 {0.80}		
X-axis O.H.L. (N) [kgf]		353 {36}	353 {36}	343 {35}	333 {34}	333 {34}	323 {33}	314 {32}	304 {31}	294 {30}	265 {27}	216 {22}	176 {18}			
Y-axis O.H.L. (N) [kgf]		529 {54}	529 {54}	519 {53}	510 {52}	500 {51}	490 {50}	470 {48}	451 {46}	441 {45}	392 {40}	314 {32}	255 {26}			
Efficiency (Reference values)		90%														
1 : 2	KBX-102	Allowable Power (kW)	0.005	0.01	0.02	0.03	0.04	0.06	0.09	0.12	0.14	0.16	0.17	0.20	59 {6}	69 {7}
		X&Y-axis torque (N · m) [kgf · m]	2.06 {0.21}	2.06 {0.21}	2.06 {0.21}	1.96 {0.20}	1.96 {0.20}	1.96 {0.20}	1.86 {0.19}	1.86 {0.19}	1.76 {0.18}	1.67 {0.17}	1.27 {0.13}	1.08 {0.11}		
		X-axis O.H.L. (N) [kgf]	88 {9}	88 {9}	88 {9}	88 {9}	88 {9}	78 {8}	78 {8}	78 {8}	78 {8}	69 {7}	59 {6}	49 {5}		
		Y-axis O.H.L. (N) [kgf]	137 {14}	137 {14}	137 {14}	127 {13}	127 {13}	127 {13}	127 {13}	118 {12}	118 {12}	108 {11}	88 {9}	69 {7}		
		Efficiency (Reference values)	90%										85%			
	KBX-152	Allowable Power (kW)	0.02	0.04	0.08	0.13	0.17	0.25	0.36	0.46	0.55	0.62	0.69	0.80	98 {10}	118 {12}
		X&Y-axis torque (N · m) [kgf · m]	8.43 {0.86}	8.43 {0.86}	8.23 {0.84}	8.13 {0.83}	8.04 {0.82}	7.84 {0.80}	7.55 {0.77}	7.25 {0.74}	7.06 {0.72}	6.57 {0.67}	5.29 {0.54}	4.21 {0.43}		
		X-axis O.H.L. (N) [kgf]	255 {26}	255 {26}	255 {26}	245 {25}	245 {25}	235 {24}	225 {23}	216 {22}	216 {22}	186 {19}	157 {16}	127 {13}		
		Y-axis O.H.L. (N) [kgf]	294 {30}	294 {30}	284 {29}	284 {29}	274 {28}	265 {27}	265 {27}	255 {26}	245 {25}	216 {22}	176 {18}	147 {15}		
		Efficiency (Reference values)	90%										85%			
	KBX-202	Allowable Power (kW)	0.05	0.10	0.19	0.28	0.37	0.53	0.77	0.99	1.15	1.31	1.40	1.57	196 {20}	274 {28}
		X&Y-axis torque (N · m) [kgf · m]	19.6 {2.00}	19.6 {2.00}	18.6 {1.90}	18.1 {1.85}	17.6 {1.80}	17.0 {1.73}	16.4 {1.67}	15.7 {16.0}	14.7 {1.50}	13.9 {1.42}	10.8 {1.10}	8.33 {0.85}		
X-axis O.H.L. (N) [kgf]		372 {38}	372 {38}	363 {37}	363 {37}	353 {36}	343 {35}	333 {34}	323 {33}	314 {32}	274 {28}	235 {24}	186 {19}			
Y-axis O.H.L. (N) [kgf]		588 {60}	588 {60}	578 {59}	568 {58}	559 {57}	539 {55}	529 {54}	510 {52}	490 {50}	441 {45}	363 {37}	294 {30}			
Efficiency (Reference values)		90%										85%				

- [ CAUTION ]**
- ① Be sure not to exceed the allowable values. Units with (1:2) reduction ratio have the slower speed in the Y-axis.
  - ② The values in the table are in effect when the service factor is 1. When the units are used under other conditions, refer to the Selection Guides.
  - ③ Overhang load (O.H.L.) means the load applied to the middle of the overhang shaft, perpendicular to the axis. When using the units under other conditions, refer to the factors K1 and K2 described in the Selection Guide.
  - ④ When the 1:2 speed ratio unit is used as a speed increaser (from the Y-axis to the X-axis), the X-axis torque becomes one half of the Y-axis torque shown in the table.
  - ⑤ The Y-axis torque of type T is the sum of the values on both right and left axis.
  - ⑥ The Y-axis O.H.L. of type T is the sum of the values on both right and left axis.





# KBX Bevel Gearboxes

L Type



Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

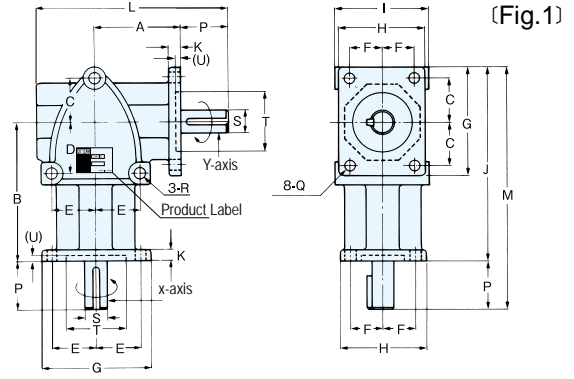
Bevel Gears

Screw Gears

Worm Gear Pair

Bevel Gearboxes

Other Products



Catalog No.	Speed Ratio	A	B	C	D	E	F	G	H	I	J	K	L	M	P	Q	R	S
<b>KBX-101L</b>	1:1	37	58	18	18	18	14	46	38	40	82	5	82	102	20	φ 5.5	φ 6.5	φ 10
<b>KBX-102L</b>	1:2																	
<b>KBX-151L</b>	1:1	66	100	31	36	31	22	80	62	66	140	8	137	170	30	φ 8.5	φ 8.5	φ 15
<b>KBX-152L</b>	1:2																	
<b>KBX-201L</b>	1:1	80	120	36	36	36	26	92	72	76	166	10	168	206	40	φ 8.5	φ 8.5	φ 20
<b>KBX-202L</b>	1:2																	



# KBX Bevel Gearboxes

T Type



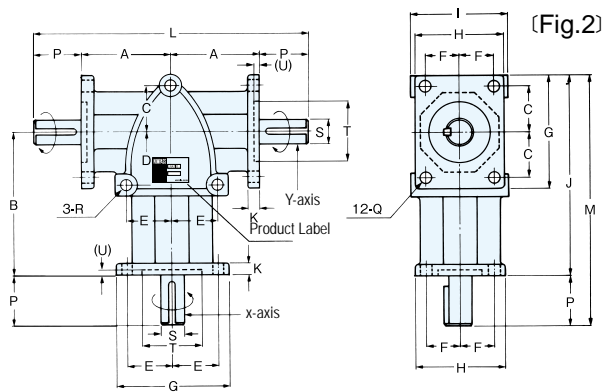
Bevel Gears

Screw Gears

Worm Gear Pair

Bevel Gearboxes

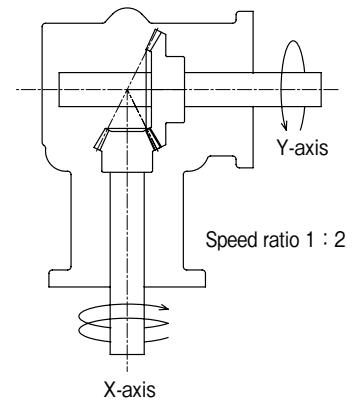
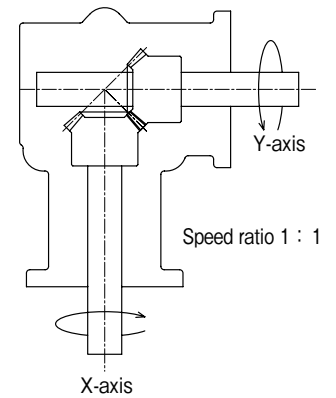
Other Products



Catalog No.	Speed Ratio	A	B	C	D	E	F	G	H	I	J	K	L	M	P	Q	R	S
<b>KBX-101T</b>	1:1	37	58	18	18	18	14	46	38	40	82	5	114	102	20	φ 5.5	φ 6.5	φ 10
<b>KBX-102T</b>	1:2																	
<b>KBX-151T</b>	1:1	66	100	31	36	31	22	80	62	66	140	8	192	170	30	φ 8.5	φ 8.5	φ 15
<b>KBX-152T</b>	1:2																	
<b>KBX-201T</b>	1:1	80	120	36	36	36	26	92	72	76	166	10	240	206	40	φ 8.5	φ 8.5	φ 20
<b>KBX-202T</b>	1:2																	

Bevel Gearboxes

- [ Caution ]
- ① The arrow marks on the shafts are intended to show the relative direction of rotation. The units can be driven in the opposite direction as well.
  - ② In the unit, the X-axis rotates clockwise, and the Y-axis counter-clockwise.
  - ③ The key grooves in the X-axis and the Y-axis do not always coincide in phase with each other.
  - ④ The tolerance of shaft diameter is JIS h7
  - ⑤ The pinion gear is mounted on the x-axis (the input side) in 1 : 2 ratio units.
  - ⑥ The key dimensions are per JIS B 1301-1976 (Standard Grade)
  - ⑦ The backlash angles are measured at the X-axis (Input Shaft).

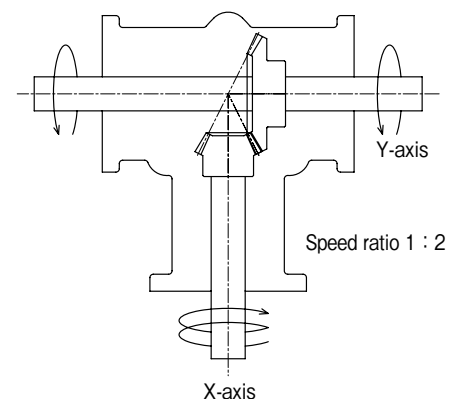
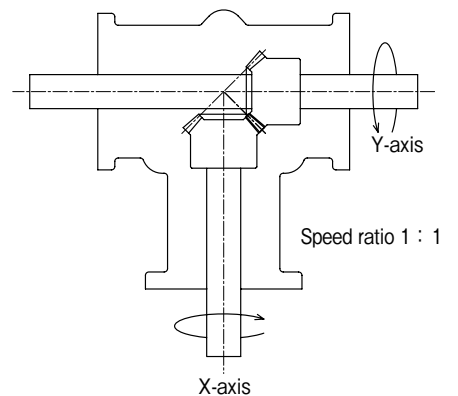


T	(U)	Key	Backlash of shaft rotation	Weight (kg)	Catalog No.
φ 26 <sub>H7</sub>	(2)	1 x 15 ℓ (flat)	16' ~ 44'	0.40	<b>KBX-101L</b>
			30' ~ 1° 23'		<b>KBX-102L</b>
φ 42 <sub>H7</sub>	(3)	5 x 5 x 27 ℓ	10' ~ 37'	1.80	<b>KBX-151L</b>
			19' ~ 1° 09'		<b>KBX-152L</b>
φ 52 <sub>H7</sub>	(4)	6 x 6 x 35 ℓ	8' ~ 33'	3.10	<b>KBX-201L</b>
			15' ~ 60'		<b>KBX-202L</b>

KBX

Bevel Gearboxes

- [ Caution ]
- ① The arrow marks on the shafts are intended to show the relative direction of rotation. The units can be driven in the opposite direction as well.
  - ② In the unit, the X-axis rotates clockwise, and the Y-axis counter-clockwise.
  - ③ The key grooves in the X-axis and the Y-axis do not always coincide in phase with each other.
  - ④ The tolerance of shaft diameter is JIS h7.
  - ⑤ The pinion gear is mounted on the x-axis (the input side) in 1 : 2 ratio units.
  - ⑥ The key dimensions are per JIS B 1301-1976(Standard Grade)
  - ⑦ The backlash angles are measured at the X-axis (Input Shaft).



T	(U)	Key	Backlash of shaft rotation	Weight (kg)	Catalog No.
φ 26 <sub>H7</sub>	(2)	1 x 15 ℓ (flat)	16' ~ 44'	0.50	<b>KBX-101T</b>
			30' ~ 1° 23'		<b>KBX-102T</b>
φ 42 <sub>H7</sub>	(3)	5 x 5 x 27 ℓ	10' ~ 37'	2.20	<b>KBX-151T</b>
			19' ~ 1° 09'		<b>KBX-152T</b>
φ 52 <sub>H7</sub>	(4)	6 x 6 x 35 ℓ	8' ~ 33'	3.40	<b>KBX-201T</b>
			15' ~ 60'		<b>KBX-202T</b>

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

Bevel Gearboxes

Other Products



Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks &amp; Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

Bevel Gearboxes

Other Products



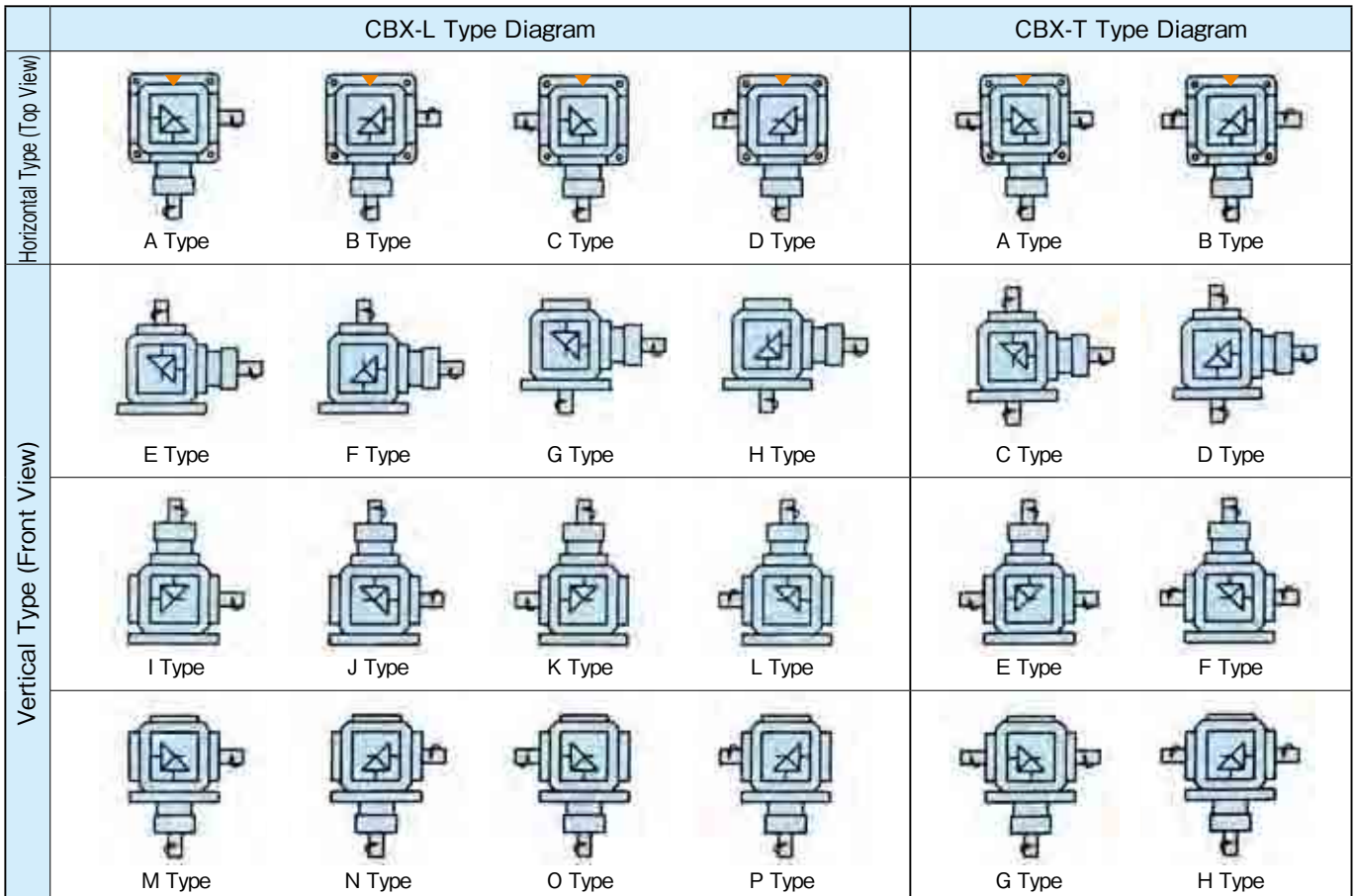
## Shaft Orientations and Orientation Codes

There are 24 permutations of shaft orientations and rotations, which are standardized for CBX Bevel Gearboxes. Please pay attention to the shaft orientations in addition to the catalog number when selecting the units.

