

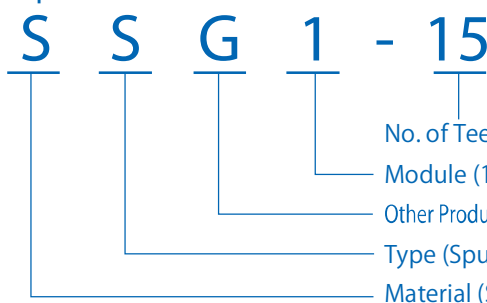
Spur Gears

MSGA/MSGB Ground Spur Gears Precision: N5 Material: SCM415 Heat Treatment: Carburized m1 ~ 4 Page 28	KSG Ground Spur Gears New Precision: N6 Material: SCM440 Heat Treatment: Thermal refined / induction hardened m1 ~ 3 Page 38	SSGS Ground Spur Pinion Shafts Precision: N7 Material: S45C Heat Treatment: Thermal refined / induction hardened m1.5 ~ 3 Page 40	SSG Ground Spur Gears Semi-Custom J Series Precision: N7 Material: S45C Heat Treatment: Gear teeth induction hardened m0.5 ~ 10 Page 42	SSG Ground Spur Gears F Series Precision: N7 equivalent Material: S45C Heat Treatment: Gear teeth induction hardened m2 ~ 3 Page 58	SSG R Series Ground Spur Gears New R Series Precision: N7 equivalent Material: S45C Heat Treatment: Gear teeth induction hardened m1.5 ~ 6 Page 64
SSAG Ground Spur Gears New J Series Precision: N7 Material: S45C Heat Treatment: Gear teeth induction hardened m1 ~ 6 Page 66	KS-H Hardened Spur Gears New Hardened Plus Precision: N9 equivalent Material: SCM440 Heat Treatment: Thermal refined / gear teeth induction hardened m1.5 ~ 5 Page 70	KS Thermal Refined Spur Gears New Precision: N8 Material: SCM440 Heat Treatment: Thermal refined m1.5 ~ 5 Page 70	SSS Spur Pinion Shafts Precision: N8 Material: S45C Heat Treatment: Thermal refined m0.5 ~ 3 Page 72	SS-H Hardened Spur Gears New Hardened Plus Precision: N9 equivalent Material: S45C Heat Treatment: Gear teeth induction hardened m1 ~ 6 Page 78	SS Spur Gears Semi-Custom J Series Precision: N8 Material: S45C m0.5 ~ 10 Page 74
SS Spur Gears F Series Precision: N8 equivalent Material: S45C m1.5 ~ 3 Page 100	SSA-H Hardened Spur Gears New Hardened Plus Precision: N9 equivalent Material: S45C Heat Treatment: Gear teeth induction hardened m1 ~ 5 Page 108	SSA Spur Gears Semi-Custom J Series Precision: N8 Material: S45C m1 ~ 5 Page 108	SSA Spur Gears F Series Precision: N8 equivalent Material: S45C m2 ~ 3 Page 116	SSY Spur Gears Precision: N8 Material: S45C m0.8, 1 Page 120	SSAY Spur Gears Precision: N8 Material: S45C m1 Page 124
SUS/SUSA Stainless Steel Spur Gears J Series Precision: N8 Material: SUS303 m1 ~ 4 Page 126	SUSF F-Loc Gears Precision: N8 Material: SUS303 m0.5, 1 Page 132	DSF F-Loc Gears Precision: N10 Material: Polyacetal (SUS303) m0.5, 1 Page 134	NSU Plastic Spur Gears with Steel Core J Series Precision: N9 Material: MC602ST (S45C) m1 ~ 3 Page 136	PU Plastic Spur Gears with Steel Core J Series Precision: N9 Material: MC901 (SUS303) m1 ~ 2 Page 140	PS/PSA Plastic Spur Gears J Series Precision: N9 Material: MC901 m1 ~ 3 Page 142
SUKB Stainless Steel Hubs PSA Dedicated Material: SUS303 φ 30 ~ 100 Page 152	DS Injection Molded Spur Gears Precision: N12 equivalent Material: Duracon (M90-44) m0.5 ~ 1 Page 154	BB Sintered Metal Bushings Material: Oil free copper alloy φ 5 ~ 8 Page 156	BSS Spur Gears Precision: N8 Material: Free cutting brass (C3604) m0.5 ~ 1 Page 158	SSR Steel Ring Gears (Spur Gears) Precision: N9 Material: S45C m2 ~ 3 Page 162	

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

M	SCM415
K	SCM440
S	S45C
SU	Stainless Steel
P	MC901
N	MC602ST
D	Polyacetal
BS	Brass
L	Sintered Metal Alloy

Type

S Spur Gears

Other Information

A	Hubless Gears
G	Ground Gears
F	F-loc Hub Gears
R	Ring Gears
S	Pinion Shafts
U	Plastic Gears with Steel Core
Y	Thin Face Gears

Spur Gears

Helical Gears

Internal Gears

Racks

CP Racks & Pinions

Miter Gears

Bevel Gears

Screw Gears

Worm Gear Pairs

Bevel Gearboxes

Other Products

Features



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 for secondary operations to be performed on the bores, shafts, outside diameters, keyways and set screws. The following table lists the main features.

Catalog Number	Module	Material	Heat Treatment	Tooth Surface Finish	Precision <small>JIS B 1702-1:1998</small>	Secondary Operations	Features
MSGA/MSGB	1 to 4	SCM415	Carburized	Ground	N5	×	High strength, abrasion-resistant and compact.
KSG	1 to 3	SCM440	Thermal refined, gear teeth induction hardened	Ground	N6	△	High-strength and high-precision spur gear made of thermally refined and hardened chrome molybdenum steel. Allows secondary operations.
SSGS	1.5 to 3	S45C	Thermal refined, gear teeth induction hardened	Ground	N7	△	Ground shaft pinions that allow for modification of the shafts to fit your bearings.
SSG	0.5 to 6	S45C	Gear teeth induction hardened <small>NOTE 1</small>	Ground	N7	△	Although heat treatment is applied to the tooth area, secondary operation can be added. Finished J, F, and R Series products are also available.
SSAG	1 to 6	S45C	Gear teeth induction hardened	Ground	N7	△	Hubless gears for lighter and more compact applications. Finished J Series products are also available.
KS	1.5 to 5	SCM440	Thermal refined	Cut	N8	○	High-strength spur gear made of thermally refined chrome molybdenum steel. Use as mating pinions for KRF thermally refined racks.
SSS	0.5 to 3	S45C	Thermal refined <small>NOTE 2</small>	Cut	N8 <small>NOTE 3</small>	○	For the SS series, Shaft-Pinions with a small number of teeth (10 to 13 teeth) are available.
SS	0.5 to 10	S45C	—	Cut	N8 <small>NOTE 3</small>	○	Low cost, large selections of modules and number of teeth. Finished J and F series products are also available.
SSA	1 to 5	S45C	—	Cut	N8	○	Hubless gears for lighter and more compact applications. Finished J and F series products are also available.
SSY	0.8, 1	S45C	—	Cut	N8 <small>NOTE 3</small>	○	Narrower face gears for light-duty applications.
SSAY	1	S45C	—	Cut	N8	○	Hubless and narrow faces for even lighter and more compact gears.
SUS/SUSA	1 to 4	SUS303	—	Cut	N8	○	SUS303 gears for more rust-resistant gears. Finished J Series products are also available.
SUSF	0.5, 1	SUS303	—	Cut	N8 <small>NOTE 3</small>	△	Fine-pitch gears with rust resistance, enabled to clamp to shafts without any keys or set screws.
DSF	0.5, 1	Polyacetal (SUS303)	—	Cut	N10 <small>NOTE 3</small>	△	Fine-pitch gears can be used without lubrication, easily clamped to shafts without any keys or set screws.
NSU	1 to 3	MC602ST (S45C)	—	Cut	N9	○	Nylon teeth with S45C hubs that can have keyways and set screws added. Finished J Series products are also available.
PU	1 to 2	MC901 (SUS303)	—	Cut	N9	○	Nylon teeth with SUS303 hubs for rust-resistance. Finished J Series products are also available.
PS/PSA	1 to 3	MC901	—	Cut	N9	○	Made of MC nylon, possible to operate without lubrication. Suitable for food processing machines. Finished J Series products are also available.
DS	0.5 to 1	Duracon (M90-44)	—	Injection Molded	N12 equivalent	△	Low cost, mass-produced products suitable for light duty office machines.
BSS	0.5 to 1	Free cutting brass (C3604)	—	Cut	N8 <small>NOTE 3</small>	○	Fine-pitch gears with rust resistance. Suitable for mating with DS gears.
SSR	2 to 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 their gear teeth being hardened.

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

[NOTE 3] The product accuracy class having a module less than 0.8 corresponds to 'equivalent' as shown in the table.

○ 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.

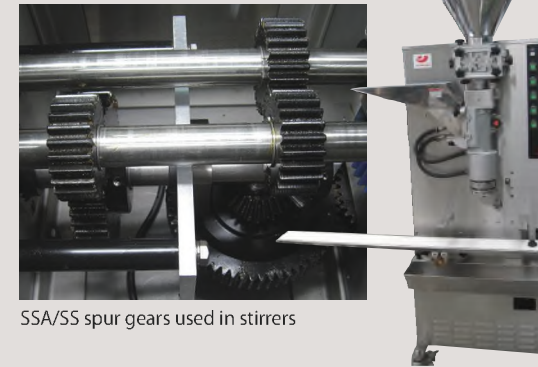
● Black products are KHK stock gears that have an applied black oxide coating for rust resistance; this is a product characteristic of KHK stock gears.

Application Examples



KHK stock spur gears are widely used in various industrial machines including food machinery.

Food machinery by Jey Machine Co.

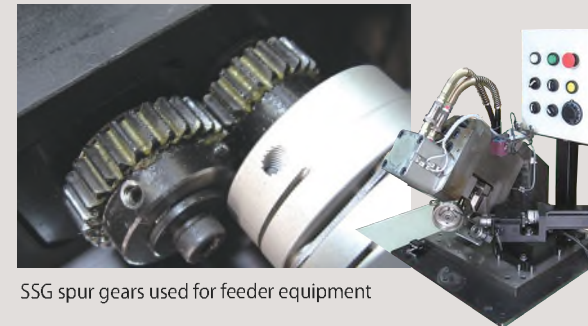


SSA/SS spur gears used in stirrers



PS/PSA spur gears used in fully-automatic food forming machines

Cutting machine with stainless steel belt



SSG spur gears used for feeder equipment

High-speed automatic wire straightening/cutting machine manufactured by Takashima Sangyo Co.



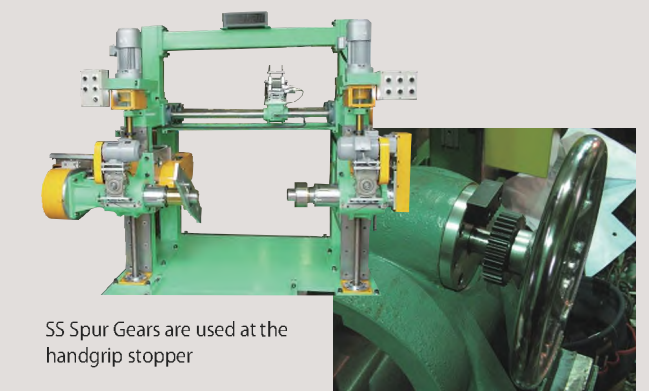
SS spur gears used for wire feeder

Packing machine by New Max



SS Spur Gears, segment shaped by secondary operation

Electric wire winder by Sakuma Tekko KK.

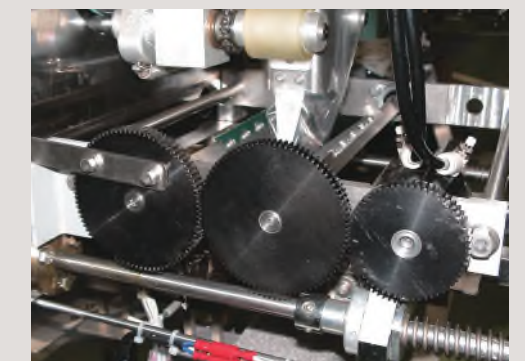


SS Spur Gears are used at the handgrip stopper

Automatic packing machine



SSA spur gears used for driving



SSAY spur gears used for film cutting

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, all spur gears, internal gears and racks can be paired as long as the module and pressure angle match. Products with different materials, tooth widths, or methods of cutting the teeth can be mated.
- When using a pinion with an internal gear with a small difference in the numbers of teeth, there are possibilities of 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 182)

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. Also, SUSF F-loc hub spur gears, DSF F-loc hub spur gears and various F series that use the friction coupling method to fasten the gear shaft need additional consideration for 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 Number	MSGA MSGB	SSGS	SSG SSAG	SSS,SS SSA,SSY SSAY,SSR	SUS SUSA SUSF	BSS	KSG	KS	NSU	PU PS PSA	DSF 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)						Racks		—				
Rotational speed	600rpm				100rpm				100 rpm				
Design life (durability)	Over 10 ⁷ cycles												
Impact from motor	Uniform load										Allowable bending stress (kgf/mm ²)		
Impact from load	Uniform load										1.38 (40°C with No Lubrication)		
Direction of load	Bidirectional										1.15 (40°C with No Lubrication)		
Allowable bending stress at root σ_{Flim} (kgf/mm ²) <small>NOTE 2</small>	47	24.5	19 (24.5) <small>Note 3</small>	19 (24.5) <small>Note 4</small>	10.5	4	30	32	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>								Supported on one end			
Allowable Hertz stress σ_{Hlim} (kgf/mm ²)	166	99	90 (62.5) <small>Note 3</small>	49 (62.5) <small>Note 4</small>	41.3	—	112	79				
Safety factor S_H	1.15											

[NOTE 1] The gear strength formula is based on JGMA (Japanese Gear Manufacturers Association) specifications, "MC Nylon Technical Data" by Nippon Polyenco Limited and "Duracon Gear Data" by Polyplastic Co. The units for the rotational speed (rpm) and the stress (kgf/mm²) are adjusted to the units needed in the formula.

[NOTE 2] The allowable bending stress at the root σ_{Flim} is calculated from JGMA401-01, and set to 2/3 of the value in the consideration of the use of planetary-, idler-, or other gear systems, loaded in both directions.

[NOTE 3] For SSG Ground Spur Gears, with module 0.8 or less, thermal refining is applied. Allowable bending stress and allowable hertz stress values are shown in parentheses.

[NOTE 4] For SSS Spur Pinion Shafts, with module over 1.5, tooth induction hardening is not applied. Allowable bending stress and allowable hertz stress values are shown in parentheses.

[NOTE 5] SSS Spur Pinion Shafts with module 1 or less (SA configuration) are set to cantilever support as they are single shaft types.

When selecting KHK standard gears, glance over the Cautions on Product Characteristics and Cautions on Performing Secondary Operations in the respective dimension tables.

- Products not listed in this catalog or materials, modules, number of teeth and the like not listed in the dimensional tables can be manufactured as custom items. Please see Page 16 for more details about custom-made orders.
- The color and shape of the product images listed on the dimension table page of each product may differ from the actual product. Be sure to confirm the shape in the dimension table before selection.
- The details (specifications, dimensions, prices, etc.) listed in the catalog may be changed without prior notice. Changes are announced on the KHK website.

Website URL: <https://khkgears.net/>
 Overseas Sales Department: TEL: 81-48-254-1744 FAX: 81-48-254-1765
 E-mail: info@khkgears.net

The most important factor in selecting gears is the gear strength.

Step 1

Determine the actual load torque applied to the gear and the gear type suitable for the purpose.

Definition of Bending Strength of Gears

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 failure. The allowable gear tooth load of a gear is defined as the allowable tangential force at the pitch circle based on the mutual gear tooth strength of two meshing gears under load.



Example of wear due to insufficient surface durability

Step 2

Select provisionally from the allowable torque table of the Master Catalog based on the load torque.

For provisional selection from the Master Catalog

Ordering Number	Module	1 (1/16")	1.25 (1/8")	1.5 (3/16")	2 (1/4")	2.5 (5/16")	3 (3/8")	4 (1/2")	5 (5/8")	6 (3/4")	8 (1")	10 (1 1/4")	12 (1 1/2")	16 (1 3/4")	20 (2")	25 (2 1/4")	30 (3")	35 (3 1/4")	40 (3 1/2")	50 (4")	60 (4 3/4")	80 (6")	100 (8")	
MSGA-10	10	8	10	12	15	18	20	22	25	30	35	40	45	50	60	70	80	90	100	120	150	200	250	300
MSGA-20	20	15	18	22	28	35	40	45	50	60	70	80	90	100	120	150	180	200	220	250	300	400	500	600
MSGA-25	25	18	22	28	35	45	50	55	60	70	80	90	100	120	150	180	200	220	250	300	400	500	600	700
MSGA-30	30	22	28	35	45	55	60	65	70	80	90	100	120	150	180	200	220	250	300	400	500	600	700	800
MSGA-40	40	30	38	48	60	75	80	85	90	100	120	150	180	200	220	250	280	300	350	400	500	600	700	800
MSGA-50	50	40	50	60	75	90	100	110	120	130	150	180	200	220	250	280	300	350	400	500	600	700	800	900
MSGA-60	60	50	60	75	90	110	120	130	140	150	170	200	220	250	280	300	350	400	500	600	700	800	900	1000
MSGA-80	80	70	80	100	120	150	160	170	180	200	220	250	280	300	350	400	450	500	600	700	800	900	1000	1200
MSGA-100	100	100	120	150	180	220	240	260	280	300	350	400	450	500	550	600	650	700	800	900	1000	1200	1400	1600

Step 3

We recommend that each user computes their own values by applying the actual usage conditions to determine the suitability of the gear strength.

Calculate the strength formally using the various gear strength formulas.

Please see Page 71 of our technical reference book for more details.

Strength confirmation is simple when using the website.

(2) Bending strength formula

In order to satisfy the bending strength, the nominal circumferential force F_t on the meshing pitch circle must be less than or equal to the allowable circumferential force F_{tlim} on the meshing pitch circle calculated by the permissible bending stress at root.

$$F_t \leq F_{tlim} \quad (10.4)$$

Alternatively, the bending stress at root σ_r obtained from the nominal circumferential force F_t on the meshing pitch circle must be less than or equal to the permissible bending stress at root σ_{Flim} .

$$\sigma_r \leq \sigma_{Flim} \quad (10.5)$$

The permissible circumferential force F_{tlim} (kgf) on the meshing pitch circle is obtained by the following equation.

$$F_{tlim} = \sigma_{Flim} \frac{m \cdot b}{Y_F Y_G Y_B} \left(\frac{K_1 K_{F\beta}}{K_V K_O} \right) \frac{1}{S_F} \quad (10.6)$$

The bending stress at root (kgf/mm²) is obtained by the following equation.

$$\sigma_r = F_t \frac{Y_F Y_G Y_B}{b m} \left(\frac{K_V K_O}{K_1 K_{F\beta}} \right) S_F \quad (10.7)$$

SS1-20 Strength calculation of gears

Meshing Gear: Spur Gears Racks Internal Gears

Meshing number of teeth: 50

Meshing Face Width: 10

Meshing Surface finish: Cut Ground

Rotating Speed: 100 rpm

Number of repetitions: Above 10,000,000

Dimension Factor of Root Stress: 1.00

	Impact from Load Side of Machine		
	Uniformed Load	Medium impact	Heavy impact
Impact from Prime Mover	1.00	1.25	1.75
Light impact	1.25	1.50	2.00
Medium impact	1.50	1.75	2.25

Kinematic Viscosity of Lubricant: ISO VG 100

Safety Factor: 1.2

Method of Gear shaft Support: Bearing on One End Bearing on Both Ends

Direction of Load: Unidirectional Bidirectional

Additional Harden: With Harden Without Harden

Unit: kgf N

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.

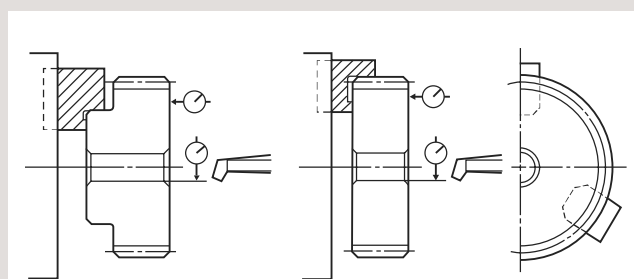
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1. Cautions on Handling

- ① KHK products are packaged one by one to prevent scratches and dents, but if you find issues such as rust, scratches, or dents when the product is removed from the box after purchase, please contact the supplier.
- ② Depending on the handling method, the product may become deformed or damaged. Resin gears and ring gears deform particularly easily, so please handle with care.

2. Cautions on Performing Secondary Operations

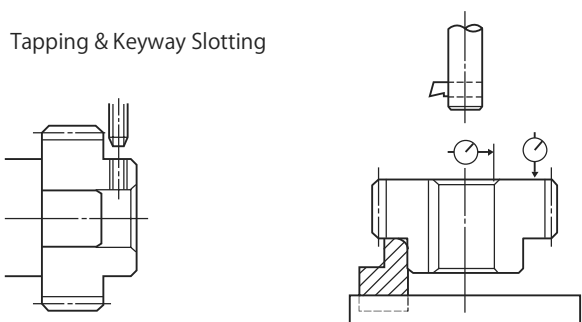
- ① If reboring, it is important to pay special attention to locating the center in order to avoid runout.
- ② The reference datum for gear cutting is the bore. Therefore, use the bore for locating the center. If it is too difficult to do for small bores, the alternative is to use one spot on the bore and the runout of the side surface.
- ③ If 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 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 concentration, round 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 When induction-hardening S45C products, thermal stress cracks may appear. 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.

Induction Hardening

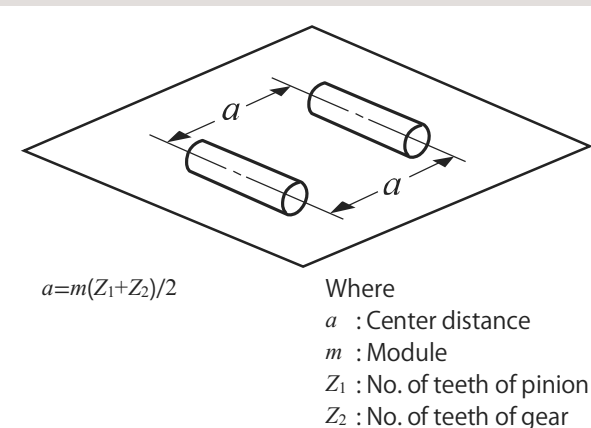
If you apply induction hardening to the gear teeth of S45C products, you need to designate the hardness and where to apply the heat treatment. Below is an example of common specifications and KHK's specifications for hardening:

- Common Specifications for Heat Treatment
Hardening location: Gear tooth surface or tooth surface and tooth root
Hardness: Within the range of 45 to 60 HRC and 10 HRC width (Example: 48 to 58 HRC)
- KHK's Specifications for Heat Treatment
Hardened location: Tooth surface, or Tooth surface and Tooth root
Hardness: 50 to 60 HRC

* Hardness and Depth of Gear-teeth Induction Hardening
The hardening method and the state of the hardened teeth area vary 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 reference diameter. For some of our products, 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.

3. Points of Caution during Assembly

- 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). For the backlash of each product, please refer to the dimension table. Backlash may be adjusted by changing the center distance of mating gears. For more information, please consult the technical section on gear backlash (page 56) in our separate technical reference book.



- 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.

■ Total Length Tolerance for Spur and Helical Gears

Total Length (mm)	Tolerance
30 or less	0 - 0.10
31 to 100	0 - 0.15
Over 100	0 - 0.20

[Note] The following products are excluded from this table: Spur pinion shafts, Injection molded spur gears, F-loc 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 Mecha-Lock, a POSI-LOCK, or a Spanning, which are parts for 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. (Check the assembly by painting a thin layer of red lead primer or the like on the gear teeth, meshing them together and rotating them.)

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



Poor tooth contact and pitting

Gear oil (equivalent to 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.

4. Cautions on Starting

- ① Check the following items before starting.
 - Are the gears installed securely?
 - Is there uneven tooth contact?
 - Is there adequate backlash?
Be sure to avoid zero-backlash.
 - Has proper lubrication been supplied?
- ② If gears are exposed, be sure to attach a safety cover to ensure safety. Also, be careful not to touch rotating gears.
- ③ Gears can be lubricated with the "grease lubrication method", "splash lubrication method (oil bath method)", or "forced lubrication method (circulation lubrication method)". For initial operation, the lubricant may deteriorate markedly, so check the condition of the lubricant after starting. For more technical information, please see the section "Gear Lubrication" (Page 112) of our technical reference book.
- ④ If there is any abnormality such as noise or vibration during startup, check the gears and assembly condition. "High gear accuracy", "smooth gear teeth surface" and "correct tooth contact" are some of the measures against gear noise. For more technical information, please see the section "Gear Noise and Countermeasures" (Page 119) of our technical reference book.

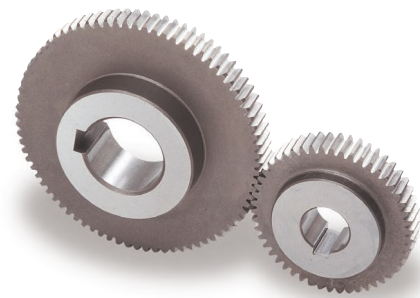
KHK considers safety a priority in the use of our products. When handling, adding secondary operations, assembling, and operating KHK products, please be aware of the following issues in order to prevent accidents.

⚠ Warning: Precautions for preventing physical and property damage

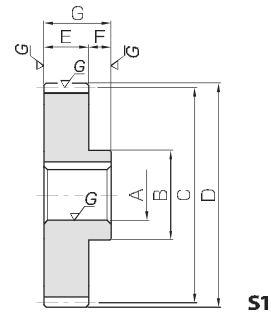
1. When using KHK products, follow relevant safety regulations (Occupational Safety and Health Regulations, etc.).
2. Pay attention to the following items when installing, removing, or performing maintenance and inspection of the product.
 - ① Turn off the power switch.
 - ② Do not reach or crawl under the product.
 - ③ Wear appropriate clothing and protective equipment for the work.

⚠ Caution Cautions in Preventing Accidents

1. Before using a KHK product, read the precautions in the catalog carefully in order to use it correctly.
2. Avoid use in environments that may adversely affect the product.
3. Our products are manufactured under a superior quality control system based on the ISO9000 quality management system; if you notice any malfunctions upon purchasing a product, please contact the supplier.



