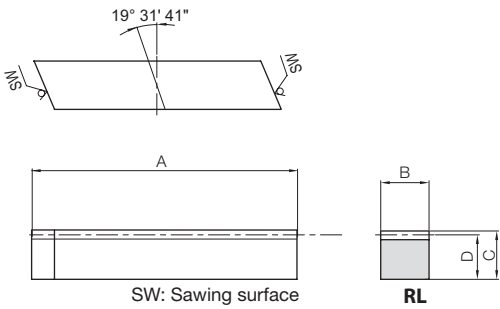




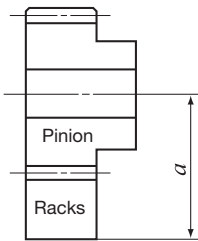
Specifications	
Precision grade	KHK R 001 grade 2
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Helix angle/direction	19° 31' 41" left helix
Material	S45C
Heat treatment	—
Tooth hardness	(less than HB210)
Surface treatment	Black oxide coating



Catalog Number	Normal module (front pitch mm)	Effective No. of teeth	Shape	Total Length	Face width	Height	Height to pitch line	Weight (kg)
				A	B	C	D	
ZST1.5-GL	m1.5 (CP5)	9	RL	59	17	17	15.5	0.11
ZST2-GL	m2 (CP6.667)	7		66	25	25	23	0.26
ZST3-GL	m3 (CP10)	8		108	30	30	27	0.62
ZST4-GL	m4 (CP13.333)	6		118	40	40	36	1.17
ZST5-GL	m5 (CP16.667)	4		115	50	50	45	1.72
ZST6-GL	m6 (CP20)	3		119	60	60	54	2.49

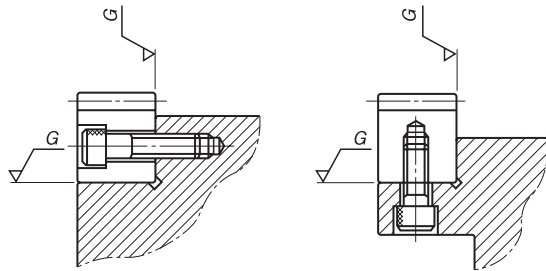
Points of Caution in Assembling

① ZST/ZSTD ground racks are designed to give the proper backlash when assembled using the mounting distance (tolerance of H7 to H8 required) given by the ZSTP Mating Pinion Dimension Table (Page 262). Make sure that the mounting distance stays constant for the length of the rack.

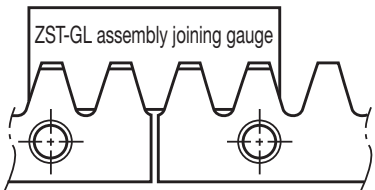


② Machined end type racks such as the ZST and ZSTD Series have pitch tolerance of -0.05 to -0.4mm at the end face. If you try to connect the racks without any space, the pitch at the connection will be too small and will cause problems. Please follow the following diagrams, "Connecting the Racks," for assembly.

③ The ZST/ZSTD type of KHK stock ground racks have four surfaces ground parallel with high precision. To maintain true angle, they should be mounted on high precision bases (within 10 μ m recommended) as shown below. It is even possible to correct for the angular errors of racks by compensating the mounting base. With recent increases in the requirement for zero backlash linear drives, such accurate assembly as shown is becoming more important. If the racks are not secured properly to the base, they could shift during operation and cause unexpected problems. It is very important to insure firm mounting by the use of dowel pins or similar devices. Please see Page 222 for more details.



Connecting the Racks



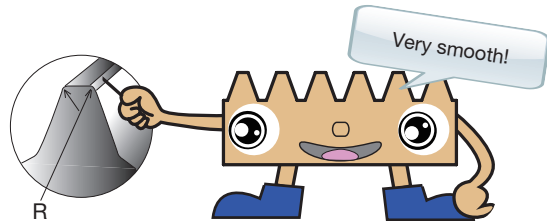
[NOTE] Please use the ZST-GL assembly gauge for the joining rack.



CP Racks & Pinions

KTSCP [CP] Tapered Pinions	STRCPF/STRCPFD [CP] Tapered Racks	MSCPG [CP] Ground Spur Gears	MRGCPF/MRGCPFD [CP] Hardened Ground Racks	KSCP [CP] Ground Spur Gears	KRGCPF-H/KRGCPFD-H [CP] Hardened Ground Racks	KRGCP/KRGCPF/KRGCPFD [CP] Thermal Refined Ground Racks
Material: SCM440 CP5, 10 Page 274	Material: S45C CP5, 10 Page 274	Material: SCM415 CP5, 10 Page 276	Material: SCM415 CP5, 10 Page 276	Material: SCM440 CP5, 10 Page 278	Material: SCM440 CP5, 10 Page 278	Material: SCM440 CP5, 10 Page 280
SSCPGS [CP] Ground Spur Pinion Shafts	SSCPG [CP] Ground Spur Gears	SRGCP/SRGCPF/SRGCPFD [CP] Hardened Ground Racks	KRCPPF-H/KRCPPFD-H [CP] Hardened Racks	KSSCP [CP] Thermal Refined Spur Gears	KRCPPF/KRCPPFD [CP] Thermal Refined Racks	SSCP [CP] Spur Gears
Material: S45C CP5, 10 Page 282	Material: S45C CP5~20 Page 282	Material: S45C CP5~20 Page 284	Material: SCM440 CP5, 10 Page 286	Material: SCM440 CP5, 10 Page 288	Material: SCM440 CP5, 10 Page 288	Material: S45C CP2.5~20 Page 290
SRCPF-H/SRCPFD-H [CP] Hardened Racks	SRCPF-HL/SRCPFD-HL [CP] Laser hardened	SRCP/SRCPF/SRCPFD/SRCPFK [CP] Racks	SUSCP [CP] Stainless Steel Spur Gears	SURCPF/SURCPFD [CP] Stainless Steel Racks	SROCP [CP] Round Racks	FRCP [CP] Metal Flexible Racks
Material: S45C CP5~20 Page 292	Material: S45C CP5~20 Page 294	Material: S45C CP2.5~20 Page 296	Material: SUS303 CP5, 10 Page 298	Material: SUS304 CP5, 10 Page 298	Material: S45C CP2.5~10 Page 300	Material: SS400 CP5 Page 300