### [ CAUTION ]

- ① The diagrams below show the mounting surface.
- ② The arrow marks on the shafts are intended to show the relative directions of rotation. The units can be driven in the opposite directions as well.
- ③ "▼" mark indicates the surface on which the oiling and drain plugs are located when mounting horizontally. The ones without the marks have the plugs on the rear surface (Standard specifications).
- ④ When the unit (other than LI-LL Type, TE-TF Type) is used with the input shaft (X-axis) pointing up and is wall mounted, the lubrication method for the bearings must be altered. Please notify us at the time of placing your order.
- ⑤ For use other than mounting on a horizontal surface, please see page 575.

## CBX Shaft Orientations Chart



## Features

- ① **Very strong**  
The unit has high grade cast iron housing and uses tapered roller bearings.
- ② **Low noise and high efficiency**  
The spiral bevel gears are made of case-hardened alloy steel.
- ③ **Freedom of installing orientation**  
The unit can be installed easily in any orientation. However, if you cannot use one of the standard orientations, please see page 575.
- ④ **Maintenance-free**  
High-grade oil is added to the casing before shipping.
- ⑤ **Selective speed ratio**  
Gear ratios of 1/1 or 1/2 are available to meet most applications.

## Lubrication

A standard volume of lubricant is sealed at the factory before shipping.

Model	Volume of lubricant	Lubrication	
CBX-19 Type	0.3L	Oil	JIS Gear oil Industrial Type 2
CBX-25 Type	0.7L		
CBX-32 Type	1.0L		
CBX-40 Type	1.5L		

## Operating preconditions

See KBX (Page 568)

**CBX Performance Chart**

Speed Ratio	Type	Specifications	X-axis revolutions per minute (rpm)												
			20	50	100	200	300	400	600	900	1200	1500	1800	2500	3600
1 : 1	CBX-191	Allowable Power (kW)	0.08	0.20	0.39	0.77	1.15	1.50	2.05	2.67	3.30	3.95	4.40	4.40	4.40
		X&Y-axis torque (N · m) [kgf · m]	37.2 [3.8]	37.2 [3.8]	37.2 [3.8]	36.3 [3.7]	36.3 [3.7]	36.3 [3.6]	32.3 [3.3]	28.4 [2.9]	26.5 [2.7]	24.5 [2.5]	23.5 [2.4]	16.7 [1.7]	10.8 [1.1]
		X-axis O.H.L. (N) [kgf]	1760 [180]	1760 [180]	1760 [180]	1760 [180]	1670 [170]	1620 [165]	1270 [130]	1080 [110]	882 [90]	833 [85]	784 [80]	686 [70]	637 [65]
		Y-axis O.H.L. (N) [kgf]	1960 [200]	1960 [200]	1960 [200]	1960 [200]	1960 [200]	1810 [185]	1470 [150]	1180 [120]	1030 [105]	980 [100]	931 [95]	784 [80]	735 [75]
		Efficiency (Reference values)	95%						90%						
	CBX-251	Allowable Power (kW)	0.25	0.62	1.24	2.47	3.68	4.70	6.40	8.60	10.5	12.3	13.8	—	—
		X&Y-axis torque (N · m) [kgf · m]	118 [12.0]	118 [12.0]	118 [12.0]	118 [12.0]	116 [11.8]	112 [11.4]	101 [10.3]	91.1 [9.3]	83.3 [8.5]	78.4 [8.0]	73.5 [7.5]	—	—
		X-axis O.H.L. (N) [kgf]	3920 [400]	3920 [400]	3920 [400]	3920 [400]	3630 [370]	3330 [340]	2940 [300]	2450 [250]	2160 [220]	1960 [200]	1760 [180]	—	—
		Y-axis O.H.L. (N) [kgf]	4120 [420]	4120 [420]	4120 [420]	4120 [420]	4020 [410]	3920 [400]	3430 [350]	2940 [300]	2550 [260]	2450 [250]	2250 [230]	—	—
		Efficiency (Reference values)	95%						90%						
	CBX-321	Allowable Power (kW)	0.36	0.88	1.77	3.53	5.26	6.72	9.15	12.3	15.0	17.5	19.7	—	—
		X&Y-axis torque (N · m) [kgf · m]	167 [17.0]	167 [17.0]	167 [17.0]	167 [17.0]	165 [16.8]	160 [16.3]	144 [14.7]	130 [13.3]	119 [12.1]	112 [11.4]	104 [10.6]	—	—
		X-axis O.H.L. (N) [kgf]	4900 [500]	4900 [500]	4900 [500]	4900 [500]	4610 [470]	4210 [430]	3720 [380]	3140 [320]	2740 [280]	2450 [250]	2160 [220]	—	—
		Y-axis O.H.L. (N) [kgf]	5190 [530]	5190 [530]	5190 [530]	5190 [530]	5100 [520]	4900 [500]	4310 [440]	3720 [380]	3230 [330]	3140 [320]	2840 [290]	—	—
		Efficiency (Reference values)	95%						90%						
	CBX-401	Allowable Power (kW)	0.62	1.59	3.18	6.32	9.50	12.0	16.1	22.0	26.5	—	—	—	—
		X&Y-axis torque (N · m) [kgf · m]	294 [30.0]	294 [30.0]	294 [30.0]	294 [30.0]	294 [30.0]	284 [29.0]	225 [26.0]	231 [23.6]	211 [21.5]	—	—	—	—
		X-axis O.H.L. (N) [kgf]	9800 [1000]	9800 [1000]	9800 [1000]	7840 [800]	5880 [600]	4900 [500]	4410 [450]	3720 [380]	3430 [350]	—	—	—	—
		Y-axis O.H.L. (N) [kgf]	11760 [1200]	11760 [1200]	11760 [1200]	9800 [1000]	7350 [750]	6370 [650]	5880 [600]	5100 [520]	4020 [410]	—	—	—	—
		Efficiency (Reference values)	95%						90%						

Speed Ratio	Type	Specifications	X-axis revolutions per minute (rpm)													
			20	50	100	200	300	400	600	900	1200	1500	1800	2500	3600	
1 : 2	CBX-192	Allowable Power (kW)	0.03	0.07	0.14	0.27	0.40	0.53	0.78	1.15	1.50	1.85	2.17	2.20	2.20	
		Y-axis torque (N · m) [kgf · m]	25.5 [2.6]	25.5 [2.6]	25.5 [2.6]	25.5 [2.6]	25.5 [2.6]	24.5 [2.5]	24.5 [2.5]	24.5 [2.5]	24.5 [2.5]	23.5 [2.4]	23.5 [2.4]	22.5 [2.3]	16.7 [1.7]	10.8 [1.1]
		X-axis O.H.L. (N) [kgf]	1180 [120]	1180 [120]	1180 [120]	1180 [120]	1180 [120]	1130 [115]	1130 [115]	1080 [110]	1080 [110]	882 [90]	833 [85]	784 [80]	735 [75]	
		Y-axis O.H.L. (N) [kgf]	1760 [180]	1760 [180]	1760 [180]	1760 [180]	1760 [180]	1720 [175]	1670 [170]	1470 [150]	1270 [130]	1080 [110]	980 [100]	833 [85]	784 [80]	
		Efficiency (Reference values)	90%						85%							
	CBX-252	Allowable Power (kW)	0.09	0.23	0.45	0.90	1.34	1.78	2.67	4.00	5.30	6.33	7.50	7.50	—	
		Y-axis torque (N · m) [kgf · m]	85.3 [8.7]	85.3 [8.7]	85.3 [8.7]	85.3 [8.7]	85.3 [8.7]	84.3 [8.6]	84.3 [8.6]	84.3 [8.6]	84.3 [8.6]	80.4 [8.2]	79.4 [8.1]	56.8 [5.8]	—	
		X-axis O.H.L. (N) [kgf]	3920 [400]	3920 [400]	3920 [400]	3920 [400]	3920 [400]	3720 [380]	3630 [370]	3530 [360]	3230 [330]	2740 [280]	2450 [230]	1670 [170]	—	
		Y-axis O.H.L. (N) [kgf]	4120 [420]	4120 [420]	4120 [420]	4120 [420]	4020 [410]	3920 [400]	3820 [390]	3720 [380]	3430 [350]	3040 [310]	2650 [270]	2350 [240]	—	
		Efficiency (Reference values)	90%						85%							
	CBX-322	Allowable Power (kW)	0.13	0.32	0.64	1.28	1.91	2.54	3.80	5.72	7.57	9.05	10.7	—	—	
		Y-axis torque (N · m) [kgf · m]	123 [12.5]	123 [12.5]	123 [12.5]	123 [12.5]	122 [12.4]	122 [12.4]	121 [12.3]	121 [12.3]	120 [12.2]	115 [11.7]	114 [11.6]	—	—	
		X-axis O.H.L. (N) [kgf]	4900 [500]	4900 [500]	4900 [500]	4900 [500]	4900 [500]	4700 [480]	4610 [470]	4410 [450]	4120 [420]	3430 [350]	2840 [290]	—	—	
		Y-axis O.H.L. (N) [kgf]	5190 [530]	5190 [530]	5190 [530]	5190 [530]	5100 [520]	4900 [500]	4800 [490]	4700 [480]	4310 [440]	3820 [390]	3330 [340]	—	—	
		Efficiency (Reference values)	90%						85%							
	CBX-402	Allowable Power (kW)	0.20	0.48	0.96	1.93	2.90	3.84	5.72	8.55	11.0	13.8	16.4	—	—	
		Y-axis torque (N · m) [kgf · m]	183 [18.7]	183 [18.7]	183 [18.7]	183 [18.7]	183 [18.7]	182 [18.6]	181 [18.5]	180 [18.4]	174 [17.8]	173 [17.6]	172 [17.5]	—	—	
		X-axis O.H.L. (N) [kgf]	9800 [1000]	9800 [1000]	9800 [1000]	9800 [1000]	9800 [1000]	8820 [900]	7840 [800]	6860 [700]	5880 [600]	4900 [500]	3920 [400]	—	—	
		Y-axis O.H.L. (N) [kgf]	11760 [1200]	11760 [1200]	11760 [1200]	11760 [1200]	11760 [1200]	9800 [1000]	8820 [900]	8820 [900]	8820 [900]	7840 [800]	6860 [700]	—	—	
		Efficiency (Reference values)	90%						85%							

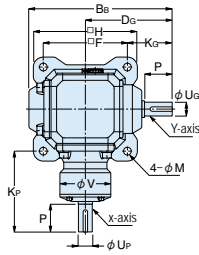
- [ CAUTION ]**
- Be sure not to exceed the allowable values. Units with (1:2) reduction ratio have the slower speed in the Y-axis.
  - The values in the table are in effect when the service factor is 1. When the units are used under other conditions, refer to the Service Factor Tables 2 and 3 (Page 576).
  - Overhang load (O.H.L.) means the load applied to the middle of the overhang shaft, perpendicular to the axis. When using the units under other conditions, refer to the factors K1 and K2 described in Tables 2 and 3 (Page 576).
  - When the 1:2 speed ratio unit is used as a speed increaser (from the Y-axis to the X-axis), the X-axis torque becomes one half of the Y-axis torque shown in the table.
  - The Y-axis torque of CBX-T Type is the sum of the values on both right and left axis.
  - The Y-axis O.H.L. of CBX-T Type is the sum of the values on both right and left axis.
  - The allowable thrust load is half of O.H.L. value in each case.

Spur Gears  
Helical Gears  
Internal Gears  
Racks  
CP Racks & Pinions  
Miter Gears  
Bevel Gears  
Screw Gears  
Worm Gear Pair  
Bevel Gearboxes  
Other Products

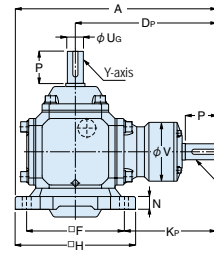
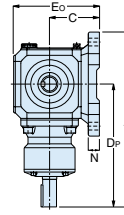


# CBX Bevel Gearboxes

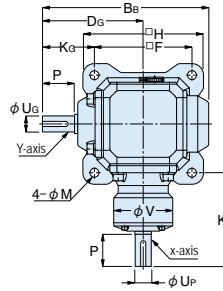
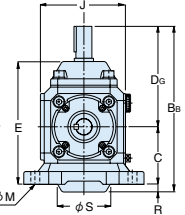
L type



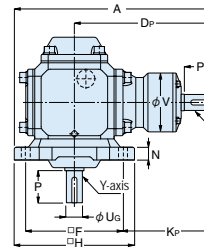
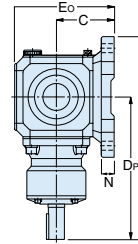
LA, LB



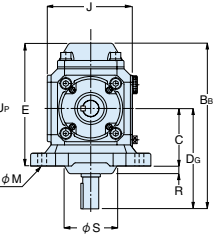
LE, LF



LC, LD



LG, LH



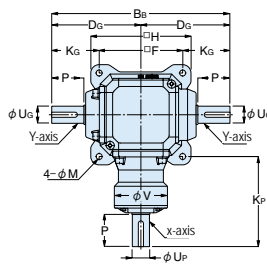
Catalog No.	Speed ratio	A	B <sub>B</sub>	C	D <sub>P</sub>	D <sub>G</sub>	E	E <sub>o</sub>	F	H	J	K <sub>P</sub>	K <sub>G</sub>	φM	N	P	R	φS
CBX-191L <input type="checkbox"/>	1:1	257	193	76	180	116	146	129	125	154	109	117.5	53.5	10.5	17	38	—	—
CBX-192L <input type="checkbox"/>	1:2																	
CBX-251L <input type="checkbox"/>	1:1	316	259	90	222	157	177.5	155	152	188	133	146	81	14	20	50	12	82.5
CBX-252L <input type="checkbox"/>	1:2																	
CBX-321L <input type="checkbox"/>	1:1	340	277	100	242	168	192.5	174	160	196	151	162	88	14	20	55	9	88.5
CBX-322L <input type="checkbox"/>	1:2																	
CBX-401L <input type="checkbox"/>	1:1	425	337	115	308	208	225	200	195	234	173	210.5	110.5	14	22	75	14	114.5
CBX-402L <input type="checkbox"/>	1:2																	

Please place one of the orientation codes (A to P) from page 572 on the box at the end of the catalog number.