Specifications	
Precision grade	JIS grade N5 (JIS B1702-1:1998)
Gear teeth	Standard full depth
Pressure angle	20°
Material	SCM415
Heat Treatment	Carburized
Tooth hardness	55 to 60HRC



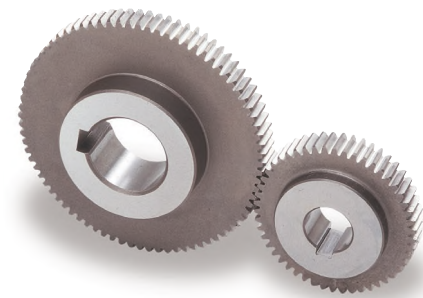
Catalog Number	Module	No. of teeth	Shape	Bore				Face width	Hub width	Total Length	Web thickness	Web O.D.
				A-H	B	C	D					
MSG1-18	m1	18	S1	8	15	18	20	10	5	15	—	—
MSG1-20 MSG1-20**		20		8 10	17	20	22					
MSG1-24 MSG1-24		24		10 12	20	24	26					
MSG1-25 MSG1-25		25		10 12	20	25	27					
MSG1-30 MSG1-30		30		10 12	25	30	32					
MSG1-35 MSG1-35		35		10 15	25	35	37					
MSG1-36 MSG1-36		36		12 15	25	36	38					
MSG1-40 MSG1-40		40		12 15	30	40	42					
MSG1-45 MSG1-45		45		12 15	30	45	47					
MSG1-48 MSG1-48		48		12 15	30	48	50					
MSG1-50 MSG1-50		50		12 15	35	50	52					
MSG1-55 MSG1-55		55		15 20	40	55	57					
MSG1-60 MSG1-60		60		15 20	40	60	62					
MSG1-70 MSG1-70		70		20 25	45	70	72					
MSG1-80 MSG1-80		80		20 25	45	80	82					
MSG1-100 MSG1-100		100		20 25	45	100	102					

Keyway Width × Depth	Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog Number
	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	MSG1-18
3 x 1.4 4 x 1.8	14.2	8.04	1.45	0.82		0.027 0.023	MSG1-20 MSG1-20**
4 x 1.8 4 x 1.8	18.5	12.0	1.88	1.22		0.038 0.034	MSG1-24 MSG1-24
4 x 1.8 4 x 1.8	19.6	13.1	2.00	1.33		0.041 0.037	MSG1-25 MSG1-25
4 x 1.8 4 x 1.8	25.1	19.0	2.56	1.94		0.065 0.061	MSG1-30 MSG1-30
4 x 1.8 5 x 2.3	30.7	26.2	3.13	2.67		0.085 0.073	MSG1-35 MSG1-35
4 x 1.8 5 x 2.3	31.9	27.8	3.25	2.84		0.085 0.077	MSG1-36 MSG1-36
4 x 1.8 5 x 2.3	36.5	34.6	3.72	3.53		0.11 0.10	MSG1-40 MSG1-40
4 x 1.8 5 x 2.3	42.3	44.3	4.31	4.51		0.14 0.13	MSG1-45 MSG1-45
4 x 1.8 5 x 2.3	45.8	50.6	4.67	5.16		0.16 0.15	MSG1-48 MSG1-48
4 x 1.8 5 x 2.3	48.1	55.1	4.91	5.62		0.18 0.17	MSG1-50 MSG1-50
5 x 2.3 6 x 2.8	54.0	67.3	5.51	6.86		0.26 0.23	MSG1-55 MSG1-55
5 x 2.3 6 x 2.8	59.9	80.6	6.11	8.22		0.29 0.27	MSG1-60 MSG1-60
6 x 2.8 8 x 3.3	71.9	111	7.33	11.4		0.37 0.35	MSG1-70 MSG1-70
6 x 2.8 8 x 3.3	83.9	147	8.55	15.0		0.47 0.44	MSG1-80 MSG1-80
6 x 2.8 8 x 3.3	103	224	10.5	22.8		0.69 0.66	MSG1-100 MSG1-100

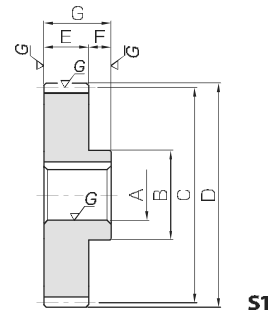
- [Caution on Product Characteristics]
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 - ② The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see Page 24 for more details.
 - ③ The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.
 - ④ 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.

- [Caution on Secondary Operations]
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Specifications	
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Pressure angle	20°
Material	SCM415
Heat Treatment	Carburized
Tooth hardness	55 to 60HRC



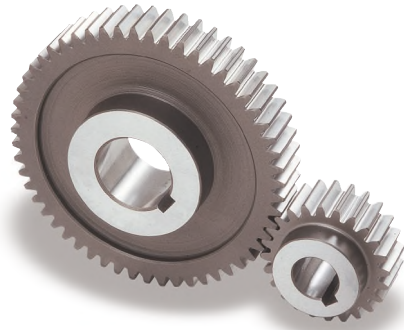
Catalog Number	Module	No. of teeth	Shape	Bore				Face width	Hub width	Total Length	Web thickness	Web O.D.
				A-H	B	C	D					
MSG1.5-15**	m1.5	15	S1	10	18	22.5	25.5	15	10	25	—	—
MSG1.5-18 MSGB1.5-18		18		10	22	27	30					
MSG1.5-20 MSGB1.5-20		20		12	25	30	33					
MSG1.5-24 MSGB1.5-24		24		12	28	36	39					
MSG1.5-25 MSGB1.5-25		25		14	30	37.5	40.5					
MSG1.5-30 MSGB1.5-30		30		15	30	45	48					
MSG1.5-35 MSGB1.5-35		35		15	32	52.5	55.5					
MSG1.5-36 MSGB1.5-36		36		15	32	54	57					
MSG1.5-40 MSGB1.5-40		40		16	35	60	63					
MSG1.5-45 MSGB1.5-45		45		16	40	67.5	70.5					
MSG1.5-48 MSGB1.5-48		48		16	40	72	75					
MSG1.5-50 MSGB1.5-50		50		18	40	75	78					
MSG1.5-55 MSGB1.5-55		55		20	45	82.5	85.5					
MSG1.5-60 MSGB1.5-60		60		20	45	90	93					
MSG1.5-70 MSGB1.5-70		70		20	45	105	108					
MSG1.5-80 MSGB1.5-80		80		20	45	120	123					
MSG1.5-100 MSGB1.5-100		100		25	50	150	153					

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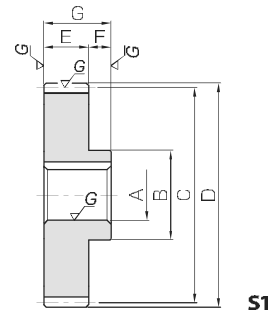
Keyway Width × Depth	Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog Number
	Bending strength	Surface durability	Bending strength	Surface durability			
4 x 1.8	30.8	14.8	3.15	1.51	0.08~0.16	0.050	MSG1.5-15**
4 x 1.8	41.0	22.1	4.18	2.26		0.080	MSG1.5-18
4 x 1.8						0.074	MSGB1.5-18
4 x 1.8	48.0	27.9	4.89	2.84		0.098	MSG1.5-20
5 x 2.3						0.085	MSGB1.5-20
4 x 1.8	62.4	41.5	6.36	4.24		0.14	MSG1.5-24
5 x 2.3					0.13	MSGB1.5-24	
5 x 2.3	66.0	45.4	6.73	4.63	0.15	MSG1.5-25	
5 x 2.3					0.14	MSGB1.5-25	
5 x 2.3	84.7	66.4	8.63	6.77	0.21	MSG1.5-30	
6 x 2.8					0.19	MSGB1.5-30	
5 x 2.3	104	91.5	10.6	9.34	0.28	MSG1.5-35	
6 x 2.8					0.26	MSGB1.5-35	
5 x 2.3	108	97.1	11.0	9.90	0.30	MSG1.5-36	
6 x 2.8					0.28	MSGB1.5-36	
5 x 2.3	123	121	12.6	12.3	0.37	MSG1.5-40	
6 x 2.8					0.34	MSGB1.5-40	
5 x 2.3	143	155	14.5	15.8	0.48	MSG1.5-45	
6 x 2.8					0.46	MSGB1.5-45	
5 x 2.3	155	177	15.8	18.1	0.54	MSG1.5-48	
6 x 2.8					0.51	MSGB1.5-48	
6 x 2.8	162	193	16.6	19.7	0.57	MSG1.5-50	
6 x 2.8					0.54	MSGB1.5-50	
6 x 2.8	182	236	18.6	24.0	0.69	MSG1.5-55	
8 x 3.3					0.65	MSGB1.5-55	
6 x 2.8	202	283	20.6	28.8	0.81	MSG1.5-60	
8 x 3.3					0.77	MSGB1.5-60	
6 x 2.8	231	372	23.6	38.0	1.08	MSG1.5-70	
8 x 3.3					1.04	MSGB1.5-70	
6 x 2.8	270	494	27.5	50.3	1.39	MSG1.5-80	
8 x 3.3					1.36	MSGB1.5-80	
8 x 3.3	347	787	35.4	80.2	2.13	MSG1.5-100	
8 x 3.3					2.09	MSGB1.5-100	

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Specifications	
Precision grade	JIS grade N5 (JIS B1702-1:1998)
Gear teeth	Standard full depth
Pressure angle	20°
Material	SCM415
Heat Treatment	Carburized
Tooth hardness	55 to 60HRC



Catalog Number	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total Length	Web thickness	Web O.D.
				A _{H7}	B	C	D	E	F	G	H	I
MSG2-15 MSG2-15**	m2	15	S1	12 15	24	30	34	20	10	30	—	—
MSG2-18 MSG2-18		18		12 15	30	36	40					
MSG2-20 MSG2-20		20		15 18	32	40	44					
MSG2-24 MSG2-24		24		15 18	35	48	52					
MSG2-25 MSG2-25		25		16 20	35	50	54					
MSG2-30 MSG2-30		30		18 22	40	60	64					
MSG2-35 MSG2-35		35		18 22	40	70	74					
MSG2-36 MSG2-36		36		18 22	40	72	76					
MSG2-40 MSG2-40		40		20 25	45	80	84					
MSG2-45 MSG2-45		45		20 25	45	90	94					
MSG2-48 MSG2-48		48		22 28	50	96	100					
MSG2-50 MSG2-50		50		22 28	50	100	104					
MSG2-55 MSG2-55		55		25 30	55	110	114					
MSG2-60 MSG2-60		60		25 30	55	120	124					
MSG2-70 MSG2-70		70		25 30	55	140	144					
MSG2-80 MSG2-80		80		30 35	60	160	164					
MSG2-100 MSG2-100	100	35 40	80	200	204							

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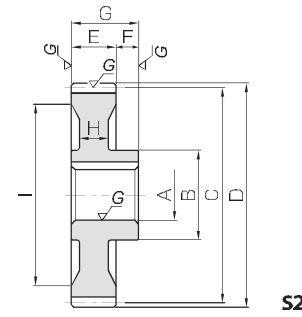
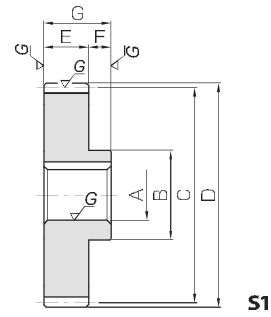
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Keyway Width × Depth	Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog Number												
	Bending strength	Surface durability	Bending strength	Surface durability															
4 x 1.8 5 x 2.3	73.1	35.7	7.46	3.64	0.10~0.20	0.12 0.10	MSG2-15 MSG2-15**												
4 x 1.8 5 x 2.3							0.19 0.17	MSG2-18 MSG2-18											
5 x 2.3 6 x 2.8							0.22 0.20	MSG2-20 MSG2-20											
5 x 2.3 6 x 2.8							0.32 0.30	MSG2-24 MSG2-24											
5 x 2.3 6 x 2.8							0.33 0.31	MSG2-25 MSG2-25											
6 x 2.8 6 x 2.8							0.48 0.45	MSG2-30 MSG2-30											
6 x 2.8 6 x 2.8	246	223	25.1	22.7	0.12~0.22	0.64 0.61	MSG2-35 MSG2-35												
6 x 2.8 6 x 2.8							0.67 0.64	MSG2-36 MSG2-36											
6 x 2.8 8 x 3.3							0.84 0.79	MSG2-40 MSG2-40											
6 x 2.8 8 x 3.3							1.05 1.00	MSG2-45 MSG2-45											
6 x 2.8 8 x 3.3							1.20 1.14	MSG2-48 MSG2-48											
6 x 2.8 8 x 3.3							1.29 1.24	MSG2-50 MSG2-50											
8 x 3.3 8 x 3.3							1.56 1.51	548	42.0	55.8	0.14~0.24	1.56 1.51	MSG2-55 MSG2-55						
8 x 3.3 8 x 3.3													1.84 1.79	MSG2-60 MSG2-60					
8 x 3.3 8 x 3.3													2.48 2.43	MSG2-70 MSG2-70					
8 x 3.3 10 x 3.3													2.55 2.49	MSG2-80 MSG2-80					
10 x 3.3 12 x 3.3													4.16 4.09	1820	80.1	186	0.14~0.24	4.16 4.09	MSG2-100 MSG2-100
10 x 3.3 12 x 3.3																			785

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Gear teeth	Standard full depth
Pressure angle	20°
Material	SCM415
Heat Treatment	Carburized
Tooth hardness	55 to 60HRC



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

Keyway Width x Depth	Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog Number
	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	MSGA2.5-15 MSGB2.5-15**
6 x 2.8 6 x 2.8	190	107	19.4	10.9		0.34 0.32	MSGA2.5-18 MSGB2.5-18
6 x 2.8 6 x 2.8	222	134	22.7	13.7		0.42 0.39	MSGA2.5-20 MSGB2.5-20
6 x 2.8 6 x 2.8	289	201	29.4	20.5	0.12~0.22	0.59 0.56	MSGA2.5-24 MSGB2.5-24
6 x 2.8 8 x 3.3	306	220	31.2	22.4		0.66 0.60	MSGA2.5-25 MSGB2.5-25
6 x 2.8 8 x 3.3	392	322	40.0	32.8		0.94 0.87	MSGA2.5-30 MSGB2.5-30
8 x 3.3 8 x 3.3	480	444	49.0	45.3	0.14~0.24	1.25 1.19	MSGA2.5-35 MSGB2.5-35
8 x 3.3 8 x 3.3	498	471	50.8	48.0		1.32 1.26	MSGA2.5-36 MSGB2.5-36
8 x 3.3 10 x 3.3	543	560	55.3	57.1		1.61 1.52	MSGA2.5-40 MSGB2.5-40
8 x 3.3 10 x 3.3	629	718	64.1	73.2	0.14~0.24	2.00 1.93	MSGA2.5-45 MSGB2.5-45
8 x 3.3 10 x 3.3	681	823	69.5	83.9		2.27 2.20	MSGA2.5-48 MSGB2.5-48
8 x 3.3 10 x 3.3	716	897	73.0	91.5		2.46 2.39	MSGA2.5-50 MSGB2.5-50
8 x 3.3 12 x 3.3	804	1090	82.0	112	0.14~0.24	3.06 2.90	MSGA2.5-55 MSGB2.5-55
8 x 3.3 12 x 3.3	892	1310	90.9	134		3.62 3.45	MSGA2.5-60 MSGB2.5-60
12 x 3.3 14 x 3.8	1020	1730	104	176		4.24 4.03	MSGA2.5-70 MSGB2.5-70

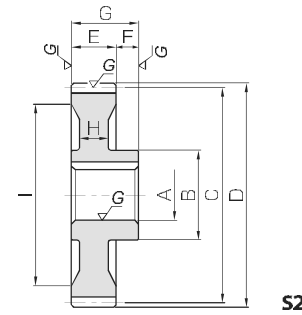
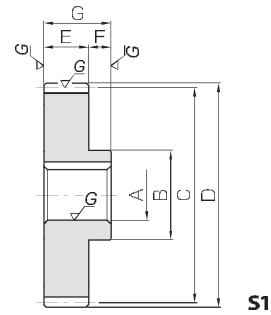
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Material	SCM415
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Tooth hardness	55 to 60HRC



Catalog Number	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total Length	Web thickness	Web O.D.							
				A-H7	B	C	D	E	F	G	H	I							
MSG3-15 MSG3-15**	m3	15	S1	18	36	45	51	30	15	45	—	—							
MSG3-18 MSG3-18				20	45	54	60												
MSG3-20 MSG3-20		20		20	45	60	66												
MSG3-24 MSG3-24				20	45	72	78												
MSG3-25 MSG3-25		25		25	55	75	81												
MSG3-30 MSG3-30				28	60	90	96												
MSG3-35 MSG3-35		35		30	60	105	111												
MSG3-36 MSG3-36				30	60	108	114												
MSG3-40 MSG3-40		40		30	70	120	126												
MSG3-45 MSG3-45				30	70	135	141												
MSG3-48 MSG3-48		48		35	70	144	150												
MSG3-50 MSG3-50				32	70	150	156												
MSG3-55 MSG3-55		55		35	70	165	171												
MSG3-60 MSG3-60				35	80	180	186												
MSG4-15 MSG4-15**		m4		15	S1	25	48						60	68	40	20	60	—	—
MSG4-18 MSG4-18						25	50						72	80					
MSG4-20 MSG4-20				20		28	60						80	88					
MSG4-24 MSG4-24						28	60						96	104					
MSG4-25 MSG4-25				25		30	60						100	108					
MSG4-30 MSG4-30						35	70						120	128					
MSG4-35 MSG4-35	35		35	70		140	148												
MSG4-36 MSG4-36			35	70		144	152												
MSG4-40 MSG4-40	40		40	80		160	168												
MSG4-45 MSG4-45			40	80		180	188												
MSG4-48 MSG4-48	48		40	80		192	200												
MSG4-50 MSG4-50			40	85		200	208												
MSG4-50 MSG4-50	50		40	85		200	208												
MSG4-50 MSG4-50			50	85		200	208												

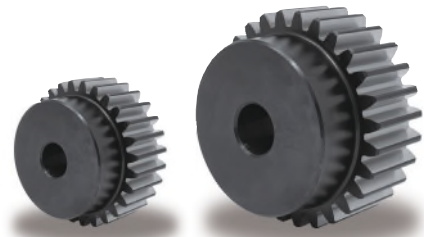
Keyway Width x Depth	Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog Number
	Bending strength	Surface durability	Bending strength	Surface durability			
6 x 2.8	247	124	25.2	12.7	0.10~0.20	0.40	MSG3-15
6 x 2.8							MSG3-15**
6 x 2.8	328	187	33.4	19.1	0.12~0.22	0.61	MSG3-18
8 x 3.3							MSG3-18
6 x 2.8	384	236	39.1	24.1	0.14~0.24	0.74	MSG3-20
8 x 3.3							MSG3-20
6 x 2.8	499	353	50.9	36.0	0.16~0.26	1.03	MSG3-24
8 x 3.3							MSG3-24
8 x 3.3	528	386	53.9	39.3	0.18~0.28	1.14	MSG3-25
10 x 3.3							MSG3-25
8 x 3.3	677	565	69.1	57.7	0.20~0.30	1.60	MSG3-30
10 x 3.3							MSG3-30
8 x 3.3	790	745	80.6	75.9	0.22~0.32	2.11	MSG3-35
10 x 3.3							MSG3-35
8 x 3.3	820	790	83.6	80.6	0.24~0.34	2.23	MSG3-36
10 x 3.3							MSG3-36
8 x 3.3	938	988	95.6	101	0.26~0.36	2.86	MSG3-40
12 x 3.3							MSG3-40
8 x 3.3	1090	1260	111	129	0.28~0.38	3.57	MSG3-45
12 x 3.3							MSG3-45
10 x 3.3	1180	1450	120	147	0.30~0.40	3.94	MSG3-48
12 x 3.3							MSG3-48
10 x 3.3	1240	1570	126	161	0.32~0.42	3.79	MSG3-50
12 x 3.3							MSG3-50
10 x 3.3	1330	1830	135	187	0.34~0.44	4.39	MSG3-55
12 x 3.3							MSG3-55
10 x 3.3	1470	2200	150	224	0.36~0.46	5.31	MSG3-60
14 x 3.8							MSG3-60
8 x 3.3	585	302	59.7	30.8	0.14~0.24	0.93	MSG4-15
8 x 3.3							MSG4-15**
8 x 3.3	777	455	79.3	46.4	0.16~0.26	1.34	MSG4-18
8 x 3.3							MSG4-18
8 x 3.3	910	574	92.8	58.6	0.18~0.28	1.72	MSG4-20
10 x 3.3							MSG4-20
8 x 3.3	1130	819	115	83.5	0.20~0.30	2.41	MSG4-24
10 x 3.3							MSG4-24
8 x 3.3	1190	896	122	91.4	0.22~0.32	2.56	MSG4-25
10 x 3.3							MSG4-25
10 x 3.3	1530	1320	156	134	0.24~0.34	3.69	MSG4-30
12 x 3.3							MSG4-30
10 x 3.3	1870	1820	191	185	0.26~0.36	4.97	MSG4-35
12 x 3.3							MSG4-35
10 x 3.3	1940	1930	198	197	0.28~0.38	5.25	MSG4-36
12 x 3.3							MSG4-36
12 x 3.3	2120	2290	216	234	0.30~0.40	6.49	MSG4-40
14 x 3.8							MSG4-40
12 x 3.3	2460	2930	251	299	0.32~0.42	8.17	MSG4-45
14 x 3.8							MSG4-45
12 x 3.3	2660	3350	272	342	0.34~0.44	7.97	MSG4-48
14 x 3.8							MSG4-48
12 x 3.3	2800	3650	285	372	0.36~0.46	8.71	MSG4-50
14 x 3.8							MSG4-50

- [Caution on Product Characteristics]
- Although the dimensions of the keyway are made to the JIS B1301 (JIS) tolerance, there may be some deviations due to the effects of the heat treatment.
 - The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see Page 24 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.
 - 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.

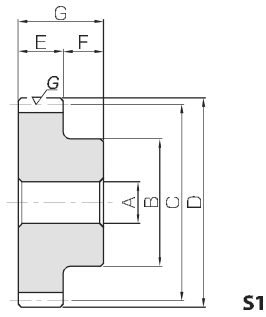
- [Caution on Secondary Operations]
- No secondary operations can be performed on these precision finished gears due to the applied carburizing process. For products which are different in specifications, such as bore size, we accept custom-made gear orders and provide a price quote.



New Product



Specifications	
Precision grade	JIS grade N6 (JIS B1702-1:1998)
Gear teeth	Standard full depth
Pressure angle	20°
Material	SCM440
Heat Treatment	Thermal refined, gear teeth induction hardened
Tooth hardness	50 to 60HRC
Surface treatment	Black oxide coated except for teeth



Recommended mating rack



KRGF-H/KRGFD-H
Hardened Ground Racks

Please see Page 200 for more details.

Catalog Number	Module	No. of teeth	Shape	Dimensions						
				Bore A _{H7}	Hub dia. B	Pitch dia. C	Outside dia. D	Face width E	Hub width F	Total Length G
KSG1-20 KSG1-25 KSG1-30 KSG1-32 KSG1-36 KSG1-40	m1	20	S1	6	15	20	22	10	10	20
25		8		20	25	27				
30		8		25	30	32				
32		10		25	32	34				
36		10		30	36	38				
40		10		35	40	42				
KSG1.5-20 KSG1.5-25 KSG1.5-30 KSG1.5-32 KSG1.5-36 KSG1.5-40	m1.5	20	S1	10	24	30	33	15	14	29
25		10		30	37.5	40.5				
30		15		35	45	48				
32		15		40	48	51				
36		15		45	54	57				
40		15		50	60	63				
KSG2-20 KSG2-25 KSG2-30 KSG2-32 KSG2-36 KSG2-40	m2	20	S1	15	30	40	44	20	16	36
25		15		40	50	54				
30		15		50	60	64				
32		18		55	64	68				
36		18		65	72	76				
40		18		70	80	84				
KSG2.5-20 KSG2.5-25 KSG2.5-30 KSG2.5-32 KSG2.5-36 KSG2.5-40	m2.5	20	S1	15	40	50	55	25	18	43
25		20		50	62.5	67.5				
30		20		65	75	80				
32		20		70	80	85				
36		20		80	90	95				
40		20		90	100	105				
KSG3-20 KSG3-25 KSG3-30 KSG3-32 KSG3-36 KSG3-40	m3	20	S1	15	50	60	66	30	20	50
25		20		65	75	81				
30		20		80	90	96				
32		25		85	96	102				
36		25		90	108	114				
40		25		110	120	126				

[Caution on Product Characteristics] ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see Page 24 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 Number
Bending strength	Surface durability	Bending strength	Surface durability			
10.3	5.48	1.05	0.56	0.08~0.16	0.034	KSG1-20
13.9	9.16	1.42	0.93			
17.6	14.0	1.80	1.43			
19.1	16.2	1.95	1.66			
22.1	21.3	2.25	2.17			
25.1	27.0	2.56	2.75			
34.8	18.5	3.55	1.89	0.08~0.16	0.12	KSG1.5-20
47.0	31.0	4.80	3.16			
59.5	47.4	6.06	4.83			
64.5	55.0	6.57	5.60			
74.6	71.9	7.60	7.34			
84.7	91.3	8.64	9.31			
82.6	44.0	8.42	4.48	0.10~0.20	0.24	KSG2-20
111	73.5	11.4	7.50			
141	112	14.4	11.5			
153	131	15.6	13.3			
177	171	18.0	17.4			
201	217	20.5	22.1			
161	86.0	16.5	8.77	0.10~0.20	0.50	KSG2.5-20
218	144	22.2	14.7			
275	220	28.1	22.4			
298	255	30.4	26.0			
345	335	35.2	34.1			
392	425	40.0	43.3			
279	149	28.4	15.2	0.10~0.20	0.90	KSG3-20
376	249	38.4	25.4			
476	381	48.5	38.9			
516	442	52.6	45.1			
597	579	60.8	59.1			
678	736	69.1	75.0			

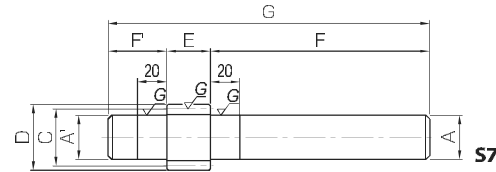
[Caution on Secondary Operations] ① Please read "Cautions on Performing Secondary Operations" (Page 26) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK system for quick modification of KHK stock gears, is also available.
② Due to the gear teeth being induction hardened, no secondary operations can be performed on tooth areas including the bottom land (approx. 2 to 3 mm).

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

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



Specifications	
Precision grade	JIS grade N7 (JIS B1702-1:1998)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat Treatment	Thermal refined, gear teeth induction hardened
Tooth hardness	50 to 60HRC
Surface treatment	Black oxide coated except for ground part



Catalog Number	Module	No. of teeth	Dislocation coefficient	Shape	Shaft dia. (L)		Pitch dia. C	Outside dia. D	Face width E	Shaft dia. (R)		Total Length G
					A'	F'				A	F	
SSGS1.5-10 SSGS1.5-11 SSGS1.5-12 SSGS1.5-13	m1.5	10	+0.5	S7	12.2	25	15	19.35	15	12.2	100	140
		11	+0.5		13.7		20.85	13.7				
		12	0		13.7		21	13.7				
		13	0		15.2		22.5	15.2				
SSGS2-10 SSGS2-11 SSGS2-12 SSGS2-13	m2	10	+0.5	S7	16.2	30	20	25.8	20	16.2	120	170
		11	+0.5		18.2		27.8	18.2				
		12	0		18.2		28	18.2				
		13	0		20.2		30	20.2				
SSGS2.5-10 SSGS2.5-11 SSGS2.5-12 SSGS2.5-13	m2.5	10	+0.5	S7	20.2	35	25	32.25	25	20.2	135	195
		11	+0.5		22.7		34.75	22.7				
		12	0		22.7		35	22.7				
		13	0		25.2		37.5	25.2				
SSGS3-10 SSGS3-11 SSGS3-12 SSGS3-13	m3	10	+0.5	S7	24.2	40	30	38.7	30	24.2	150	220
		11	+0.5		27.2		41.7	27.2				
		12	0		27.2		42	27.2				
		13	0		30.2		45	30.2				

- [Caution on Product Characteristics]
- The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see Page 24 for more details.
 - Products with modules 1.5 or higher and number of teeth of 10 and 11 are profile shifted gears ($x = +0.5$). Please refer to the table below for the center distance at the time of assembly.
 - The indicated backlash is the backlash in the normal direction when a 30-tooth SSG spur gear is assembled with the same module using theoretical values.

Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog Number
Bending strength	Surface durability	Bending strength	Surface durability			
12.7	3.76	1.30	0.38	0.08~0.16	0.14	SSGS1.5-10
14.5	4.61	1.48	0.47			
9.97	4.70	1.02	0.48			
12.1	5.51	1.23	0.56			
30.2	9.07	3.08	0.93	0.11~0.21	0.30	SSGS2-10
34.3	11.0	3.50	1.12			
23.6	11.3	2.41	1.15			
28.6	13.3	2.92	1.35			
58.9	17.9	6.01	1.83	0.11~0.21	0.54	SSGS2.5-10
67.1	22.0	6.84	2.24			
46.2	22.4	4.71	2.28			
46.6	21.9	4.75	2.23			
102	31.3	10.4	3.19	0.11~0.21	0.89	SSGS3-10
96.6	31.9	9.85	3.26			
66.5	32.6	6.78	3.32			
80.4	38.3	8.20	3.91			

- [Caution on Secondary Operations]
- Please read "Cautions on Performing Secondary Operations" (Page 26) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK 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. 2 to 3 mm). Please use a carbide tool or the like when machining shafts that are close to the tooth root.

Center distance of stock spur gear meshing with profile shifted gear

The center distance of the stock gear ($x = 0$) that meshes with profile shifted gear ($x = +0.5$) of $m = 1$ is shown in the table at right. Please multiply the module of the gear to be used.