M Includes Made to Order



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) Racks

S R CP 5 - 100

Material (S45C)
Type (Rack)
Circular pitch (5)
Total Length (100mm)

Material
M SCM415
K SCM440
S S45C
SU Stainless Steel
F SS400

Type
R Racks
RO Round Racks
S Spur Gears
TR(TS) Tapered Racks (Spur Gears)

Other Information
F Racks with Machined Ends
D Racks with Bolt Holes
K Racks with Drill Holes
G Ground Gears
H Gear teeth induction hardened
S Pinion Shafts
HL Laser hardened

Features



The KHK stock CP racks & pinions are easy-to-use racks with clear pitch.

For your convenience, we offer circular pitches of 2.5 to 20 mm and in lengths of up to 2000 mm. (FRCP is available to 4000 mm)

Racks

Catalog Number Note 1	Pitch mm	Total Length mm Parentheses show no. of teeth	Material	Heat Treatment	Tooth Surface Finish	Gear accuracy KHK R 001 Parentheses show JIS B 1702-1	Features
STRCPF STRCPFD	5, 10	1000	S45C	—	Cut	4	Racks with tapered helix with adjustable backlash.
MRGCPF MRGCPFD	5, 10	500	SCM415	Tooth area carburized	Ground	1	CP racks that have been carburized and ground that have excellent accuracy, strength and wear resistance. Secondary operations are possible except for teeth.
KRGCPF-H KRGCPFD-H	5, 10	500, 1000	SCM440	Thermal refined, gear teeth induction hardened	Ground	1	CP racks that have been tempered, hardened and ground that have excellent accuracy, strength and wear resistance. Secondary operations are possible except for teeth.
KRGCP/KRGCPF KRGCPFD	5, 10	100, 500, 1000	SCM440	Thermal refined	Ground	1	CP racks that have been tempered and ground that have excellent accuracy and strength.
SRGCP/SRGCPF SRGCPFD	5, 10, 15, 20	100, 500, 1000	S45C	Gear teeth induction hardened	Ground	3	Racks that have been hardened and ground with a good balance of accuracy, wear resistance and cost. Secondary operations are possible except for teeth.
KRCPF-H KRCPFD-H	5, 10	1000	SCM440	Thermal refined, gear teeth induction hardened	Cut	5	CP racks that have been tempered and hardened that have excellent strength and wear resistance. Secondary operations are possible except for teeth.
SRCPF-H SRCPFD-H	5, 10, 15, 20	1000	S45C	Gear teeth induction hardened	Cut	5	CP racks that have been hardened with excellent wear resistance. Secondary operations are possible except for teeth.
SRCPF-HL SRCPFD-HL	5, 10, 15, 20	1000, 1500, 2000	S45C	Gear teeth laser hardened	Cut	4	CP racks that have been laser hardened with a good balance of wear resistance and cost. Secondary operations are possible except for teeth.
KRCPF/KRCPFD	5, 10	500, 1000	SCM440	Thermal refined	Cut	4	CP racks that have been tempered with excellent strength.
SRCP/SRCPF SRCPFD/SRCPFK	2.5, 5, 10, 15, 20	100, 500, 1000, 1500, 2000	S45C	—	Cut	4	Many lineups are available at a low price and excellent usability.
SURCPF SURCPFD	5, 10	500, 1000	SUS304	Solution treated	Cut	5	Stainless steel CP racks with rust resistance.
SROCP	2.5, 5, 10	500, 1000	S45C	—	Cut	4	CP round racks that are suitable when the rack side moves.
FRCP	5	2000, 3000, 4000	SS400	—	Cut	8	Thin CP racks that can be bent.

Pinion

KTSCP	5, 10	(20~40)	SCM440	Thermal refined	Cut	(N8)	STRCPF pinion with adjustable backlash.
KSCPG	5, 10	(20~40)	SCM440	Thermal refined, gear teeth induction hardened	Ground	(N6)	CP gears that have been tempered, hardened and ground that has excellent accuracy, strength and abrasion resistance. Recommended for pinions of ground CP racks. Secondary operations are possible except for teeth.
SSCPGS	5, 10	(10~25)	S45C	Thermal refined, gear teeth induction hardened	Ground	(N7)	CP gears with shafts that have been tempered, hardened and ground. Secondary operations can be given except for the teeth. This product is ideal for the pinion of the SRGCPF rack.
SSCPG	5, 10, 15, 20	(20~40)	S45C	Gear teeth induction hardened	Ground	(N7)	CP gears that have been hardened and ground. Secondary operations can be given except for the teeth. This product is ideal for the pinion of the SRGCPF rack.
KSSCP	5, 10	(20~40)	SCM440	Thermal refined	Cut	(N8)	Tempered gears with excellent bending strength that can be given secondary operations. The teeth can be additionally hardened. This product is ideal for the pinion of the KRCPF rack.
SSCP	2.5, 5, 10, 15, 20	(20~40)	S45C	—	Cut	(N8)	Available at a low price. The teeth can be additionally hardened. This product is ideal for the pinion of the SRCP and SROCP racks.
SUSCP	5, 10	(20~30)	SUS303	—	Cut	(N8)	Stainless steel CP gears with rust resistance. This product is ideal for the pinion of the SURCPF rack.

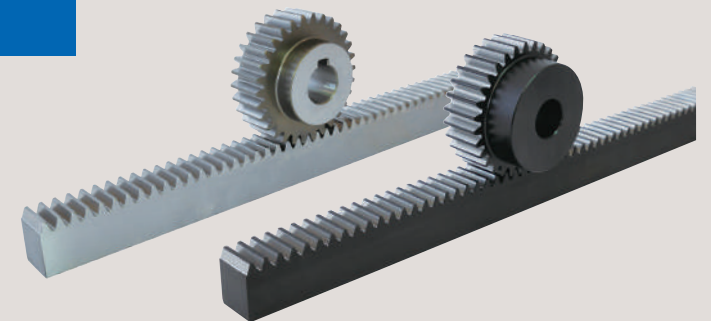
[NOTE 1] The catalog numbers of the above racks with (F) suffix have both ends machined so that they can be butted against each other. The items with (D) have mounting screw holes for immediate assembly.