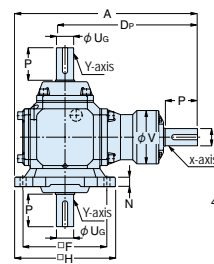
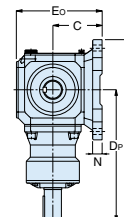


# CBX Bevel Gearboxes

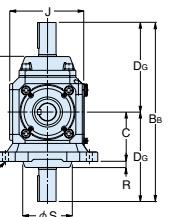
T type



TA, TB



TC, TD

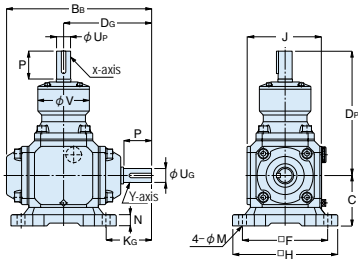


Catalog No.	Speed ratio	A	B <sub>B</sub>	C	D <sub>P</sub>	D <sub>G</sub>	E	E <sub>o</sub>	F	H	J	K <sub>P</sub>	K <sub>G</sub>	φM	N	P	R	φS
CBX-191T <input type="checkbox"/>	1:1	257	232	76	180	116	146	129	125	154	109	117.5	53.5	10.5	17	38	—	—
CBX-192T <input type="checkbox"/>	1:2																	
CBX-251T <input type="checkbox"/>	1:1	316	314	90	222	157	177.5	155	152	188	133	146	81	14	20	50	12	82.5
CBX-252T <input type="checkbox"/>	1:2																	
CBX-321T <input type="checkbox"/>	1:1	340	336	100	242	168	192.5	174	160	196	151	162	88	14	20	55	9	88.5
CBX-322T <input type="checkbox"/>	1:2																	
CBX-401T <input type="checkbox"/>	1:1	425	416	115	308	208	225	200	195	234	173	210.5	110.5	14	22	75	14	114.5
CBX-402T <input type="checkbox"/>	1:2																	

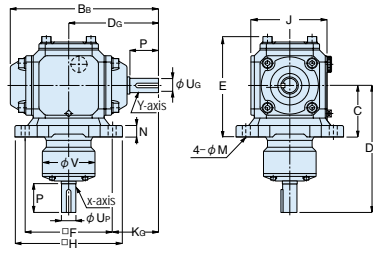
Please place one of the orientation codes (A – P) from page 572 on the box at the end of the catalog number.

Since these products are assembled to each customer's specifications, the delivery lead time is about 7 working days after placing an order. These units are not available from stock.

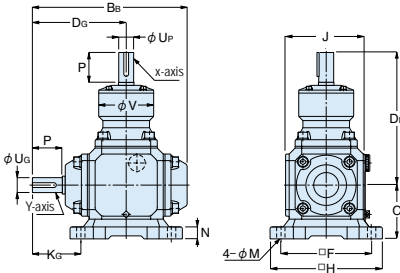
Bevel Gearboxes



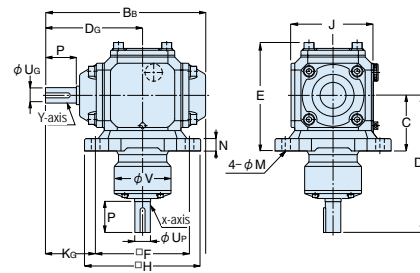
LI, LJ



LM, LN



LK, LL

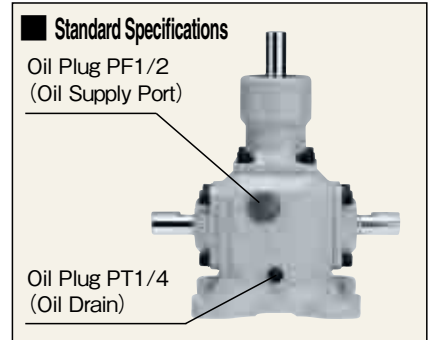


LO, LP

φV	X-axis φUp	Y-axis φUg	Key	Backlash of shaft rotation	Weight (kg)	Catalog No.
66	19	19	6 x 6 x 27ℓ	11' ~30'	10.0	CBX-191L <input type="checkbox"/>
	18			17' ~47'		CBX-192L <input type="checkbox"/>
92	25	25	8 x 7 x 40ℓ	9' ~22'	17.0	CBX-251L <input type="checkbox"/>
				15' ~36'		CBX-252L <input type="checkbox"/>
100	32	32	10 x 8 x 50ℓ	9' ~21'	22.0	CBX-321L <input type="checkbox"/>
				15' ~36'		CBX-322L <input type="checkbox"/>
124	40	40	12 x 8 x 60ℓ	8' ~20'	33.0	CBX-401L <input type="checkbox"/>
				15' ~37'		CBX-402L <input type="checkbox"/>

[ Caution ]

- ① The key grooves in the X-axis and the Y-axis do not always coincide in phase with each other.
- ② The tolerance of shaft diameter is JIS h6.
- ③ The key dimensions are per JIS B 1301-1976(Standard Grade)
- ④ The backlash angles are measured at the X-axis (Input Shaft).
- ⑤ Sides of the oil plugs are for the supply port → PF 1/2 and for the drain port → PT 1/4 (standard specifications.) We can accept as a special order units that are mounted on the ceiling or on a wall. Please let us know at the time or ordering.

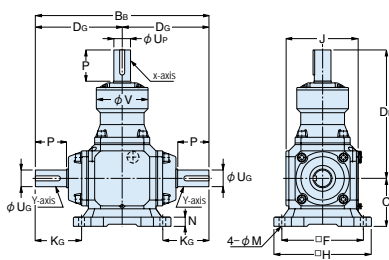


CBX

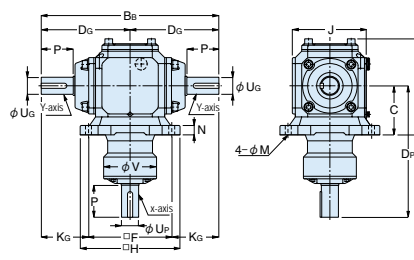
**Additional Oil Plug Locations**

The mark "●" indicates the possible positions for additional oil plug.

※ Starting on the surface containing the standard oil plug as A, go clockwise looking from the top as B, C and D surfaces.



TE, TF



TG, TH

φV	X-axis φUp	Y-axis φUg	Key	Backlash of shaft rotation	Weight (kg)	Catalog No.
66	19	19	6 x 6 x 27ℓ	11' ~30'	10.0	CBX-191T <input type="checkbox"/>
	18			17' ~47'		CBX-192T <input type="checkbox"/>
92	25	25	8 x 7 x 40ℓ	9' ~22'	18.0	CBX-251T <input type="checkbox"/>
				15' ~36'		CBX-252T <input type="checkbox"/>
100	32	32	10 x 8 x 50ℓ	9' ~21'	23.0	CBX-321T <input type="checkbox"/>
				15' ~36'		CBX-322T <input type="checkbox"/>
124	40	40	12 x 8 x 60ℓ	8' ~20'	34.0	CBX-401T <input type="checkbox"/>
				15' ~37'		CBX-402T <input type="checkbox"/>



- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

## Selection Guide

### Essential data for selection

Load torque, type of prime mover, input speed, speed ratio, running time, coupling method, and frequency of start and stop.

### Selection Procedure

The performance table in the catalog is based on the design conditions that the prime mover is a motor, the load is uniform, and the unit runs 10 hours per day.

- a) When using the units under any other condition, it is necessary to correct the value of load to torque by applying the service factors shown in Table 1.

**Corrected Load Torque = Load torque applied to gearbox x Service factor <See Table 1>.**

Service factors (Sf) (Table 1)

Loading condition	Service factors (Sf)		
	Less than 3 hrs/day operation	3-10 hrs/day operation	More than 10 hrs/day operation
Uniform load	1 (1)	1 (1.25)	1.25 (1.50)
Light impact load	1 (1.25)	1.25 (1.50)	1.50 (1.75)
Heavy impact load	1.25 (1.50)	1.50 (1.75)	1.75 (2.00)

(NOTE) 1. Use the factors in parentheses when frequency of starts and stops exceed 10 times per hour.  
 2. Also, use the factors in parentheses when a prime mover other than a motor is used (for example, an internal combustion engine).

Keep the corrected load torque at the speed at less than the allowed X & Y axis torque (Speed ratio 1:1), or the allowable Y axis torque (Speed ratio 1:2) shown in the performance table.

- b) Select an appropriate shaft layout from the shaft layout drawing for each model.
- c) Check for overhang load space (O.H.L.)  
 Overhang load is a load applied beyond the bearing support. Examining the overhang load is indispensable whenever chains, belts, or gears are used to couple the unit with the mating machinery.

$$O.H.L. = \frac{T_{LE} \times K_1 \times K_2}{R} \text{ (N) [kgf]}$$

$T_{LE}$  : Corrected load torque applied to the gearbox shaft (N · m) {kgf · m}  
 $R$  : Pitch radius of sprocket, pulley, gear, etc., mounted on the gearbox shaft (m)  
 $K_1$  : Factor depending on the method of coupling <See Table 2>  
 $K_2$  : Factor depending on the position of load <See Table 3>

\* The value of O.H.L. from the equation above must be smaller than the value of allowable O.H.L. on the X-and the Y-axis shown on the performance table.

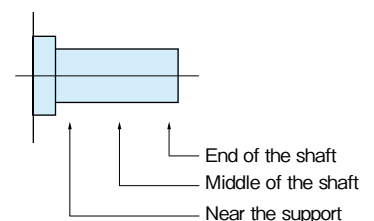
Factor  $K_1$  (Table 2)

Coupling method	$K_1$
Chain, timing belt	1.00
Gear	1.25
V belt	1.50

Factor  $K_2$  (Table 3)

Position of load	$K_2$
Near the support	0.75
Middle of shaft	1.00
End of the shaft	1.50

### ● Position of load



- d) Select a model capable to satisfy all of a), b) and c) obtained above.



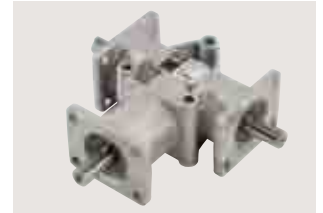
PBX-L Type



PBX-T Type



KBX-L Type



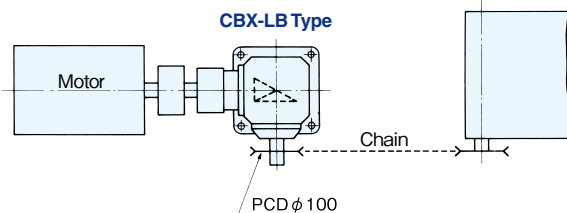
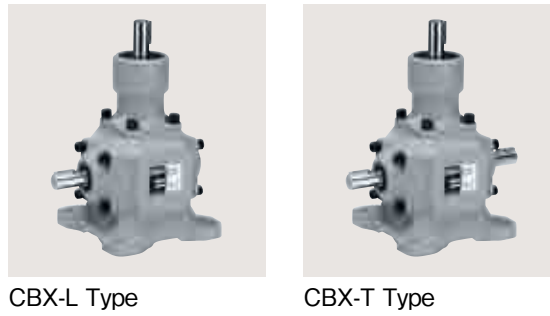
KBX-T Type



■ Selection Examples

Example 1

- Application / Conveyor (uniform load)
- Load torque / 78.4N · m {8kgf · m}
- X-axis rotational speed / 300rpm
- Speed Ratio / 1 : 2
- Shaft layout / As illustrated at right
- Running time / 12 hours/day
- Coupling method / X-axis – Coupling  
Y-axis – Chain (positioned at the middle of the shaft)
- Installation / Horizontal
- Location / Indoors



① Torque Analysis

Service factor under load is  $S_f = 1.25$  (Table 1).  
Accordingly, corrected load torque applied to Y-axis.  
 $T_{LE} = 78.4 \times 1.25 = 98\text{N} \cdot \text{m}$  {  $T_{LE} = 8 \times 1.25 = 10\text{kgf} \cdot \text{m}$  }

② O.H.L. Analysis

O.H.L.on the Y-axis

$$\text{O.H.L.} = \frac{T_{LE} \times K_1 \times K_2}{R} = \frac{98 \times 1 \times 1}{2 \times 1000} = 1960\text{N}$$

$$\{ \text{O.H.L.} = \frac{T_{LE} \times K_1 \times K_2}{R} = \frac{10 \times 1 \times 1}{2 \times 1000} = 200\text{kgf} \}$$

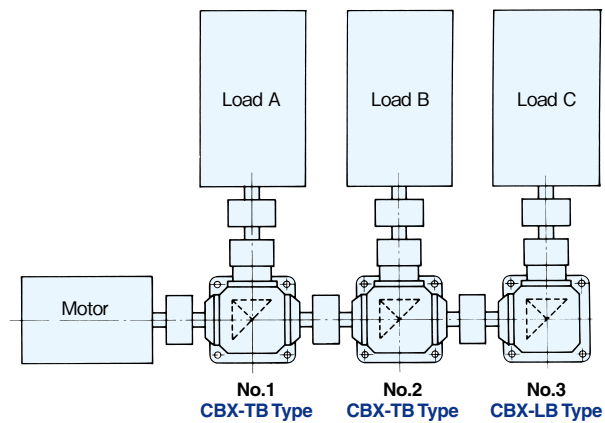
③ Model Selection

A model capable of satisfying all of the design conditions, torque and O.H.L. is **CBX-322LB**.

Example 2

- Application / Line shaft drive
- Load torque / 58.8N · m {6kgf · m} (uniform load) for each A,B and C
- Rotational speed / 600rpm
- Speed Ratio / 1 : 1
- Shaft layout / As illustrated at right
- Running time / 8 hours/day
- Coupling method / All couplings
- Installation / Horizontal
- Location / Indoors

In case of an inline shaft drive, load applied to the Y-axis varies with the location of the gearbox. Therefore, an adequate model must be selected individually for each position. Service factor (Table 1) under the design condition is  $S_f=1.0$  for all gearboxes.



① Gearbox No.1

Corrected load torque applied to the X-axis that drives only load A is:  
 $58.8 \times 1.0 = 58.8\text{N} \cdot \text{m}$  {  $6 \times 1.0 = 6\text{kgf} \cdot \text{m}$  }

Corrected load torque applied to the Y-axis that drives load A, B and C is:  
 $(58.8 + 58.8 + 58.8) \times 1.0 = 176.4\text{N} \cdot \text{m}$   
{  $(6 + 6 + 6) \times 1.0 = 18\text{kgf} \cdot \text{m}$  }

**CBX-401TB** is selected from the performance table.

② Gearbox No.2

Corrected load torque applied to the X-axis that drives only load B is:  
 $58.8 \times 1.0 = 58.8\text{N} \cdot \text{m}$  {  $6 \times 1.0 = 6\text{kgf} \cdot \text{m}$  }

Corrected load torque applied to the Y-axis that drives load B and C is:  
 $(58.8 + 58.8) \times 1.0 = 117.6\text{N} \cdot \text{m}$   
{  $(6 + 6) \times 1.0 = 12\text{kgf} \cdot \text{m}$  }

**CBX-321TB** is selected from the performance table.

③ Gearbox No.3

Corrected load torque applied to the X-axis that drives only load C is:  
 $58.8 \times 1.0 = 58.8\text{N} \cdot \text{m}$  {  $6 \times 1.0 = 6\text{kgf} \cdot \text{m}$  }

Corrected load torque applied to the Y-axis that drives only load C is:  
 $58.8 \times 1.0 = 58.8\text{N} \cdot \text{m}$  {  $6 \times 1.0 = 6\text{kgf} \cdot \text{m}$  }

**CBX-251LB** is selected from the performance table.

④ Model selection

No.1 gearbox is **CBX-401TB**  
No.2 gearbox is **CBX-321TB**  
No.3 gearbox is **CBX-251LB**



## ■ Moment of Inertia of KBX Bevel Gearbox's

Unit :  $\text{kg} \cdot \text{m}^2$

Type	Catalog No.	Pinion Shaft (X-axis)	Gear Shaft (Y-axis)
L	KBX-101L	$4.45 \times 10^{-6}$	$4.45 \times 10^{-6}$
	KBX-102L	$2.16 \times 10^{-6}$	$8.65 \times 10^{-6}$
	KBX-151L	$5.30 \times 10^{-5}$	$5.30 \times 10^{-5}$
	KBX-152L	$3.65 \times 10^{-5}$	$1.47 \times 10^{-4}$
	KBX-201L	$1.79 \times 10^{-4}$	$1.79 \times 10^{-4}$
	KBX-202L	$7.85 \times 10^{-5}$	$3.15 \times 10^{-4}$
T	KBX-101T	$4.75 \times 10^{-6}$	$4.75 \times 10^{-6}$
	KBX-102T	$2.23 \times 10^{-6}$	$8.93 \times 10^{-6}$
	KBX-151T	$5.60 \times 10^{-5}$	$5.60 \times 10^{-5}$
	KBX-152T	$3.37 \times 10^{-5}$	$1.50 \times 10^{-4}$
	KBX-201T	$1.94 \times 10^{-4}$	$1.94 \times 10^{-4}$
	KBX-202T	$8.20 \times 10^{-5}$	$3.28 \times 10^{-4}$