Center distance where number of teeth is 12 to 30 (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	

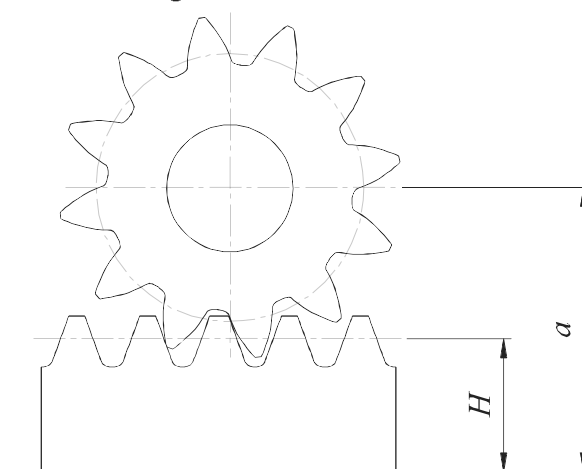
Center distance where number of teeth is 32 to 62 (unit: mm)

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	

Center distance where number of teeth is 64 to 200 (unit: mm)

No. of teeth ($x = 0$)	No. of teeth ($x = +0.5$)	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	

Mounting distance of a profile shifted gear and the meshing rack



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

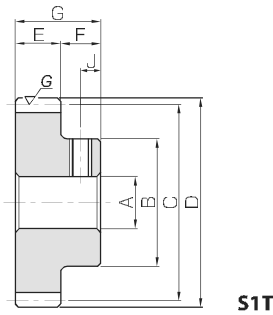
Where
 a : Mounting distance
 H : Pitch line height
 m : Module
 z : No. of teeth
 x : Dislocation coefficient





Specifications	
Precision grade	JIS grade N7 (JIS B1702-1:1998)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C*
Heat Treatment	— *
Tooth hardness	200 to 270HB
Surface treatment	Black oxide coated except for teeth

*Products with modules of 0.8 or under use S45C thermal refined equivalent materials and are not hardened.



S1T

Catalog Number	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total Length	Keyway
				A _{H7}	B	C	D	E	F	G	Width × Depth
SSG0.5-30A SSG0.5-30B	m0.5	30	S1T	5	13	15	16	5	7	12	—
SSG0.5-32A		32		5	14	16	17				
SSG0.5-40B		40		6	18	20	21				
SSG0.5-50B		50		6	22	25	26				
SSG0.5-60A SSG0.5-60B		60		6	28	30	31				
SSG0.5-70B		70		8	28	35	36				
SSG0.5-80A		80		6	28	40	41				
SSG0.8-20A SSG0.8-20B		m0.8		20	S1T	5	13				
SSG0.8-25A	25		5	16		20	21.6				
SSG0.8-30A	30		5	20		24	25.6				
SSG0.8-34A	34		6	22		27.2	28.8				
SSG0.8-40B	40		8	28		32	33.6				
SSG0.8-50A	50		6	28		40	41.6				
SSG0.8-60A SSG0.8-60B	60		6	28		48	49.6				
SSG0.8-70A	70		6	28		56	57.6				
SSG0.8-80A	80		6	28		64	65.6				

- [Caution on Product Characteristics]
- ① For products having 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 24 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 When using S1T set screws for fastening gears to a shaft, only use this method for applications with light load usage. For secure fastening, please use dowel pins in combination.

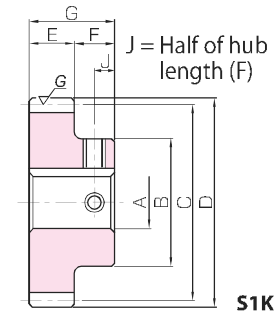
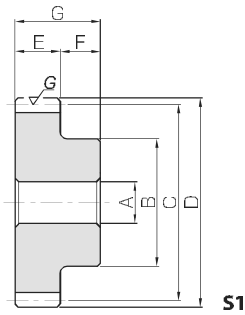
Socket head screw	Allowable torque (N·m)	Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog Number	
		Bending strength	Surface durability				
M4	3.5	1.63	0.29	0.17	0.030	0~0.08	
		1.78	0.34	0.18	0.035		
		2.38	0.55	0.24	0.056		
		3.14	0.89	0.32	0.091		
		M4 M5	3.91	1.32	0.40		0.13
		M5 M4	3.90	1.53	0.40		0.16
M4	4	4.55	2.04	0.46	0.21	0~0.08	
		3.79	0.53	0.39	0.054		
		5.22	0.88	0.53	0.090		
		6.70	1.30	0.68	0.13		
		7.90	1.71	0.81	0.17		
		8.11	2.02	0.83	0.21		
		10.7	3.26	1.09	0.33		
		M4 M5	13.3	4.83	1.36		0.49
		M4	16.0	6.73	1.63		0.69
		M4	18.7	8.97	1.90		0.91

- [Caution on Secondary Operations]
- ① Please read "Cautions on Performing Secondary Operations" (Page 26) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK system for quick modification of KHK stock gears, is also available.



Specifications	
Precision grade	JIS grade N7 (JIS B1702-1:1998)*
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat Treatment	Gear teeth induction hardened
Tooth hardness	50 to 60HRC
Surface treatment	Black oxide coated except for teeth

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



Additional Products



To order J Series products, please specify: **Catalog No. + J + BORE.**

Catalog Number	No. of teeth	Shape	Bore		Pitch dia.	Outside dia.	Face width	Hub width	Total Length	Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)
			A _{H7}	B						Bending strength	Surface durability	Bending strength	Surface durability		
SSG4-14	14	20	40	56	64	40	25	65	176	63.4	17.9	6.47	0.14~0.24	0.86	
SSG4-15	15		45	60	68				197	74.1	20.1	7.55			
SSG4-16	16		50	64	72				218	85.6	22.3	8.73			
SSG4-18	18		60	72	80				262	111	26.7	11.4			
SSG4-20	20		65	80	88				307	141	31.3	14.3			
SSG4-22	22		70	88	96				352	174	35.9	17.7			
SSG4-24	24		75	96	104				368	194	37.5	19.8			
SSG4-25	25		80	100	108				389	213	39.7	21.7			
SSG4-28	28		85	112	120				455	270	46.4	27.5			
SSG4-30	30		90	120	128				499	313	50.9	31.9			
SSG4-32	32	S1	90	128	136	40	25	65	544	358	55.5	36.5	0.16~0.26	5.04	
SSG4-35	35		90	140	148				612	432	62.4	44.0			
SSG4-36	36		90	144	152				634	458	64.7	46.7			
SSG4-40	40		90	160	168				674	529	68.7	54.0			
SSG4-42	42		90	168	176				717	586	73.1	59.7			
SSG4-44	44		90	176	184				760	646	77.5	65.8			
SSG4-45	45		90	180	188				781	677	79.6	69.0			
SSG4-48	48		100	192	200				846	774	86.3	79.0			
SSG4-50	50		100	200	208				889	842	90.7	85.9			
SSG4-55	55		100	220	228				998	1030	102	105			
SSG4-56	56	110	224	232	1020	1060	104	109							
SSG4-60	60	110	240	248	1110	1230	113	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 24 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 "Cautions on Performing Secondary Operations" (Page 26) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK 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. 2 to 3 mm).

Bore H7	* The product shapes of J Series items are identified by background color.													
	20	22	25	28	30	32	35	40	45	50	55	60	65	70
Keyway J _{S9}	20	22	25	28	30	32	35	40	45	50	55	60	65	70
Screw size	6×2.8	8×3.3	10×3.3	12×3.3	14×3.8	16×4.3	18×4.4	20×4.9						
Catalog Number	M5	M6	M8	M10	M12	M16								
SSG4-14 J BORE	S1K	S1K												
SSG4-15 J BORE	S1K	S1K	S1K											
SSG4-16 J BORE	S1K	S1K	S1K	S1K	S1K									
SSG4-18 J BORE	S1K	S1K	S1K	S1K	S1K	S1K	S1K							
SSG4-20 J BORE	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K						
SSG4-22 J BORE	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K						
SSG4-24 J BORE	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K					
SSG4-25 J BORE	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K				
SSG4-28 J BORE	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K				
SSG4-30 J BORE	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K			
SSG4-32 J BORE			S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K		
SSG4-35 J BORE			S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K		
SSG4-36 J BORE			S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K		
SSG4-40 J BORE			S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K		
SSG4-42 J BORE			S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K		
SSG4-44 J BORE					S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K		
SSG4-45 J BORE					S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K		
SSG4-48 J BORE					S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	
SSG4-50 J BORE					S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	
SSG4-55 J BORE					S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	
SSG4-56 J BORE					S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	
SSG4-60 J BORE					S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	

[Caution on J series] ① As available-on-request products, these require a lead-time for shipping within 7 working days (excludes the day ordered), after placing an order.

② Up to 5 units are supported. For quantities of 6 or more pieces, we need to quote price and lead time.

③ Keyways are made according to JIS B1301 standards, J_{S9} tolerance.

④ Certain products which would otherwise have a very long tapped hole are counterbored to reduce the length of the tap. For details, please see the KHK Web Catalog.

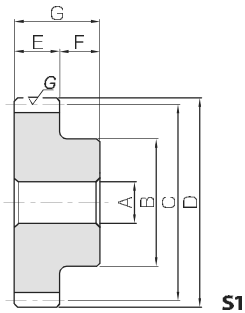
⑤ Areas of products which have been re-worked will not be black oxide coated.

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



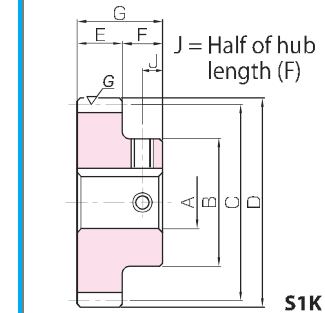
Specifications	
Precision grade	JIS grade N7 (JIS B1702-1:1998)*
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat Treatment	Gear teeth induction hardened
Tooth hardness	50 to 60HRC
Surface treatment	Black oxide coated except for teeth

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



S1

J Series



S1K

Ground Spur Gears

Additional Products



Catalog Number	No. of teeth	Shape	Bore A _{H7}	Hub dia. B	Pitch dia. C	Outside dia. D	Face width E	Hub width F	Total Length G	Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)
										Bending strength	Surface durability	Bending strength	Surface durability		
SSG5-20	20	S1	25	82	100	110	50	25	75	553	259	56.4	26.5	0.14~0.26	3.83
SSG5-25	25			105	125	135				760	426	77.5	43.4	0.18~0.30	6.23
SSG5-30	30			120	150	160				975	623	99.4	63.5	0.18~0.30	8.87
SSG5-32	32	S1	25	120	160	170	50	25	75	987	651	101	66.4	0.14~0.26	9.82
SSG5-35	35			130	175	185				1110	786	113	80.1		11.8
SSG5-36	36			130	180	190				1151	834	117	85.0		12.3
SSG5-40	40			140	200	210				1317	1040	134	106		15.1
SSG5-42	42			140	210	220				1401	1153	143	118		16.3
SSG5-44	44			150	220	230				1485	1271	151	130		18.1
SSG5-45	45			150	225	235				1527	1333	156	136		18.8
SSG5-48	48			150	240	250				1653	1527	169	156		20.9
SSG5-50	50			150	250	260				1738	1664	177	170		22.5
SSG5-55	55			150	275	285				1820	1899	186	194		26.5
SSG5-56	56	150	280	290	1860	1972	190	201	27.4						
SSG5-60	60	150	300	310	2020	2281	206	233	30.9						
SSG6-20	20	S1	25	100	120	132	60	28	88	955	457	97.4	46.6	0.18~0.30	6.71
SSG6-25	25		30	125	150	162				1310	747	134	76.2		10.5
SSG6-30	30		30	150	180	192				1560	1020	160	104		15.4
SSG6-32	32	S1	30	150	192	204	60	28	88	1706	1146	174	117	0.18~0.30	17.0
SSG6-35	35			160	210	222				1918	1383	196	141		20.2
SSG6-36	36			160	216	228				1990	1468	203	150		21.2
SSG6-40	40			170	240	252				2276	1833	232	187		25.8
SSG6-42	42			170	252	264				2420	2031	247	207		28.0
SSG6-44	44			170	264	276				2394	2091	244	213		30.3
SSG6-45	45			180	270	282				2462	2192	251	224		32.1
SSG6-48	48			180	288	300				2666	2511	272	256		35.8
SSG6-50	50			180	300	312				2803	2737	286	279		38.4
SSG6-55	55			180	330	342				3146	3345	321	341		45.4
SSG6-56	56	180	336	348	3215	3475	328	354	46.9						
SSG6-60	60	180	360	372	3491	4018	356	410	53.1						
SSG8-20	20	S1	30	130	160	176	75	35	100	2125	1012	217	103	0.22~0.38	14.9
SSG8-25	25			160	200	216				2924	1644	298	168		23.4
SSG8-30	30			190	240	256				3481	2238	355	228		33.8
SSG8-32	32			200	256	272				3792	2563	387	261		38.3
SSG8-35	35			210	280	296				4263	3095	435	316		45.2
SSG8-36	36			210	288	304				4421	3284	451	335		47.3
SSG8-40	40			220	320	336				5058	4099	516	418		57.2
SSG8-42	42			230	336	352				5379	4542	548	463		63.0
SSG8-44	44			230	352	368				5701	5010	581	511		68.1
SSG8-45	45			230	360	376				5862	5252	598	536		70.7
SSG8-48	48	240	384	400	5925	5616	604	573	80.0						
SSG8-50	50	240	400	416	6228	6120	635	624	85.8						
SSG8-55	55	240	440	456	6991	7456	713	760	101						
SSG8-56	56	240	448	464	7144	7738	728	789	105						
SSG8-60	60	240	480	496	7757	8920	791	910	118						
SSG10-20	20	S1	40	160	200	220	90	40	130	3985	1948	406	199	0.26~0.42	27.2
SSG10-25	25			200	250	270				5090	2926	519	298		43.3
SSG10-30	30			240	300	320				6526	4294	665	438		62.9
SSG10-32	32			250	320	340				7110	4919	725	502		71.0
SSG10-35	35			260	350	370				7994	5940	815	606		83.4
SSG10-36	36			270	360	380				8290	6303	845	643		88.6
SSG10-40	40			280	400	420				8852	7344	903	749		107

To order J Series products, please specify: **Catalog No. + J + BORE.**

Bore H7	* The product shapes of J Series items are identified by background color.															
	25	28	30	32	35	40	45	50	55	60	65	70	75	80		
Keyway J _{S9}	8x3.3		10x3.3			12x3.3		14x3.8		16x4.3		18x4.4		20x4.9		
Screw size	M6				M8				M10				M12			
Catalog Number	M6				M8				M10				M12			
SSG5-20 J BORE	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	
SSG5-25 J BORE	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	
SSG5-30 J BORE	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	
SSG6-20 J BORE	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	
SSG6-25 J BORE			S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	
SSG6-30 J BORE			S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	

- [Caution on J series]
- As available-on-request products, these require a lead-time for shipping within 7 working days (excludes the day ordered), after placing an order.
 - Up to 5 units are supported. For quantities of 6 or more pieces, we need to quote price and lead time.
 - Keyways are made according to JIS B1301 standards, J_{S9} tolerance.
 - Certain products which would otherwise have a very long tapped hole are counterbored to reduce the length of the tap. For details, please see the KHK Web Catalog.
 - 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.

S Semi-custom standard products

- No effort spent on design
Simply select the gears you need from the catalog, eliminating design costs.
- Fast delivery available
Products are delivered with a consistent production system and within the lead time listed in the catalog (for orders of 5 units or less).
- Reliable quality
The mark of trust "KHK" guarantees the quality of products listed in the catalog.

- [Caution on Product Characteristics]
- The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see Page 24 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.
 - Products marked with S are semi-custom standard products. The delivery will take about 25 business days after the order is received.
 - For semi-custom standard products weighing 15 kg or more, eyebolt mounting screws (2-M12 depth 25 mm) are machined around the periphery of the boss side surface.

- [Caution on Secondary Operations]
- Please read "Cautions on Performing Secondary Operations" (Page 26) when performing modifications and/or secondary operations for safety concerns.
KHK Quick-Mod Gears, the KHK 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. 2 to 3 mm).



Specifications	
Precision grade	JIS grade N7 (JIS B1702-1:1998)*
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat Treatment	Gear teeth induction hardened
Tooth hardness	50 to 60HRC
Surface treatment	Black oxide coated except for teeth and portions given secondary operation

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

Catalog Number	No. of teeth	Hub dia.		Pitch dia.		Outside dia.		Face width		Hub width	
		B	C	D	E	F					
SSG2-25	25	40	50	54							
SSG2-26	26	42	52	56							
SSG2-27	27	44	54	58							
SSG2-28	28	45	56	60							
SSG2-29	29	48	58	62							
SSG2-30	30	50	60	64							
SSG2-32	32	50	64	68							
SSG2-34	34	50	68	72							
SSG2-35	35	50	70	74							
SSG2-36	36	50	72	76							
SSG2-38	38	50	76	80							
SSG2-40	40	60	80	84							
SSG2-42	42	60	84	88							
SSG2-44	44	60	88	92							
SSG2-45	45	60	90	94							
SSG2-48	48	60	96	100							
SSG2-50	50	60	100	104							
SSG2-55	55	60	110	114							
SSG2-56	56	60	112	116							
SSG2-60	60	65	120	124							
SSG2-64	64	65	128	132							
SSG2-70	70	70	140	144							
SSG2-75	75	70	150	154							
SSG2-80	80	80	160	164							
SSG2-90	90	80	180	184							
SSG2-100	100	80	200	204							

Bore A	Sintered Metal Bushings		Total Length	Hex socket bolt		Ref. thrust load	Ref. slipping torque	Bolt tightening torque	Bushing weight
	L	K		Qty	Size				
15	6.5	31.5	42.5	6	M4x15	9.46	70	3.9	66
16		33				9.46	75	3.9	75
17		33.5				12.6	110	3.9	75
18		34.5				12.6	115	3.9	80
19		35.5				12.6	120	3.9	81
20	8	42	44	8	M5x18	21.6	220	8.8	144
22		44				26	290	8.8	165
25		47				27.2	350	8.8	188
28		50				27	380	8.8	195
30	8.5	52	44.5	10	M6x20	27	410	8.8	208
32		54				27	440	8.8	219
35		62				41.1	720	15.7	325
40	10	67	46	10	M6x20	40.2	810	15.7	380
45		72				52.9	1200	15.7	435
50		77				56.3	1500	15.7	485

*For the permitted torque and backlash of each product, please refer to the dimensional table of the original product.

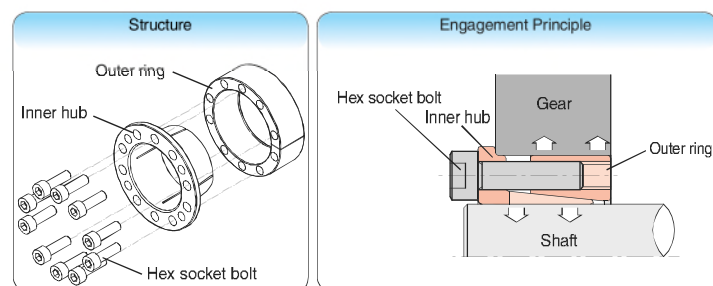
Features of F Series

- No rattling of shaft and gear when fastening
- Freely positionable mounting for easy meshing of teeth
- Easily mounted and removed for repeated use
- The bushing slides when overloaded to reduce damage to the gears.

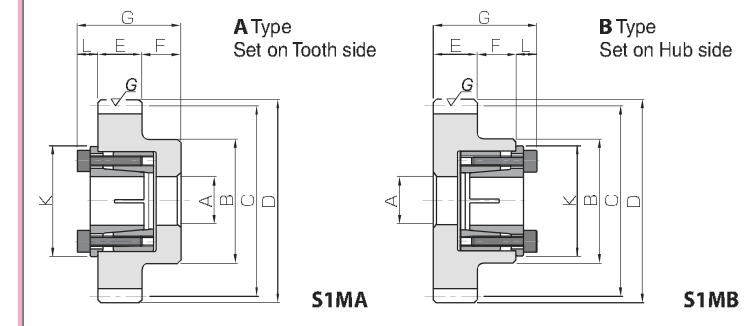


Structure and Engagement Principles

The structure consists of an outer ring and inner ring with split grooves in the tapered part, and hexagon socket head cap screws that convert the force into tightening strength. In principle, the tightening strength of hexagon socket head cap screws spreads the outer and inner rings by taper engagement, and the gear and shaft become fastened by surface pressure.



F Series



To order F Series products, please specify: **Catalog Number + F + BORE + Type.**

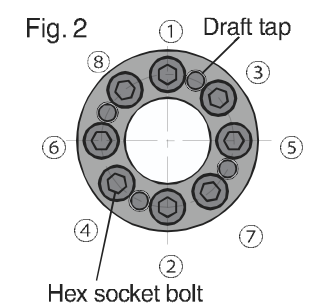
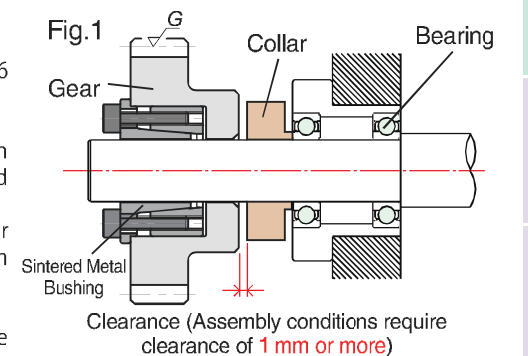
A Type Only
A/B Types

Catalog Number	Bore A															
	15	16	17	18	19	20	22	25	28	30	32	35	40	45	50	
SSG2-25 F Bore Type	S1MA/S1MB	S1MA	S1MA													
SSG2-26 F Bore Type	S1MA/S1MB	S1MA/S1MB	S1MA	S1MA	S1MA											
SSG2-27 F Bore Type	S1MA/S1MB	S1MA/S1MB	S1MA	S1MA	S1MA											
SSG2-28 F Bore Type	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA	S1MA											
SSG2-29 F Bore Type	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB											
SSG2-30 F Bore Type				S1MA/S1MB	S1MA/S1MB											
SSG2-32 F Bore Type				S1MA/S1MB	S1MA/S1MB	S1MA										
SSG2-34 F Bore Type				S1MA/S1MB	S1MA/S1MB	S1MA										
SSG2-35 F Bore Type				S1MA/S1MB	S1MA/S1MB	S1MA										
SSG2-36 F Bore Type				S1MA/S1MB	S1MA/S1MB	S1MA	S1MA	S1MA								
SSG2-38 F Bore Type				S1MA/S1MB	S1MA/S1MB	S1MA	S1MA	S1MA								
SSG2-40 F Bore Type						S1MA/S1MB	S1MA	S1MA	S1MA	S1MA	S1MA					
SSG2-42 F Bore Type						S1MA/S1MB	S1MA	S1MA	S1MA	S1MA	S1MA					
SSG2-44 F Bore Type						S1MA/S1MB	S1MA	S1MA	S1MA	S1MA	S1MA					
SSG2-45 F Bore Type						S1MA/S1MB	S1MA	S1MA	S1MA	S1MA	S1MA					
SSG2-48 F Bore Type						S1MA/S1MB	S1MA	S1MA	S1MA	S1MA	S1MA					
SSG2-50 F Bore Type							S1MA	S1MA	S1MA	S1MA	S1MA					
SSG2-55 F Bore Type							S1MA	S1MA	S1MA	S1MA	S1MA					
SSG2-56 F Bore Type							S1MA	S1MA	S1MA	S1MA	S1MA					
SSG2-60 F Bore Type							S1MA	S1MA	S1MA	S1MA	S1MA					
SSG2-64 F Bore Type							S1MA	S1MA	S1MA	S1MA	S1MA					
SSG2-70 F Bore Type							S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA	S1MA				
SSG2-75 F Bore Type							S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA	S1MA				
SSG2-80 F Bore Type							S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA	S1MA	S1MA	S1MA		
SSG2-90 F Bore Type							S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA	S1MA	S1MA	S1MA		
SSG2-100 F Bore Type							S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA	S1MA	S1MA	S1MA		

- [Caution on F Series]
- ① As available-on-request products, these require a lead-time for shipping within 2 working days (excludes the day ordered), after placing an order.
 - 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 Additionally the machined parts of the fastener components and gears are not black oxide coated.

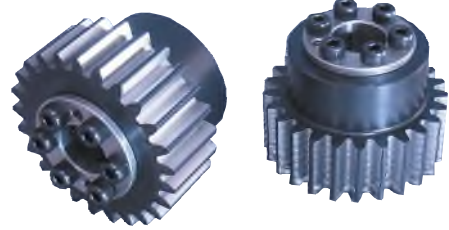
Mounting Method and Precautions

- ① Shaft diameter recommended tolerance is h7. The limit is h8, but we recommend h6 when minimizing runout. Use 1.6a as reference for the surface roughness of the shaft diameter.
- ② Wipe away any debris, dirt or oil on the shaft surface and hole of the fastened section with thinner or the like, and lightly apply hydraulic oil #68. Do not apply molybdenum-based oil or oil with additives, as this may cause reduced fastening torque or slippage.
- ③ Pass completely through the shaft while pressing the bushing flange against the gear before tightening. Removal will not be possible, so be sure to leave a clearance of 1mm or more on the gear rear surface side. (Fig.1)
- ④ Use a torque wrench to fasten bolts on opposite sides when tightening. First tighten at 1/4 of the regulated torque, then at 1/2 of the regulated torque, before finally tightening up to the regulated torque. Do not tighten without passing through the shaft, or fasten the bolts after insertion on the draft tap side. (Fig.2)
- ⑤ If the shaft has a keyway, the fastened section contact area is reduced and the transmission rate is decreased by 15 to 20%.



Removal Method and Precautions

- ① Turn off the power source (supply), check that no load is applied to the gear, and confirm that there is no danger due to falling, etc.
- ② Insert removed bolts into all draft taps, and gradually and evenly tighten each bolt in diagonal order until removal is complete.
- ③ The washer and thread surfaces will be roughened, compromising tightening strength, if the bolts are reused. Consequently, we recommend using new bolts of the same size.



Specifications	
Precision grade	JIS grade N7 (JIS B1702-1:1998)*
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat Treatment	Gear teeth induction hardened
Tooth hardness	50 to 60HRC
Surface treatment	Black oxide coated except for teeth and portions given secondary operation

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

Catalog Number	No. of teeth	Hub dia.		Pitch dia.		Outside dia.		Face width		Hub width
		B	C	D	E	F				
SSG2.5-30	30	65	75	80						
SSG2.5-32	32	70	80	85						
SSG2.5-34	34	70	85	90						
SSG2.5-35	35	70	87.5	92.5						
SSG2.5-36	36	70	90	95						
SSG2.5-38	38	70	95	100						
SSG2.5-40	40	70	100	105						
SSG2.5-42	42	75	105	110						
SSG2.5-44	44	75	110	115						
SSG2.5-45	45	75	112.5	117.5						
SSG2.5-48	48	75	120	125						
SSG2.5-50	50	80	125	130						
SSG2.5-55	55	80	137.5	142.5						
SSG2.5-56	56	80	140	145						
SSG2.5-60	60	80	150	155						
SSG2.5-70	70	80	175	180						
SSG2.5-75	75	90	187.5	192.5						
SSG2.5-80	80	90	200	205						

Bore A	Sintered Metal Bushings		Total Length	Hex socket bolt		Ref. thrust load kN	Ref. slipping torque N-m	Bolt tightening torque N-m	Bushing weight (g)
	L	K		Qty	Size				
20		42				21.6	220	8.8	144
22	8	44	51	8	M5x18	26	290	8.8	165
25		47				27.2	350	8.8	188
28		50				27	380	8.8	195
30	8.5	52	51.5	10	M5x18	27	410	8.8	208
32		54				27	440	8.8	219
35		62		8	M6x20	41.1	720	15.7	325
40	10	67	53	10	M6x20	40.2	810	15.7	380
45		72				52.9	1200	15.7	435
50	10.5	77	53.5			56.3	1500	15.7	485

*For the permitted torque and backlash of each product, please refer to the dimensional table of the original product.

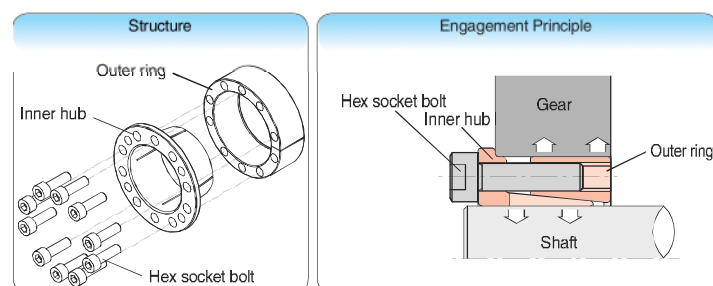
Features of F Series

- No rattling of shaft and gear when fastening
- Freely positionable mounting for easy meshing of teeth
- Easily mounted and removed for repeated use
- The bushing slides when overloaded to reduce damage to the gears.