- KHK stock CP racks have round semi-topping at the corners of the top land of the gear tooth.
- Black products are KHK stock CP gears that have an applied black oxide coating for rust resistance.

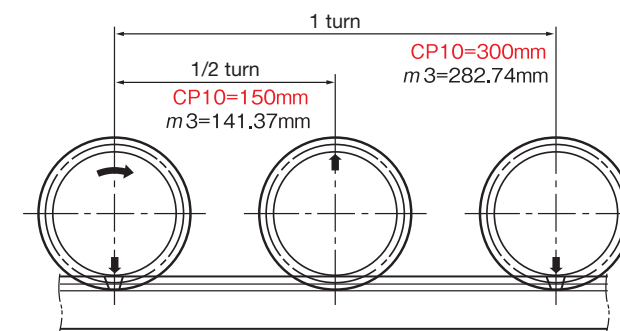
CP racks & pinions are ideal for linear positioning.

CP Racks & Pinions

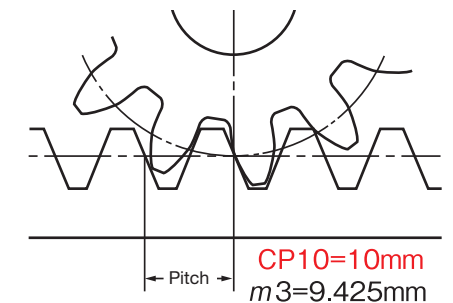
The design can be made easier by setting the moving length of one rotation of a pinion to an integer (mm). Circular pitch racks solve these problems. This problem is solved by CP racks and pinions where one rotation of a pinion moves it precisely 50, 100, 150, ... 600 mm, etc. The following table lists the main features.



Movement of one cycle of the CP10-30 pinion vs SS3-30.



Difference between CP10 and m3



STRCPF/STRCPFD & KTSCP

Taper Racks & Pinions



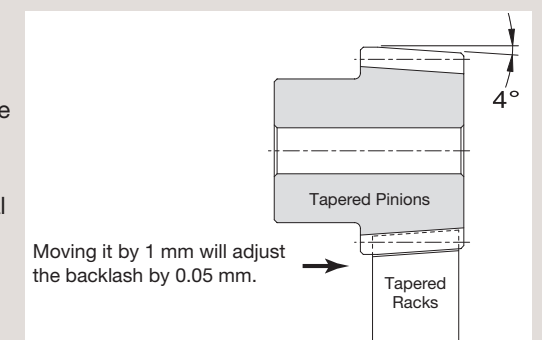
* For product details, please see Page 274.

Features of Tapered Racks & Pinions

- Easy to adjust the backlash
Normally, the backlash is adjusted by the mounting distance (height of pinion shaft), but for KHK Tapered Racks & Pinions, it can simply be adjusted by moving the pinion mounting position in the axial direction.
- Backlash within 0.05 mm
The backlash of the conventional stock racks & pinions (SRCP5-1000 & SSCP 5-30) is 0.09 to 0.25 mm, but KHK Tapered Racks & Pinions (STRCPF5-1000 & KTSCP5-30) are manufactured within 0.05 mm.
- Thrust load is not applied
As with ordinary racks & pinions, KHK Tapered Racks and Pinions can be used without worrying about the thrust load. Pinions are CP spur gears that are continuously shifted in the helix direction.

Assembly and backlash adjustment method

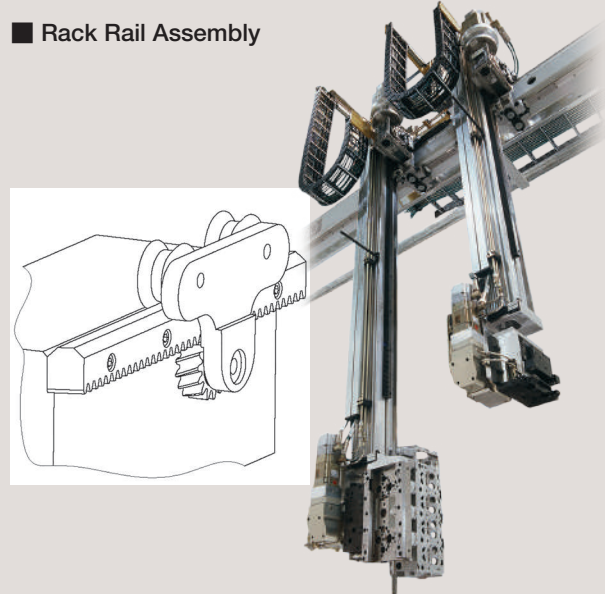
- Assemble at the mounting distance of the theoretical value at the reference tooth position of the racks & pinions.
For the mounting distance and backlash, see the dimension table of the tapered spur gear.
- The backlash can be adjusted by moving the tapered spur gear in the axial direction. Moving it by 1 mm will adjust the backlash by 0.05 mm.
- When the tapered spur gear is pushed to the large end of the rack, the backlash is reduced. Conversely, retracting it will increase the backlash.



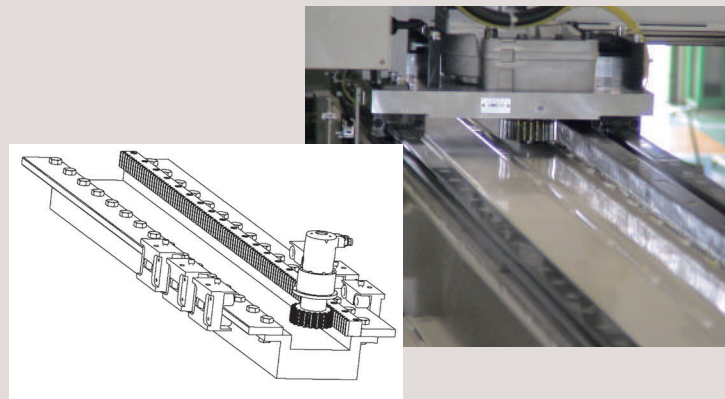
Application Examples

KHK stock CP racks & pinions are adopted in driving devices for all kinds of linear systems, including transport devices.