**[CAUTION]** The moments of inertia shown in this table are reference values. Please use data only for reference.

## ■ Moment of Inertia of CBX Bevel Gearbox's


Unit :  $\text{kg} \cdot \text{m}^2$

Type	Catalog No.	Pinion Shaft (X-axis)	Gear Shaft (Y-axis)
L	CBX-191L	$4.00 \times 10^{-4}$	$4.00 \times 10^{-4}$
	CBX-192L	$1.86 \times 10^{-4}$	$7.43 \times 10^{-4}$
	CBX-251L	$2.48 \times 10^{-3}$	$2.48 \times 10^{-3}$
	CBX-252L	$1.03 \times 10^{-3}$	$4.13 \times 10^{-3}$
	CBX-321L	$4.00 \times 10^{-3}$	$4.00 \times 10^{-3}$
	CBX-322L	$1.29 \times 10^{-3}$	$5.18 \times 10^{-3}$
	CBX-401L	$8.95 \times 10^{-3}$	$8.95 \times 10^{-3}$
	CBX-402L	$3.83 \times 10^{-3}$	$1.53 \times 10^{-2}$
T	CBX-191T	$4.05 \times 10^{-4}$	$4.05 \times 10^{-4}$
	CBX-192T	$1.87 \times 10^{-4}$	$7.48 \times 10^{-4}$
	CBX-251T	$2.50 \times 10^{-3}$	$2.50 \times 10^{-3}$
	CBX-252T	$1.04 \times 10^{-3}$	$4.15 \times 10^{-3}$
	CBX-321T	$4.08 \times 10^{-3}$	$4.08 \times 10^{-3}$
	CBX-322T	$1.31 \times 10^{-3}$	$5.25 \times 10^{-3}$
	CBX-401T	$9.20 \times 10^{-3}$	$9.20 \times 10^{-3}$
	CBX-402T	$3.88 \times 10^{-3}$	$1.55 \times 10^{-2}$


**[CAUTION]** The moments of inertia shown in this table are reference values. Please use data only for reference.

Spur Gears  
Helical Gears  
Internal Gears  
Racks  
CP Racks & Pinions  
Miter Gears  
Bevel Gears  
Screw Gears  
Worm Gear Pair  
Bevel Gearboxes  
Other Products


**SRT · SRTB · SRT-C**  
Pawls & Ratchets




P2.09 ~ 12.56 Page 580



**GC · GC-I**  
Gear Couplings



m2, 2.5 Page 584



**SV · SVI**  
Involute Spline Shafts,  
Spline Bushings



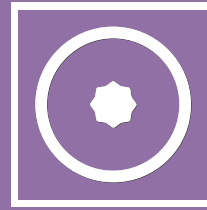
m1.667 Page 588



**QSGA · QSG**  
Master Gears (Spur Gear)



m0.4 ~ 1 Page 592

# Other Products

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

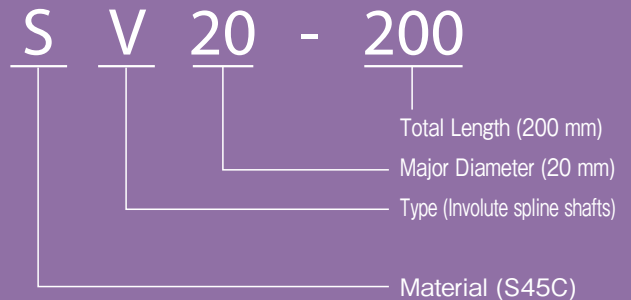
Bevel Gearboxes

Other Products

## Catalog Number of KHK Stock Gears

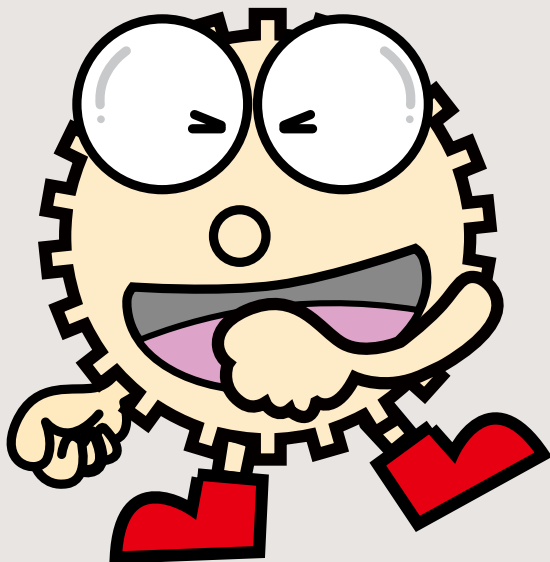
The Catalog Number for KHK stock gears is based on the simple formula listed below. Please order KHK gears by specifying the Catalog Numbers.

(Example) Other Products













**Material**  
S S45C

**Type**  
RT Pawls and Ratchets  
GC Gear Coupling  
V Involute Spline



### Feature Icons

- |  |  |
|--|--|
|  RoHS Compliant Product |  Stainless Product          |
|  Re-machinable Product  |  Resin Product              |
|  Finished Product       |  Copper Alloy Product       |
|  Heat Treated Product   |  Injection Molded Product   |
|  Ground Gear            |  Black Oxide coated Product |



Spur  
Gears

Helical  
Gears

Internal  
Gears

Racks

CP Racks  
& Pinions

Miter  
Gears

Bevel  
Gears

Screw  
Gears

Worm  
Gear Pair

Bevel  
Gearboxes

Other  
Products



## ■ Features

### Characteristics of Pawls and Ratchets

- A simple structure used to restrict the rotational direction in one-way.
- The tips of pawls and the teeth of ratchets are induction hardened and therefore have superior durability.

## ■ Points to observe during use

- No secondary operations can be performed on tooth areas including the bottom land (approx. 1 to 2 mm), due to gear teeth induction hardened.
- The pawls are designed to prevent reverse rotation. They are not suitable for use as driving ratchets or driving rotation.
- SRT2/ 3-C is manufactured using a lost wax casting method.
- Regarding SRTB ratchets with hubs, please note the direction of teeth, viewing from the hub side. KHK can produce ratchets which have the teeth pointed in the opposite direction as a custom order item.

## ■ Bending strength of Ratchets

The allowable transmission forces  $F_b$  (N) of ratchets is the value calculated by the following formula.

$$F_b = \sigma_b \cdot \frac{b \cdot e^2}{6} \cdot \frac{1}{h} \cdot \frac{1}{S_F}$$

Also, the SRT Ratchet's allowable torque  $T$  (N · m) for bending strength is calculated by the following formula.

$$T = F_b \cdot r_i$$

Where

$\sigma_b$  = Bending stress (Assumed 225.55MPa)

$b$  = Face width E (mm)

$e$  = Root length (mm)

$$e = \text{Depth of teeth } (h) \times \tan\left(60 - \frac{360}{\text{No. of teeth } (z)}\right)$$

$h$  = Depth of teeth (H) (mm)

$S_F$  = Safety factor (Assumed 2)

$r_i$  = Tooth root radius (m)

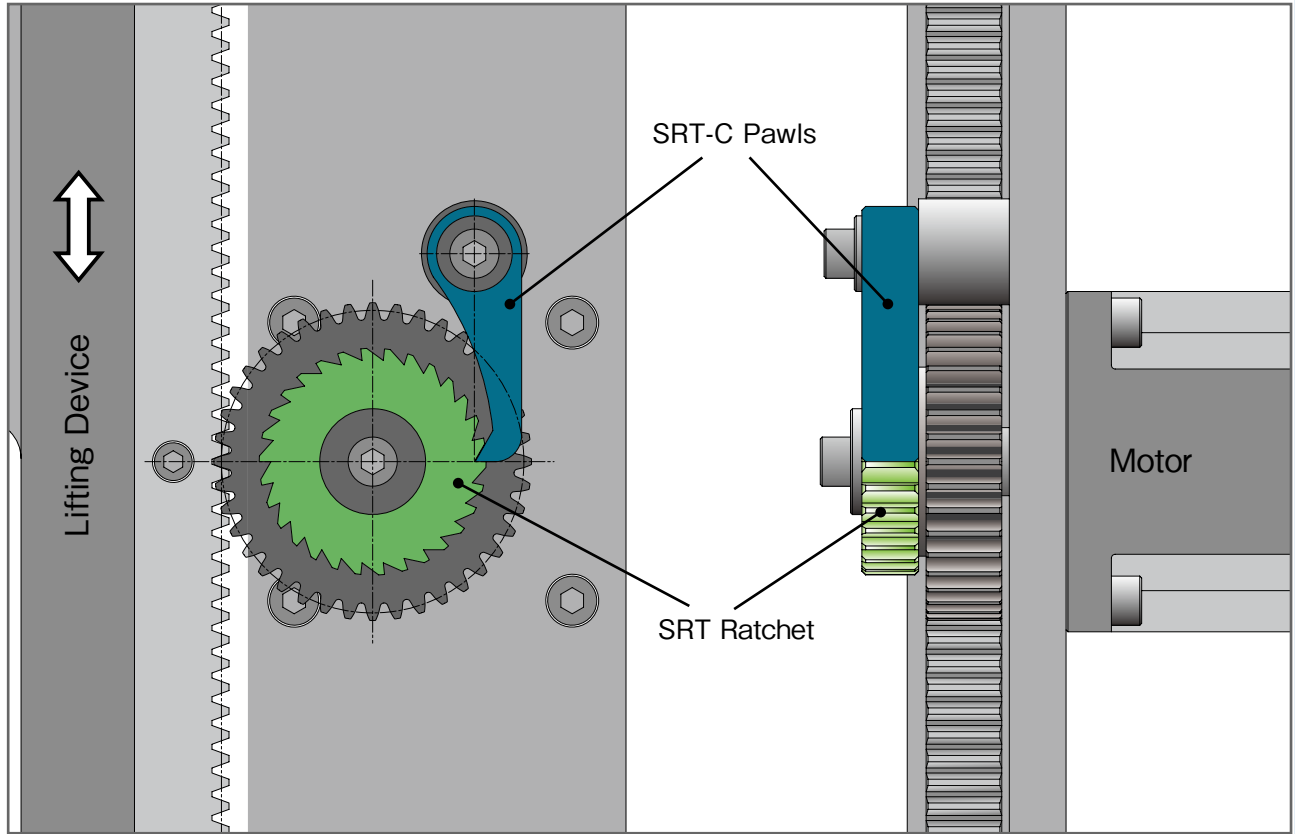
$$\rightarrow r_i = \frac{\text{Outside dia. } D - (2 \cdot h)}{2000}$$



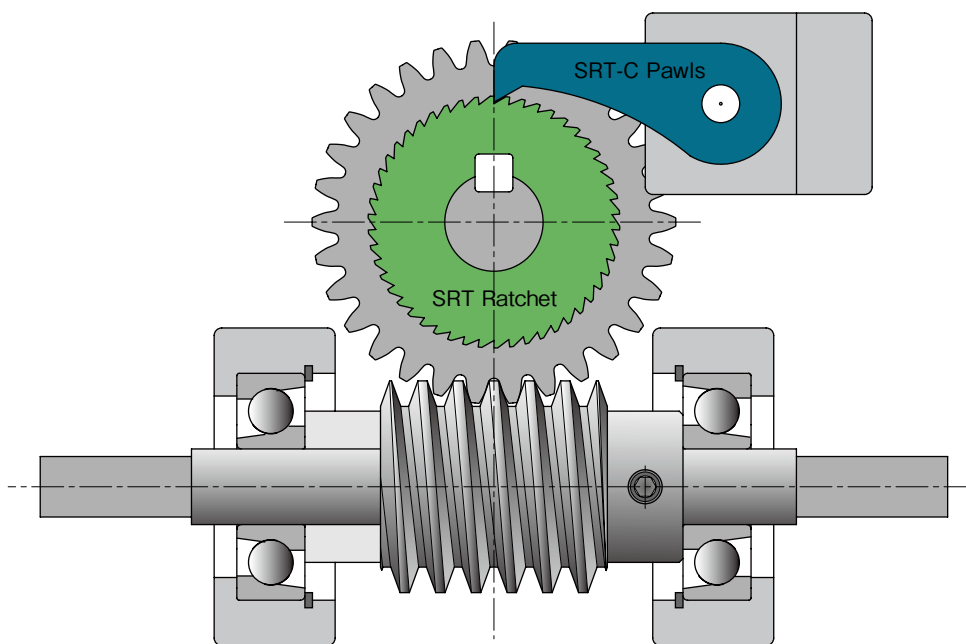
Assembly example: KHK Stock Gears Sample Units

Application

\* The illustration is a design example, not a design for machinery or a device in actual use.

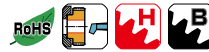


Example: SRT Ratchets used as a free-fall prevention mechanism of a lift device\*

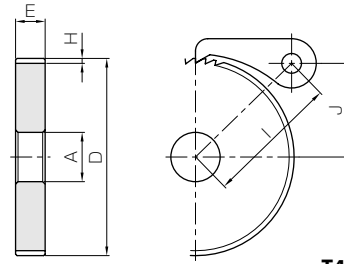


Example: ratchets used for complete reverse prevention of worm gears \*

- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products



Specifications	
Angle of teeth	60°
Material	S45C
Heat treatment	Induction hardened teeth
Tooth hardness	45 ~ 55HRC



T4

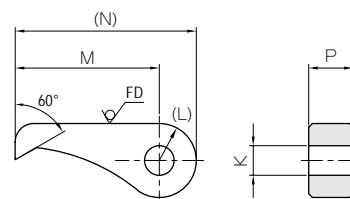
Catalog No.	Pitch	No. of teeth	Shape	Bore	Hub dia.	Outside dia.	Face width	Hub width	Total length	Depth of teeth	Center distance	Mounting distance																					
				A	B	D	E	F	G	H	I	J																					
SRT2/3-50 SRT2/3-60 SRT2/3-80 SRT2/3-90 SRT2/3-100	2.09	50 60 80 90 100	T4	10 10 12 12 12	—	33.3 40 53.3 60 66.6	6	—	6	1	33.84 35.51 39.48 41.73 44.11	15.67 19 25.67 29 32.33																					
SRT1-50 SRT1-60 SRT1-80 SRT1-90 SRT1-100		3.14		50 60 80 90 100		T4					12 15 15 15 15	—	50 60 80 90 100	12	—	12	1.6	45.48 48.24 54.73 58.35 62.16	23.4 28.4 38.4 43.4 48.4														
SRT2-30 SRT2-40 SRT2-50 SRT2-60				6.28							30 40 50 60		T4					15 15 15 15	—	60 80 100 120	15	—	15	3.1	61.23 66.23 72.28 79.14	26.9 36.9 46.9 56.9							
SRT3-30 SRT3-40 SRT3-50											9.42							30 40 50		T4					15 20 20	—	90 120 150	20	—	20	5	76.32 85.15 95.52	40 55 70
SRT4-30 SRT4-40 SRT4-50																		12.56							30 40 50		T4					20 20 20	—
SRTB2/3-50 SRTB2/3-60 SRTB2/3-80 SRTB2/3-90 SRTB2/3-100	2.09		50 60 80 90 100		T9		10 10 12 12 12	—	33.3 40 53.3 60 66.6	6															10							16	
SRTB1-50 SRTB1-60 SRTB1-80 SRTB1-90 SRTB1-100		3.14	50 60 80 90 100	T9		12 15 15 15 15	—		35 40 50 50 50		12	12	24	1.6	45.48 48.24 54.73 58.35 62.16	23.4 28.4 38.4 43.4 48.4																	
SRTB2-30 SRTB2-40 SRTB2-50 SRTB2-60			6.28			30 40 50 60			T9						15 15 15 15	—	50 60 80 65	15	14	29	3.1	61.23 66.23 72.28 79.14	26.9 36.9 46.9 56.9										
SRTB3-30 SRTB3-40 SRTB3-50						9.42									30 40 50		T9					15 20 20	—	75 80 85		20	16	36	5	76.32 85.15 95.52	40 55 70		
SRTB4-30 SRTB4-40 SRTB4-50															12.56							30 40 50		T9						20 20 20	—		90 90 100

(Caution on Product Characteristics) ① Regarding SRTB ratchets with hubs, please note the direction of teeth, viewed from the hub side. KHK can produce ratchets that have teeth pointed in the opposite direction as a custom order item.  
 (Caution on Secondary Operations) ① Due to gear teeth induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 1 to 2 mm).