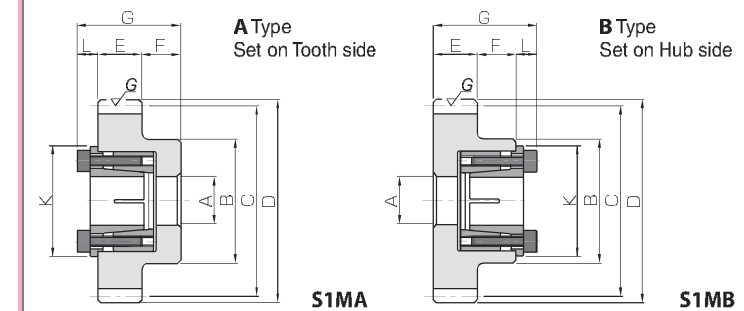


Structure and Engagement Principles

The structure consists of an outer ring and inner ring with split grooves in the tapered part, and hexagon socket head cap screws that convert the force into tightening strength. In principle, the tightening strength of hexagon socket head cap screws spreads the outer and inner rings by taper engagement, and the gear and shaft become fastened by surface pressure.



F Series



To order F Series products, please specify: **Catalog Number + F + BORE + Type.**

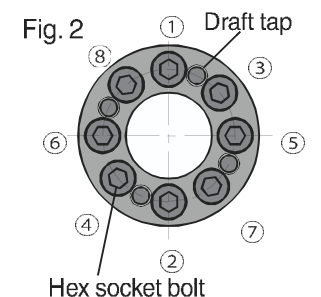
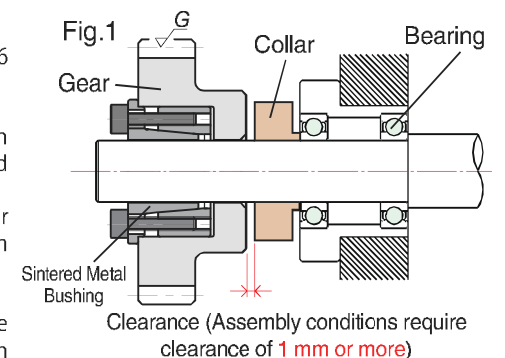
A Type Only
A/B Types

Bore A	Catalog Number									
	20	22	25	28	30	32	35	40	45	50
SSG2.5-30 F Bore Type	S1MA/S1MB	S1MA	S1MA	S1MA						
SSG2.5-32 F Bore Type	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB				
SSG2.5-34 F Bore Type	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB				
SSG2.5-35 F Bore Type	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB				
SSG2.5-36 F Bore Type	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB				
SSG2.5-38 F Bore Type	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA			
SSG2.5-40 F Bore Type			S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA	S1MA		
SSG2.5-42 F Bore Type			S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA	S1MA		
SSG2.5-44 F Bore Type			S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA	S1MA		
SSG2.5-45 F Bore Type			S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA	S1MA	S1MA	
SSG2.5-48 F Bore Type			S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA	S1MA	S1MA	
SSG2.5-50 F Bore Type			S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA	S1MA	S1MA	S1MA
SSG2.5-55 F Bore Type			S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA	S1MA	S1MA	S1MA
SSG2.5-56 F Bore Type			S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA	S1MA	S1MA	S1MA
SSG2.5-60 F Bore Type			S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA	S1MA	S1MA	S1MA
SSG2.5-70 F Bore Type			S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA	S1MA	S1MA	S1MA
SSG2.5-75 F Bore Type			S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA	S1MA
SSG2.5-80 F Bore Type			S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA	S1MA

- [Caution on F Series]
- ① As available-on-request products, these require a lead-time for shipping within 2 working days (excludes the day ordered), after placing an order.
 - 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 Additionally the machined parts of the fastener components and gears are not black oxide coated.

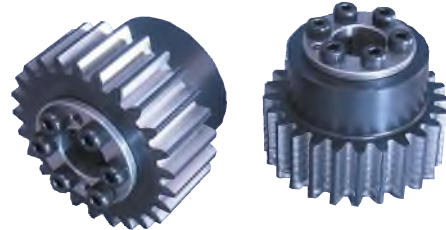
Mounting Method and Precautions

- ① Shaft diameter recommended tolerance is h7. The limit is h8, but we recommend h6 when minimizing runout. Use 1.6a as reference for the surface roughness of the shaft diameter.
- ② Wipe away any debris, dirt or oil on the shaft surface and hole of the fastened section with thinner or the like, and lightly apply hydraulic oil #68. Do not apply molybdenum-based oil or oil with additives, as this may cause reduced fastening torque or slippage.
- ③ Pass completely through the shaft while pressing the bushing flange against the gear before tightening. Removal will not be possible, so be sure to leave a clearance of 1mm or more on the gear rear surface side. (Fig.1)
- ④ Use a torque wrench to fasten bolts on opposite sides when tightening. First tighten at 1/4 of the regulated torque, then at 1/2 of the regulated torque, before finally tightening up to the regulated torque. Do not tighten without passing through the shaft, or fasten the bolts after insertion on the draft tap side. (Fig.2)
- ⑤ If the shaft has a keyway, the fastened section contact area is reduced and the transmission rate is decreased by 15 to 20%.



Removal Method and Precautions

- ① Turn off the power source (supply), check that no load is applied to the gear, and confirm that there is no danger due to falling, etc.
- ② Insert removed bolts into all draft taps, and gradually and evenly tighten each bolt in diagonal order until removal is complete.
- ③ The washer and thread surfaces will be roughened, compromising tightening strength, if the bolts are reused. Consequently, we recommend using new bolts of the same size.



Specifications	
Precision grade	JIS grade N7 (JIS B1702-1:1998)*
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat Treatment	Gear teeth induction hardened
Tooth hardness	50 to 60HRC
Surface treatment	Black oxide coated except for teeth and portions given secondary operation

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

Catalog Number	No. of teeth	Hub dia.		Pitch dia.		Outside dia.		Face width	Hub width
		B	C	D	E	F			
SSG3-25	25	60	75	81					
SSG3-26	26	62	78	84					
SSG3-27	27	65	81	87					
SSG3-28	28	70	84	90					
SSG3-29	29	70	87	93					
SSG3-30	30	75	90	96					
SSG3-32	32	75	96	102					
SSG3-34	34	75	102	108					
SSG3-35	35	80	105	111					
SSG3-36	36	80	108	114					
SSG3-38	38	80	114	120					
SSG3-40	40	80	120	126	30	20			
SSG3-42	42	80	126	132					
SSG3-44	44	80	132	138					
SSG3-45	45	80	135	141					
SSG3-48	48	85	144	150					
SSG3-50	50	85	150	156					
SSG3-55	55	90	165	171					
SSG3-56	56	90	168	174					
SSG3-60	60	100	180	186					
SSG3-70	70	100	210	216					
SSG3-75	75	100	225	231					
SSG3-80	80	100	240	246					

Bore A	Sintered Metal Bushings		Total Length	Hex socket bolt		Ref. thrust load kN	Ref. slipping torque N-m	Bolt tightening torque N-m	Bushing weight (g)
	L	K		G	Qty				
20		42				21.6	220	8.8	144
22	8	44	58	8	M5×18	26	290	8.8	165
25		47				27.2	350	8.8	188
28		50				27	380	8.8	195
30	8.5	52	58.5	10	M5×18	27	410	8.8	208
32		54				27	440	8.8	219
35		62		8	M6×20	41.1	720	15.7	325
40	10	67	60	10	M6×20	40.2	810	15.7	380
45		72				52.9	1200	15.7	435
50	10.5	77	60.5			56.3	1500	15.7	485

* For the permitted torque and backlash of each product, please refer to the dimensional table of the original product.

Features of F Series

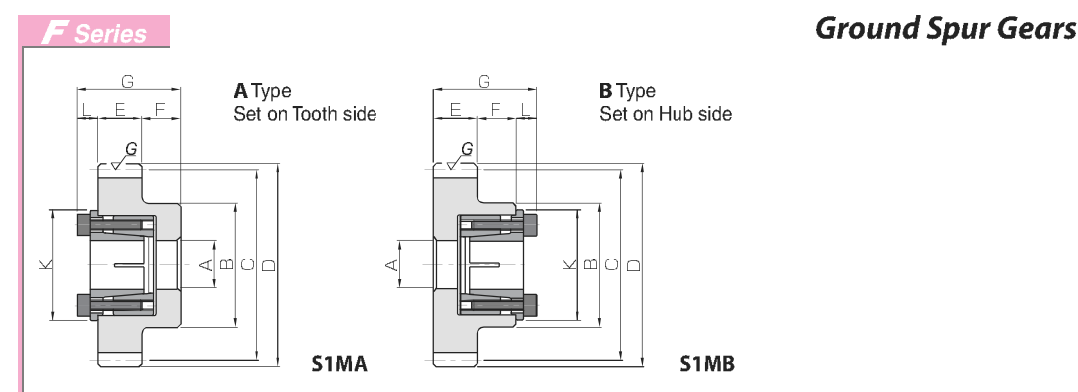
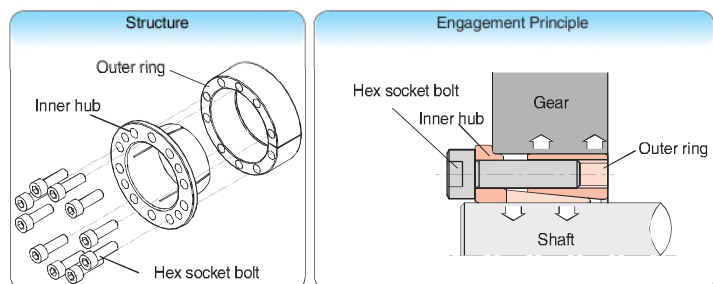
- No rattling of shaft and gear when fastening
- Freely positionable mounting for easy meshing of teeth
- Easily mounted and removed for repeated use
- The bushing slides when overloaded to reduce damage to the gears.



Structure and Engagement Principles

The structure consists of an outer ring and inner ring with split grooves in the tapered part, and hexagon socket head cap screws that convert the force into tightening strength.

In principle, the tightening strength of hexagon socket head cap screws spreads the outer and inner rings by taper engagement, and the gear and shaft become fastened by surface pressure.



To order F Series products, please specify: **Catalog Number + F + BORE + Type.**

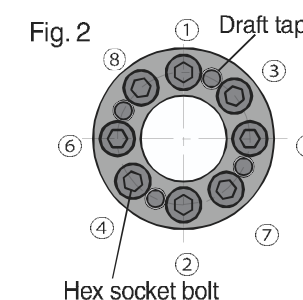
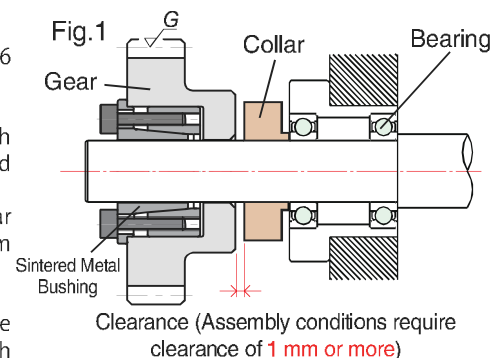
A Type Only
A/B Types

Bore A	Bore A										
	Catalog Number	20	22	25	28	30	32	35	40	45	50
SSG3-25 F Bore Type	S1MA/S1MB	S1MA	S1MA								
SSG3-26 F Bore Type	S1MA/S1MB	S1MA	S1MA	S1MA	S1MA	S1MA					
SSG3-27 F Bore Type	S1MA/S1MB	S1MA	S1MA	S1MA	S1MA	S1MA					
SSG3-28 F Bore Type	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB				
SSG3-29 F Bore Type	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB				
SSG3-30 F Bore Type			S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB				
SSG3-32 F Bore Type			S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA				
SSG3-34 F Bore Type			S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA	S1MA			
SSG3-35 F Bore Type			S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA	S1MA			
SSG3-36 F Bore Type			S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA	S1MA			
SSG3-38 F Bore Type			S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA	S1MA	S1MA		
SSG3-40 F Bore Type			S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA	S1MA	S1MA	S1MA	
SSG3-42 F Bore Type			S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA	S1MA	S1MA	S1MA	S1MA
SSG3-44 F Bore Type			S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA	S1MA	S1MA	S1MA	S1MA
SSG3-45 F Bore Type			S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA	S1MA	S1MA	S1MA	S1MA
SSG3-48 F Bore Type			S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA	S1MA	S1MA	S1MA	S1MA
SSG3-50 F Bore Type					S1MA/S1MB	S1MA/S1MB	S1MA	S1MA	S1MA	S1MA	S1MA
SSG3-55 F Bore Type					S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA	S1MA
SSG3-56 F Bore Type					S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA	S1MA
SSG3-60 F Bore Type					S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA	S1MA
SSG3-70 F Bore Type					S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA	S1MA
SSG3-75 F Bore Type					S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA	S1MA
SSG3-80 F Bore Type					S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA/S1MB	S1MA	S1MA

- [Caution on F Series]
- ① As available-on-request products, these require a lead-time for shipping within 2 working days (excludes the day ordered), after placing an order.
 - 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 Additionally the machined parts of the fastener components and gears are not black oxide coated.

Mounting Method and Precautions

- ① Shaft diameter recommended tolerance is h7. The limit is h8, but we recommend h6 when minimizing runout. Use 1.6a as reference for the surface roughness of the shaft diameter.
- ② Wipe away any debris, dirt or oil on the shaft surface and hole of the fastened section with thinner or the like, and lightly apply hydraulic oil #68. Do not apply molybdenum-based oil or oil with additives, as this may cause reduced fastening torque or slippage.
- ③ Pass completely through the shaft while pressing the bushing flange against the gear before tightening. Removal will not be possible, so be sure to leave a clearance of 1mm or more on the gear rear surface side. (Fig.1)
- ④ Use a torque wrench to fasten bolts on opposite sides when tightening. First tighten at 1/4 of the regulated torque, then at 1/2 of the regulated torque, before finally tightening up to the regulated torque. Do not tighten without passing through the shaft, or fasten the bolts after insertion on the draft tap side. (Fig.2)
- ⑤ If the shaft has a keyway, the fastened section contact area is reduced and the transmission rate is decreased by 15 to 20%.



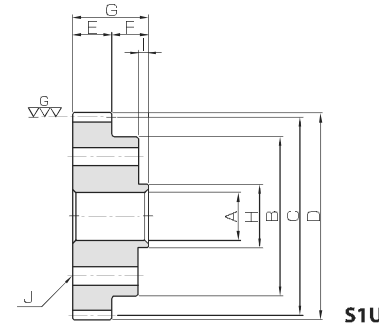
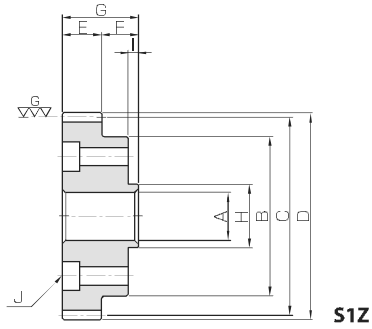
Removal Method and Precautions

- ① Turn off the power source (supply), check that no load is applied to the gear, and confirm that there is no danger due to falling, etc.
- ② Insert removed bolts into all draft taps, and gradually and evenly tighten each bolt in diagonal order until removal is complete.
- ③ The washer and thread surfaces will be roughened, compromising tightening strength, if the bolts are reused. Consequently, we recommend using new bolts of the same size.

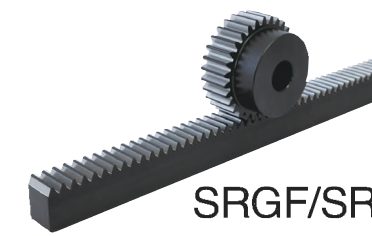


Specifications	
Precision grade	JIS grade N7 (JIS B1702-1:1999)*
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat Treatment	Gear teeth induction hardened
Tooth hardness	50 to 60HRC
Surface treatment	Black oxide coated except for teeth and portions given secondary operation

* The R Series is given secondary operations and has accuracy grades "equivalent" to the original products.



Recommended mating rack



SRGF/SRFGD
Hardened Ground Racks

Please see Page 204 for more details.

Catalog Number	Module	No. of teeth	Shape	Bore		Pitch dia.	Outside dia.	Face width	Hub width	Total Length	Mounting hub dia.	Mounting hub width
				A	B							
SSG1.5-50R24	m1.5	50	S1Z	18	60	75	78	15	14	29	24	4
SSG2-40R24	m2	40	S1Z	20	60	80	84	20	16	36	24	4
SSG2.5-27R24	m2.5	27	S1U	20	56	67.5	72.5	25	18	43	24	4
SSG2.5-28R24		28	60		70	75						
SSG2.5-29R24		29	60		72.5	77.5						
SSG2.5-30R24		30	65		75	80						
SSG2.5-42R32		42	75		105	110						
SSG3-23R24	m3	23	S1U	20	56	69	75	30	20	50	24	4
SSG3-24R24		24	58		72	78						
SSG3-25R24		25	60		75	81						
SSG3-26R24		26	62		78	84						
SSG3-30R32		30	75		90	96						
SSG3-32R32		32	75		96	102						
SSG3-34R32		34	75		102	108						
SSG3-35R32		35	80		105	111						
SSG3-36R32	36	80	108	114								
SSG4-24R32	m4	24	S1Z	20	75	96	104	40	25	65	32	4
SSG4-25R32		25			80	100	108					
SSG5-20R32	m5	20	S1Z	25	82	100	110	50	25	75	32	4
SSG5-30R47		30			120	150	160				47	6
SSG6-25R47	m6	25	S1Z	30	125	150	162	60	28	88	47	6
SSG6-30R60		30			150	180	192				60	6

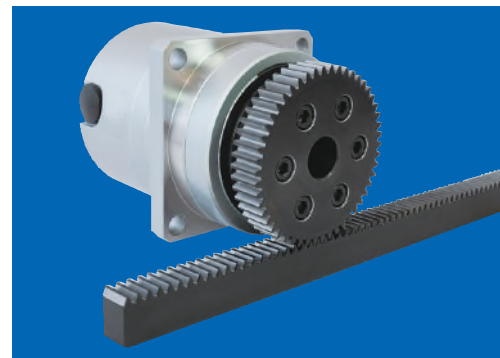
[Caution on Product Characteristics] ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see Page 24 for more details.
② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

Mounting hole specification						Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog Number
J						Bending strength		Surface durability				
Drilled hole dia.	Counterbore dia.	Counterbore depth	Quantity	P.C.D.	Included screws	Bending strength	Surface durability	Bending strength	Surface durability			
6.6	11	9	6	45	M6×20	54.7	47.2	5.58	4.82	0.10~0.18	0.63	SSG1.5-50R24
6.6	11	14	6	45	M6×25	98.3	72.1	10.0	7.35	0.12~0.22	0.89	SSG2-40R24
6.6	11	19	6	45	M6×45	115	63.2	11.7	6.44	0.12~0.22	0.82	SSG2.5-27R24
					M6×25	120	68.2	12.3	6.95			SSG2.5-28R24
					M6×25	126	73.3	12.9	7.48			SSG2.5-29R24
9	14	17	6	60	M8×30	132	78.7	13.5	8.03	0.14~0.24	1.02	SSG2.5-30R24
					M8×30	188	147	19.2	15.0			SSG2.5-42R32
					M6×50	158	78.7	16.1	8.02			SSG3-23R24
6.6	11	24	6	45	M6×30	168	86.4	17.1	8.81	0.12~0.22	1.01	SSG3-24R24
					M6×30	178	94.5	18.1	9.64			SSG3-25R24
					M6×30	188	103	19.2	10.5			SSG3-26R24
9	14	22	6	60	M8×35	228	138	23.3	14.1	0.14~0.24	1.65	SSG3-30R32
					M8×35	229	146	23.4	14.9			SSG3-32R32
					M8×35	248	166	25.3	17.0			SSG3-34R32
9	14	32	6	60	M8×40	258	177	26.3	18.0	0.14~0.24	2.27	SSG3-35R32
					M8×40	268	188	27.3	19.1			SSG3-36R32
					M8×40	368	194	37.5	19.8			SSG4-24R32
9	14	42	14	100	M8×40	389	213	39.7	21.7	0.14~0.24	2.84	SSG4-25R32
					M8×35	553	259	56.4	26.5			SSG5-20R32
9	14	52	14	100	M8×40	975	623	99.4	63.5	0.18~0.30	7.52	SSG5-30R47
					M16×60	1310	747	134	76.2			SSG6-25R47
18	26	44	6	120	M16×60	1560	1020	160	104	0.18~0.30	13.1	SSG6-30R60

[Caution on R Series] ① As available-on-request products, these require a lead-time for shipping within 2 working days (excludes the day ordered), after placing an order.
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 Additionally, the machined parts of the mounted parts and counterbored holes are not black oxide coated.
④ Required number of hexagon socket head cap screws are included.

Features of R Series

- Products matching the mounting holes of the corresponding speed reducer series.
- They come with set bolts and can be used immediately.
- As flange mounting types, they have high rigidity and the gear does not bend.
- Ideal for the mating pinion of racks.

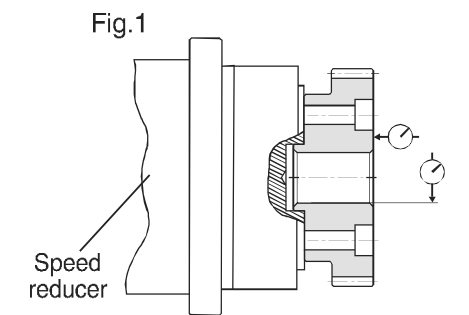


Compatible speed reducers

Manufacturer name	Speed reducer series
Harmonic Drive Systems Co., Ltd.	HPG
Nidec Shimpo Corporation	VRG
Sumitomo Heavy Industries, Ltd.	IB

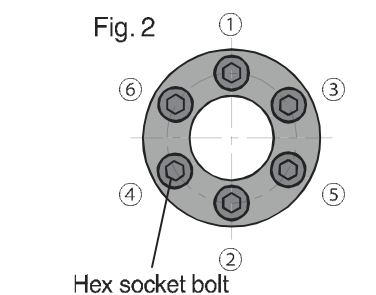
Mounting Method and Precautions

- ① Clean the gear mounting surface and flange surface of the speed reducer and make sure that there are no scratches or dents.
- ② Set the mounting hub of the gear in the hole at the rotational center of the flange, and temporarily tighten the hexagon socket head cap screws.
- ③ Tighten the hexagon socket head cap screws on the diagonals while checking the runout of the gear reference face (Fig. 1). (Fig.2)



Removal Method and Precautions

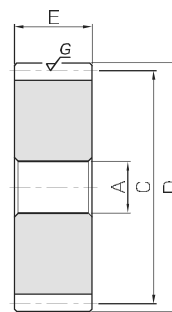
- ① Turn off the power source (supply) and check that no load is applied to the gear.
- ② Loosen the hexagon socket head cap screws and make sure that the gear moves freely.
- ③ Remove the hexagon socket head cap screws while making sure that there is no danger of falling, etc.





Specifications	
Precision grade	JIS grade N7 (JIS B1702-1: 1988)*
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat Treatment	Gear teeth induction hardened
Tooth hardness	50 to 60HRC
Surface treatment	Black oxide coated except for teeth

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



S5

Catalog Number	Module	No. of teeth	Shape	Bore			Face width	Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)
				A _{H7}	C	D		E	Bending strength	Surface durability	Bending strength		
SSAG1-25	m1	25	S5	8	25	27	10	7.92	3.82	0.81	0.39	0.08~0.16	0.035
SSAG1-30		30			32	10.2		5.57	1.04	0.57	0.052		
SSAG1-32		32			34	9.22		5.30	0.94	0.54	0.059		
SSAG1-36		36		38	10.7	6.77		1.10	0.69	0.074			
SSAG1-40		40		42	12.3	8.42		1.25	0.86	0.092			
SSAG1-50		50		52	16.2	13.4		1.65	1.36	0.15			
SSAG1.5-16	m1.5	16	S5	10	24	27	15	13.8	5.02	1.41	0.51	0.08~0.16	0.044
SSAG1.5-18		18			30	16.6		6.51	1.69	0.66	0.058		
SSAG1.5-20		20			33	19.4		8.20	1.98	0.84	0.074		
SSAG1.5-25		25		37.5	22.2	11.1		2.27	1.13	0.12			
SSAG1.5-30		30		45	28.5	16.3		2.91	1.66	0.17			
SSAG1.5-32		32		48	31.1	18.6		3.17	1.90	0.19			
SSAG1.5-36	15	36	36.2	23.8	3.70	2.43	0.10~0.18	0.25					
SSAG1.5-40		40	60	41.5	29.6	4.23		3.02	0.31				
SSAG1.5-50		50	75	54.7	47.2	5.58		4.82	0.50				
SSAG2-15		m2	15	S5	10	30		34	20	29.6	10.5	3.01	1.07
SSAG2-16	16		32			27.3	10.1	2.78		1.03	0.11		
SSAG2-18	18		36			32.7	13.1	3.34		1.34	0.15		
SSAG2-20	20		40		38.3	16.6	3.91	1.69		0.17			
SSAG2-25	25		50		52.7	27.0	5.38	2.75		0.28			
SSAG2-30	30		60		67.6	39.5	6.89	4.03		0.42			
SSAG2-32	18	32	64	73.7	45.2	7.51	4.61	0.12~0.22	0.47				
SSAG2-36		36	72	85.9	57.8	8.76	5.90		0.60				
SSAG2-40		40	80	98.3	72.1	10.0	7.35		0.75				
SSAG2-50		50	100	120	106	12.2	10.8		1.19				
SSAG2.5-15	m2.5	15	S5	15	37.5	42.5	25	48.1	17.4	4.91	1.77	0.10~0.20	0.18
SSAG2.5-16		16			40	53.3		20.1	5.44	2.05	0.21		
SSAG2.5-18		18			45	63.9		26.1	6.52	2.66	0.28		
SSAG2.5-20		20		50	74.8	32.9		7.63	3.36	0.35			
SSAG2.5-25		25		62.5	103	53.8		10.5	5.48	0.54			
SSAG2.5-30		30		75	132	78.7		13.5	8.03	0.81			
SSAG2.5-32	20	32	144	90.1	14.7	9.19	0.12~0.22	0.92					
SSAG2.5-36		36	80	168	115	17.1		11.8	1.19				
SSAG2.5-40		40	90	177	133	18.1		13.6	1.48				
SSAG2.5-50		50	125	234	213	23.8		21.7	2.35				

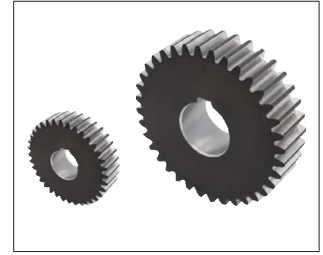
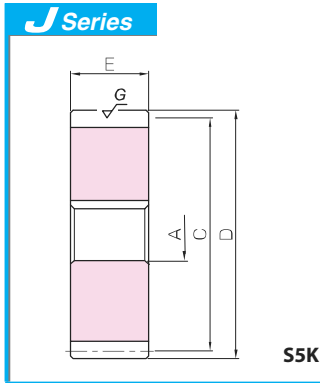
[Caution on Product Characteristics]

- The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see Page 24 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 "Cautions on Performing Secondary Operations" (Page 26) when performing modifications and/or secondary operations for safety concerns.
KHK Quick-Mod Gears, the KHK 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. 2 to 3 mm).
- A reference surface is set for gear grinding. Use the surface opposite from the markings as the reference surface for secondary operation.