Rack Rail Assembly



Rack Drive Linear Guide



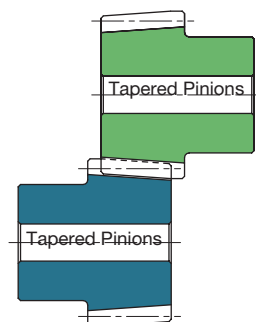
Cleaning machine manufactured by Kan Manufactory Co., Ltd.



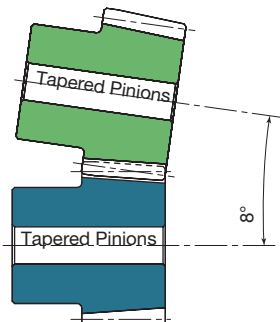
SRCPF-H racks and SSCP spur gears used in cleaning device with automatic transport for automobile parts

Examples of using tapered spur gears

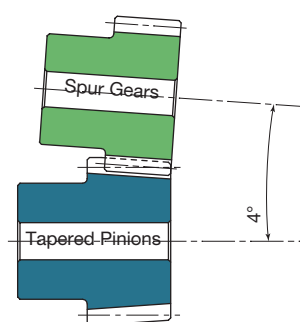
Changing the assembly direction of the tapered spur gear or assembling it with a general spur gear will allow it to be used at the axial angle shown below.



When the boss is set in the opposite direction, the axial angle is 0° (parallel shaft).



When the boss is set in the same direction, the axial angle is 8°.



When the taper spur gear and general spur gear are set, the axial angle is 4°.

Selection Hints

Please select the most suitable products by carefully considering the characteristics of items and contents of the product tables. It is also important to read all applicable notes shown below before the final selection.

1. Caution in Selecting the Mating Gears

- KHK stock CP racks are mated with CP spur gears having the same pitch. Since CP2.5 (m0.796), CP5 (m1.592) and CP10 (m3.183) are very close in size to m0.8, m1.5 and m3 respectively, selecting the proper mating gear should be verified to make sure that the items are correct. Otherwise, complications could arise.
- STRCPF and STRCPFD Tapered CP Racks are mated with KTSCP Tapered CP Spur Gears having the same pitch.

2. Caution in Selecting Gears Based on Gear Strength

The gear strength values shown in the product pages were computed by assuming the application environment in the table below. Therefore, they should be used as reference only. We recommend that each user computes their own values by applying the actual usage conditions. 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		Racks						Pinion											
		MRGCPF MRGCPFD	KRGCPF-H KRGCPFD-H KRCPF-H KRCPFD-H	KRGCP KRGCPF KRGCPFD KRCPF KRCPFD	SRGCP SRGCPF SRGCPFD SRCPF-H SRCPFD-H	SRCPF-HL SRCPF-HL	SRCP/SRCPF SRCPFD SRCPF-K SROCP STRCPF STRCPFD	SURCPF SURCPFD	FRCP	MSCPG	KSCPG	SSCPGS	SSCPG	KTSCP	KSSCP	KSSCP-H	SSCP	SSCP-H	SUSCP
Formula NOTE 1		Formula of spur and helical gears on bending strength (JGMA401-01)																	
No. of teeth of mating gears		30								Racks									
Rotational Speed of Pinion		100rpm																	
Design Life (Durability)		Over 10 ⁷ cycles																	
Impact from motor		Uniform load																	
Impact from load		Uniform load																	
Direction of load		Bidirectional load (calculated with allowable bending stress of 2/3)																	
Allowable bending stress at root σ_{Fim} (kgf/mm ²)		47	32	32	20	20	20	10.5	47	30	24.5	19	28.5	32	32	19	19	10.5	
Safety factor S_F		1.2																	

Calculation of Surface Durability (Except where it is common with bending strength)

Formula NOTE 1	Formula of spur and helical gears on surface durability (JGMA402-01)																		
Kinematic viscosity of lubricant	100cSt (50°C)																		
How to support pinions	Supported on one end.																		
Allowable Hertz stress σ_{Hlim} (kgf/mm ²)	166	112	79	90	80	52.5	41.3	-	166	112	99	90	74.5	79	112	49	90	41.3	
Safety factor S_H	1.15																		

[NOTE 1] The gear strength formula is based on JGMA (Japanese Gear Manufacturers Association) specifications.
The units for the rotational speed (rpm) and the stress (kgf/mm²) are adjusted to the units needed in the formula.

3. Cautions on Selecting Racks By Precision

The precision standards of KHK stock racks are established by us.
The table below indicates the tolerance ranges of our racks.

- Pitch Error of Racks (KHK R 001) → Page 219
- Precision of Rack Blanks → Page 220
- Backlash of Rack Teeth → Page 220

When selecting KHK standard gears, glance over the Cautions on Product Characteristics and Cautions on Performing Secondary Operations on Page 270.

- 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 26 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, etc.) listed in the catalog may be changed without prior notice. Changes are announced on the KHK website.

Website URL: <https://khkgears.net/new/>
Overseas Sales Department: Phone: +81-48-254-1744 Fax: +81-48-254-1765 E-mail: info@khkgears.net



Product Precautions



CP Rack Common Notes

[Caution on Product Characteristics]

- (1) The allowable forces shown in the table are calculated values according to the assumed usage conditions. Please see Page 269 for more details.
- (2) The backlash values shown in the table are the theoretical values for the backlash in the circumferential direction of recommended pinions with the same pitch.
- (3) There is a decarburized layer on the surface, so 0.5mm or so will not be at the specified hardness.
- (4) After attaching the racks to the base, fasten with dowel pins. Clamping only with mounting screws could possibly cause the screws to be broken, due to a heavy load.