SRT-C  
Pawls



Specifications	
Angle of teeth	60°
Material	S45C
Heat treatment	Induction hardened teeth
Tooth hardness	42 ~ 55HRC



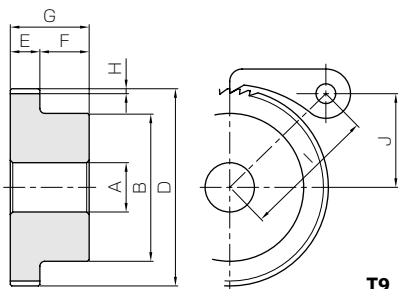
\* FD has die-forged finish.

T5

Catalog No.	Shape	K	(L)	M	(N)	P	Weight (kg)
SRT2/3-C	T5	5	(8)	30	(38)	6	0.020
SRT1-C		8	(10)	39	(49)	12	0.057
SRT2-C		10	(12.5)	55	(67.5)	15	0.13
SRT3-C		12	(15)	65	(80)	20	0.23
SRT4-C		13	(18)	80	(98)	25	0.38

(Caution on Product Characteristics) ① The pawls are designed to prevent reverse rotation. They are not suitable for use as driving ratchets or driving rotation.  
 ② SRT2/3-C is manufactured using a lost wax casting method.

Ratchets



Allowable torque (N · m)	Allowable torque (kgf · m)	Weight (kg)	Catalog No.
Bending strength	Bending strength		
3.07	0.31	0.035	<b>SRT2/3-50</b>
4.10	0.42	0.053	<b>SRT2/3-60</b>
6.00	0.61	0.096	<b>SRT2/3-80</b>
7.11	0.73	0.12	<b>SRT2/3-90</b>
8.24	0.84	0.15	<b>SRT2/3-100</b>
14.7	1.50	0.16	<b>SRT1-50</b>
19.5	1.99	0.24	<b>SRT1-60</b>
29.4	3.00	0.44	<b>SRT1-80</b>
34.5	3.52	0.56	<b>SRT1-90</b>
39.4	4.02	0.70	<b>SRT1-100</b>
29.0	2.96	0.28	<b>SRT2-30</b>
49.2	5.02	0.53	<b>SRT2-40</b>
70.8	7.22	0.85	<b>SRT2-50</b>
94.3	9.61	1.24	<b>SRT2-60</b>
92.6	9.44	0.86	<b>SRT3-30</b>
158	16.1	1.58	<b>SRT3-40</b>
229	23.3	2.54	<b>SRT3-50</b>
226	23.0	1.89	<b>SRT4-30</b>
385	39.3	3.53	<b>SRT4-40</b>
559	57.0	5.66	<b>SRT4-50</b>
3.07	0.31	0.067	<b>SRTB2/3-50</b>
4.10	0.42	0.10	<b>SRTB2/3-60</b>
6.00	0.61	0.16	<b>SRTB2/3-80</b>
7.11	0.73	0.21	<b>SRTB2/3-90</b>
8.24	0.84	0.24	<b>SRTB2/3-100</b>
14.7	1.50	0.24	<b>SRTB1-50</b>
19.5	1.99	0.34	<b>SRTB1-60</b>
29.4	3.00	0.61	<b>SRTB1-80</b>
34.5	3.52	0.73	<b>SRTB1-90</b>
39.4	4.02	0.87	<b>SRTB1-100</b>
29.0	2.96	0.47	<b>SRTB2-30</b>
49.2	5.02	0.82	<b>SRTB2-40</b>
70.8	7.22	1.14	<b>SRTB2-50</b>
94.3	9.61	1.59	<b>SRTB2-60</b>
92.6	9.44	1.40	<b>SRTB3-30</b>
158	16.1	2.17	<b>SRTB3-40</b>
229	23.3	3.22	<b>SRTB3-50</b>
226	23.0	2.75	<b>SRTB4-30</b>
385	39.3	4.38	<b>SRTB4-40</b>
559	57.0	6.72	<b>SRTB4-50</b>

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pair

SRT-C

Pawls

Bevel Gearboxes

Other Products

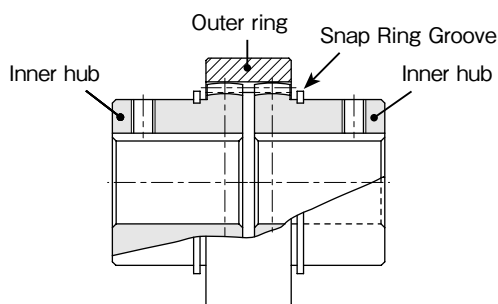


## ■ Features

### Characteristics of Gear Couplings

- There are many ways to couple shafts to transmit power. We have developed these standardized gear couplings of our own design. They are easier to connect or disconnect than chain couplings.
- The gear teeth of the inner hubs are crowned to allow for up to 5° of shaft angle offset.
- Due to induction hardened gear teeth, these couplings have excellent durability. All surfaces are plated (Unichromic plating).
- The units are machined complete with keyways, set screw holes and finished bores and are ready for immediate installation. We also offer minimum bore models for users who want to perform their own secondary operations.

### ■ Points to observe during use



- If you require one set of GC2-30, you will need one GC2-I (outer ring) and two GC2-30 (inner hubs). These components may also be purchased separately. Therefore, please specify set or each when ordering.
- Inner hubs come with snap rings, S type products have prepared minimum bores and finished products come with set screws.
- Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 1 to 2 mm).

### ■ Bending Strength of Gear Couplings

Tolerance torques of the gear couplings are determined in accordance with the shear strength of the keys. Allowable shear force of keys  $F$  (N) are calculated from the following formula.

$$F = b \cdot L \cdot \sigma \cdot \frac{1}{s}$$

Additionally, allowable torques ( $T$ ) of the inner hubs of the gear coupling, versus shear force of keys, can be calculated from the formula below.

$$T = \frac{F \cdot d}{2000}$$

$b$  : Key Width (mm) → Keyway width of inner hubs of the GC Gear Coupling

$L$  : Key Length (mm) → Set at -2 mm from the total length of the inner hub of the GC Gear Coupling

$\sigma$  : Allowable Shear Force of keys → Set at 49MPa (5kgf/mm<sup>2</sup>)

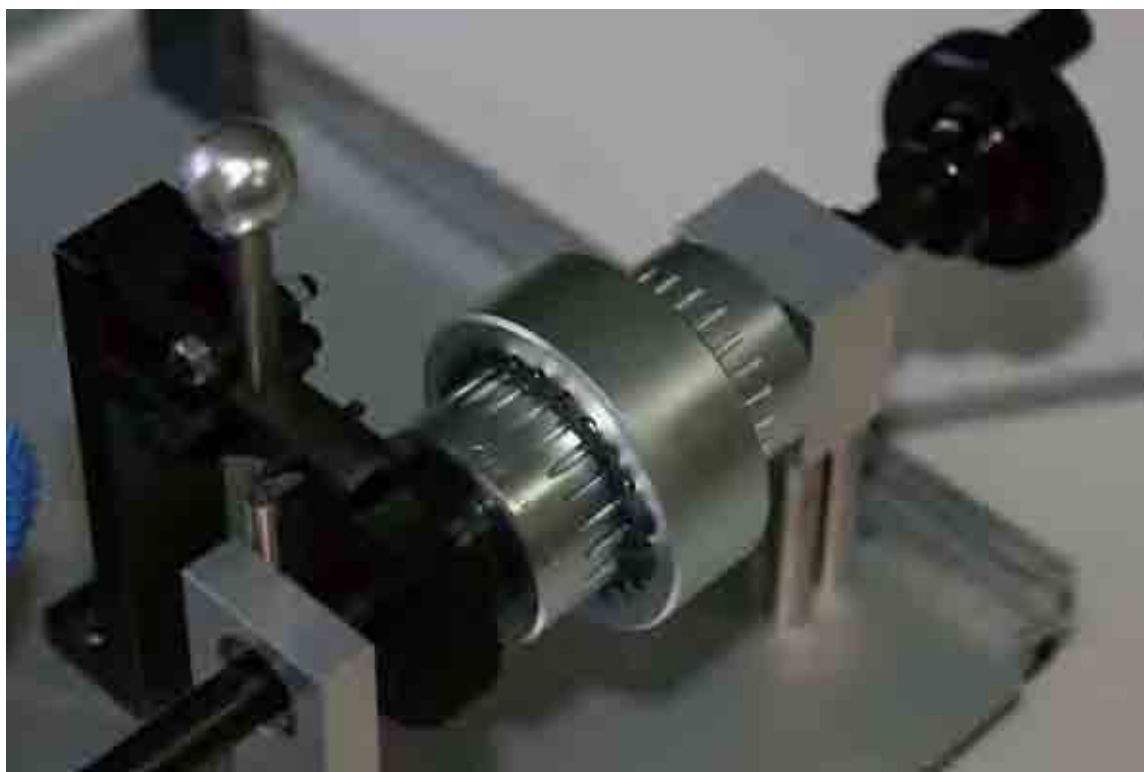
$s$  : Safety Factor → Optionally set

$d$  : Bore size (mm) → Bore size A of the inner hub of the GC Gear Coupling

Caution: Safety Factor ( $S$ ) must be set at a value between 1 to 3, depending on the load types or the coupling displacement.

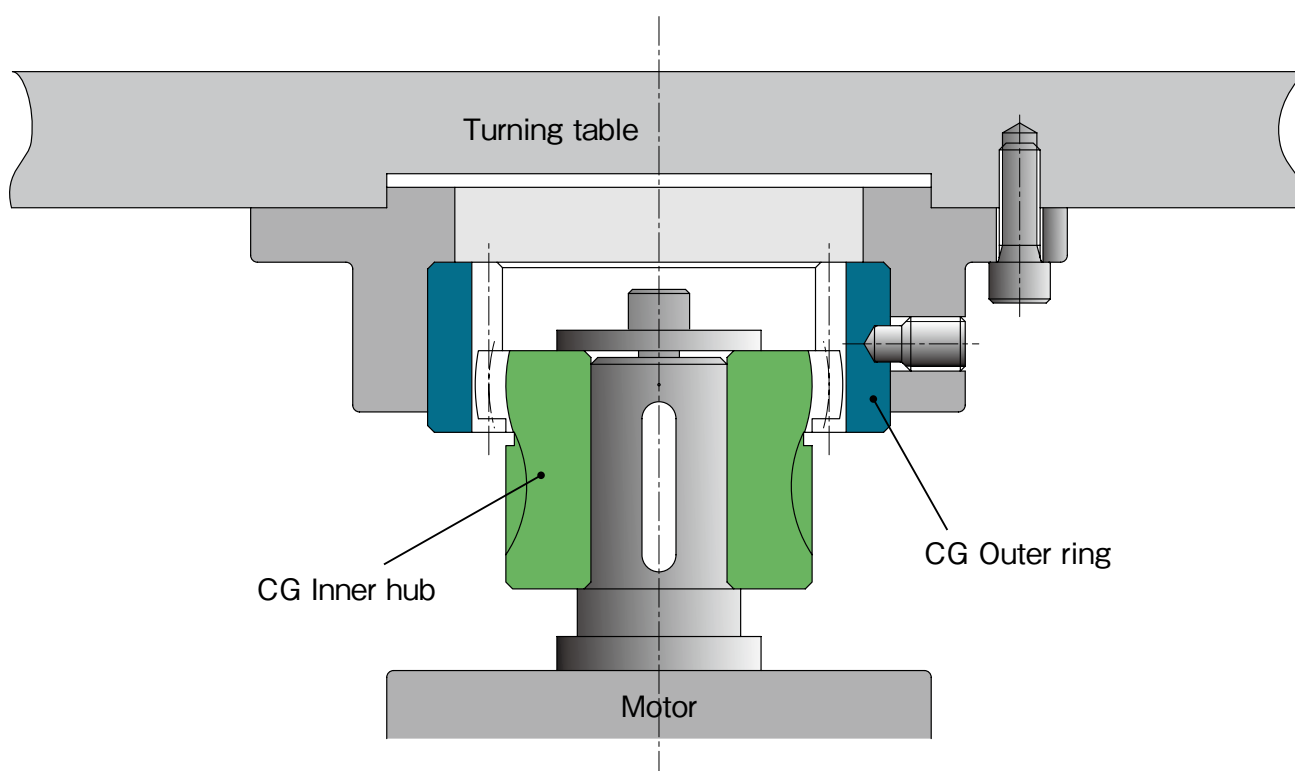


## Application



Assembly Example: KHK Stock Gears Sample Unit

**Module 2 to 2.5**



Specific usage for turning the work having no shafts or bores.

Spur  
GearsHelical  
GearsInternal  
Gears

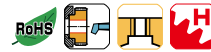
Racks

CP Racks  
& PinionsMiter  
GearsBevel  
GearsScrew  
GearsWorm  
Gear PairBevel  
GearboxesOther  
Products

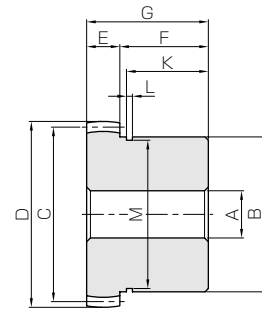


# GC Gear Couplings (Inner hub)

Module 2 ~ 2.5



Specifications	
Gear teeth	Standard full depth
Pressure angle	20° (Crowning)
Material	S45C
Heat treatment	Tooth surface induction hardened
Tooth hardness	45 ~ 55HRC



T2

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Set Screw	
				A	B <sub>H7</sub>	C	D	E	F	G	Size	L
<b>GC1-12S</b> <b>GC1-20</b> <b>GC1-22</b> <b>GC1-25</b>	<b>m2</b>	25	T2 TK TK TK	12	45	50	54	10	25	35	—	—
20				M5							10	
22				M6							10	
25				M6							10	
<b>GC2-20S</b> <b>GC2-30</b> <b>GC2-32</b> <b>GC2-35</b> <b>GC2-40</b>	<b>m2</b>	40	T2 TK TK TK TK	20	70	80	84	15	40	55	—	—
30				M6							13	
32				M10							13	
35				M10							13	
40				M10							13	
<b>GC3-20S</b> <b>GC3-45</b> <b>GC3-50</b>	<b>m2.5</b>	42	T2 TK TK	20	90	105	110	20	45	65	—	—
45				M10							20	
50				M10							20	

[Caution on Product Characteristics]

① "S" denotes minimum bore products. Inner hubs come with snap rings and set screw.

② The allowable torques in the table are obtained from the shear strength of keyways. The shear strength of keyway is assumed to be 49MPa (5kgf/mm<sup>2</sup>).

[Caution on Secondary Operations]

① Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 1 to 2 mm).