New Product



To order J Series products, please specify: **Catalog No. + J + BORE.**

Bore H7		* The product shapes of J Series items are identified by background color.																		
Keyway Js9	8	10	12	14	15	16	17	18	19	20	22	25	28	30	32	35	40	45	50	
Screw size	3x1.4	4x1.8	5x2.3					6x2.8					8x3.3			10x3.3	12x3.3	14x3.8		
Catalog Number	—																			
SSAG1-25 J BORE	S5K	S5K																		
SSAG1-30J BORE	S5K	S5K	S5K																	
SSAG1-32J BORE	S5K	S5K	S5K	S5K																
SSAG1-36J BORE		S5K	S5K	S5K	S5K	S5K														
SSAG1-40J BORE		S5K	S5K	S5K	S5K	S5K	S5K	S5K												
SSAG1-50J BORE		S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K									
SSAG1.5-16 J BORE		S5K																		
SSAG1.5-18 J BORE		S5K																		
SSAG1.5-20 J BORE		S5K	S5K																	
SSAG1.5-25 J BORE		S5K	S5K	S5K	S5K	S5K														
SSAG1.5-30 J BORE					S5K	S5K	S5K	S5K	S5K	S5K										
SSAG1.5-32 J BORE					S5K	S5K	S5K	S5K	S5K	S5K	S5K									
SSAG1.5-36 J BORE					S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K								
SSAG1.5-40 J BORE					S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K							
SSAG1.5-50 J BORE					S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K				
SSAG2-15J BORE		S5K	S5K																	
SSAG2-16J BORE		S5K	S5K																	
SSAG2-18J BORE		S5K	S5K	S5K	S5K															
SSAG2-20J BORE					S5K	S5K	S5K													
SSAG2-25J BORE					S5K	S5K	S5K	S5K	S5K	S5K										
SSAG2-30J BORE					S5K	S5K	S5K	S5K	S5K	S5K	S5K									
SSAG2-32J BORE								S5K	S5K	S5K	S5K	S5K	S5K							
SSAG2-36J BORE								S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K					
SSAG2-40J BORE								S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K				
SSAG2-50J BORE								S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K		
SSAG2.5-15 J BORE					S5K															
SSAG2.5-16 J BORE					S5K	S5K														
SSAG2.5-18 J BORE					S5K	S5K	S5K	S5K	S5K											
SSAG2.5-20 J BORE					S5K	S5K	S5K	S5K	S5K	S5K										
SSAG2.5-25 J BORE									S5K	S5K	S5K	S5K								
SSAG2.5-30 J BORE									S5K	S5K	S5K	S5K	S5K	S5K						
SSAG2.5-32 J BORE									S5K	S5K	S5K	S5K	S5K	S5K	S5K					
SSAG2.5-36 J BORE									S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K				
SSAG2.5-40 J BORE									S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K			
SSAG2.5-50 J BORE									S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	

- [Caution on J series]
- ① Production is completed in 2 working days excluding the day ordered for products with module 3 or under, and 7 days for products with module 4 or higher.
 - ② Number of products is 1 to 20 units for products with module 3 or under, and up to 5 units for products with module 4 or higher.
 - ③ Keyways are made according to JIS B1301 standards, Js9 tolerance.
 - ④ Black oxide is not re-applied after hole and key secondary operations.

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

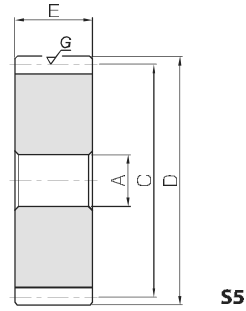


New Product



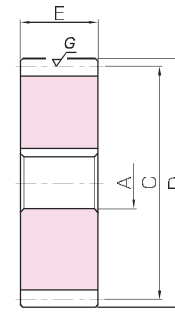
Specifications	
Precision grade	JIS grade N7 (JIS B1702-1:1998)*
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat Treatment	Gear teeth induction hardened
Tooth hardness	50 to 60HRC
Surface treatment	Black oxide coated except for teeth

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

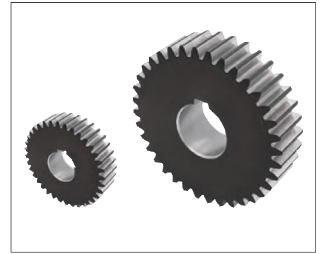


S5

J Series



S5K



To order J Series products, please specify: **Catalog No. + J + BORE.**

Catalog Number	Module	No. of teeth	Shape	Bore AH7	Pitch dia. C	Outside dia. D	Face width E	Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)
								Bending strength	Surface durability	Bending strength	Surface durability		
SSAG3-15	m3	15	S5	15	45	51	30	83.1	30.5	8.48	3.11	0.1~0.2	0.33
SSAG3-16		48			54	92.1		35.2	9.39	3.59			
SSAG3-18		54			60	110		45.8	11.3	4.67			
SSAG3-20		60			66	129		57.8	13.2	5.90			
SSAG3-25		75			81	178		94.5	18.1	9.64			
SSAG3-30		20		30	90	96	228	138	23.3	14.1	0.12~0.22	1.42	
SSAG3-32				32	96	102	229	146	23.4	14.9			
SSAG3-36				108	114	268	188	27.3	19.1				
SSAG3-40				120	126	306	234	31.2	23.9				
SSAG3-50				150	156	404	374	41.2	38.1				
SSAG3-30	25	30	90	96	228	138	23.3	14.1	0.14~0.24	1.42			
SSAG3-32		32	96	102	229	146	23.4	14.9					
SSAG3-36		108	114	268	188	27.3	19.1						
SSAG3-40		120	126	306	234	31.2	23.9						
SSAG3-50		150	156	404	374	41.2	38.1						

Catalog Number	Module	No. of teeth	Shape	Bore AH7	Pitch dia. C	Outside dia. D	Face width E	Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)
								Bending strength	Surface durability	Bending strength	Surface durability		
SSAG4-15	m4	15	S5	20	60	68	40	197	74.1	20.1	7.55	0.14~0.24	0.79
SSAG4-16		64			72	218		85.6	22.3	8.73			
SSAG4-18		72			80	262		111	26.7	11.4			
SSAG4-20		80			88	307		141	31.3	14.3			
SSAG4-25		100			108	389		213	39.7	21.7			
SSAG4-30		25		30	120	128	499	313	50.9	31.9	0.16~0.26	3.45	
SSAG4-32				32	128	136	544	358	55.5	36.5			
SSAG4-36				144	152	634	458	64.7	46.7				
SSAG4-40				160	168	674	529	68.7	54.0				
SSAG4-50				200	208	889	842	90.7	85.9				
SSAG5-20	m5	20	S5	25	100	110	50	553	259	56.4	26.5	0.14~0.26	2.89
SSAG5-25		125			135	760		426	77.5	43.4			
SSAG5-30		150			160	975		623	99.4	63.5			
SSAG6-20	m6	20	S5	25	120	132	60	955	457	97.4	46.6	0.18~0.30	5.10
SSAG6-25		150			162	1310		747	134	76.2			
SSAG6-30		180			192	1560		1020	160	104			

- [Caution on Product Characteristics]
- The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see Page 24 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 "Cautions on Performing Secondary Operations" (Page 26) when performing modifications and/or secondary operations for safety concerns.
KHK Quick-Mod Gears, the KHK 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. 2 to 3 mm).
 - A reference surface is set for gear grinding. Use the surface opposite from the markings as the reference surface for secondary operation.

Bore H7	* The product shapes of J Series items are identified by background color.															
	15	16	17	18	19	20	22	25	28	30	32	35	40	45	50	
Keyway Js9	5x2.3			6x2.8				8x3.3			10x3.3		12x3.3		14x3.8	
Screw size	5x2.3			6x2.8				8x3.3			10x3.3		12x3.3		14x3.8	
Catalog Number	—															
SSAG3-15J BORE	S5K	S5K	S5K	S5K												
SSAG3-16J BORE	S5K	S5K	S5K	S5K	S5K	S5K										
SSAG3-18J BORE	S5K	S5K	S5K	S5K	S5K	S5K	S5K									
SSAG3-20J BORE	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K								
SSAG3-25J BORE						S5K	S5K	S5K	S5K	S5K	S5K					
SSAG3-30J BORE						S5K	S5K	S5K	S5K	S5K	S5K	S5K				
SSAG3-32J BORE								S5K	S5K	S5K	S5K	S5K	S5K			
SSAG3-36J BORE									S5K	S5K	S5K	S5K	S5K	S5K		
SSAG3-40J BORE										S5K	S5K	S5K	S5K	S5K	S5K	
SSAG3-50J BORE											S5K	S5K	S5K	S5K	S5K	

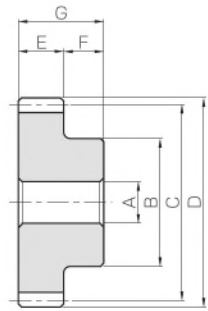
To order J Series products, please specify: **Catalog No. + J + BORE.**

Bore H7	* The product shapes of J Series items are identified by background color.																				
	20	22	25	28	30	32	35	40	45	50	55	60	65	70	75	80					
Keyway Js9	6x2.8		8x3.3				10x3.3			12x3.3		14x3.8		16x4.3		18x4.4		20x4.9		22x5.4	
Screw size	6x2.8		8x3.3				10x3.3			12x3.3		14x3.8		16x4.3		18x4.4		20x4.9		22x5.4	
Catalog Number	—																				
SSAG4-15J BORE	S5K	S5K	S5K																		
SSAG4-16J BORE	S5K	S5K	S5K																		
SSAG4-18J BORE	S5K	S5K	S5K	S5K	S5K																
SSAG4-20J BORE	S5K	S5K	S5K	S5K	S5K	S5K	S5K														
SSAG4-25J BORE	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K												
SSAG4-30J BORE	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K										
SSAG4-32J BORE			S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K									
SSAG4-36J BORE			S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K								
SSAG4-40J BORE			S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K							
SSAG4-50J BORE			S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K					
SSAG5-20J BORE			S5K	S5K	S5K	S5K	S5K	S5K	S5K												
SSAG5-25J BORE			S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K										
SSAG5-30J BORE			S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K									
SSAG6-20J BORE			S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K									
SSAG6-25J BORE			S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K								
SSAG6-30J BORE			S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K					

- [Caution on J series]
- Production is completed in 2 working days excluding the day ordered for products with module 3 or under, and 7 days for products with module 4 or higher.
 - Number of products is 1 to 20 units for products with module 3 or under, and up to 5 units for products with module 4 or higher.
 - Keyways are made according to JIS B1301 standards, Js9 tolerance.
 - Black oxide is not re-applied after hole and key secondary operations.



Specifications	
Precision grade	JIS grade N8 (JIS B1702-1:1998)
Gear teeth	Standard full depth
Pressure angle	20°
Material	SCM440
Heat Treatment	Thermal refining only
Tooth hardness	225 to 285HB
Surface treatment	Black oxide coating



S1

H To order Hardened Plus, please specify Catalog No. + H.

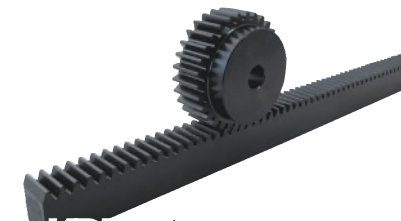
Catalog Number	Module	No. of teeth	Shape	Bore A _{H7}	Hub dia. B	Pitch dia. C	Outside dia. D	Face width E	Hub width F	Total Length G	Allowable torque (N-m)		Allowable torque (kgf-m)	
											Bending strength	Surface durability	Bending strength	Surface durability
KS1.5-20	m1.5	20	S1	8	24	30	33	15	14	29	37.2	7.38	3.79	0.75
KS1.5-25		25			30	37.5	40.5				50.2	12.6	5.12	1.29
KS1.5-30		30			38	45	48				63.4	19.7	6.47	2.01
KS2-20	m2	20	S1	12	32	40	44	20	16	36	88.1	18.1	8.98	1.84
KS2-25		25			40	50	54				119	30.9	12.1	3.15
KS2-30		30			50	60	64				150	48.3	15.3	4.92
KS2.5-20	m2.5	20	S1	15	40	50	55	25	18	43	172	36.2	17.5	3.69
KS2.5-25		25			50	62.5	67.5				232	62.0	23.7	6.32
KS2.5-30		30			65	75	80				294	96.7	29.9	9.86
KS3-20	m3	20	S1	15	50	60	66	30	20	50	297	63.8	30.3	6.51
KS3-25		25		60	75	81	401				109	40.9	11.2	
KS3-30		30		75	90	96	507				171	51.7	17.4	
KS4-20	m4	20	S1	20	65	80	88	40	25	65	705	156	71.9	16.0
KS4-25		25			80	100	108				951	268	97.0	27.4
KS4-30		30			90	120	128				1203	419	123	42.7
KS5-20	m5	20	S1	22	82	100	110	50	25	75	1377	314	140	32.0
KS5-25		25		105	125	135	1858				538	189	54.9	
KS5-30		30		120	150	160	2349				841	240	85.8	

- [Caution on Product Characteristics]
- The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see Page 24 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.

Backlash (mm)	Weight (kg)	Catalog Number
0.10~0.22	0.12	KS1.5-20
	0.20	KS1.5-25
	0.29	KS1.5-30
0.12~0.26	0.27	KS2-20
	0.43	KS2-25
	0.66	KS2-30
0.14~0.28	0.50	KS2.5-20
	0.82	KS2.5-25
	1.28	KS2.5-30
0.14~0.32	0.90	KS3-20
	1.36	KS3-25
	2.07	KS3-30
0.18~0.38	2.07	KS4-20
	3.29	KS4-25
	4.64	KS4-30
0.20~0.44	3.90	KS5-20
	6.23	KS5-25
	8.87	KS5-30

- [Caution on Secondary Operations]
- Please read "Cautions on Performing Secondary Operations" (Page 26) when performing modifications and/or secondary operations for safety concerns.
KHK Quick-Mod Gears, the KHK 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.

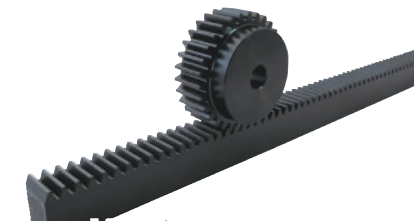
KS-H Hardened Spur Gear recommended mating racks



KRF-H/KRFD-H Hardened Racks

Please see Page 206 for more details.

KS Thermal Refined Spur Gear recommended mating racks



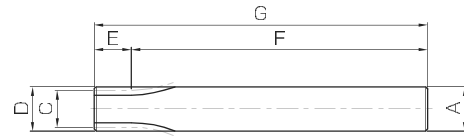
KRF/KRFD Thermal Refined Racks

Please see Page 212 for more details.

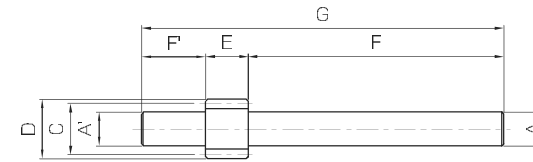


Specifications	
Precision grade	JIS grade N8 (JIS B1702-1:1998)*
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat Treatment	Thermal refined**
Tooth hardness	200~270HB**
Surface treatment	Black oxide coating

* The precision grade of products with a module of less than 0.8 is equivalent to the value shown in the table.
 ** SA-shaped products have no material thermal refinement treatment. The gear teeth hardness is 194 HB or less.



SA



SB

Catalog Number	Module	No. of teeth	Dislocation 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 SSS0.5-11 SSS0.5-12 SSS0.5-13	m0.5	10	0	SA	—	—	5	6	7	6	38	45
11		5.5					6.5	6.5				
12		6					7	7				
13		6.5					7.5	7.5				
SSS0.8-10 SSS0.8-11 SSS0.8-12 SSS0.8-13	m0.8	10	0	SA	—	—	8	9.6	10	9.6	60	70
11		8.8					10.4	10.4				
12		9.6					11.2	11.2				
13		10.4					12	12				
SSS1-10 SSS1-11 SSS1-12 SSS1-13	m1	10	0	SA	—	—	10	12	12	12	78	90
11		11					13	13				
12		12					14	14				
13		13					15	15				
SSS1.5-10 SSS1.5-11 SSS1.5-12 SSS1.5-13	m1.5	10	+0.5	SB	—	25	15	19.35	15	12.2	100	140
11		+0.5	16.5				20.85	13.7				
12		0	18				21	13.7				
13		0	19.5				22.5	15.2				
SSS2-10 SSS2-11 SSS2-12 SSS2-13	m2	10	+0.5	SB	—	30	20	25.8	20	16.2	120	170
11		+0.5	22				27.8	18.2				
12		0	24				28	18.2				
13		0	26				30	20.2				
SSS2.5-10 SSS2.5-11 SSS2.5-12 SSS2.5-13	m2.5	10	+0.5	SB	—	35	25	32.25	25	20.2	135	195
11		+0.5	27.5				34.75	22.7				
12		0	30				35	22.7				
13		0	32.5				37.5	25.2				
SSS3-10 SSS3-11 SSS3-12 SSS3-13	m3	10	+0.5	SB	—	40	30	38.7	30	24.2	150	220
11		+0.5	33				41.7	27.2				
12		0	36				42	27.2				
13		0	39				45	30.2				

Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog Number
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			
0.32	0.011	0.032	0.0011			
0.38	0.013	0.039	0.0014			
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			
1.29	0.047	0.13	0.0048			
1.56	0.055	0.16	0.0056			
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			
2.52	0.092	0.26	0.0094			
3.05	0.11	0.31	0.011			
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			
9.97	0.89	1.02	0.091			
12.1	1.05	1.23	0.11			
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			
23.6	2.18	2.41	0.22			
28.6	2.57	2.92	0.26			
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			
46.2	4.37	4.71	0.45			
55.9	5.13	5.70	0.52			
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			
79.8	7.68	8.14	0.78			
96.5	9.02	9.84	0.92			

- (Caution on Product Characteristics)
- The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see Page 24 for more details.
 - Products with modules 1.5 or higher and number of teeth of 10 and 11 are profile shifted gears ($x = +0.5$). Please refer to the table below for the center distance at the time of assembly.
 - The indicated backlash is the backlash in the normal direction when a 30-tooth SSG spur gear is assembled with the same module using theoretical values.

- (Caution on Secondary Operations)
- Please read "Cautions on Performing Secondary Operations" (Page 26) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK 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.

Center distance of stock spur gear meshing with profile shifted gear

The center distance of the stock gear ($x = 0$) that meshes with profile shifted gear ($x = +0.5$) of $m = 1$ is shown in the table at right. Please multiply the module of the gear to be used.

Center distance where number of teeth is 12 to 30 (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	

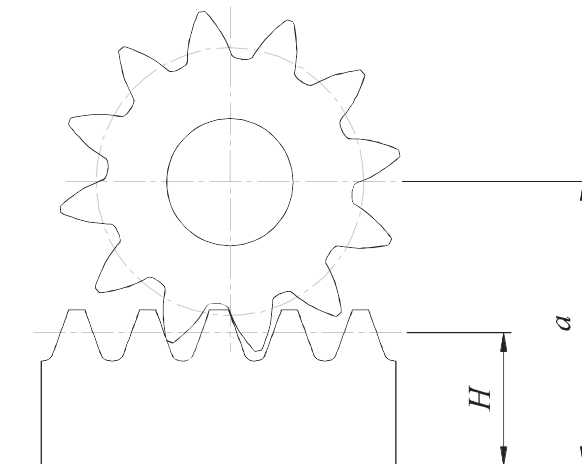
Center distance where number of teeth is 32 to 62 (unit: mm)

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	

Center distance where number of teeth is 64 to 200 (unit: mm)

No. of teeth ($x = 0$)	No. of teeth ($x = +0.5$)	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	

Mounting distance of a profile shifted gear and the meshing rack



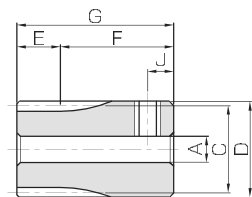
$$a = \frac{zm}{2} + H + xm$$

Where
 a : Mounting distance
 H : Pitch line height
 m : Module
 z : No. of teeth
 x : Dislocation coefficient

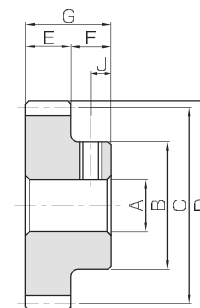


Specifications	
Precision grade	JIS grade N8 (JIS B 1702-1:1998)*
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat Treatment	—
Tooth hardness	(less than 194HB)
Surface treatment	Black oxide coating

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



S3T



S1T

Catalog Number	Module	No. of teeth	Shape	Bore				Face width	Hub width	Total Length	Keyway
				A _{H7}	B	C	D				
SS0.5-15A	m0.5	15	S3T	3	8.5	7.5	8.5	5	11	16	—
SS0.5-16A		16		3	9	8	9				
SS0.5-18A		18		4	10	9	10				
SS0.5-20A		20		3	11	10	11				
SS0.5-20B				4	11.5	10.5	11.5				
SS0.5-21A		21		4	12	11	12				
SS0.5-22A		22		4	13	12	13				
SS0.5-24A		24		4	13.5	12.5	13.5				
SS0.5-24B				5	14.5	13.5	14.5				
SS0.5-25B		25		5	15	14	15				
SS0.5-27A		27		5	16	15	16				
SS0.5-28A		28		5	17	16	17				
SS0.5-30A		30	4	18	17.5	18.5					
SS0.5-30B			5	18	18	19					
SS0.5-30C			6	18	20	21					
SS0.5-32A		32	5	20	22.5	23.5					
SS0.5-35A		35	5	22	25	26					
SS0.5-36A		36	5	25	27	28					
SS0.5-40A		40	5	28	30	31					
SS0.5-40B			6	28	35	36					
SS0.5-45A		45	6	28	40	41					
SS0.5-50A		50	6	28	45	46					
SS0.5-50B			8	28	48	49					
SS0.5-54A		54	8	28	50	51					
SS0.5-60A	60	8	28	60	61						
SS0.5-60B		8	28	60	61						
SS0.5-70A	70	8	28	60	61						
SS0.5-70B		8	28	60	61						
SS0.5-80A	80	8	28	60	61						
SS0.5-80B		8	28	60	61						
SS0.5-90A	90	8	28	60	61						
SS0.5-96A	96	8	28	60	61						
SS0.5-100A	100	8	28	60	61						
SS0.5-120A	120	8	28	60	61						

- [Caution on Product Characteristics]
- The key groove used is a JIS B 1301 normal type (Js9) and a set screw is included for products with a tapped hole.
 - The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see Page 24 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.
 - If the bore diameter is less than $\varphi 4$, the bore tolerance class is H8. If the bore diameter is $\varphi 5$ or $\varphi 6$, and the hole length (total length) exceeds 3 times the diameter, then the class is also H8.
 - When using S3T and S1T set screws for fastening gears to a shaft, only use this method for applications with light load usage. For secure fastening, please use dowel pins in combination.

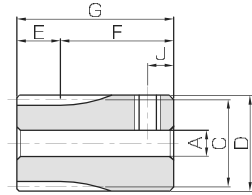
Socket head screw	Allowable torque (N·m)	Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog Number
		Bending strength	Surface durability			
Size	J	Bending strength	Surface durability	Bending strength	Surface durability	
M3	2.5	0.46	0.022	0.047	0.0022	0.0056 SS0.5-15A
M3		0.51	0.025	0.052	0.0025	0.0064 SS0.5-16A
M3		0.61	0.032	0.063	0.0033	0.0076 SS0.5-18A
M3		0.72	0.040	0.073	0.0041	0.010 SS0.5-20A
M3		0.77	0.044	0.079	0.0045	0.0095 SS0.5-20B
M3		0.83	0.049	0.084	0.0050	0.011 SS0.5-21A
M3		0.93	0.059	0.095	0.0060	0.012 SS0.5-22A
M3		0.99	0.064	0.10	0.0065	0.014 SS0.5-24A
M4	3	0.99	0.064	0.10	0.0065	0.013 SS0.5-24B
M4	3	0.99	0.064	0.10	0.0065	0.014 SS0.5-25B
M3	2.5	1.10	0.075	0.11	0.0076	0.018 SS0.5-27A
M3	3.5	1.16	0.081	0.12	0.0082	0.011 SS0.5-28A
M3		1.27	0.093	0.13	0.0095	0.013 SS0.5-30A
M4		1.38	0.11	0.14	0.011	0.012 SS0.5-30B
M4		1.55	0.13	0.16	0.013	0.011 SS0.5-30C
M4		1.61	0.14	0.16	0.014	0.014 SS0.5-32A
M4		1.84	0.17	0.19	0.017	0.017 SS0.5-35A
M4		2.14	0.21	0.22	0.022	0.019 SS0.5-36A
M4		2.43	0.27	0.25	0.027	0.024 SS0.5-40A
M4	2.67	0.32	0.27	0.032	0.023 SS0.5-40B	
M4	3.03	0.39	0.31	0.040	0.030 SS0.5-45A	
M4	3.63	0.55	0.37	0.056	0.038 SS0.5-50A	
M4	4.24	0.72	0.43	0.074	0.055 SS0.5-50B	
M5	4.85	0.93	0.49	0.095	0.068 SS0.5-70A	
M5	5.21	1.06	0.53	0.11	0.065 SS0.5-70B	
M5	5.46	1.16	0.56	0.12	0.079 SS0.5-80A	
M5	6.68	1.70	0.68	0.17	0.077 SS0.5-80B	
					0.090 SS0.5-90A	
					0.099 SS0.5-96A	
					0.10 SS0.5-100A	
					0.14 SS0.5-120A	

- [Caution on Secondary Operations]
- Please read "Cautions on Performing Secondary Operations" (Page 26) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK 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.

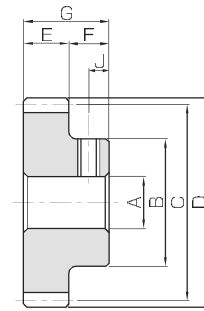


Specifications	
Precision grade	JIS grade N8 (JIS B 1702-1:1998)*
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat Treatment	—
Tooth hardness	(less than 194HB)
Surface treatment	Black oxide coating

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



S3T



S1T

Catalog Number	Module	No. of teeth	Shape	Bore				Pitch dia.	Outside dia.	Face width	Hub width	Total Length	Keyway				
				A _{H7}	B	C	D										
SS0.8-15A	m0.8	15	S3T	5	13.6	12	13.6	8	8	14	22	—					
SS0.8-16A		16		5	14.4	12.8	14.4										
SS0.8-20A		20		5	13	16	17.6										
SS0.8-20B				6	14	16.8	18.4										
SS0.8-21A		21		6	14	16.8	18.4										
SS0.8-24A		24		5	16	19.2	20.8										
SS0.8-25A		25	5	16	20	21.6											
SS0.8-25B			6	18	20.8	22.4											
SS0.8-26A		26	6	18	20.8	22.4											
SS0.8-28A		28	6	18	22.4	24											
SS0.8-30A		30	30	S1T	5	20	24						25.6	8	8	16	—
SS0.8-30B					6	22	25.6						27.2				
SS0.8-30C	8				28	32	33.6										
SS0.8-32A	32	6	22	25.6	27.2												
SS0.8-40A	40	6	28	32	33.6												
SS0.8-45A	45	6	28	36	37.6												
SS0.8-48A	48	6	28	38.4	40												
SS0.8-50A	50	6	28	40	41.6												
SS0.8-60A	60	60	S1T	6	28	48	49.6	8	8	16	—						
SS0.8-60B				8	48	49.6											
SS0.8-70A	70	6	28	56	57.6												
SS0.8-80A	80	6	28	64	65.6												
SS0.8-90A	90	8	28	72	73.6												
SS0.8-96A	96	8	28	76.8	78.4												
SS0.8-100A	100	8	28	80	81.6												
SS0.8-120A	120	8	28	96	97.6												

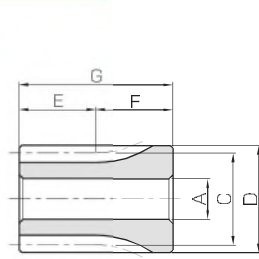
Socket head screw	Allowable torque (N·m)	Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog Number
		Bending strength	Surface durability			
M4	3.5	1.89	0.088	0.19	0.0090	SS0.8-15A
M4		2.10	0.10			0.21
M4	3.5	2.94	0.17	0.30	0.017	SS0.8-20A
M4		3.16	0.18	0.32	0.019	SS0.8-20B
M4	3.5	3.82	0.25	0.39	0.025	SS0.8-21A
M4		4.05	0.27	0.41	0.027	SS0.8-24A
M4	3.5	4.28	0.29	0.44	0.030	SS0.8-25A
M4		4.73	0.34	0.48	0.035	SS0.8-25B
M4	3.5	4.73	0.34	0.48	0.035	SS0.8-26A
M4		5.19	0.39	0.53	0.040	SS0.8-28A
M4	3.5	5.19	0.39	0.53	0.040	SS0.8-30A
M4		5.66	0.45	0.58	0.046	SS0.8-30B
M4	3.5	5.66	0.45	0.58	0.046	SS0.8-30C
M4		5.66	0.45	0.58	0.046	SS0.8-32A
M4	3.5	7.55	0.72	0.77	0.074	SS0.8-40A
M4		8.75	0.93	0.89	0.095	SS0.8-45A
M4	3.5	9.47	1.06	0.97	0.11	SS0.8-48A
M4		9.96	1.16	1.02	0.12	SS0.8-50A
M4	3.5	12.4	1.70	1.26	0.17	SS0.8-60A
M4		14.9	2.35	1.52	0.24	SS0.8-60B
M4	3.5	14.9	2.35	1.52	0.24	SS0.8-70A
M4		17.4	3.11	1.77	0.32	SS0.8-80A
M5	4	19.9	3.99	2.02	0.41	SS0.8-90A
M5		21.4	4.57	2.18	0.47	SS0.8-96A
M5	4	22.4	4.98	2.28	0.51	SS0.8-100A
M5		27.4	7.32	2.79	0.75	SS0.8-120A

- [Caution on Product Characteristics]
- ① The key groove used is a JIS B 1301 normal type (Js9) and a set screw is included for products with a tapped hole.
 - ② The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see Page 24 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 diameter is less than $\phi 4$, 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.
 - ⑤ When using S3T and S1T set screws for fastening gears to a shaft, only use this method for applications with light load usage. For secure fastening, please use dowel pins in combination.