[Caution on Secondary Operations]

- (1) Please read "Cautions on Performing Secondary Operations" on Page 272 when performing modifications and/or secondary operations for safety concerns.
- (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).

[J Series]

- (1) Cancellation is not possible for made-to-order products. For lead time details, see Page 38.
- (2) Black oxide is not re-applied to parts undergoing secondary operations.

CP Spur Gears Common Notes

[Caution on Product Characteristics]

- (1) The allowable torque shown in the table are calculated values according to the assumed usage conditions. Please see Page 269 for more details.
- (2) The backlash values shown in the table are the theoretical values for the backlash in the circumferential direction of recommended mating racks with the same pitch.
- (3) Keyways are made according to JIS B1301 standards, Js9 tolerance. Also note that keyway tooth position alignment is not performed.
- (4) For products having a tapped hole, a set screw is included.
- (5) For hole lengths 3.5x the bore or more, the hole center is out of H7 tolerance.

[Caution on Secondary Operations]

- (1) Please read "Cautions on Performing Secondary Operations" on Page 48 when performing modifications and/or secondary operations for safety concerns.
- (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).
- (3) See Page 22 for more details on Hardened Plus (H Series and HJ Series).

[J Series]

- (1) Cancellation is not possible for made-to-order products. For lead time details, see Page 38.
- (2) Certain products which would otherwise have a very long tapped hole are counterbored. For details, please see the KHK website.
- (3) Black oxide is not re-applied to parts undergoing secondary operations.
- (4) For bores over ϕ 50, the bore tolerance is H8.

STRCPF(D) CP Tapered Racks

[Caution on Product Characteristics]

- (1) When connecting the racks for use, correctly adjust the joint pitch with identical products at hand or with an SRCP □ -100 rack product of the same pitch. See "Points of Caution in Assembling" on Page 272 for details.

[Caution on Secondary Operations]

- (1) Avoid hardening racks with bolt holes, due to mounting hole deformation.

SSCPGS CP Ground Spur Pinion Shafts

[Caution on Product Characteristics]

- (1) For the center distance of the profile shifted gear, please refer to "Center distance of stock spur gear meshing with profile shifted gear" on Pages 56~57.

MRGCPF(D) CP Hardened Ground Racks

[Caution on Secondary Operations]

- (1) In the illustration, the area surrounded with ---- line is masked during the carburization process (max. HRC40 or so) and can be modified.

KRCPF(D)-H CP Hardened Racks

[Caution on Product Characteristics]

- (1) The dimensions may vary widely due to hardening. Therefore, the total composite error is excluded from the rack accuracy table on Page 219.

SRCPF(D)-H CP Hardened Racks

[Caution on Product Characteristics]

- (1) The dimensions may vary widely due to hardening. Therefore, the total composite error is excluded from the rack accuracy table on Page 219.

SRCPF(D)-HL CP Laser Hardened

[Caution on Secondary Operations]

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

SRCPFD CP Racks

[Caution on Product Characteristics]

- (1) Avoid hardening racks with bolt holes, due to mounting hole deformation.

SURCPF(D) CP Stainless Steel Racks

[Caution on Product Characteristics]

- (1) The stainless steel material is given solution treatment and passivation.

SROCP CP Round Racks

[Caution on Product Characteristics]

- (1) Because this is extruded material, the outer diameter may be out of H9 tolerance in parts.

[Caution on Secondary Operations]

- (1) Avoid hardening round racks, due to twisting and deformation occurring and the difficulty of straightening the rack after hardening.

FRCP CP Metal Flexible Racks

[Caution on Product Characteristics]

- (1) When using the metal flexible rack in an arc, the minimum bending radius (R) is 150 mm for both the external and internal teeth. This increases the pitch errors and tooth profile errors which prevent the teeth from meshing at the normal center distance, so be sure to make adjustments before use.
- (2) The tolerance of height (size C) is 0 to -0.15, and the tolerance of base width (size F) is 0 to -0.1.
- (3) It cannot be used where positioning accuracy is required.

Application Hints

In order to use KHK stock CP racks 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.

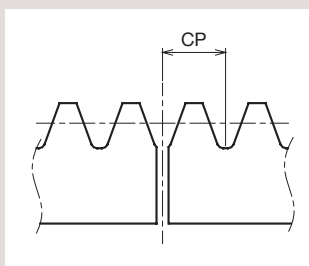
E-mail: info@khkgears.net

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. Long racks and round racks deform particularly easily, so please handle with care.

2. Caution on Performing Secondary Operations

- ① Secondary operations can be performed on all KHK stock CP racks except for the racks with their gear teeth induction hardened. To avoid problems of gear precision, do not reduce the face width.
- ② Height of pitch lines of racks are controlled by the bottom surface as the reference datum and over-pin measurements on tooth thickness. If you machine the bottom surfaces, the precision of the racks may be affected.
- ③ When connecting two racks, the machining of the mating end pitch (CP) requires careful consideration. The meshing will be poor if the pitch straddling the connection has a positive tolerance. We recommend a minus tolerance on pitch of at the connection. The below is an indication of pitch tolerance for each module.



Unit: mm

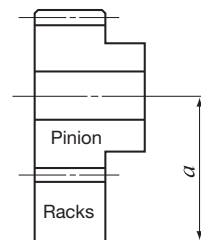
CP	Tolerance
CP2.5	-0.05 -0.25
CP5	-0.1 -0.3
CP10	-0.1
CP15	-0.4
CP20	-0.4

- ④ To use dowel pins to secure racks, attach the racks to the base and drill both simultaneously.
- ⑤ KHK stock CP racks made of S45C and SCM440 (except for ground racks) can be induction hardened. However, the precision of pitch is decreased.
- ⑥ To be able to handle parts safely, all burrs and sharp corners should be removed after the secondary operations are done.
- ⑦ If you are going to modify the gear by gripping the teeth, please exercise caution not to crush the teeth by applying too much pressure. Any scarring will cause noise during operation.
- ⑧ There is a decarburized layer (about 0.5 mm) on the surface of the extruded products. The hardness of the decarburized layer does not increase even if it is quenched.