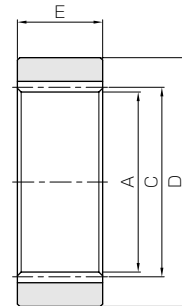


# GC-I Gear Couplings (Outer ring)

Module 2 ~ 2.5



Specifications	
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	Tooth surface induction hardened
Tooth hardness	45 ~ 55HRC



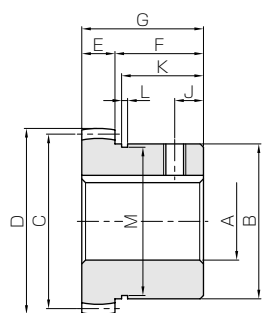
T1

Catalog No.	Module	No. of teeth	Shape	Internal dia.	Pitch dia.	Outside dia.	Face width	Backlash (mm)	Weight (kg)
				A	C	D	E		
<b>GC1-I</b>	<b>m2</b>	25	T1	46	50	68	25	0.40~0.60	0.33
<b>GC2-I</b>	<b>m2</b>	40		76	80	105	36		1.03
<b>GC3-I</b>	<b>m2.5</b>	42		100	105	145	48		2.96

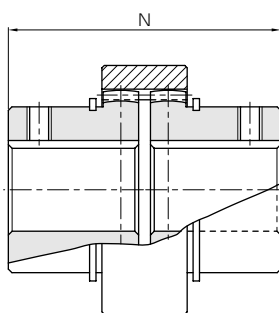
[Caution on Secondary Operations]

① Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 1 to 2 mm).

## Gear Couplings (Inner hub)



TK



C-Shaped Snap Ring Groove			Total Width of Gear Coupling N	Keyway Width×Depth	Allowable torque (N · m)		Backlash (mm)	Weight (kg)	Catalog No.
K	L	M			Bending strength				
23	1.95	42.5	73	—	—	—	0.40~0.60	0.43	<b>GC1-12S</b> <b>GC1-20</b> <b>GC1-22</b> <b>GC1-25</b>
				5 x 2.3	68.7	7.00		0.37	
				7 x 3	98.1	10.0		0.35	
7 x 3	137	14.0	0.32						
37	2.7	67	115	—	—	—	0.40~0.60	1.66	<b>GC2-20S</b> <b>GC2-30</b> <b>GC2-32</b> <b>GC2-35</b> <b>GC2-40</b>
				7 x 3	245	25.0		1.48	
				10 x 3.3	294	30.0		1.42	
				10 x 3.3	392	40.0		1.36	
				10 x 3.3	490	50.0		1.23	
42	3.2	86.5	135	—	—	—	0.40~0.60	3.43	
				12 x 3.3	785	80.0		2.74	
				12 x 3.3	883	90.0		2.56	

GC-I

## Gear Couplings (Outer ring)

Spur  
GearsHelical  
GearsInternal  
Gears

Racks

CP Racks  
& PinionsMiter  
GearsBevel  
GearsScrew  
GearsWorm  
Gear PairBevel  
GearboxesOther  
Products



Spur  
Gears

Helical  
Gears

Internal  
Gears

Racks

CP Racks  
& Pinions

Miter  
Gears

Bevel  
Gears

Screw  
Gears

Worm  
Gear Pair

Bevel  
Gearboxes

Other  
Products



## ■ Features

### Characteristics of Gear Couplings

- SV and SVI series are made according to the automotive involute spline standard, JIS D 2001: 1959 (FLAT ROOT SIDE FIT, Backlash 0.06 to 0.15)
- Involute spline shafts and bushings are thermal refined to have good abrasion-resistance.
- Spline bushings may be made in CAC (bronze) type material as a special custom order item.

## ■ Points to observe during use

- Be sure not to bend shafts or break teeth when performing secondary operations on SV Involute Spline shafts.
- When using SVI Spline Bushings with sliding movement, lubrication is necessary on the sliding surface. To prevent scuffing, it is recommended to apply lubricating grease. If used in applications where oil contamination is not desirable, solid lubrication is recommended.

### ■ The surface strength of Spline

The design concept of the spline surface strength is the same as that of a key. Here is the formula for the allowable transmission force (N) of spline.

$$F = \eta \cdot z \cdot h_w \cdot l \cdot \sigma$$

And the formula of allowable torque T (N · m) of spline with respect to the surface strength.

$$T = \frac{F \cdot d_w}{2000}$$

In designing a spline shafts, besides considering the surface strength, we should take into account the torsional and bending stresses of the spline.

Here

$\eta$  : Contact ratio of surface → 0.75 (assumed)

$z$  : Number of teeth → number of teeth (z) of spline from the table

$h_w$  : Contact depth of tooth → 1.485

$l$  : Contact length of spline → Total length (A) of involute spline bushing

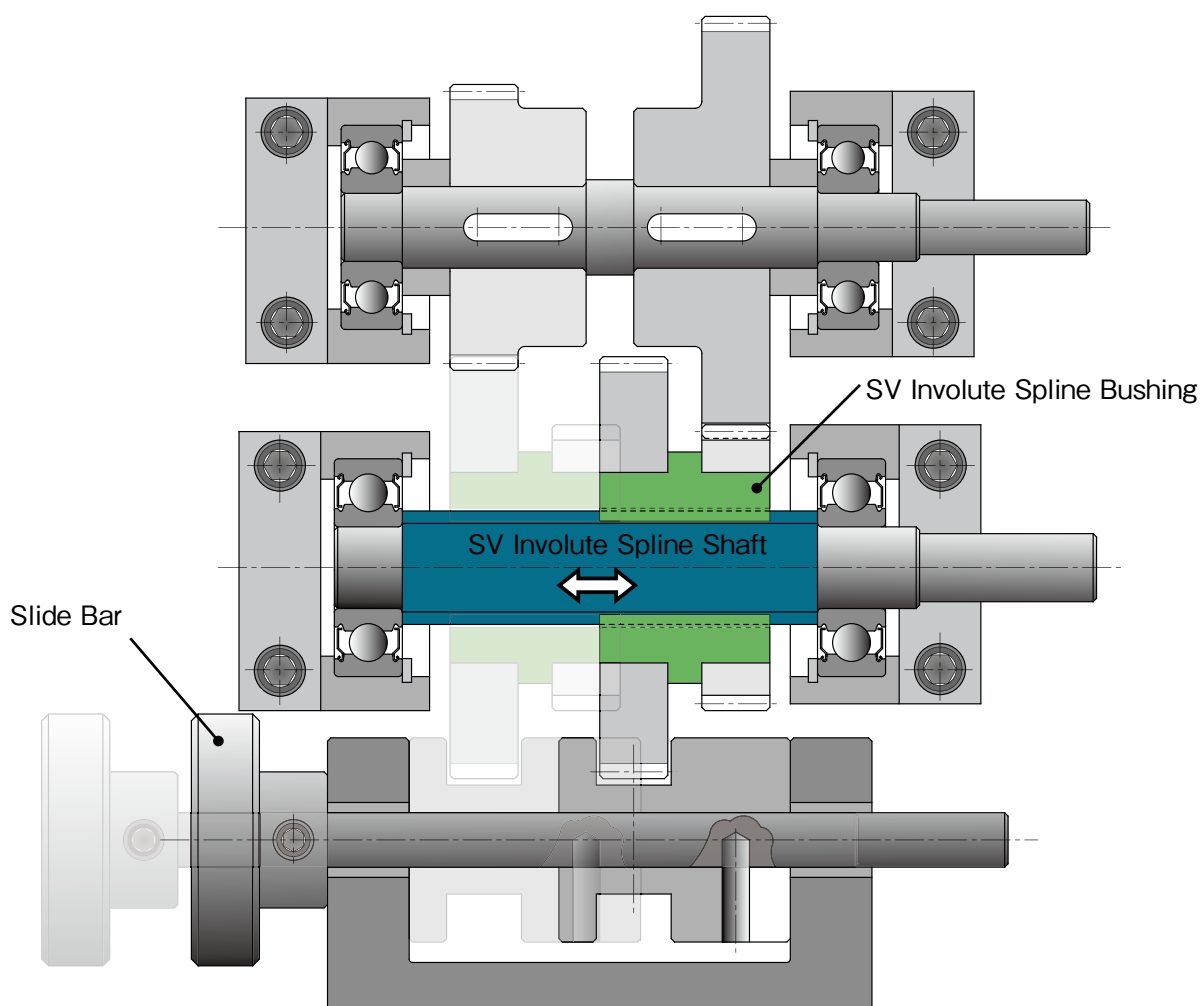
$\sigma$  : Allowable surface stress of spline → 19.61MPa (2kgf/mm<sup>2</sup>) (assumed)

$d_w$  : Contact diameter (mm) → Tip diameter of spline shaft  $D - h_w$

## Application



Assembly Example: KHK Stock Gears Sample Unit



SV Involute Spline Shafts are used in shift transmission mechanisms

Spur  
GearsHelical  
GearsInternal  
Gears

Racks

CP Racks  
& PinionsMiter  
GearsBevel  
GearsScrew  
GearsWorm  
Gear PairBevel  
GearboxesOther  
Products

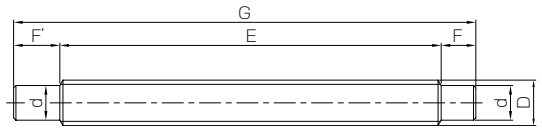


# SV Involute Spline Shafts

Module 1.667



Specifications	
Gear teeth	Stub teeth
Pressure angle	20°
Material	S45C
Heat treatment	Thermal refined
Tooth hardness	225 ~ 260HB



TA

Catalog No.	Module	No. of teeth	Shape	Outside dia.	Shaft dia.	Face width	Shaft length (R)	Shaft length (L)	Total length	Backlash (mm)	Weight (kg)
				D	$d \begin{smallmatrix} +0.22 \\ +0.15 \end{smallmatrix}$	E	F	F'	G		
<b>SV17-170</b>	<b>m1.667</b>	8	TA	16.67	13	135	20	15	170	0.06~0.15	0.26
<b>SV20-200</b>		10	TA	19.67	15	165	20	15	200	0.06~0.15	0.43
<b>SV25-250</b>		13	TB	24.67	20	220	—	30	250	0.06~0.15	0.88
<b>SV30-300</b>		16	TB	29.67	25	270	—	30	300	0.06~0.15	1.55

[Caution on Secondary Operations] ① Be sure not to bend shafts or break teeth when performing secondary operations on SV Involute Spline shafts.

- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

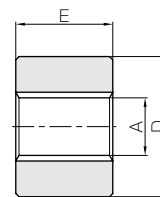


# SVI Involute Spline Bushings

Module 1.667



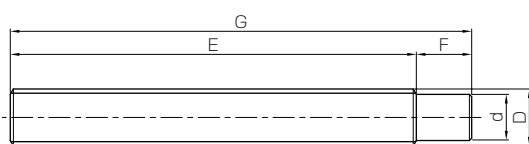
Specifications	
Gear teeth	Stub teeth
Pressure angle	20°
Material	S45C
Heat treatment	Thermal refined
Tooth hardness	225 ~ 260HB



T1

Catalog No.	Module	No. of teeth	Shape	Internal dia.	Outside dia.	Face width	Allowable torque (N · m)	Allowable torque (kgf · m)	Backlash (mm)	Weight (kg)
				A	D	E	Surface durability	Surface durability		
<b>SVI17-40</b>	<b>m1.667</b>	8	T1	13.7	40	25	33.2	3.38	0.06~0.15	0.21
<b>SVI20-45</b>		10		16.7	45	30	59.6	6.08	0.06~0.15	0.31
<b>SVI25-55</b>		13		21.7	55	38	125	12.8	0.06~0.15	0.57
<b>SVI30-65</b>		16		26.7	65	45	222	22.6	0.06~0.15	0.93

[Caution on Product Characteristics] ① The allowable torques are calculated based on "The surface strength of Spline".  
 ② It is essential to apply lubricant on contact surface of the spline shaft and the hub. To prevent scuffing, it is recommended to apply lubricating grease. If used in applications where oil contamination is not desirable, solid lubrication is recommended.

**Involute Spline Shafts**

TB

Spur  
GearsHelical  
GearsInternal  
Gears

Racks

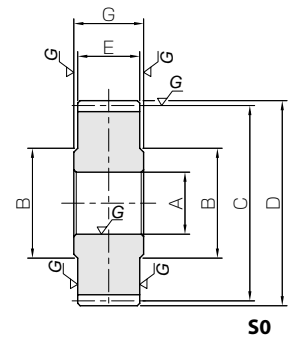
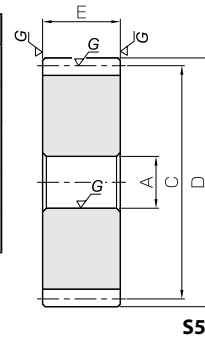
CP Racks  
& PinionsMiter  
Gears

SVI

**Involute Spline Bushings**Bevel  
GearsScrew  
GearsWorm  
Gear PairBevel  
GearboxesOther  
Products



Specifications	
Precision grade	JIS grade M00 (JIS B 1751)
Gear teeth	Standard full depth
Pressure angle	20°
Material	SK3
Heat treatment	Vacuum Hardening



Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length
				AH7	B	C	D	E	F	G
<b>QSGA0.4</b>	0.4	100	S5	10	—	40.0	40.8	10	—	10
<b>QSGA0.45</b>	0.45	88				39.6	40.5			
<b>QSGA0.5</b>	0.5	80				40.0	41.0			
<b>QSGA0.55</b>	0.55	72				39.6	40.7			
<b>QSGA0.6</b>	0.6	66				39.6	40.8			
<b>QSGA0.65</b>	0.65	62				40.3	41.6			
<b>QSGA0.7</b>	0.7	58				40.6	42.0			
<b>QSGA0.75</b>	0.75	54				40.5	42.0			
<b>QSGA0.8</b>	0.8	50				40.0	41.6			
<b>QSGA0.9</b>	0.9	44				39.6	41.4			
<b>QSGA1.0</b>	1	40	40.0	42.0						

(Caution on Product Characteristics) As custom order products, requires a lead-time for shipping (from the factory) **20 working-days after placing an order**. Please allow additional shipping time to get to your local distributor.

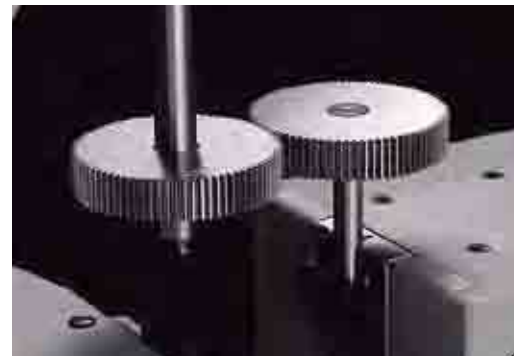
Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length
				AH7	B	C	D	E	F	G
<b>QSG0.4</b>	0.4	100	S0	12.7	22.5	40.0	40.8	12.7	0.8	14.3
<b>QSG0.45</b>	0.45	88				39.6	40.5			
<b>QSG0.5</b>	0.5	80				40.0	41.0			
<b>QSG0.55</b>	0.55	72				39.6	40.7			
<b>QSG0.6</b>	0.6	66				39.6	40.8			
<b>QSG0.65</b>	0.65	62				40.3	41.6			
<b>QSG0.7</b>	0.7	58				40.6	42.0			
<b>QSG0.75</b>	0.75	54				40.5	42.0			
<b>QSG0.8</b>	0.8	50				40.0	41.6			
<b>QSG0.9</b>	0.9	44				39.6	41.4			
<b>QSG1.0</b>	1	40	40.0	42.0						

(Caution on Product Characteristics) As custom order products, requires a lead-time for shipping (from the factory) **20 working-days after placing an order**. Please allow additional shipping time to get to your local distributor.

## High Precision Master Gears for meshing test machine.

KHK Matter Gears are high precision gears used in meshing test machines. We proudly provide master gears with technologies acquired through our experience in manufacturing standard gears.

- \* These gears are not for power transmission.
- \* Mashing Pitch Inspection Data is included for these products.