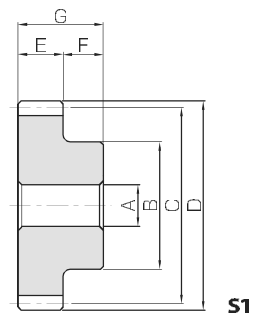
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- ① Please read "Cautions on Performing Secondary Operations" (Page 26) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK system for quick modification of KHK stock gears, is also available.
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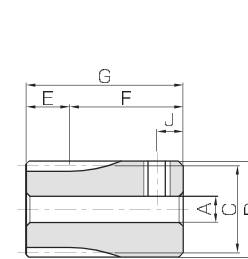
Specifications	
Precision grade	JIS grade N8 (JIS B1702-1:1998)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat Treatment	—
Tooth hardness	(less than 194HB)
Surface treatment	Black oxide coating



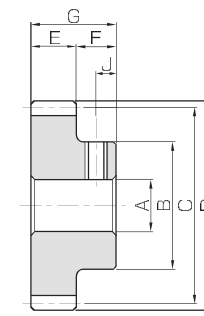
S3



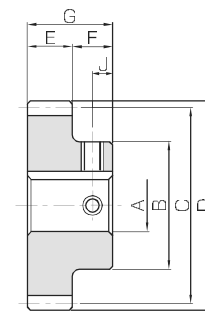
S1



S3T



S1T



S1K

H To order Hardened Plus, please specify Catalog No. + H.

Catalog Number	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total Length	Keyway	
				A _{H7}	B	C	D	E	F	G	Width × Depth	
SS1-15 SS1-15A SS1-15B	m1	15	S3 S3T S3T	8 5 6	17	15	17	10	20	30	—	
SS1-16 SS1-16A SS1-16B		16	S3 S3T S3T	8 5 6	18	16	18					
SS1-17		17	S3	8	19	17	19					
SS1-18 SS1-18B		18	S3 S3T	8 8	20	18	20					
SS1-19		19	S3	8	21	19	21					
SS1-20 SS1-20A SS1-20B SS1-20C		20	S1 S1T S1T S1T	8 5 6 8	16	20	22					
SS1-21		21	S1	8	17	21	23					
SS1-22 SS1-22A		22	S1 S1T	8	18	22	24					
SS1-23		23	S1	8	18	23	25					
SS1-24 SS1-24A SS1-24B SS1-24C		24	S1 S1T S1T S1K	8 6 8 10	20	24	26					— — — 4 x 1.8
SS1-25 SS1-25A SS1-25B SS1-25C		25	S1 S1T S1T S1K	8 6 8 10	20	25	27					— — — 4 x 1.8
SS1-26		26	S1	8	22	26	28					—
SS1-27		27	S1	8	22	27	29					—
SS1-28 SS1-28B		28	S1 S1K	8 10	22	28	30					— 4 x 1.8
SS1-29		29	S1	8	24	29	31					—
SS1-30 SS1-30A SS1-30B SS1-30C SS1-30D		30	S1 S1T S1T S1K S1K	10 6 8 10 12	25	30	32					— — — 4 x 1.8 4 x 1.8
SS1-32 SS1-32A		32	S1 S1T	10 8	26	32	34					— —
SS1-34		34	S1	10	26	34	36					—
SS1-35		35	S1	10	26	35	37					—
SS1-36		36	S1	10	28	36	38					—
SS1-38		38	S1	10	32	38	40					—
SS1-40 SS1-40A SS1-40B SS1-40C		40	S1 S1T S1K S1K	10 8 10 12	35	40	42					— — 4 x 1.8 4 x 1.8
SS1-42		42	S1	10	35	42	44					—
SS1-44		44	S1	10	35	44	46					—
SS1-45 SS1-45A SS1-45B SS1-45C		45	S1 S1T S1K S1K	10 8 10 12	35	45	47					— — 4 x 1.8 4 x 1.8
SS1-46		46	S1	10	35	46	48					—
SS1-48		48	S1	10	35	48	50					—

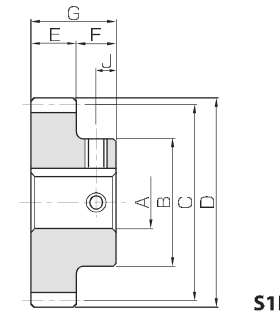
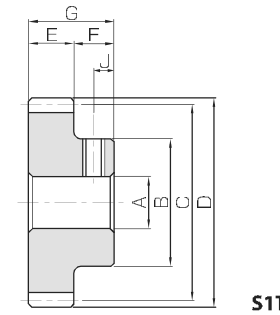
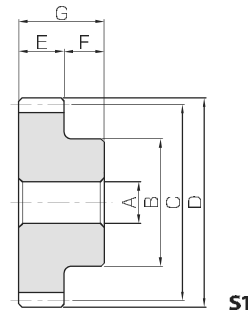
Socket head screw	Size	J	Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog Number
			Bending strength	Surface durability	Bending strength	Surface durability			
—	—	—	—	—	—	—	—	—	—
M4	4	4	3.69	0.17	0.38	0.018	0.038 0.044 0.042	SS1-15 SS1-15A SS1-15B	
M4	4	4	4.09	0.2	0.42	0.021			
—	—	—	4.5	0.23	0.46	0.023			
M5	4	4	4.91	0.26	0.5	0.027			
—	—	—	5.33	0.29	0.54	0.030			
M4	5	5	5.75	0.33	0.59	0.033			
M4	5	5	—	—	—	—			
M5	5	5	—	—	—	—			
—	—	—	6.17	0.36	0.63	0.037			
M5	5	5	6.6	0.4	0.67	0.041			
—	—	—	7.03	0.45	0.72	0.045			
M4	5	5	7.47	0.49	0.76	0.050			
M5	5	5	—	—	—	—			
M4	5	5	7.91	0.54	0.81	0.055			
M5	5	5	—	—	—	—			
M4	5	5	8.35	0.58	0.85	0.059			
—	—	—	8.79	0.63	0.9	0.064			
M4	5	5	9.24	0.68	0.94	0.070			
—	—	—	9.69	0.73	0.99	0.075			
M4	5	5	10.1	0.79	1.03	0.081			
M5	5	5	—	—	—	—			
M4	5	5	11.1	0.90	1.13	0.092			
M5	5	5	—	—	—	—			
—	—	—	12.0	1.03	1.22	0.10			
—	—	—	12.4	1.09	1.27	0.11			
—	—	—	12.9	1.16	1.31	0.12			
—	—	—	13.8	1.30	1.41	0.13			
M5	5	5	14.7	1.45	1.50	0.15			
M4	5	5	—	—	—	—			
M4	5	5	15.7	1.61	1.60	0.16			
—	—	—	16.6	1.77	1.69	0.18			
—	—	—	17.1	1.86	1.74	0.19			
M5	5	5	—	—	—	—			
M4	5	5	17.6	1.95	1.79	0.20			
M4	5	5	—	—	—	—			
—	—	—	18.5	2.13	1.89	0.22			

- [Caution on Product Characteristics]
- The key groove used is a JIS B 1301 normal type (Js9) and a set screw is included for products with a tapped hole.
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 - 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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 - 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)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat Treatment	—
Tooth hardness	(less than 194HB)
Surface treatment	Black oxide coating



H To order Hardened Plus, please specify Catalog No. + H.

Catalog Number	Module	No. of teeth	Shape	Bore				Face width	Hub width	Total Length	Keyway	
				A _{H7}	B	C	D					
SS1-50 SS1-50A SS1-50B	m1	50	S1	10	35	50	52	10	10	20	—	
SS1-52			S1T	8							—	
SS1-54			S1K	10							4 x 1.8	
SS1-55			S1	10							—	
SS1-56			S1	10							—	
SS1-58			S1	10							—	
SS1-60 SS1-60A SS1-60B SS1-60C		60	60	S1	10	40	60				62	—
SS1-62				S1K	10							4 x 1.8
SS1-64				S1K	12							4 x 1.8
SS1-65			S1K	15	5 x 2.3							
SS1-66			S1	10	—							
SS1-68			S1	10	—							
SS1-70		S1	10	—								
SS1-72		S1	10	—								
SS1-75		S1	10	—								
SS1-76		S1	10	—								
SS1-80 SS1-80A		80	80	S1	10	40	80				82	—
SS1-84				S1K	12							4 x 1.8
SS1-85				S1	10							—
SS1-88			S1	10	—							
SS1-90 SS1-90A	90		90	S1	10		90	92	—			
SS1-95				S1K	12				4 x 1.8			
SS1-96		S1		10	—							
SS1-100 SS1-100B	100	100	S1	10	100	102	—					
SS1-110			S1K	15			5 x 2.3					
SS1-120			S1	15			—					
SS1-150	S1	20	—									
SS1-200	S1	20	—									

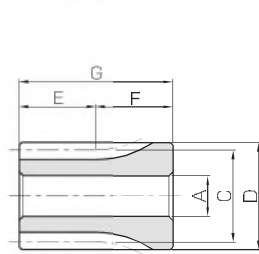
Socket head screw Size	J	Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog Number
		Bending strength	Surface durability	Bending strength	Surface durability			
—	—	—	—	—	—	0.08~0.18	0.22	SS1-50
M5	5	19.5	2.32	1.98	0.24		0.22	SS1-50A
M4	5	—	—	—	—		0.21	SS1-50B
—	—	20.4	2.52	2.08	0.26		0.23	SS1-52
—	—	21.4	2.73	2.18	0.28		0.24	SS1-54
—	—	21.8	2.83	2.23	0.29		0.25	SS1-55
—	—	22.3	2.94	2.28	0.30		0.26	SS1-56
—	—	23.3	3.17	2.37	0.32		0.27	SS1-58
—	—	—	—	—	—		0.29	SS1-60
M4	5	24.2	3.40	2.47	0.35		0.28	SS1-60A
M4	5	—	—	—	—		0.28	SS1-60B
M4	5	—	—	—	—		0.27	SS1-60C
—	—	25.2	3.64	2.57	0.37		0.32	SS1-62
—	—	26.2	3.89	2.67	0.40		0.34	SS1-64
—	—	26.6	4.02	2.72	0.41		0.35	SS1-65
—	—	27.1	4.15	2.77	0.42		0.35	SS1-66
—	—	28.1	4.42	2.86	0.45		0.37	SS1-68
—	—	29.1	4.70	2.96	0.48		0.39	SS1-70
—	—	30.0	4.98	3.06	0.51		0.41	SS1-72
—	—	31.5	5.43	3.21	0.55		0.43	SS1-75
—	—	32.0	5.59	3.26	0.57	0.44	SS1-76	
—	—	—	—	—	—	0.48	SS1-80	
M4	5	33.9	6.23	3.46	0.63	0.47	SS1-80A	
—	—	35.8	6.90	3.66	0.7	0.52	SS1-84	
—	—	36.3	7.08	3.71	0.72	0.53	SS1-85	
—	—	37.8	7.62	3.85	0.78	0.56	SS1-88	
—	—	—	—	—	—	0.59	SS1-90	
M4	5	38.8	7.98	3.95	0.81	0.58	SS1-90A	
—	—	41.2	8.95	4.20	0.91	0.64	SS1-95	
—	—	41.7	9.15	4.25	0.93	0.65	SS1-96	
—	—	—	—	—	—	0.70	SS1-100	
M4	5	43.7	9.97	4.45	1.02	0.68	SS1-100B	
—	—	48.6	12.2	4.95	1.24	0.87	SS1-110	
—	—	53.5	14.7	5.45	1.50	1.01	SS1-120	
—	—	68.2	23.6	6.96	2.41	2.23	SS1-150	
—	—	71.5	33.6	7.29	3.42	4.00	SS1-200	

- [Caution on Product Characteristics]
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 - 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.
 - When using S3T and S1T set screws for fastening gears to a shaft, only use this method for applications with light load usage. For secure fastening, please use dowel pins in combination.

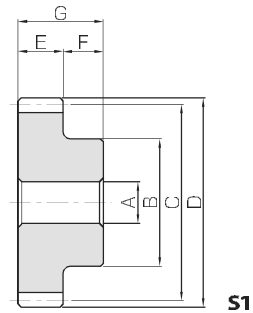
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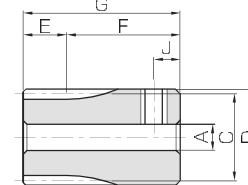
Specifications	
Precision grade	JIS grade N8 (JIS B1702-1:1998)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat Treatment	—
Tooth hardness	(less than 194HB)
Surface treatment	Black oxide coating



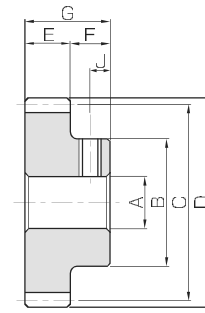
S3



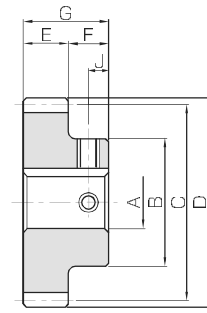
S1



S3T



S1T



S1K

To order Hardened Plus, please specify Catalog No. + H.

Catalog Number	Module	No. of teeth	Shape	Bore				Pitch dia.	Outside dia.	Face width	Hub width	Total Length	Web thickness	Web O.D.	Keyway
				A _{H7}	B	C	D								
SS1.5-12 SS1.5-12A	m1.5	12	S3 S3T	8 6	21	18	21	15	15	30	—	—	—	—	
SS1.5-13		13	S3	8	22.5	19.5	22.5								
SS1.5-14 SS1.5-14B		14	S1 S1T	8 8	16	21	24								
SS1.5-15 SS1.5-15A		15	S1 S1T	8 6	18	22.5	25.5								
SS1.5-16 SS1.5-16B		16	S1 S1T	8 8	20	24	27								
SS1.5-17		17	S1	8	21	25.5	28.5								
SS1.5-18		18	S1	8	22	27	30								
SS1.5-19		19	S1	8	23	28.5	31.5								
SS1.5-20 SS1.5-20A SS1.5-20C		20	S1 S1T S1K	8 6 10	24	30	33								4 x 1.8
SS1.5-21		21	S1	8	25	31.5	34.5								—
SS1.5-22		22	S1	8	26	33	36								—
SS1.5-23		23	S1	8	27	34.5	37.5								—
SS1.5-24 SS1.5-24C		24	S1 S1K	8 12	28	36	39								4 x 1.8
SS1.5-25		25	S1	8	30	37.5	40.5								—
SS1.5-26 SS1.5-26A		26	S1 S1K	10 12	32	39	42								4 x 1.8
SS1.5-27		27	S1	10	34	40.5	43.5								—
SS1.5-28 SS1.5-28A		28	S1 S1K	10 12	36	42	45								4 x 1.8
SS1.5-29		29	S1	10	37	43.5	46.5								—
SS1.5-30 SS1.5-30B SS1.5-30C		30	S1 S1K S1K	10 12 15	38	45	48								4 x 1.8 5 x 2.3
SS1.5-32 SS1.5-32B		32	S1 S1K	10 12	40	48	51								4 x 1.8
SS1.5-34		34	S1	10	40	51	54								—
SS1.5-35		35	S1	10	42	52.5	55.5								—
SS1.5-36 SS1.5-36A		36	S1 S1K	10 12	45	54	57								4 x 1.8
SS1.5-38		38	S1	12	45	57	60								—
SS1.5-40 SS1.5-40A SS1.5-40B		40	S1 S1K S1K	12 12 15	45	60	63								4 x 1.8 5 x 2.3

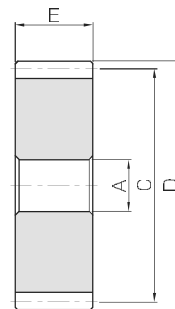
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 - The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see Page 24 for more details.
 - The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.
 - When using S3T and S1T set screws for fastening gears to a shaft, only use this method for applications with light load usage. For secure fastening, please use dowel pins in combination.

Socket head screw	Allowable torque (N·m)	Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog Number
		Bending strength	Surface durability			
—	—	6.86	0.36	0.10~0.22	0.059	SS1.5-12
M4	4	8.84	0.44		0.063	SS1.5-12A
—	—	11.1	0.52		0.070	SS1.5-13
M5	5	12.5	0.60		0.046	SS1.5-14
—	—	13.8	0.70		0.057	SS1.5-15
M4	5	15.2	0.80		0.061	SS1.5-15A
—	—	16.6	0.91		0.068	SS1.5-16
M5	5	18.0	1.03		0.067	SS1.5-16B
—	—	19.4	1.15		0.077	SS1.5-17
—	—	20.8	1.29		0.087	SS1.5-18
—	—	22.3	1.43		0.098	SS1.5-19
—	—	23.7	1.58		0.11	SS1.5-20
M4	5	25.2	1.73	0.11	SS1.5-20A	
—	—	26.7	1.90	0.10	SS1.5-20C	
—	—	28.2	2.06	0.12	SS1.5-21	
M4	5	29.7	2.23	0.13	SS1.5-22	
—	—	31.2	2.41	0.15	SS1.5-23	
—	—	32.7	2.60	0.16	SS1.5-24	
M4	5	34.2	2.79	0.14	SS1.5-24C	
—	—	37.3	3.19	0.18	SS1.5-25	
—	—	40.4	3.63	0.19	SS1.5-26	
—	—	41.9	3.85	0.18	SS1.5-26A	
—	—	43.5	4.09	0.21	SS1.5-27	
M4	5	46.6	4.58	0.23	SS1.5-28	
—	—	49.8	5.10	0.22	SS1.5-28A	
M4	5	50.7	5.07	0.24	SS1.5-29	
M4	5	57.0	5.70	0.26	SS1.5-30	
M4	5	63.0	6.30	0.25	SS1.5-30B	
M4	5	69.0	6.90	0.24	SS1.5-30C	
—	—	73.5	7.35	0.30	SS1.5-32	
—	—	77.0	7.70	0.28	SS1.5-32B	
—	—	80.5	8.05	0.32	SS1.5-34	
—	—	84.0	8.40	0.35	SS1.5-35	
—	—	87.5	8.75	0.38	SS1.5-36	
M4	5	90.0	9.00	0.34	SS1.5-36A	
—	—	93.5	9.35	0.40	SS1.5-38	
—	—	97.0	9.70	0.44	SS1.5-40	
M4	5	100.0	10.00	0.41	SS1.5-40A	
M4	5	103.0	10.30	0.39	SS1.5-40B	

- [Caution on Secondary Operations]
- Please read "Cautions on Performing Secondary Operations" (Page 26) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK 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.



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



S5

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

H To order Hardened Plus, please specify Catalog No. + H.

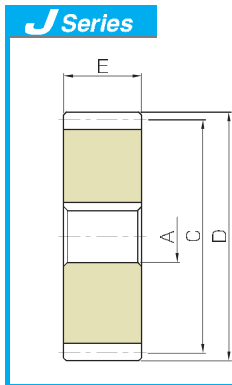
Catalog Number	Module	No. of teeth	Shape	Bore	Pitch dia.	Outside dia.	Face width	Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)
				A _{H7}	C	D	E	Bending strength	Surface durability	Bending strength	Surface durability		
SSA1-20	m1	20	S5	8	20	22	10	5.75	0.33	0.59	0.033	0.08~0.18	0.021
SSA1-24		24			26	7.47		0.49	0.76	0.050	0.032		
SSA1-25		25			27	7.91		0.54	0.81	0.055	0.035		
SSA1-28		28			30	9.24		0.68	0.94	0.070	0.044		
SSA1-30		30			32	10.1		0.79	1.03	0.081	0.052		
SSA1-32		32			34	11.1		0.90	1.13	0.092	0.059		
SSA1-35		35		37	12.4	1.09	1.27	0.11	0.072				
SSA1-36		36		38	12.9	1.16	1.31	0.12	0.076				
SSA1-40		40		42	14.7	1.45	1.50	0.15	0.095				
SSA1-45		45		47	17.1	1.86	1.74	0.19	0.12				
SSA1-48		48		50	18.5	2.13	1.89	0.22	0.14				
SSA1-50		50		52	19.5	2.32	1.98	0.24	0.15				
SSA1-55	55	57	21.8	2.83	2.23	0.29	0.18						
SSA1-56	56	58	22.3	2.94	2.28	0.30	0.19						
SSA1-60	60	62	24.2	3.40	2.47	0.35	0.22						
SSA1-70	70	72	29.1	4.70	2.96	0.48	0.30						
SSA1-80	80	82	33.9	6.23	3.46	0.63	0.39						
SSA1-100	100	102	43.7	9.97	4.45	1.02	0.61						
SSA1-120	120	122	53.5	14.7	5.45	1.50	0.88						
SSA1.5-20	m1.5	20	S5	10	30	33	15	19.4	1.15	1.98	0.12	0.10~0.22	0.074
SSA1.5-24		36			39	25.2		1.73	2.57	0.18	0.11		
SSA1.5-25		37.5			40.5	26.7		1.90	2.72	0.19	0.12		
SSA1.5-28		42			45	31.2		2.41	3.18	0.25	0.15		
SSA1.5-30		45			48	34.2		2.79	3.49	0.28	0.18		
SSA1.5-32		48			51	37.3		3.19	3.80	0.33	0.20		
SSA1.5-35		52.5		55.5	41.9	3.85	4.28	0.39	0.25				
SSA1.5-36		54		57	43.5	4.09	4.43	0.42	0.26				
SSA1.5-40		60		63	49.8	5.10	5.07	0.52	0.31				
SSA1.5-45		67.5		70.5	57.7	6.53	5.88	0.67	0.40				
SSA1.5-48		72		75	62.4	7.47	6.37	0.76	0.46				
SSA1.5-50		75		78	65.7	8.15	6.69	0.83	0.50				
SSA1.5-55	82.5	85.5	73.7	9.96	7.51	1.02	0.61						
SSA1.5-56	84	87	75.3	10.4	7.68	1.06	0.63						
SSA1.5-60	90	93	81.8	12.0	8.34	1.22	0.73						
SSA1.5-70	105	108	98.0	16.6	10.0	1.69	1.00						
SSA1.5-80	120	123	114	22.0	11.7	2.24	1.31						
SSA1.5-100	150	153	147	35.5	15.0	3.62	2.06						

[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see Page 24 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 "Cautions on Performing Secondary Operations" (Page 26) when performing modifications and/or secondary operations for safety concerns.
KHK Quick-Mod Gears, the KHK 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.



S5K



To order J Series products, please specify: **Catalog No. + J + BORE.**

Bore H7		* The product shapes of J Series items are identified by background color.																		
Keyway J _{S9}		8	10	12	14	15	16	17	18	19	20	22	25	28	30	32	35	40	45	50
Screw size		3x1.4	4x1.8		5x2.3				6x2.8				8x3.3			10x3.3	12x3.3	14x3.8		
Catalog Number		—																		
SSA1-20J BORE	S5K																			
SSA1-24J BORE	S5K	S5K																		
SSA1-25J BORE	S5K	S5K																		
SSA1-28J BORE	S5K	S5K	S5K																	
SSA1-30J BORE	S5K	S5K	S5K																	
SSA1-32J BORE	S5K	S5K	S5K	S5K																
SSA1-35J BORE	S5K	S5K	S5K	S5K	S5K	S5K														
SSA1-36J BORE	S5K	S5K	S5K	S5K	S5K	S5K	S5K													
SSA1-40J BORE	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K												
SSA1-45J BORE	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K										
SSA1-48J BORE	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K									
SSA1-50J BORE		S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K									
SSA1-55J BORE		S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K								
SSA1-56J BORE		S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K								
SSA1-60J BORE		S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K							
SSA1-70J BORE		S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K						
SSA1-80J BORE		S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K					
SSA1-100J BORE		S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K		
SSA1-120J BORE		S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	
SSA1.5-20J BORE		S5K	S5K																	
SSA1.5-24J BORE		S5K	S5K	S5K	S5K	S5K														
SSA1.5-25J BORE		S5K	S5K	S5K	S5K	S5K														
SSA1.5-28J BORE		S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K											
SSA1.5-30J BORE		S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K										
SSA1.5-32J BORE		S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K									
SSA1.5-35J BORE		S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K									
SSA1.5-36J BORE		S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K								
SSA1.5-40J BORE					S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K							
SSA1.5-45J BORE					S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K						
SSA1.5-48J BORE					S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K						
SSA1.5-50J BORE					S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K					
SSA1.5-55J BORE					S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K					
SSA1.5-56J BORE					S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K				
SSA1.5-60J BORE					S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K			
SSA1.5-70J BORE					S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K
SSA1.5-80J BORE					S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K
SSA1.5-100J BORE					S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K	S5K

- [Caution on J series]
- ① As available-on-request products, these require a lead-time for shipping within 2 working days (excludes the day ordered), after placing an order.
 - 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, Js9 tolerance.
 - ④ Black oxide is not re-applied after hole and key secondary operations.

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



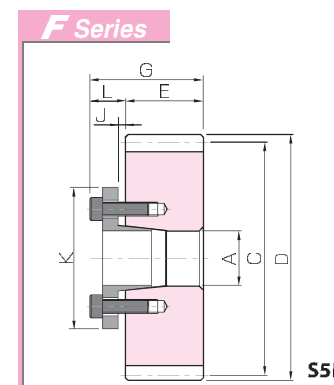
Specifications	
Precision grade	JIS grade N8 (JIS B1702-1:1998)*
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat Treatment	—
Tooth hardness	(less than 194HB)
Surface treatment	Black oxide coated except for portions given secondary operation

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

Catalog Number	Module	No. of teeth	Pitch dia.			Face width
			C	D	E	
SSA3-20	m3	20	60	66	30	
SSA3-24		24	72	78		
SSA3-25		25	75	81		
SSA3-28		28	84	90		
SSA3-30		30	90	96		
SSA3-32		32	96	102		
SSA3-35		35	105	111		
SSA3-36		36	108	114		
SSA3-40		40	120	126		
SSA3-45		45	135	141		
SSA3-48		48	144	150		
SSA3-50		50	150	156		
SSA3-55		55	165	171		
SSA3-56		56	168	174		
SSA3-60		60	180	186		
SSA3-70		70	210	216		
SSA3-80	80	240	246			

Bore A	Sintered Metal Bushings		Clearance	Total Length	Hex socket bolt		Ref. thrust load	Ref. slipping torque	Bolt tightening torque	Bushings weight
	L	K			Qty	Size				
15	12	37	3	42	4	M4×15	5.10	39	3.9	40
16		38					42	41		
17		39					45	43		
18		40					48	45		
19		42					5.12	49		49
20	14	46	44	44	4	M5×18	9.68	97	7.8	71
22		47					110	71		
25		51					124	81		
28		53					141	84		
30		56					149	93		
32		58					163	97		
35		61					173	106		
40	19	71	49	6	M6×25	12.3	725	13.7	237	

* For the permitted torque and backlash of each product, please refer to the dimensional table of the original product.



To order F Series products, please specify: **Catalog Number + F + BORE.**

Catalog Number	* The product shapes of F Series items are identified by background color.												
	15	16	17	18	19	20	22	25	28	30	32	35	40
SSA3-20 F Bore	S5M	S5M	S5M	S5M									
SSA3-24 F Bore	S5M	S5M	S5M	S5M	S5M								
SSA3-25 F Bore	S5M	S5M	S5M	S5M	S5M								
SSA3-28 F Bore						S5M	S5M	S5M	S5M	S5M	S5M	S5M	
SSA3-30 F Bore						S5M	S5M	S5M	S5M	S5M	S5M	S5M	
SSA3-32 F Bore						S5M	S5M	S5M	S5M	S5M	S5M	S5M	
SSA3-35 F Bore						S5M	S5M	S5M	S5M	S5M	S5M	S5M	S5M
SSA3-36 F Bore						S5M	S5M	S5M	S5M	S5M	S5M	S5M	S5M
SSA3-40 F Bore								S5M	S5M	S5M	S5M	S5M	S5M
SSA3-45 F Bore								S5M	S5M	S5M	S5M	S5M	S5M
SSA3-48 F Bore								S5M	S5M	S5M	S5M	S5M	S5M
SSA3-50 F Bore								S5M	S5M	S5M	S5M	S5M	S5M
SSA3-55 F Bore								S5M	S5M	S5M	S5M	S5M	S5M
SSA3-56 F Bore								S5M	S5M	S5M	S5M	S5M	S5M
SSA3-60 F Bore								S5M	S5M	S5M	S5M	S5M	S5M
SSA3-70 F Bore								S5M	S5M	S5M	S5M	S5M	S5M
SSA3-80 F Bore								S5M	S5M	S5M	S5M	S5M	S5M

- [Caution on F Series]
- As available-on-request products, these require a lead-time for shipping within 2 working days (excludes the day ordered), after placing an order.
 - 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.
 - Additionally the machined parts of the fastener components and gears are not black oxide coated.