3. Points of Caution during Assembly

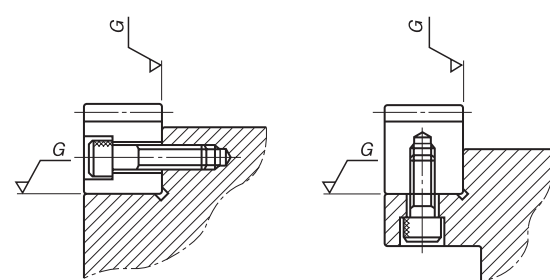
- ① The recommended assembly distance tolerance of KHK stock CP racks is H7 for ground racks and H8 for cut racks. The backlash values are given in the table on Page 220. Make sure that the mounting distance stays constant for the length of the rack.

Mounting distance a = Height of pitch line of rack + Pitch radius of pinion



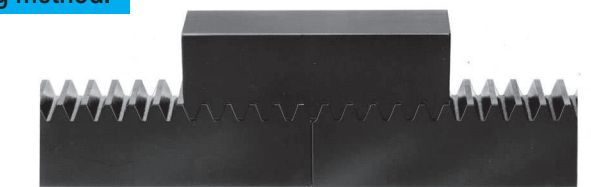
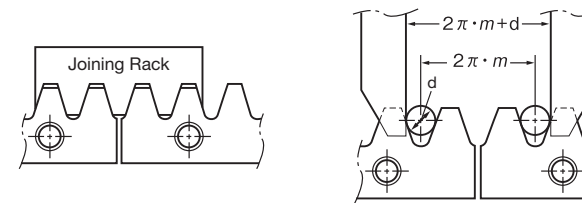
[NOTE] Pinions are assumed to be standard stock spur gears ($x=0$).

- ② The recommended flatness and squareness of the mounting surface of KHK stock CP racks is 0.01 mm for ground racks and 0.05 mm for cut racks.



- ③ If the racks are not secured properly to the base, they could shift during operation and cause unexpected problems. It is very important to insure firm mounting by the use of dowel pins or similar devices.
- ④ Machined end type racks such as SRCPF and SRCPFD series have smaller pitch tolerance at the end face. If you try to connect the racks without any space, the pitch at the connection will be too small and will cause problems. Please follow the following diagrams for assembly.
- ⑤ With SRCPFD etc., if using more than 10 racks connected together to form a rack with mounting holes machined along a length of 1 meter, the pitch precision and machining precision may cause the rack and base mounting holes to deviate, leading to set screw interference with the counterbored hole and preventing mounting. When using a rack for long lengths such as 10 meters or 20 meters, have the mounting holes additionally machined into long holes.

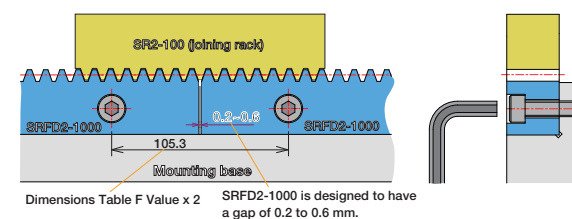
As an example of Rack Joining, we recommend the following method.



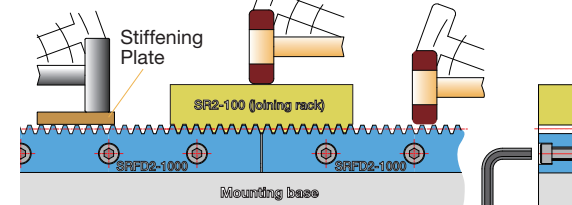
[NOTE] Joining gauge racks for helical racks must have the opposite hand from the racks. Please use 100 mm short racks as a joining gauge rack, or alternatively the rack of the same specifications on hand.

How to mount racks on a mounting base (For SRFD2-1000)

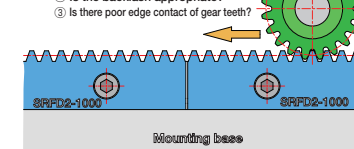
1. Pitch alignment
Place SRFD2-1000 on the mounting base, align SR2-100 and temporarily tighten the bolt.



2. Securing to the mounting base
Tap with a plastic hammer, bring it into close contact with the mounting base, and further tighten the bolt. (When using a metal hammer, be careful not to damage the gear teeth by using a stiffening plate, etc.)

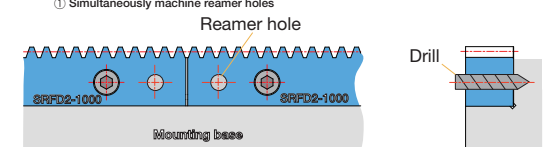


3. Run the pinion and check the following
① Is there abnormal noise or vibration?
② Is the backlash appropriate?
③ Is there poor edge contact of gear teeth?

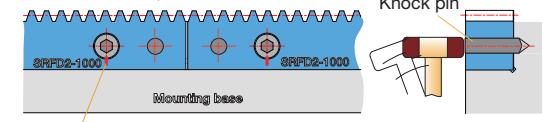


4. Secure fixation to the mounting base
We recommend that you tap the knock pin so that the rack does not shift due to vibration, etc.

- ① Simultaneously machine reamer holes



- ② Drive the knock pin



Tighten again after tapping the knock pin. It can be marked with a pen to find looseness.

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?
 - 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 If there is any abnormality such as noise or vibration during startup, stop the operation immediately and check the assembly condition such as tooth contact, eccentricity and looseness.

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.