## Master Gears are available by request



### Available Production

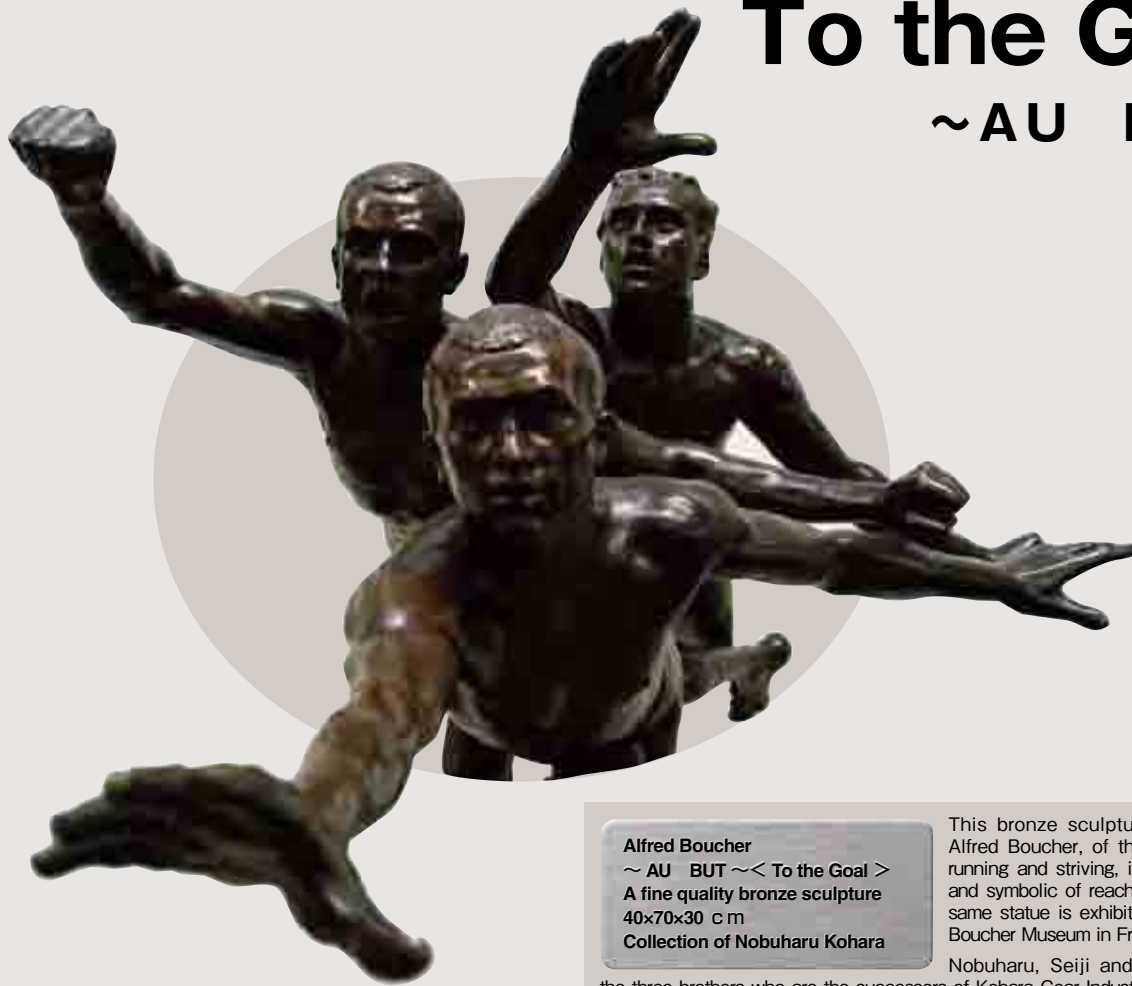
We accept orders even for gears with special specifications, such as Helical Gears. Please feel free to contact us.

- Module: 0.4 to 1
- Number or Teeth: can be designated as you request.
- Pressure Angles: Adaptable for various sizes, such as 14.5°, 20° and 22.5°.



# To the Goal

~AU BUT~



**Alfred Boucher**  
~ AU BUT ~ < To the Goal >  
A fine quality bronze sculpture  
40×70×30 cm  
Collection of Nobuharu Kohara

This bronze sculpture, created by Alfred Boucher, of three young men running and striving, is an expression and symbolic of reaching a goal. This same statue is exhibited at the Alfred Boucher Museum in France.

Nobuharu, Seiji and Shoji Kohara, the three brothers who are the successors of Kohara Gear Industry Co. Ltd, have taken over the spirit of the founder and strived together to develop the company. As a commemoration of these efforts and achievements, this statue symbolizes KHK the company, continuously achieving new goals.

## We are diligent in upgrading our technological capabilities to enable us to produce highly reliable products.

We are waging a company-wide effort to provide our customers with quality products. With this in mind, we have obtained two critical ISO quality management certifications.

ISO 9001 and ISO 14001. Through effective implementation of the ISO system, we are diligent in developing our technological skills to increase our productivity, while minimizing the adverse impact on the environment.

We sincerely hope that our past and present future business relationships with our customers will continue well into the future.

### Company Profile

Company Name	Kohara Gear Industry Co., Ltd.
Founded	May, 1935
Capital	99,000,000 Yen
President	Toshiharu Kohara
Number of Employees	200 people (in KHK group)
Our Bankers	Saitama Resona Bank Ltd. Kawaguchi Branch Sumitomo Mitsui Banking Corporation Kawaguchi Branch
Scope of Business	Designing, manufacturing and selling KHK Stock Gears Manufacturing and selling of custom gears Other business incidental to the above two.

### Address

Head Office & Factory	13-17 Nakacho, Kawaguchi-shi, Saitama-ken, 332-0022 Japan Phone: 048(255)4871 Fax: 048(256)2269
Osaka Office	Tanimachi Yuetsukan Building, 6-22 Tanimachi 5-chome, Chuo-ku, Osaka-shi, Osaka 540-0012 Japan Phone: 06-6763-0641 Fax: Int 06-6764-7445
Nagoya Office	Louvre Building, 3-96 Issha, Higashi-ku, Nagoya-shi, Aichi-ken, 465-0093 Japan Phone: 052-704-1681

### Our Line of Business

- Manufacture and sale of KHK Stock Gears
- Manufacture of high-precision custom gears
- Ultra-high precision gear cutting

### Our Membership Status

Japan Gear Manufacturing Association  
Saitam-ken Keiei Gorika Kyokai  
(Saitama prefecture Industrial Rationalization Association)  
Kawaguchi-shi Kikai Kogyo Kyodo Kumiai  
(Kawaguchi Industrial Machinery Association)  
Kawaguchi Shoko Kaigisho  
(Kawaguchi Chamber of Commerce & Industry)

### Affiliated Companies

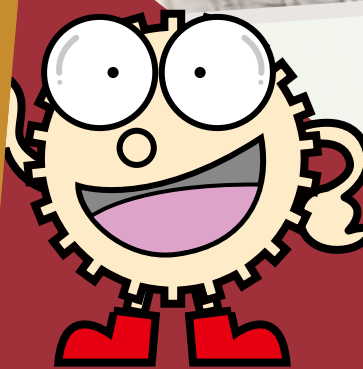
KHK CO.,LTD.  
● Exporter of gears and transmission components

KHK NODA CO.,LTD.  
● Producers of gears  
● Producers of transmission components

E-mail: [kohara@khkgears.co.jp](mailto:kohara@khkgears.co.jp)  
[www.khkgears.co.jp/](http://www.khkgears.co.jp/)

Creating gears for over 76 years.





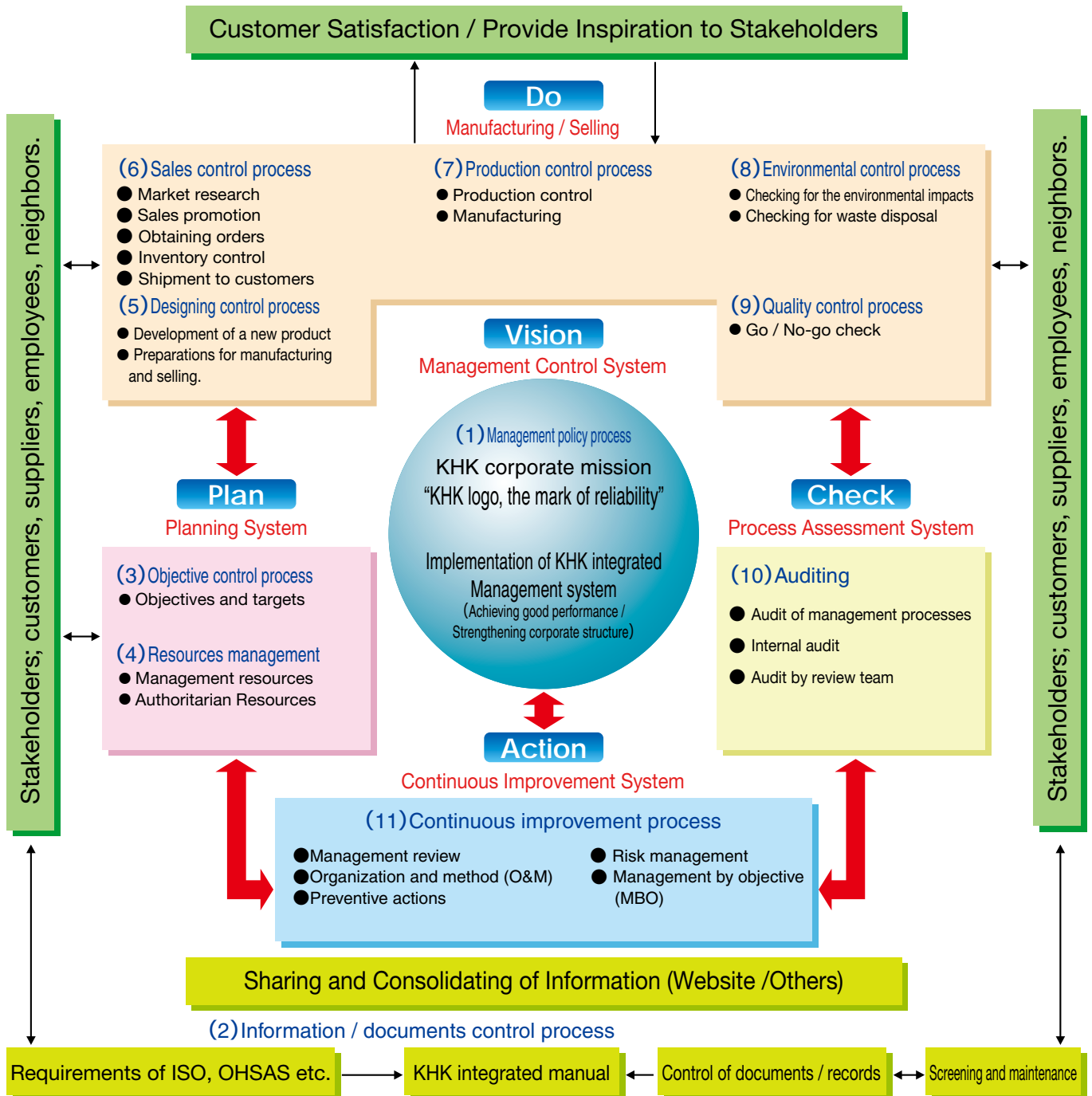
- 1935 Tomizou Kohara, the first president of our company, founded the Kohara Haguruma Factory in Nishiki-cho, Kawaguchi, Saitama, Japan.
- 1954 Developed standardized, replacement gears for lathes, where all KHK Stock Gears originated.
- 1955 As a specialized gear manufacturing company, we started to plan, manufacture, and sell original products as KHK Stock Gears.
- 1973 "KHK" was registered domestically as our trademark.  
Began to export our products to the United States, and to Southeast Asian countries.
- 1975 Awarded excellence as a declaration tax company.
- 1979 Designated as a model factory for a rationalization project organized by the Small and Medium Enterprise Agency, Japan. (J-SMECA)
- 1995 Noda factory, a new organization was formed from Kohara Gear and became an independent entity named KHK Noda Co., Ltd.
- 1996 Achieved ISO9001 certification, a first in the Japanese stock gear industry.  
The first, official KHK web site was built and published on the Internet.
- 1997 The Electronic Catalog KHK 3007E was published and adapted for Windows OS.
- 1998 KHK was designated as a model office for skill development projects, organized by Kawaguchi City, Saitama.
- 2001 KHK was designated as a partner company for Sainokuni, an Industrial development project organized by the Saitama Prefecture in Japan.
- 2002 KHK created a sales partnership with Nissei Corporation.  
Launched the Web Catalog, featuring search functions and automatic drawing functions.
- 2004 KHK obtained ISO14001 Certification.
- 2005 The Kawaguchi Office/Factory building was completed.  
Our management innovation plan was approved by the governor of Saitama Prefecture.
- 2006 HAGURUMA KOBO (KHK's system for fast modification of KHK Stock Gears) was registered as our trademark.
- 2007 Factory extension work of the KHK Noda building was completed.  
Selected as one of the "300 of Japan's Most Dynamic Monozukuri (Manufacturers) SME's" by J-SMECA.  
Employed Haguruma Boy (Gear Boy) as KHK's advertising character.
- 2008 The Noda Factory 3 was newly built for material cutting and quenching.  
The launched J Series, is a line of gear products with standardized holes, keyways and taps.
- 2009 KHK's TV commercial at ACC CM FESTIVAL was awarded the Gold Prize.  
Began offering GCSW, a free software for gear calculation.
- 2010 KHK's social contribution activities were awarded by the Kawaguchi Chamber of Commerce.



## We are focusing all our energies on supplying highly reliable products to our customers.

Under this system we are moving ahead to manufacture top quality products to meet our customers' demands. We take care to carry out environmentally sound practices. Also, "Kaizen" or "continual improvement" is being used to help achieve these goals.

Flowchart of KHK integrated management system.



ISO9001 Certificate



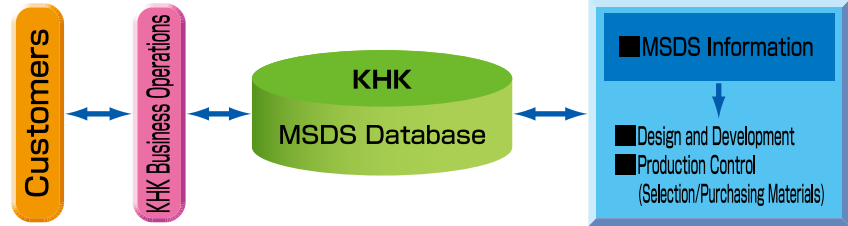
ISO14001 Certificate

We are working hard to provide quality products to all our customers. With this in mind, we have obtained two quality management certifications, ISO 9001 and ISO 14001. We employ the methodology "Vision-Plan-Do-Check" cycle so that we can continue our improvement and satisfy our customer's demands.



## We are taking every possible measure to minimize any adverse effects on the environment.

We have MSDS (Material Safety Data Sheets) available for all materials used by KHK. Copies are available upon request.



Every detail concerning the materials used by KHK is recorded in the MSDS database. These materials include metals, plastics, rust-prevention oil, packing materials, and others.

MSDS (Material Safety Data Sheets)



## Environmental improvement activities at the stages of designing, manufacturing, and selling, result in industrial safety, quality improvements and cost effectiveness.

■ Press ahead with employing "dry-cut" gear cutting methods.



### Results

Reduces air pollution from vaporized cutting oils, also saves natural resources and cuts production time.

■ Adiabatic films covering windows and adiabatic paint applied on the roof of our building



### Results

Blocks heat from entering the building during summer and keeps building interiors warm during winter; cutting power consumption for air-conditioning/heating.

■ The choice of hybrid cars and idling stop cars



### Results

The choice of hybrid cars for business purposes and enforcing best practices of minimizing the idling of parked cars. It results in reducing the impact on the environment.