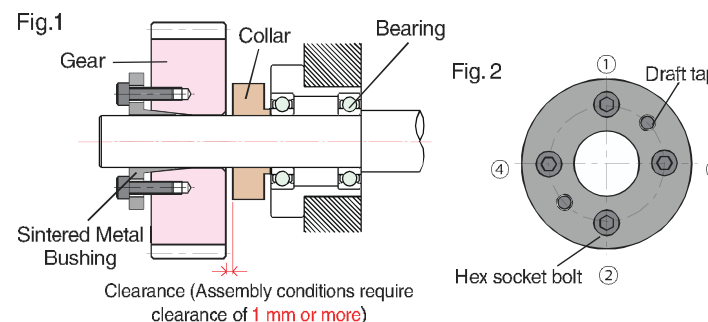
Features of F Series

- No rattling of shaft and gear when fastening
- Freely positionable mounting for easy meshing of teeth
- Easily mounted and removed for repeated use
- The bushing slides when overloaded to reduce damage to the gears.



Mounting Method and Precautions

- Shaft diameter recommended tolerance is h7. The limit is h8, but we recommend h6 when minimizing runout. Use 1.6a as reference for the surface roughness of the shaft diameter.
- Wipe away any debris, dirt or oil on the shaft surface and hole of the fastened section with thinner or the like, and lightly apply hydraulic oil #68. Do not apply molybdenum-based oil or oil with additives, as this may cause reduced fastening torque or slippage.
- Pass completely through the shaft while pressing the bushing flange against the gear before tightening. Removal will not be possible, so be sure to leave a clearance of 1mm or more on the gear rear surface side. (Fig.1)
- Use a torque wrench to fasten bolts on opposite sides when tightening. First tighten at 1/4 of the regulated torque, then at 1/2 of the regulated torque, before finally tightening up to the regulated torque. Do not tighten without passing through the shaft, or fasten the bolts after insertion on the draft tap side. (Fig.2)
- If the shaft has a keyway, the fastened section contact area is reduced and the transmission rate is decreased by 15 to 20%.

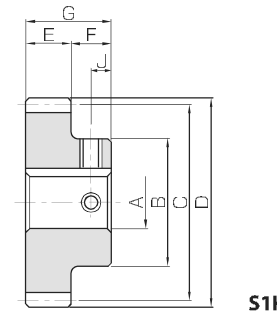
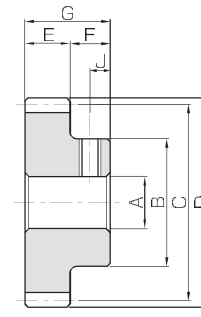
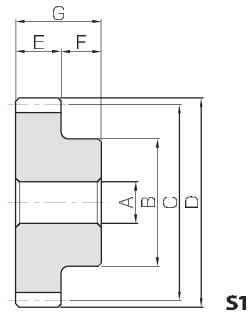


Removal Method and Precautions

- Turn off the power source (supply), check that no load is applied to the gear, and confirm that there is no danger due to falling, etc.
- Insert removed bolts into all draft taps, and gradually and evenly tighten each bolt in diagonal order until removal is complete.
- The washer and thread surfaces will be roughened, compromising tightening strength, if the bolts are reused. Consequently, we recommend using new bolts of the same size.



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

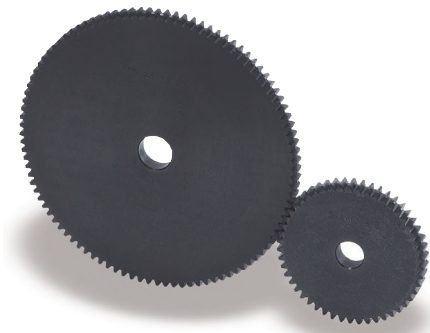


Catalog Number	Module	No. of teeth	Shape	Bore				Face width	Hub width	Total Length	Keyway
				A _{H7}	B	C	D				
SSY1-50 SSY1-50A	m1	50	S1 S1T	8	28	50	52	6	8	14	—
SSY1-55 SSY1-55A		55	S1 S1K	8 10	28	55	57				4 x 1.8
SSY1-56 SSY1-56A		56	S1 S1K	8 10	28	56	58				4 x 1.8
SSY1-60 SSY1-60A SSY1-60B		60	S1 S1K S1K	8 10 12	35	60	62				4 x 1.8 4 x 1.8
SSY1-64 SSY1-64A		64	S1 S1K	8 10	35	64	66				4 x 1.8
SSY1-65 SSY1-65A		65	S1 S1K	8 10	35	65	67				4 x 1.8
SSY1-70 SSY1-70A		70	S1 S1K	8 10	35	70	72				4 x 1.8
SSY1-72 SSY1-72A		72	S1 S1K	8 10	35	72	74				4 x 1.8
SSY1-75 SSY1-75A		75	S1 S1K	8 10	35	75	77				4 x 1.8
SSY1-80 SSY1-80A		80	S1 S1K	10 12	40 35	80	82				4 x 1.8
SSY1-85 SSY1-85A		85	S1 S1K	10 12	40 35	85	87				4 x 1.8
SSY1-90 SSY1-90A		90	S1 S1K	10 12	40 35	90	92				4 x 1.8
SSY1-95 SSY1-95A		95	S1 S1K	10 12	40 35	95	97				4 x 1.8
SSY1-96 SSY1-96A		96	S1 S1K	10 12	40 35	96	98				4 x 1.8
SSY1-100 SSY1-100A		100	S1 S1K	10 12	50 35	100	102				4 x 1.8
SSY1-110 SSY1-110A		110	S1 S1K	10 12	50 35	110	112				4 x 1.8
SSY1-120 SSY1-120A	120	S1 S1K	10 12	50 35	120	122	4 x 1.8				

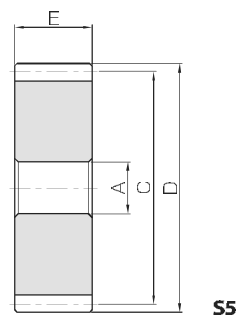
Socket head screw Size	J	Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog Number
		Bending strength	Surface durability	Bending strength	Surface durability			
— M5	— 4	11.7	1.39	1.19	0.14	0.08~0.18	0.13 0.12	SSY1-50 SSY1-50A
— M4	— 4	13.1	1.70	1.34	0.17		0.15 0.14	SSY1-55 SSY1-55A
— M4	— 4	13.4	1.77	1.37	0.18		0.15 0.14	SSY1-56 SSY1-56A
— M4 M4	— 4 4	14.5	2.04	1.48	0.21		0.19 0.18 0.18	SSY1-60 SSY1-60A SSY1-60B
— M4	— 4	15.7	2.34	1.60	0.24		0.21 0.20	SSY1-64 SSY1-64A
— M4	— 4	16.0	2.41	1.63	0.25		0.21 0.21	SSY1-65 SSY1-65A
— M4	— 4	17.4	2.82	1.78	0.29		0.24 0.23	SSY1-70 SSY1-70A
— M4	— 4	18.0	2.99	1.84	0.30		0.25 0.24	SSY1-72 SSY1-72A
— M4	— 4	18.9	3.26	1.93	0.33		0.26 0.26	SSY1-75 SSY1-75A
— M4	— 4	20.3	3.74	2.07	0.38		0.31 0.28	SSY1-80 SSY1-80A
— M4	— 4	21.8	4.25	2.22	0.43		0.34 0.31	SSY1-85 SSY1-85A
— M4	— 4	23.3	4.79	2.37	0.49		0.37 0.35	SSY1-90 SSY1-90A
— M4	— 4	24.7	5.37	2.52	0.55		0.40 0.38	SSY1-95 SSY1-95A
— M4	— 4	25.0	5.49	2.55	0.56		0.41 0.39	SSY1-96 SSY1-96A
— M4	— 4	26.2	5.98	2.67	0.61		0.48 0.42	SSY1-100 SSY1-100A
— M4	— 4	29.1	7.31	2.97	0.75		0.56 0.49	SSY1-110 SSY1-110A
— M4	— 4	32.1	8.80	3.27	0.90	0.65 0.58	SSY1-120 SSY1-120A	

- [Caution on Product Characteristics]
- The key groove used is a JIS B 1301 normal type (Js9) and a set screw is included for products with a tapped hole.
 - The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see Page 24 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 "Cautions on Performing Secondary Operations" (Page 26) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK system for quick modification of KHK stock gears, is also available.
 - When using a product with secondary operations applied, please be careful of runout and deformation as the tooth width is thin. Heat treatment in particular may cause the gear to warp.
 - 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)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat Treatment	—
Tooth hardness	(less than 194HB)
Surface treatment	Black oxide coating



S5

Catalog Number	Module	No. of teeth	Shape	Bore			Face width E	Allowable torque (N·m)		Allowable torque (kgf·m)	
				A _{H7}	C	D		Bending strength	Surface durability	Bending strength	Surface durability
SSAY1-20	m1	20	S5	6	20	22	6	3.45	0.20	0.35	0.021
SSAY1-24		24			26	4.48		0.30	0.46	0.030	
SSAY1-25		25			27	4.74		0.32	0.48	0.033	
SSAY1-28		28			30	5.55		0.41	0.57	0.042	
SSAY1-30		30			32	6.08		0.47	0.62	0.048	
SSAY1-32		32			34	6.63		0.54	0.68	0.055	
SSAY1-35		35		37	7.45	0.66	0.76	0.067			
SSAY1-36		36		38	7.73	0.70	0.79	0.071			
SSAY1-40		40		42	8.84	0.87	0.90	0.089			
SSAY1-45		45		47	10.3	1.12	1.05	0.11			
SSAY1-48		48		50	11.1	1.28	1.13	0.13			
SSAY1-50		50		52	11.7	1.39	1.19	0.14			
SSAY1-55		55		57	13.1	1.70	1.34	0.17			
SSAY1-56		56		58	13.4	1.77	1.37	0.18			
SSAY1-60		60		62	14.5	2.04	1.48	0.21			
SSAY1-70		70		72	17.4	2.82	1.78	0.29			
SSAY1-80		80		82	20.3	3.74	2.07	0.38			
SSAY1-100		100		102	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 24 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.

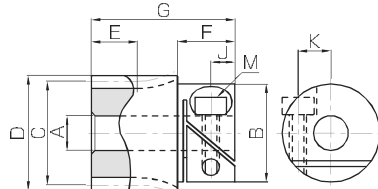
Backlash (mm)	Weight (kg)	Catalog Number
	0.037 0.044 0.047 0.058 0.074	SSAY1-32 SSAY1-35 SSAY1-36 SSAY1-40 SSAY1-45
	0.084 0.090 0.11 0.11 0.13	SSAY1-48 SSAY1-50 SSAY1-55 SSAY1-56 SSAY1-60
	0.18 0.23 0.37	SSAY1-70 SSAY1-80 SSAY1-100

- [Caution on Secondary Operations]
- ① Please read "Cautions on Performing Secondary Operations" (Page 26) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK system for quick modification of KHK stock gears, is also available.
 - ② When using a product with secondary operations applied, please be careful of runout and deformation as the tooth width is thin. Heat treatment in particular may cause the gear to warp.
 - ③ Avoid performing secondary operations that narrow the tooth width, as it affects precision and strength.

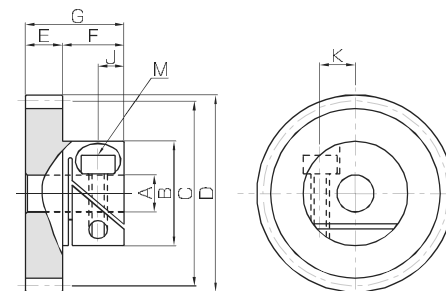


Specifications	
Precision grade	JIS grade N8 (JIS B1702-1:1998)*
Gear teeth	Standard full depth
Pressure angle	20°
Material	SUS303
Heat Treatment	—
Tooth hardness	(less than 187HB)

*The gear grade listed is the value before clamping.
The precision grade of products with a module of 0.5 or less is equivalent to the value shown in the table.



S3



S1

Catalog Number	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total Length	Hex socket screw					
				A _{H7}	B	C	D	E	F	G	M	J	K			
SUSF0.5-16 SUSF0.5-18 SUSF0.5-20 SUSF0.5-24 SUSF0.5-25	m0.5	16 18 20 24 25	S3	4	14	8 9 10 12 12.5	9 10 11 13 13.5	7	8	22	M2.5	3.3	4.4			
SUSF0.5-28 SUSF0.5-30 SUSF0.5-32 SUSF0.5-35 SUSF0.5-36		28 30 32 35 36				S1	6							17	14 15 16 17.5 18	15 16 17 18.5 19
SUSF0.5-40 SUSF0.5-45 SUSF0.5-48 SUSF0.5-50 SUSF0.5-60		40 45 48 50 60													20 22.5 24 25 30	21 23.5 25 26 31
SUSF0.5-64 SUSF0.5-70 SUSF0.5-80 SUSF0.5-90 SUSF0.5-100		64 70 80 90 100													32 35 40 45 50	33 36 41 46 51
SUSF0.5-120		120				60	61							14 15 16 18 20	16 17 18 20 22	8
SUSF1-14 SUSF1-15 SUSF1-16 SUSF1-18 SUSF1-20		m1	14 15 16 18 20	S3	6	17	14 15 16 18 20	16 17 18 20 22	8	10	16	M3	4.5	6		
SUSF1-24 SUSF1-25 SUSF1-28 SUSF1-30 SUSF1-32			24 25 28 30 32				24 25 28 30 32	26 27 30 32 34								
SUSF1-35 SUSF1-36 SUSF1-40 SUSF1-45 SUSF1-48			35 36 40 45 48				35 36 40 45 48	37 38 42 47 50								
SUSF1-50 SUSF1-60 SUSF1-64 SUSF1-70 SUSF1-80 SUSF1-90 SUSF1-100			50 60 64 70 80 90 100				50 60 64 70 80 90 100	52 62 66 72 82 92 102								

Allowable torque (N·m)		Allowable torque (kgf·m)		Ref. slipping torque / Standard screw tightening torque (N·m)	Backlash (mm)	Weight (g)	Catalog Number	
Bending strength	Surface durability	Bending strength	Surface durability					
0.40 0.47 0.56 0.72 0.76	0.023 0.030 0.038 0.056 0.061	0.040 0.048 0.057 0.074 0.078	0.0023 0.0031 0.0039 0.0057 0.0062	0.62 / 0.36	0~0.10	13.7 15.2 16.9 19.7 20.8	SUSF0.5-16 SUSF0.5-18 SUSF0.5-20 SUSF0.5-24 SUSF0.5-25	
0.89 0.98 0.76 0.86 0.89	0.079 0.091 0.075 0.088 0.096	0.091 0.10 0.078 0.088 0.091	0.0080 0.0093 0.0077 0.009 0.010	0.62 / 0.36		15.7 16.6 22.2 23.8 24.3	SUSF0.5-28 SUSF0.5-30 SUSF0.5-32 SUSF0.5-35 SUSF0.5-36	
1.02 1.18 1.28 1.34 1.67	0.12 0.15 0.17 0.19 0.28	0.10 0.12 0.13 0.14 0.17	0.012 0.015 0.018 0.019 0.029	1.79 / 0.63		26.6 29.9 32.0 33.5 43.8	SUSF0.5-40 SUSF0.5-45 SUSF0.5-48 SUSF0.5-50 SUSF0.5-60	
1.81 2.01 2.34 2.68 3.02	0.32 0.39 0.51 0.66 0.82	0.18 0.20 0.24 0.27 0.31	0.033 0.040 0.052 0.067 0.084	2.22 / 0.63		47.6 53.8 86.8 99.8 114	SUSF0.5-64 SUSF0.5-70 SUSF0.5-80 SUSF0.5-90 SUSF0.5-100	
3.69	1.21	0.38	0.123	4.50 / 1.50		148	SUSF0.5-120	
1.46 1.63 1.81 2.17 1.90	0.088 0.10 0.12 0.15 0.14	0.15 0.17 0.18 0.22 0.19	0.0090 0.010 0.012 0.015 0.015	1.79 / 0.63		32.8 35.6 38.6 26.1 28.9	SUSF1-14 SUSF1-15 SUSF1-16 SUSF1-18 SUSF1-20	
2.48 2.62 3.06 3.36 3.66	0.21 0.23 0.29 0.34 0.39	0.25 0.27 0.31 0.34 0.37	0.021 0.023 0.030 0.034 0.039	2.22 / 0.63		35.3 37.1 43.0 48.9 53.5	SUSF1-24 SUSF1-25 SUSF1-28 SUSF1-30 SUSF1-32	
4.12 4.27 4.89 5.66 6.14	0.47 0.49 0.62 0.79 0.91	0.42 0.44 0.50 0.58 0.63	0.047 0.050 0.063 0.081 0.093			0~0.10	60.9 63.5 74.7 90.3 101	SUSF1-35 SUSF1-36 SUSF1-40 SUSF1-45 SUSF1-48
6.45 8.03 8.67 9.63 11.2 12.9 14.5	0.99 1.45 1.66 2.00 2.65 3.40 4.25	0.66 0.82 0.88 0.98 1.15 1.31 1.48	0.10 0.15 0.17 0.20 0.27 0.35 0.43			4.50 / 1.50	129 169 188 217 272 335 405	SUSF1-50 SUSF1-60 SUSF1-64 SUSF1-70 SUSF1-80 SUSF1-90 SUSF1-100

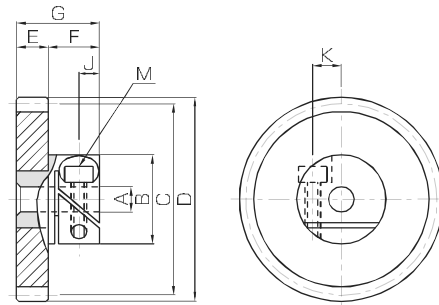
- [Caution on Product Characteristics]
- The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see Page 24 for more details.
 - The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.
 - F-Loc gears are attached to the shaft by a friction coupling. Recommended shaft tolerances are g6, h6, or h7. Torque slippage should be considered when making a selection.
 - Do not tighten the clamping screw without inserting a shaft, or the bore will be permanently deformed and will not accept a shaft.
 - The tooth (SUS303) and hub (SUS303) mating section has a rotation-stop pin inserted.

- [Caution on Secondary Operations]
- Avoid performing secondary operations, as this is a complete product.



Specifications	
Precision grade	JIS grade N10 (JIS B1702-1:1998)*
Gear teeth	Standard full depth
Pressure angle	20°
Material	Polyacetal (Hub: SUS303)
Heat Treatment	—
Tooth hardness	(110 to 120HRR)

* The gear grade listed is the value before clamping.
The precision grade of products with a module of 0.5 or less is equivalent to the value shown in the table.



S1

Catalog Number	Module	No. of teeth	Shape	Bore				Face width	Hub width	Total Length	Hex socket screw														
				A _{H7}	B	C	D				M	J	K												
DSF0.5-36 DSF0.5-40 DSF0.5-45 DSF0.5-48 DSF0.5-50	m0.5	36 40 45 48 50	S1	5	14	18 20 22.5 24 25	19 21 23.5 25 26	5	8.5	13.5	M2.5	3.3	4.4												
DSF0.5-60 DSF0.5-64 DSF0.5-70 DSF0.5-80 DSF0.5-90		60 64 70 80 90				30 32 35 40 45	31 33 36 41 46																		
DSF0.5-100 DSF0.5-120		100 120				50 60	51 61							10	15	M3	4.5	6							
DSF1-20 DSF1-24 DSF1-25 DSF1-28 DSF1-30		20 24 25 28 30				5	14												20 24 25 28 30	22 26 27 30 32	8.5	14.5	M2.5	3.3	4.4
DSF1-32 DSF1-35 DSF1-36 DSF1-40 DSF1-45		32 35 36 40 45																	32 35 36 40 45	34 37 38 42 47					
DSF1-48 DSF1-50 DSF1-60 DSF1-64 DSF1-70		48 50 60 64 70		8	19	8	19	48 50 60 64 70	50 52 62 66 72	6	10	16	M3	4.5	6										
DSF1-80 DSF1-90 DSF1-100		80 90 100						80 90 100	82 92 102																

Allowable torque (N·m)	Allowable torque (kgf·m)	Ref. slipping torque / Standard screw tightening torque (N·m)	Backlash (mm)	Weight (g)	Catalog Number		
						Bending strength	Bending strength
0.49 0.55 0.64 0.69 0.73	0.050 0.057 0.065 0.071 0.075	0.62 / 0.36	0~0.10	11.5 12.0 12.5 12.9 13.2	DSF0.5-36 DSF0.5-40 DSF0.5-45 DSF0.5-48 DSF0.5-50		
0.90 0.97 1.07 1.25 1.42	0.092 0.099 0.11 0.13 0.14			14.7 15.4 16.5 18.6 31.1	DSF0.5-60 DSF0.5-64 DSF0.5-70 DSF0.5-80 DSF0.5-90		
1.59 1.93	0.16 0.20			33.7 39.8	DSF0.5-100 DSF0.5-120		
0.96 1.22 1.28 1.48 1.61	0.098 0.12 0.13 0.15 0.16			0.62 / 0.36	0~0.10	12.6 13.7 14.1 15.1 26.2	DSF1-20 DSF1-24 DSF1-25 DSF1-28 DSF1-30
1.75 1.96 2.04 2.33 2.69	0.18 0.20 0.21 0.24 0.27					27.0 28.3 28.8 30.8 33.6	DSF1-32 DSF1-35 DSF1-36 DSF1-40 DSF1-45
2.92 3.07 3.78 4.07 4.50	0.30 0.31 0.39 0.41 0.46					35.5 36.8 44.1 47.4 52.7	DSF1-48 DSF1-50 DSF1-60 DSF1-64 DSF1-70
5.23 5.95 6.68	0.53 0.61 0.68					62.7 74.0 86.6	DSF1-80 DSF1-90 DSF1-100

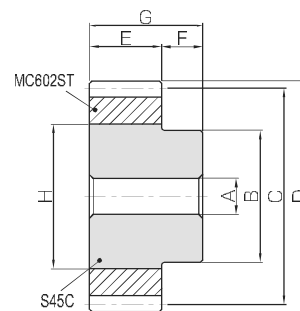
- [Caution on Product Characteristics]
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 - The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.
 - The tooth (acetal) and hub (SUS303) mating section has a rotation-stop pin inserted.
 - F-Loc gears are attached to the shaft by a friction coupling. Recommended shaft tolerances are g6, h6, or h7. Torque slippage should be considered when making a selection.
 - Do not tighten the clamping screw without inserting a shaft, or the bore will be permanently deformed and will not accept a shaft.

- [Caution on Secondary Operations]
- Avoid performing secondary operations, as this is a complete product.



Specifications	
Precision grade	JIS grade N9 (JIS B1702-1: 1998)*
Gear teeth	Standard full depth
Pressure angle	20°
Material	MC602ST with S45C core
Heat Treatment	—
Tooth hardness	(115 to 120HRR)

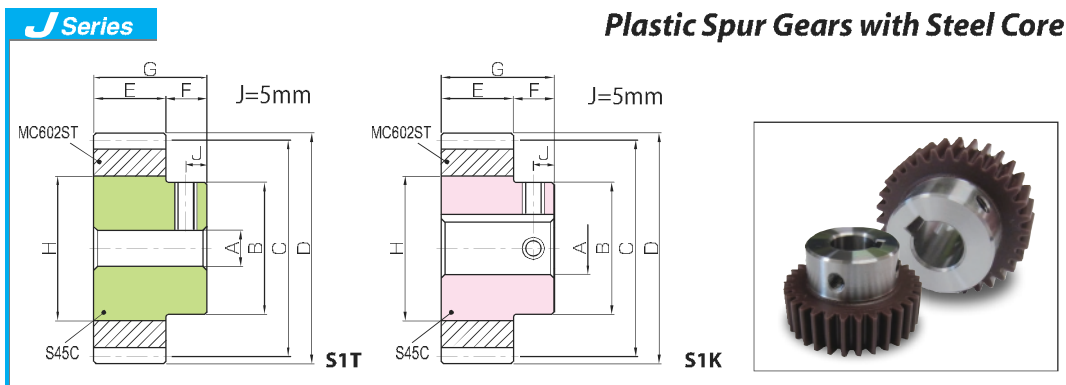
* The precision grade of J Series products is equivalent to the value shown in the table.



S1

Catalog Number	No. of teeth	Shape	Bore A _{H7}	Hub dia. B	Pitch dia. C	Outside dia. D	Face width E	Hub width F	Total Length G	Core O.D. H	Allowable torque (N·m)		Backlash (mm)	Weight (kg)	
											Bending strength	Bending strength			
NSU1-30	30	S1	8	20	30	32	10	10	20	20	1.23	0.13	0~0.34	0.046	
NSU1-32	32			22	32	34				22	1.34	0.14		0.057	
NSU1-34	34			25	34	36				25	1.44	0.15		0.074	
NSU1-35	35			25	35	37				25	1.50	0.15		0.075	
NSU1-36	36			25	36	38				25	1.56	0.16		0.076	
NSU1-40	40			25	40	42				28	1.78	0.18		0.082	
NSU1-45	45		30	45	47	34	2.06	0.21	0.12						
NSU1-48	48		30	48	50	34	2.23	0.23	0.13						
NSU1-50	50		30	50	52	34	2.35	0.24	0.13						
NSU1-60	60		40	60	62	45	2.93	0.30	0.23						
NSU1-70	70	S1	10	70	72	15	12	27	45	3.46	0.35	0~0.36	0.24		
NSU1-80	80			80	82				45	4.00	0.41		0.25		
NSU1-90	90			90	92				55	4.56	0.46		0.32		
NSU1-100	100			100	102				65	5.12	0.52		0.40		
NSU1.5-28	28		S1	10	30	42	45	15	12	27	30	3.82	0.39	0~0.38	0.15
NSU1.5-30	30				45	48	30				4.15	0.42	0.15		
NSU1.5-32	32				48	51	33				4.51	0.46	0.18		
NSU1.5-34	34				51	54	33				4.88	0.50	0.19		
NSU1.5-35	35				52.5	55.5	36				5.07	0.52	0.20		
NSU1.5-36	36			54	57	36	5.26	0.54	0.21						
NSU1.5-40	40	60		63	45	6.00	0.61	0.31							
NSU1.5-45	45	67.5		70.5	45	6.94	0.71	0.33							
NSU1.5-48	48	72		75	45	7.53	0.77	0.33							
NSU1.5-50	50	75		78	45	7.92	0.81	0.33							
NSU1.5-56	56	12	50	84	87	55	9.09	0.93	0.50						
NSU1.5-60	60			90	93	55	9.89	1.01	0.51						
NSU1.5-68	68			102	105	67	11.3	1.15	0.66						
NSU1.5-70	70			105	108	70	11.7	1.19	0.70						
NSU1.5-80	80			120	123	85	13.5	1.38	1.01						
NSU1.5-90	90			135	138	100	15.4	1.57	1.29						
NSU2-20	20	S1	10	22	40	44	20	14	34	22	5.89	0.60	0~0.42	0.10	
NSU2-22	22			44	48	30				6.66	0.68	0.19			
NSU2-24	24			30	48	52				30	7.43	0.76		0.19	
NSU2-25	25			50	54	30				7.85	0.80	0.20			
NSU2-28	28			56	60	35				9.05	0.92	0.27			
NSU2-30	30		60	64	35	9.84	1.00	0.28							
NSU2-32	32		64	68	40	10.7	1.09	0.35							
NSU2-34	34		68	72	45	11.6	1.18	0.41							
NSU2-35	35		70	74	45	12.0	1.22	0.41							
NSU2-36	36		72	76	45	12.5	1.27	0.42							
NSU2-40	40	15	60	80	84	60	14.2	1.45	0.71						
NSU2-44	44			88	92	60	16.0	1.63	0.74						
NSU2-45	45			90	94	60	16.5	1.68	0.74						
NSU2-48	48			96	100	65	17.8	1.82	0.88						
NSU2-50	50			100	104	65	18.8	1.92	0.90						
NSU2-56	56			112	116	65	21.5	2.20	0.95						
NSU2-60	60	120	124	85	23.5	2.39	1.29								
NSU2-68	68	136	140	100	26.8	2.74	1.66								
NSU2-70	70	140	144	105	27.7	2.82	1.79								
NSU2-80	80	160	164	125	32.0	3.27	2.38								

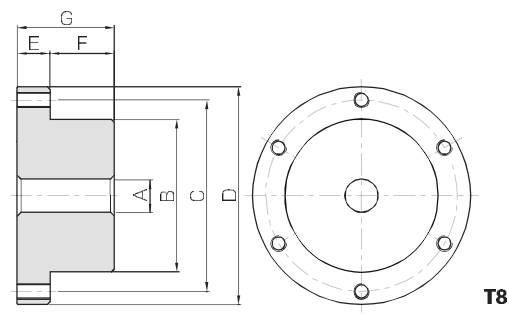
* Please see the next page for Cautions on Product Characteristics, Cautions on Performing Secondary Operations and Caution on J Series.