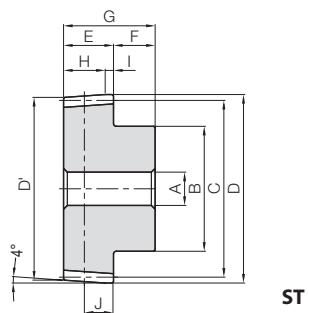


KTSCP CP Tapered Pinions

Tapered Spur Gears

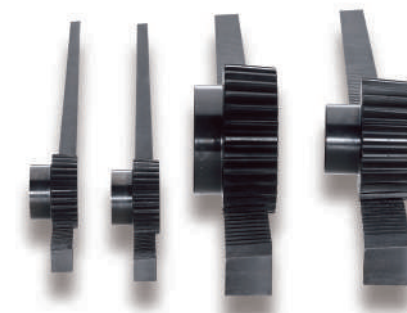
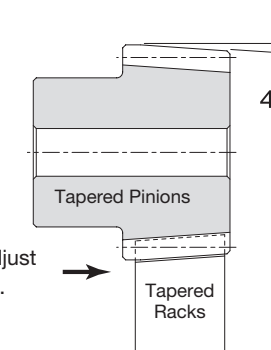


Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998)
Gear teeth	Standard full depth
Pressure angle	20°
Material	SCM440
Heat treatment	Thermal refining only
Tooth hardness	225 to 352HB
Surface treatment	Black oxide coating



Catalog Number	Pitch mm (Module)	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia. (major)	Outside dia. (minor)	Total tooth width	Hub width	Total length
				A _{H7}	B	C	D	D'	E	F	G
KTSCP5-20	CP5 (1.5915)	20	ST	8	25	31.83	36.06	33.97	18	15	33
KTSCP5-25		25		10	32	39.79	44.02	41.92			
KTSCP5-30		30		10	38	47.75	51.98	49.88			
KTSCP5-40		40		12	45	63.66	67.89	65.8			
KTSCP10-20	CP10 (3.1831)	20		15	50	63.66	72.13	67.93	36	20	56
KTSCP10-25		25		20	60	79.58	88.04	83.85			
KTSCP10-30		30		20	75	95.49	103.96	99.76			
KTSCP10-40		40		20	80	127.32	135.79	131.59			

Moving it by 1 mm will adjust the backlash by 0.05 mm.



Reference face width	Adjustable width	Position of reference tooth	Distance traveled in one turn (mm)	Allowable torque (N·m)		Allowable torque (kgf·m)		Mounting distance (mm)	Backlash (mm)	Weight (kg)	Catalog Number
				Bending strength	Surface durability	Bending strength	Surface durability				
15	3	10.5	100	41.2	8.13	4.20	0.83	33.30	0~0.11	0.16	KTSCP5-20
			125	55.6	14.0	5.67	1.43	37.28		0.25	KTSCP5-25
			150	70.3	21.9	7.16	2.23	41.26		0.37	KTSCP5-30
			200	100	43.3	10.2	4.41	49.21		0.61	KTSCP5-40
30	6	21	200	329	71.2	33.6	7.26	62.10	0~0.12	1.13	KTSCP10-20
			250	445	122	45.3	12.4	70.06		1.71	KTSCP10-25
			300	562	189	57.3	19.2	78.02		2.58	KTSCP10-30
			400	801	371	81.7	37.8	93.93		4.25	KTSCP10-40

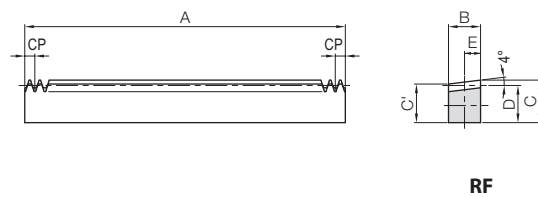


STRCPF/STRCPFD CP Tapered Racks

Tapered Racks

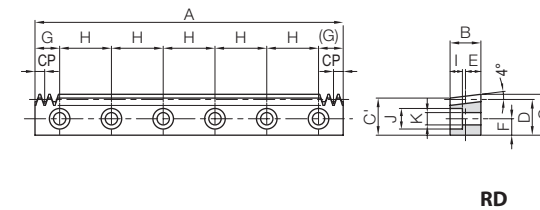


Specifications	
Precision grade	KHK R 001 grade 4
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	(less than HB210)
Surface treatment	Black oxide coating



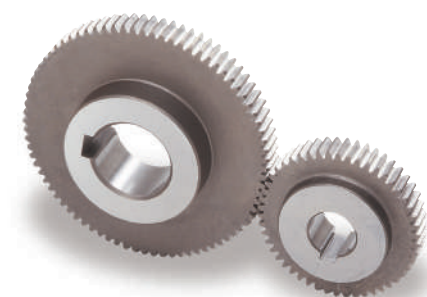
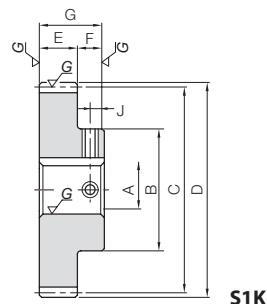
Catalog Number	Pitch mm (Module)	No. of teeth	Shape	Total Length	Face width	Height (major)	Height (minor)	Height to pitch line	Position of reference tooth
				A	B	C	C'	D	E
STRCPF5-1000	CP5 (1.5915)	200	RF	1000	15	19.5	18.45	17.38	7.5
STRCPF10-1000	CP10 (3.1831)	100			30	34.5	32.4	30.27	15

Catalog Number	Pitch mm (Module)	No. of teeth	Shape	Total Length	Face width	Height (major)	Height (minor)	Height to pitch line	Position of reference tooth	Mounting hole dimensions				
				A	B	C	C'	D	E	F	G	H	No. of holes	Screw size
STRCPFD5-1000	CP5 (1.5915)	200	RD	1000	15	19.5	18.45	17.38	7.5	8	50	180	6	M5
STRCPFD10-1000	CP10 (3.1831)	100			30	34.5	32.4	30.27	15	14	50	180	6	M10



Allowable force (N)		Allowable force (kgf)		Backlash (mm)	Weight (kg)	Catalog Number
Bending strength	Surface durability	Bending strength	Surface durability			
2290	468	233	47.7	0~0.11	2.05	STRCPF5-1000
9150	1870	933	191	0~0.12	7.13	STRCPF10-1000