■ Solar Panels placed on the roof of our building (10kW-Rated)



### Results

60 solar panels on the roof reduced 1.89 tons of CO2 emission per year. CO2 emissions are known to be contributors in global warming.

## An appeal from KHK for the disposal of KHK Stock Gears and packing materials

■ Steel Products



Please sort by materials and recycle.

■ Nylon Gears



Nylon gears are a plastic waste. Please dispose as a reusable industrial waste.

■ Cardboards



Please recycle cardboards used as packing.

■ Paperboards



Please recycle paperboards used as packing.

■ Other packing materials



Packing materials like plastic bags, mirrors and boxes are plastic waste. Please dispose as a reusable industrial waste.



# KHK Production System

## It is our intention to stay on the cutting edge of gear technology.

The integrated production system at KHK Noda Co., includes all the manufacturing processes from cutting to packing, which enables the production of quality products with a short lead time. We continuously strive to satisfy our customers.

Our entire manufacturing process is computerized for consistent production output, optimized by just-in-time (JIT) production processes where we can precisely inform of the production status, at any time, by request from a customer.

KHK Noda Co.,  
143 Nakazato, Noda-shi, Chiba, 270-0237 Japan



The Factory 1



The Factory 2



**The Factory 3 is a newly-built factory for material cutting and quenching.**

The cutting factory in Kanenoi was relocated to the rear of the Factory 2, for ease of the transportation of material for the next manufacturing process. The overall result was a savings in time.

Not only for material cutting, but for the newly began, high-frequency hardening processes at the Factory 3, which was targeted towards higher quality production, for a shorter delivery.



## Quality Assurance



Karl Zeiss UMC-550 3-D Coordinate Measuring Machine



CNC Automatic Gear Measuring Machine (TTi-300E)

At KHK Noda, cutting-edge calibration instruments are used to test our products to ensure that they meet our customer's expectations of quality. We have established a quality control system managed by a quality assurance department with qualified staff, constantly reviewing inspection methods for each production process along with introducing new inspection standards.

## New Machinery Additions



CNC Bevel Gear Grinding Machine (PH-275HG)



CNC Hobbing Machine (8-FN)

## Gear Cutting Equipment



CNC Lathe (BA26- III)



CNC Dry-cut Hobbing Machine (KN151+Robot)



CNC Straight Bevel Coniflex Generator (NO.104CNC) + Robot



CNC Straight Bevel Coniflex Generator (PH-275HC)



CNC Rack Cutting Machine (NR-18S)



CNC Rack Grinding Machine (NRG-130)



CNC Lathe (NL2500Y-700)



CNC Gear Grinding Machine (TAG400)

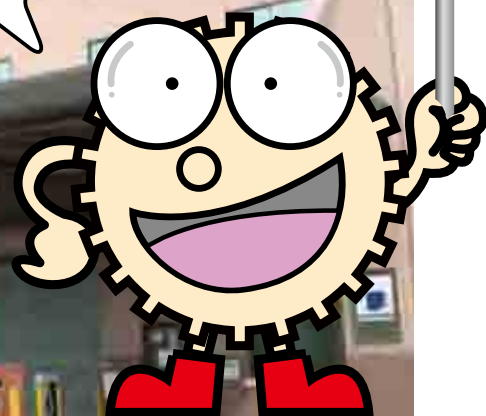


## Head Office & Factory



Please feel free to visit us.

Factory tours can be arranged.



Head Office & Factory  
13-17 Nakacho, Kawaguchi-shi, Saitama-ken, 332-0022 Japan  
Phone: Int+81-(0) 48-255-4871 Fax: Int+81-(0) 48-256-2269



### Location Map





4F



Cafeteria



Nap Room



Solar Panels



Exercise Room



Terrace

3F



Warehouse of KHK Stock Gears

2F



Cutting, JIT Production Lines



Showcase Room



Office Space and Conference Rooms

1F



Entrance Hall



Entrance



Machinery Equipments, Grinding



Inspection and Packaging



Shipping



## We participate and exhibit our products at domestic and overseas tradeshows.



M-Tech 2010 - Japan

Our mandate is to make contact with as many gear consumers as possible, to acquaint them with our full range of stock gears and manufacturing capabilities.

**To find our latest  
tradeshow news, please  
visit KHK web site.**

[www.khkgears.co.jp/en/](http://www.khkgears.co.jp/en/)



MECT2009



M-Tech Tokyo 2009 - Japan



M-Tech Osaka 2009



Study Meeting



Business Arena 2009 - Japan



MEX Kanazawa - Japan

**To provide our customers with the best possible product,**

Each KHK product is individually wrapped to ensure their quality.



KHK product is in stock at agents.



























































































































































## Tradeshows are held in various countries around the world.

KHK participates in tradeshows held in major cities around the world. Come and visit our company booth to learn more about KHK products. (For information on KHK distributors, please see Page 9)









































































































































































	Series	Gear Type	Page	Features
A	AG	Worm Wheels	522~525,532~539	  
	AGDL	Duplex Worms Wheels	516~521	  
	AGF	Worm Wheels	526~531	  
	AN	Aluminum-Bronze Screw Gears	502~503	  
	ARL	Rack Guide Rails	391	
B	BB	Sintered Metal Bushings	338,447,482	  
	BG	Bronze Worm Wheels	540~555	  
	BSR	Brass Racks	389	  
	BSS	Brass Spur Gears	340~345	  
C	CBX	Bevel Gearboxes	574~575	
	CG	Gray Iron Worm Wheels	542~555	
D	DB	Injection Molded Bevel Gears	482~483	   
	DG	Plastic Worm Wheels	556~557	  
	DM	Injection Molded Miter Gears	446	  
	DR	Molded Flexible Racks	390~391	  
	DS	Injection Molded Spur Gears	336~339	  
	DSL	Acetal Fairloc Hub Spur Gears	270~273	
F	FRCP	 Metal Flexible Racks	418	
G	GC	Gear Couplings (Inner Hubs)	584~585	   
	GC-I	Gear Couplings (Outer Rings)	584	 
	GCU	Gear Assembly Kit	32	
K	KBX	Bevel Gearboxes	570~571	
	KHG	Ground Helical Gears	352~361	    
	KRCPF	 Thermal Refined Racks	412	   
	KRF	Thermal Refined Racks with Machined Ends	378	   
	KRG	Ground Racks	378~379	   
	KRGCP	 Ground Racks	408~409	   
	KRGCPD	 Ground Racks	408~409	   
	KRGCPF	 Ground Racks	408~409	   
	KRGD	Ground Racks	378~379	   
	KRGF	Ground Racks	378~379	   
	KRHG	Ground Helical Racks	394~395	   
	KRHGF	Ground Helical Racks	394~395	   
	KSP	Ground Spiral Bevel Gears	486~491	   
	KTSCP	 Tapered Pinions	404~405	   
	KWG	Ground Worm Shafts	522~531	    
	KWGDL	Duplex Worms	516~521	    
	KWGDLs	Duplex Worms	516~521	    
L	LM	Sintered Metal Miter Gears	438~439	
	LS	Sintered Metal Spur Gears	216~217	
M	MBSA	Finished Bore Spiral Bevel Gears	462~465	   
	MBSB	Finished Bore Spiral Bevel Gears	462~465	  
	MBSG	Ground Spiral Bevel Gears	458~459	   

## Feature Icons

 RoHS Compliant Product	 Re-machinable products	 Finished Product	 Heat Treated Product	 Ground Gear
 Stainless Product	 Resin Product	 Copper alloy Product	 Injection Molded Product	 Black Oxide Coated Product

	Series	Gear Type	Page	Features
M	MHP	High-Ratio Hypoid Gears	456~457	
	MM	Carburized & Hardened Miter Gears	438~439	
	MMS	Spiral Miter Gears	430~431	
	MMSA	Finished Bore Spiral Miter Gears	428~429	
	MMSB	Finished Bore Spiral Miter Gears	428~429	
	MMSG	Ground Spiral Miter Gears	424~425	
	MSGA	Ground Spur Gears	38~49	
	MSGB	Ground Spur Gears	38~49	
N	NSU	Plastic Spur Gears with Steel Core	274~279	
P	PB	Plastic Bevel Gears	480~481	
	PBX	Miniature Bevel Gearboxes	566~567	
	PG	Plastic Worm Wheels	558~561	
	PM	Plastic Miter Gears	446~447	
	PN	Plastic Screw Gears	504~505	
	PR	Plastic Racks	388	
	PRF	Plastic Racks	388	
	PS	Plastic Spur Gears	282~327	
	PSA	Plastic Spur Gears	302~333	
	PU	Plastic Spur Gears with Stainless Steel Core	280~281	
	Q	QSGA	Master Gears	592
QSG		Master Gears	592	
S	SAM	Angular Miter Gears	442~443	
	SB	Steel Bevel Gears	472~477	
	SB	Steel Bevel Gears & Pinion Shafts	476~477	
	SBS	Spiral Bevel Gears	466~469	
	SBSG	Ground Spiral Bevel Gears	460~461	
	SBY	Steel Bevel Gears	472~477	
	SBZG	Ground Zerol Bevel Gears	470~471	
	SH	Steel Helical Gears	362~363	
	SI	Steel Internal Gears	368	
	SIR	Steel Ring Gears	369	
	SM	Steel Miter Gears	440~441	
	SMA	Finished Bore Miter Gears	436~437	
	SMB	Finished Bore Miter Gears	436~437	
	SMC	Finished Bore Miter Gears	436~437	
	SMS	Spiral Miter Gears	432~433	
	SMSG	Ground Spiral Miter Gears	426~437	
	SMZG	Ground Zerol Miter Gears	434~435	
	SN	Steel Screw Gears	496~499	
	SR	Steel Racks	382	
	SRCP	Racks	414~415	
	SRCPF	Racks	414~415	
	SRCPFD	Racks	414~415	
	SRF	Steel Racks with Machined Ends	383	
	SRFD	Steel Racks with Bolts Holes	384~385	
	SRFK	Steel Racks with Bolts Holes	384~385	
	SRG	Ground Racks	380~381	
	SRGCP	Ground Racks	410~411	
	SRGCPF	Ground Racks	410~411	
	SRGCPFD	Ground Racks	410~411	
	SRGF	Ground Racks	380~381	
SRGFD	Ground Racks	380~381		
SRGFK	Ground Racks	380~381		

	Series	Gear Type	Page	Features
S	SRH	Steel Helical Racks	396~397	  
	SRHF	Steel Helical Racks	396~397	  
	SRHFD	Steel Helical Racks	396~397	  
	SRO	Steel Round Racks	392	  
	SROCP	 Round Racks	326	  
	SROS	Round Racks	418	  
	SRS	Rack Clamps	390	
	SRT	Ratchets	580~581	   
	SRTB	Ratchets with Hubs	580~581	   
	SRT-C	Pawls	580	   
	SS	Steel Spur Gears	108~199	   
	SSA	Steel Hubless Spur Gears	200~205	  
	SSAY	Steel Hubless Thin Face Spur Gears	210~211	  
	SSAY/K	Spur Gears with Built-In Clamps	212~215	  
	SSCP	 Steel Spur Gears	412~413	  
	SSCPG	 Ground Spur Gears	406~407	    
	SSCPGS	 Ground Spur Pinion Shafts	406~407	    
	SSDR	DR Rack Pinions	390~391	  
	SSG	Ground Spur Gears	52~105	     
	SSGS	Ground Spur Pinion Shafts	50~51	    
	SSR	Steel Ring Gears (Spur Gears)	346	  
	SSS	Spur Pinion Shafts	106~107	   
	SSY	Steel Thin Face Spur Gears	206~209	  
	STRCPF	 Tapered Racks	404~405	  
	STRCPFD	 Tapered Racks	404~405	  
	SUB	Stainless Steel Bevel Gears	478~479	  
	SUKB	Stainless Steel Hubs	334~335	  
	SUM	Stainless Steel Miter Gears	444~445	  
	SUMA	Finished Bore Stainless Steel Miter Gears	444~445	   
	SUN	Stainless Steel Screw Gears	500~501	  
	SUR	Stainless Steel Racks	386~387	  
	SURCPF	 Stainless Steel Racks	416~417	  
	SURCPFD	 Stainless Steel Racks	416~417	  
SURF	Stainless Steel Racks	386~387	  	
SURFD	Stainless Steel Racks	386~387	  	
SURO	Stainless Steel Round Racks	393	  	
SUS	Stainless Steel Spur Gears	218~263	   	
SUSA	Stainless Steel Spur Gears	238~265	   	
SUSCP	 Stainless Steel Spur Gears	416~417	  	
SUSL	Stainless Steel Fairloc Hub Spur Gears	266~269	  	
SUW	Stainless Steel Worms	556~561	   	
SV	Involute Spline Shafts	584~585	   	
SVI	Involute Spline Bushings	584	   	
SW	Steel Worms	540~555	   	
SWG	Ground Worms	532~539	     	



RoHS Compliant Product



Re-machinable products



Finished Product



Heat Treated Product



Ground Gear



Stainless Product



Resin Product



Copper alloy Product



Injection Molding Product



Black Oxide Coated Product



# KHK Stock Gears - Discontinued Product List



Category	Discontinued Products		Specifications		Alternative	Sales Period													
	Item	Range	Characteristics	Material		Item	1973	1975	1978	1980	1984	1988	1992	1996	2000	2002	2004	2006	2008
Spur Gears	SSY	Module 1.25	With Hub	S45C	Custom order														
	SSAY	Module 1.25	Hubless	S45C	Custom order														
	SSH	All	Honing treatment on Tooth Surface	S45C	SSG														
	CS	All	Molded	FC200	SS														
	PSU	All	With core hub	MC901 (FC200)	PU														
Helical Gears	KHCPG	All	CP, Ground	SCM440	Custom order														
Internal Gears	CI	All	Molded	FCD55	SI														
Racks	SR	Lengths Over 1000 mm	Common Type	S45C	SRF														
	BSR	Module 1.25	Contains Brass	C3604	Custom order														
	CR	All	Molded	FC200	SRF														
	SRCP	Lengths Over 1000 mm	CP	S45C	SRCPF														
Helical Racks	KRHGCPF	All	CP, Ground	SCM440	Custom order														
Spiral Miter Gears	SMS	Module 1.25	Common Type	S45C	Custom order														
Straight Miter Gears	CM	All	Molded	FC20	SM														
	FM	All	Precision Molded	S45C	SM														
Spiral Bevel Gears	MBSA	Module smaller than m1.5	Finished	SCM415	Custom order														
	MBSB	Module smaller than m1.5	Finished	SCM415	Custom order														
Straight Bevel Gears	FB	All	Precision Molded	S45C	SB														
	SB	CB gear mating pinions with module over m5	Common Type	S45C	SBY														
	CB	All items having SB	Molded	FC200	SB, SBY														
	CB	SB mating gears with module over m5	Molded	FC200	SB, SBY														
Worms	KWGD	Module Over m5	Duplex, Ground	SCM440	Custom order														
	KWGDLS	Module Over m5	Duplex, Ground Shaft	SCM440	Custom order														
	KWG	Right-hand helix with double threads with module over m5 (R, 2)	Ground Shaft	SCM440	Custom order														
	SW	Left-hand helix with double threads with module over m5 (L1, L2)	Common Type	S45C	Custom order														
Worm Wheels	AGDL	Module Over m5	Duplex	CAC702 (AIBC2)	Custom order														
	AGF	Right-hand helix with double threads with module over m5 (R2)	Contains Aluminum Bronze	CAC702 (AIBC2)	Custom order														
	BG	Left-hand helix with double threads with module over m5 (L1, L2)	Contains Phosphor Bronze	CAC502 (PBC2)	Custom order														
	CG	Left-hand helix with module over m5 (L1, L2)	Molded	FC200	Custom order														
One-cycle-clutch type geared motor	F	All	Without motor		No production														
	IM	All	With motor		No production														
	M	All	With motor		No production														

[Caution] Equivalent products will not be identical to the discontinued items. For more information please contact us.

# Customer Trust and Satisfaction



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