To order J Series products, please specify: **Catalog No. + J + BORE.**

Bore H7	* The product shapes of J Series items are identified by background color.																	
	8	10	12	14	15	16	17	18	19	20	22	25	28	30	32	35		
Keyway Jis9	—			4x1.8				5x2.3				6x2.8				8x3.3		10 X 3.3
Screw size	—			M4				M5				M6		M8				
Catalog Number	M5																	
NSU1-30 J BORE	S1T																	
NSU1-32 J BORE	S1T	S1K																
NSU1-34 J BORE	S1T	S1K	S1K															
NSU1-35 J BORE	S1T	S1K	S1K															
NSU1-36 J BORE	S1T	S1K	S1K															
NSU1-40 J BORE		S1K	S1K															
NSU1-45 J BORE		S1K	S1K	S1K	S1K	S1K	S1K											
NSU1-48 J BORE		S1K	S1K	S1K	S1K	S1K	S1K											
NSU1-50 J BORE		S1K	S1K	S1K	S1K	S1K	S1K											
NSU1-60 J BORE		S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K							
NSU1-70 J BORE		S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K							
NSU1-80 J BORE		S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K							
NSU1-90 J BORE		S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K							
NSU1-100 J BORE		S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K							
NSU1.5-28 J BORE		S1K	S1K	S1K	S1K	S1K	S1K											
NSU1.5-30 J BORE		S1K	S1K	S1K	S1K	S1K	S1K											
NSU1.5-32 J BORE		S1K	S1K	S1K	S1K	S1K	S1K											
NSU1.5-34 J BORE		S1K	S1K	S1K	S1K	S1K	S1K											
NSU1.5-35 J BORE		S1K	S1K	S1K	S1K	S1K	S1K											
NSU1.5-36 J BORE		S1K	S1K	S1K	S1K	S1K	S1K											
NSU1.5-40 J BORE		S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K							
NSU1.5-45 J BORE		S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K							
NSU1.5-48 J BORE		S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K							
NSU1.5-50 J BORE			S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K							
NSU1.5-56 J BORE			S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K				
NSU1.5-60 J BORE			S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K				
NSU1.5-68 J BORE			S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K				
NSU1.5-70 J BORE			S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K				
NSU1.5-80 J BORE			S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K		
NSU1.5-90 J BORE			S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K		
NSU2-20 J BORE		S1K																
NSU2-22 J BORE		S1K	S1K	S1K	S1K	S1K	S1K											
NSU2-24 J BORE		S1K	S1K	S1K	S1K	S1K	S1K											
NSU2-25 J BORE		S1K	S1K	S1K	S1K	S1K	S1K											
NSU2-28 J BORE		S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K									
NSU2-30 J BORE		S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K									
NSU2-32 J BORE			S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K							
NSU2-34 J BORE			S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K							
NSU2-35 J BORE			S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K							
NSU2-36 J BORE			S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K							
NSU2-40 J BORE				S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K				
NSU2-44 J BORE				S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K				
NSU2-45 J BORE				S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K				
NSU2-48 J BORE				S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K		
NSU2-50 J BORE				S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K		
NSU2-56 J BORE				S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K		
NSU2-60 J BORE				S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K		
NSU2-68 J BORE				S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K		
NSU2-70 J BORE				S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K		
NSU2-80 J BORE				S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K		

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



Material: SUS303

Catalog Number	Partner	Shape	Bore		Socket head screw			Flange diameter	Flange length	Hub width	Total Length
			A _{H7}	B	No.	Size	C				
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]
- The area where PSA Plastic Spur Gears are attached, with hub tolerance h7.
 - The coupling torques shown in the table are reference values calculated according to these set values; friction coefficients and fastening torques of the tapping screw.
 - 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.
 - 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.
 - If a fastened hexagon socket head cap screw comes loose, the tightening torque values shown in the table cannot be maintained. It is recommended to check the fasteners regularly and retighten when required.
 - 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.

Coupling Torque for Stainless Steel Hubs

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.

$$F = \frac{n \cdot 1000 \cdot T}{K \cdot d}$$

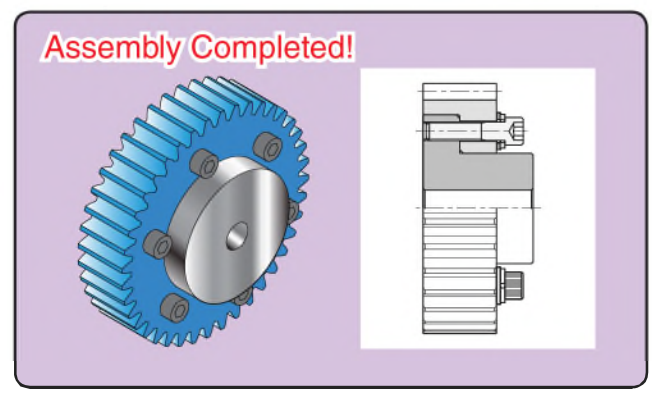
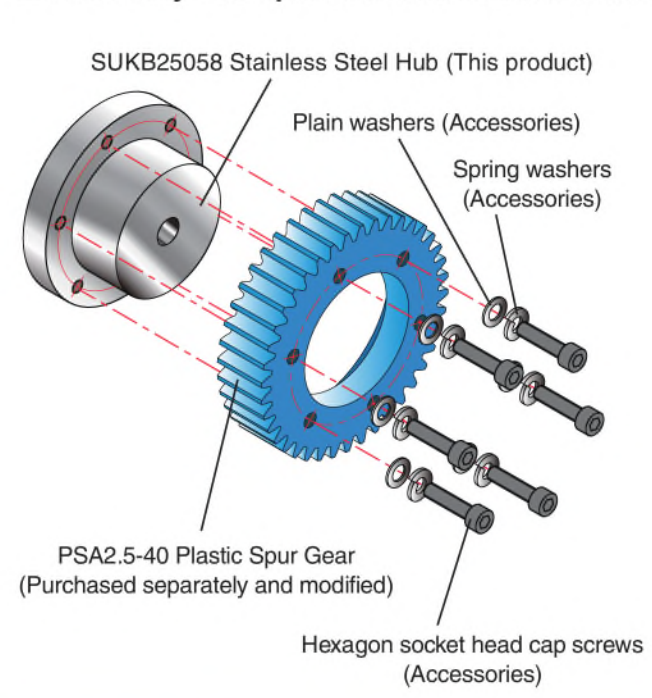
n : Number → No. of threaded holes shown in the dimension table.
 T : Tightening torque (N·m) → Fastening torque shown in the dimension table.
 K : Torque coefficient → Set the value at 0.164
 d : Nominal diameter (mm) → Socket head screw size shown in the dimension table (M5 = 5mm)

Coupling torque T_r(N·m) is calculated from the equation below.

$$T_r = \frac{F \cdot \mu \cdot d_w}{2000}$$

F : Fastening torque (N) → The value obtained from the calculation above.
 μ : 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

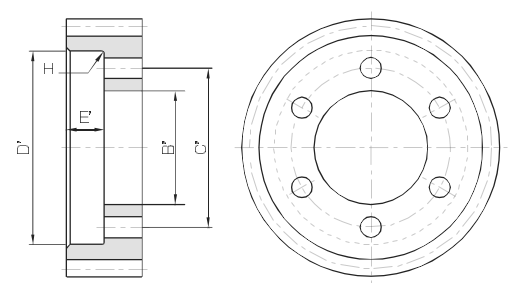
Assembly Example of Stainless Steel Hubs



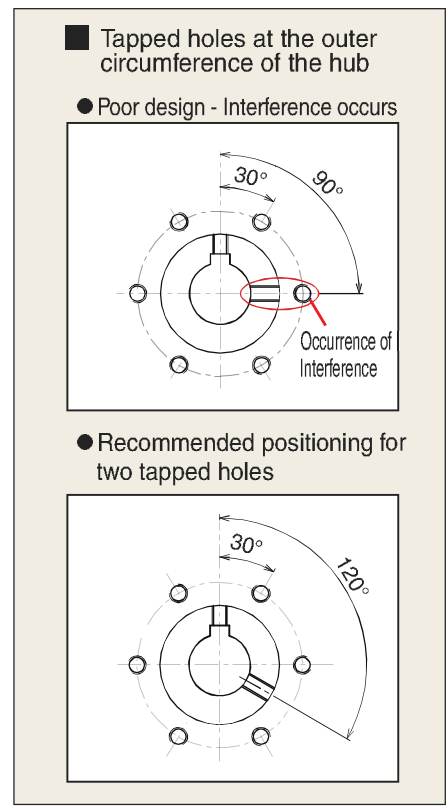
Recommended fastening torque		Coupling torque		Weight (kg)	Catalog Number
(N·m)	(kgf·m)	(N·m)	(kgf·m)		
3.00	0.31	83	8.5	0.24	SUKB20030 SUKB20046 SUKB20066
		115	11.7	0.51	
		154	15.7	0.97	
5.20	0.53	151	15.4	0.47	SUKB25038 SUKB25058 SUKB25083
		208	21.2	0.98	
		280	28.5	1.88	
12.5	1.27	329	33.6	0.82	SUKB30046 SUKB30070 SUKB30100
		453	46.2	1.72	
		607	61.9	3.29	

- [Caution on Secondary Operations]
- Please read "Cautions on Performing Secondary Operations" (Page 26) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK system for quick modification of KHK stock gears, is also available.
 - 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.
 - 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.

Partner Products and Modifications



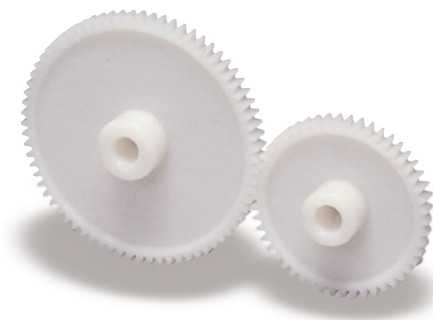
Stainless Steel Hubs		Partner						
Catalog Number	Catalog Number	Bore B _{H7}	Drilled hole			Bore 2 D' _{+0.1/0}	Hole length E' _{+0.1}	Fillet radius H
			No.	Size	C'			
SUKB20030 SUKB20046 SUKB20066	PSA2-32 or more PSA2-40 or more PSA2-50 or more	30 46 66	6	φ 5.5	42 58 78	51 67 87	10	R0.5 or less
SUKB25038 SUKB25058 SUKB25083	PSA2.5-32 or more PSA2.5-40 or more PSA2.5-50 or more	38 58 83			53 73 98	63 83 108		
SUKB30046 SUKB30070 SUKB30100	PSA3-32 or more PSA3-40 or more PSA3-50 or more	46 70 100			φ 9	64 88 118		



To find more information on KHK Quick-Mod Gears, please see Page 14.

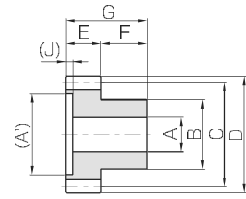
Leave secondary operations to the KHK Quick-Mod Gears.

Modifications for SUKB Products (With fee) Modifications for PSA Products (Purchased separately and modified with fee)

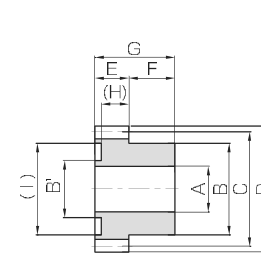


Specifications	
Precision grade	JIS grade N12 (JIS B1702-1:1998)*
Gear teeth	Standard full depth
Pressure angle	20°
Material	Duracon (M90-44)
Heat Treatment	—
Tooth hardness	(110 to 120HRR)

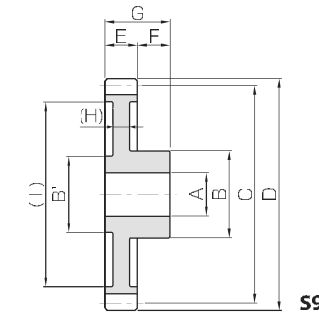
*The precision grade of these products is equivalent to the value shown in the table.



S8



S8B



S9

Catalog Number	Module	No. of teeth	Shape	Bores	Hub dia. 1	Hub dia. 2	Pitch dia.	Outside dia.	Face width	Hub width	
				A	(A')	B	B'	C	D	E	F
DS0.5-12	m0.5	12	S8	2	(4)	4.5	—	6	7	3	4
DS0.5-15		15	S8	—	(5.5)	4.5	—	7.5	8.5		
DS0.5-16		16	S8	3	(6)	6	—	8	9		
DS0.5-20		20	S8B	—	—	8	5	10	11		
DS0.5-24		24	S9	4	—	8	5	12	13	5	
DS0.5-30		30	S9	5	—	10	7	15	16		
DS0.5-40		40				12	8	20	21		
DS0.5-45		45				12	8	22.5	23.5		
DS0.5-48		48				12	8	24	25		
DS0.5-50		50				12	8	25	26		
DS0.5-56	56	S9	6	—	14	10	28	29	5		
DS0.5-60	60				14	10	30	31			
DS0.5-70	70				14	10	35	36			
DS0.5-80	80				14	10	40	41			
DS0.8-12	m0.8	12	S8	3	6	4	9.6	11.2	4	5	
DS0.8-15		15		6	4.5	12	13.6				
DS0.8-16		16		8	6	12.8	14.4				
DS0.8-20		20		10	8	16	17.6				
DS0.8-24		24		10	8	19.2	20.8				
DS0.8-30		30	S9	6	—	12	10	24	25.6	4	
DS0.8-40		40				12	10	32	33.6		
DS0.8-45		45				12	10	36	37.6		
DS0.8-48		48				14.5	11.7	38.4	40		
DS0.8-50		50				14.5	11.7	40	41.6		
DS0.8-56	56	S9	6	—	14.5	11.7	44.8	46.4	6		
DS0.8-60	60				14.5	11.7	48	49.6			
DS0.8-70	70				15.5	11.7	56	57.6			
DS0.8-80	80				15.5	11.7	64	65.6			

[Caution on Product Characteristics] ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see Page 24 for more details.

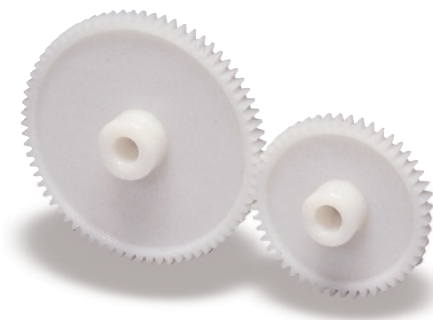
② The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.

③ The bore tolerance is -0.05 to -0.30, but it may be slightly higher at the center of the hole.

④ For the dimensional accuracy of each part, see the dimensional tolerance of molded items in the separate table.

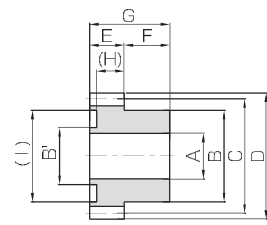
Total Length	Web thickness	Web O.D.	Hole depth	Allowable torque (N·m)	Allowable torque (kgf·m)	Backlash (mm)	Weight (g)	Catalog Number
G	(H)	(I)	(J)	Bending strength	Bending strength			
7	—	—	(0.6)	0.063	0.0064	0~0.30	0.17	DS0.5-12
	—	—	(0.6)	0.092	0.0094		0.23	DS0.5-15
	—	—	(0.6)	0.10	0.010		0.28	DS0.5-16
	(2.4)	(8)	—	0.14	0.014		0.47	DS0.5-20
	(1.8)	(9.5)	—	0.17	0.018		0.58	DS0.5-24
	(1.8)	(21.5)	—	0.44	0.045		2.02	DS0.5-50
8	(24.5)	—	—	0.50	0.051	0~0.48	2.77	DS0.5-56
	(26.5)	—	—	0.54	0.055		3.02	DS0.5-60
	(31.5)	—	—	0.64	0.066		3.71	DS0.5-70
	(36.5)	—	—	0.75	0.076		4.51	DS0.5-80
9	(6.7)	—	—	0.22	0.022	0~0.48	0.48	DS0.8-12
	(8.8)	—	—	0.31	0.032		0.64	DS0.8-15
	(9.2)	—	—	0.35	0.035		0.84	DS0.8-16
	(12.7)	—	—	0.47	0.048		1.26	DS0.8-20
	(15)	—	—	0.59	0.060		1.59	DS0.8-24
	(19.5)	—	—	0.79	0.080		2.37	DS0.8-30
(27.5)	—	—	1.13	0.12	3.47	DS0.8-40		
(31)	—	—	1.31	0.13	4.18	DS0.8-45		
(33.5)	—	—	1.42	0.15	5.31	DS0.8-48		
(35)	—	—	1.50	0.15	5.60	DS0.8-50		
10	(39.5)	—	—	1.70	0.17	0~0.48	6.55	DS0.8-56
	(42.5)	—	—	1.85	0.19		7.30	DS0.8-60
	(50.5)	—	—	2.20	0.22		9.52	DS0.8-70
	(55.5)	—	—	2.55	0.26		11.8	DS0.8-80

[Caution on Secondary Operations] ① As it is a molded item, bubbles may form inside the material. Avoid performing secondary operations.

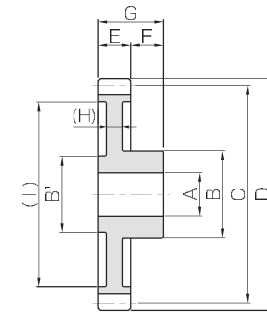


Specifications	
Precision grade	JIS grade N12 (JIS B1702-1:1998)*
Gear teeth	Standard full depth
Pressure angle	20°
Material	Duracon (M90-44)
Heat Treatment	—
Tooth hardness	(110 to 120HRR)

*The precision grade of these products is equivalent to the value shown in the table.



S8B



S9

Catalog Number	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
DS1-12	m1	12	S8B	4	—	8	6	12	14	6	6
DS1-15		8				7	15	17			
DS1-16		10				8	16	18			
DS1-18		10				8	18	20			
DS1-20		11.7				9	20	22			
DS1-24		24	5	—	11.7	9	24	26	6	6	
DS1-25		11.7			9	25	27				
DS1-28		11.7			9	28	30				
DS1-30		14			12	30	32				
DS1-32		32	14	12	32	34					
DS1-35		35	6	S9	—	14	12	35	37	6	6
DS1-36		36				14	12	36	38		
DS1-40		40				16	14	40	42		
DS1-45		45				16	14	45	47		
DS1-48		48				16	14	48	50		
DS1-50		50	8	S9	—	16	14	50	52	6	8
DS1-56		56				18	15.6	56	58		
DS1-60		60				18	15.6	60	62		
DS1-64		64				18	15.6	64	66		
DS1-70		70				18	15.6	70	72		
DS1-72	72	80	S9	—	18	15.6	72	74	6	8	
DS1-80	80						80	82			

[Caution on Product Characteristics] ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see Page 24 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 -0.05 to -0.30, but it may be slightly higher at the center of the hole.
 ④ For the dimensional accuracy of each part, see the dimensional tolerance of molded items in the separate table.

Total Length	Web thickness	Web O.D.	Hole depth	Allowable torque (N·m)	Allowable torque (kgf·m)	Backlash (mm)	Weight (g)	Catalog Number	
G	(H)	(I)	(J)	Bending strength	Bending strength				
12	(5.5)	(8.5)	—	0.44	0.045	0~0.60	1.10	DS1-12	
	(5)	(11)		0.65	0.066		1.49	DS1-15	
	(3)	(11.5)		0.71	0.073		1.87	DS1-16	
		(13.5)		0.83	0.085		2.15	DS1-18	
		(15)		0.96	0.098		2.85	DS1-20	
		(17)		1.22	0.12		3.81	DS1-24	
	14	(20)		(20)	1.28		0.13	3.76	DS1-25
		(23)		(23)	1.48		0.15	4.39	DS1-28
		(24)		(24)	1.61		0.16	5.46	DS1-30
		(26.5)		(26.5)	1.75		0.18	5.86	DS1-32
(29)		(29)	1.96	0.20	6.73	DS1-35			
(30)		(30)	2.04	0.21	7.01	DS1-36			
(34)		(34)	2.33	0.24	8.39	DS1-40			
(39.5)		(39.5)	2.69	0.27	9.87	DS1-45			
(40)		(40)	2.92	0.30	12.0	DS1-48			
(42.5)		(42.5)	3.07	0.31	12.6	DS1-50			
(48.5)	(48.5)	3.49	0.36	15.8	DS1-56				
(52.5)	(52.5)	3.78	0.39	17.6	DS1-60				
(56.5)	(56.5)	4.07	0.41	19.4	DS1-64				
(62.5)	(62.5)	4.50	0.46	22.4	DS1-70				
(64)	(64)	4.65	0.47	23.7	DS1-72				
(72.5)	(72.5)	5.23	0.53	27.9	DS1-80				

[Caution on Secondary Operations] ① As it is a molded item, bubbles may form inside the material. Avoid performing secondary operations.

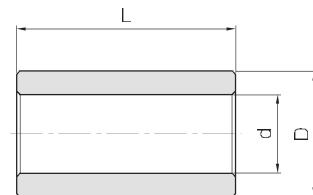


BB
Sintered Metal Bushings

Sintered Metal Bushings



When using the injection molded spur gear with an idler gear (bearing metal press fitting) and diameter smaller than the inside diameter of the molded gear, please press fit the following standard bushing.



T8

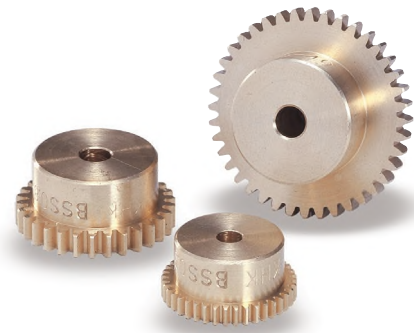
Catalog Number	Inner dia. $d^{+0.02}_0$	Outside dia. $D^{+0.02}_{-0.01}$	Length $L^0_{-0.3}$	Gear example
BB30507	3	5	7	DS0.5
BB30608	3	6	8	DS0.5, DS0.8
BB40609	4	6	9	DS0.8
BB40612	4	6	12	DS1
BB50812	5	8	12	DS1
BB50814	5	8	14	DS1

Material: Oil-free copper alloy

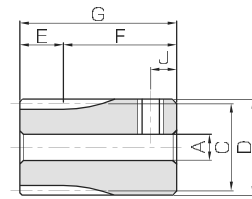


Dimensional tolerance of molded item (unit: mm)

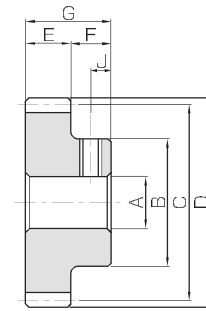
Dimensional classification	Grade	Rough grade
	3 or less	
4 to 6		±0.25
7 to 10		±0.30
11 to 18		±0.35
19 to 30		±0.40
Over 30		±0.50



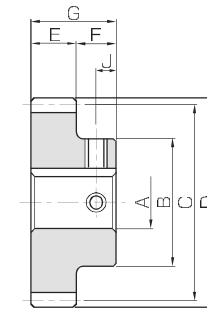
Specifications	
Precision grade	JIS grade N8 (JIS B1702-1:1998)
Gear teeth	Standard full depth
Pressure angle	20°
Material	Free cutting brass (C3604)
Heat Treatment	—
Tooth hardness	(80HV or more)



S3T



S1T



S1K

Catalog Number	Module	No. of teeth	Shape	Bore				Face width	Hub width	Total Length	Keyway
				A _{H7}	B	C	D				
BSS0.8-30 BSS0.8-30A	m0.8	30	S1 S1T	5 4	20	24	25.6	4	8	12	—
BSS0.8-40		40	S1	5	20	32	33.6				
BSS0.8-50A		50	S1T	5	28	40	41.6				
BSS0.8-60B		60		6	28	48	49.6				
BSS1-15A BSS1-15B	m1	15	S3T	4 5	17	15	17	6	8	14	—
BSS1-16A BSS1-16B		16	4 5	12	16	18					
BSS1-18B		18	6	15	18	20					
BSS1-20A BSS1-20B BSS1-20C		20	S1T	4 5 6	16	20	22				
BSS1-22A		22	6	18	22	24					
BSS1-24B		24	6	20	24	26					
BSS1-25A		25	5	22	25	27					
BSS1-28A		28	6	25	28	30					
BSS1-30B BSS1-30D		30	S1T S1K	6 10	25	30	32				
BSS1-40A		40	S1T	6	28	40	42				
BSS1-50A BSS1-50C	50	S1T S1K	6 10	28	50	52					

- [Caution on Product Characteristics]
- For products having a tapped hole, a set screw is included.
 - The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see Page 24 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.
 - If the bore diameter is less than $\phi 4$, 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.

Socket head screw		Allowable torque (N·m)	Allowable torque (kgf·m)	Backlash (mm)	Weight (kg)	Catalog Number
Size	J					
—	—	0.55	0.056	0~0.10	0.034	BSS0.8-30
M3	4	0.79	0.081		0.035	BSS0.8-30A
—	—	1.05	0.11		0.046	BSS0.8-40
M4	4	1.31	0.13		0.081	BSS0.8-50A
				0.099	BSS0.8-60B	
M3 M4	4	0.47	0.048	0.08~0.18	0.035	BSS1-15A
M3 M4		0.52	0.053		0.034	BSS1-15B
M4		0.62	0.063		0.016	BSS1-16A
					0.015	BSS1-16B
M3 M4 M4		0.73	0.074		0.021	BSS1-18B
M4		0.83	0.085		0.028	BSS1-20A
M4		0.94	0.10		0.027	BSS1-20B
M4		1.00	0.10		0.026	BSS1-20C
M4		1.17	0.12		0.033	BSS1-22A
M4		1.28	0.13		0.040	BSS1-24B
M4	1.86	0.19	0.047	BSS1-25A		
			0.060	BSS1-28A		
M4 M4			0.065	BSS1-30B		
			0.058	BSS1-30D		
M4			0.10	BSS1-40A		
M4 M4			0.14	BSS1-50A		
			0.13	BSS1-50C		

- [Caution on Secondary Operations]
- Please read "Cautions on Performing Secondary Operations" (Page 26) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK 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.
 - When using a product with secondary operations applied, please be careful of runout and deformation as the tooth width is thin.

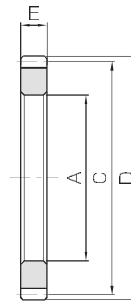


SSR Steel Ring Gears (Spur Gears)

Steel Ring Gears (Spur Gears)



Specifications	
Precision grade	JIS grade N9 (JIS B1702-1: 1998)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat Treatment	—
Tooth hardness	(less than 194HB)



S5

Catalog Number	Module	No. of teeth	Shape	Bore	Pitch dia.	Outside dia.	Face width	Allowable torque (N·m)		Allowable torque (kgf·m)	
				A-B	C	D	E	Bending strength	Surface durability	Bending strength	Surface durability
SSR2-120 SSR2-200	m2	120 200	S5	194 354	240 400	244 404	20	366 630	44.0 84.2	37.4 64.3	4.49 8.59
SSR2.5-120 SSR2.5-200	m2.5	120 200	S5	245 445	300 500	305 505	25	715 1230	88.5 169	72.9 126	9.02 17.2
SSR3-120 SSR3-160	m3	120 160	S5	296 416	360 480	366 486	30	1240 1680	157 226	126 171	16.0 23.0

[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see Page 24 for more details.
- ② 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 S5 spur gear.
- ③ The bore tolerance is finished to H8, but there may be some errors as the ring shape deforms easily.

Backlash (mm)	Weight (kg)	Catalog Number
0.17~0.37	2.46	SSR2-120
0.20~0.41	4.28	SSR2-200
0.19~0.41	4.62	SSR2.5-120
0.22~0.46	8.01	SSR2.5-200
0.22~0.45	7.77	SSR3-120
0.22~0.45	10.6	SSR3-160

[Caution on Secondary Operations]

- ① Please read "Cautions on Performing Secondary Operations" (Page 26) when performing modifications and/or secondary operations for safety concerns. KHK Quick-Mod Gears, the KHK 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 Pairs
- Bevel Gearboxes
- Other Products