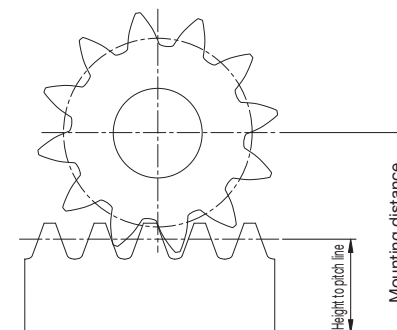
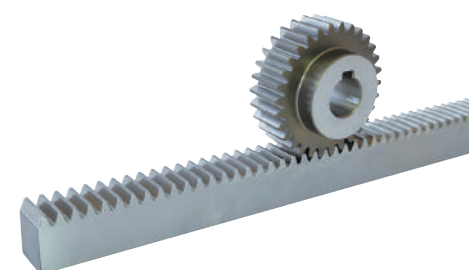
Counterbore dimensions			Allowable force (N)		Allowable force (kgf)		Backlash (mm)	Weight (kg)	Catalog Number
I	J	K	Bending strength	Surface durability	Bending strength	Surface durability			
6	10	6	2290	468	233	47.7	0~0.11	2.01	STRCPFD5-1000
10.8	17.5	11	9150	1870	933	191	0~0.12	6.92	STRCPFD10-1000



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

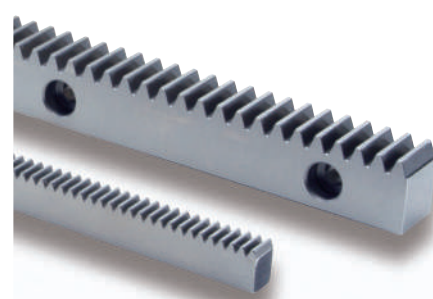
Catalog Number	Pitch mm (Module)	No. of teeth	Profile shift coefficient	Mounting distance	Shape	Bore						
						A _{H7}	B	C	D	E	F	G
MSCPG5-20A (Made to Order) MSCPG5-20B (Made to Order)	CP5 (1.5915)	20	+0.425	35	S1K	12 15	28	31.83	36.37	15	15	30
MSCPG5-25A (Made to Order) MSCPG5-25B (Made to Order)		25	+0.438	39		12 15	35	39.79	44.37			
MSCPG5-30A (Made to Order) MSCPG5-30B (Made to Order)		30	+0.451	43		15 20	40	47.75	52.37			
MSCPG5-40A (Made to Order) MSCPG5-40B (Made to Order) MSCPG5-40C (Made to Order)		40	+0.478	51		15 20 25	45	63.66	68.37			
MSCPG10-20A (Made to Order) MSCPG10-20B (Made to Order)	CP10 (3.1831)	20	+0.111	64	S1K	20 25	50	63.66	70.73	30	20	50
MSCPG10-25A (Made to Order) MSCPG10-25B (Made to Order)		25	+0.124	72		25 30	60	79.58	86.73			
MSCPG10-30A (Made to Order) MSCPG10-30B (Made to Order)		30	+0.137	80		30 40	70	95.49	102.73			
MSCPG10-40A (Made to Order) MSCPG10-40B (Made to Order)		40	+0.164	96		30 40	70	127.32	134.73			

[Precautions for Made to Order Products] Prices and lead times for Made to Order products require separate estimates. Contact your dealer.



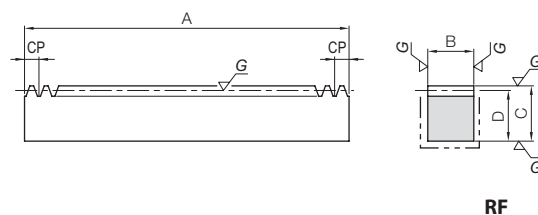
Mounting distance of a profile shifted gear and the meshing rack

Keyway Width × Depth	Socket head screw		Distance traveled in one turn (mm)	Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog Number
	Size	J		Bending strength	Surface durability	Bending strength	Surface durability			
4x 1.8 5x 2.3	M4	7.5	100	70.0	46.7	7.13	4.76	0.04~0.14	0.14 0.13	MSCPG5-20A (Made to Order) MSCPG5-20B (Made to Order)
4x 1.8 5x 2.3	M4		125	91.8	78.2	9.37	7.97		0.24 0.22	MSCPG5-25A (Made to Order) MSCPG5-25B (Made to Order)
5x 2.3 6x 2.8	M4 M5		150	114	119	11.6	12.2		0.32 0.29	MSCPG5-30A (Made to Order) MSCPG5-30B (Made to Order)
5x 2.3 6x 2.8 8x 3.3	M4 M5 M6		200	159	229	16.2	23.4		0.53 0.50 0.45	MSCPG5-40A (Made to Order) MSCPG5-40B (Made to Order) MSCPG5-40C (Made to Order)
6x 2.8 8x 3.3	M5 M6	10	200	514	375	52.4	38.2	0.05~0.16	0.94 0.87	MSCPG10-20A (Made to Order) MSCPG10-20B (Made to Order)
8x 3.3	M6		250	689	628	70.3	64.1		1.43 1.34	MSCPG10-25A (Made to Order) MSCPG10-25B (Made to Order)
8x 3.3 12x 3.3	M6 M8		300	868	960	88.5	97.9		2.03 1.80	MSCPG10-30A (Made to Order) MSCPG10-30B (Made to Order)
8x 3.3 12x 3.3	M6 M8		400	1230	1850	126	188		3.36 3.13	MSCPG10-40A (Made to Order) MSCPG10-40B (Made to Order)



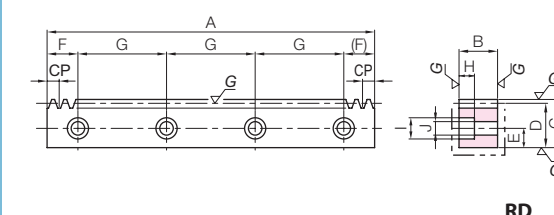
Specifications	
Precision grade	KHK R 001 Grade 1 *
Gear teeth	Standard full depth
Pressure angle	20°
Material	SCM415
Heat treatment	Tooth area carburized
Tooth hardness	55 to 60HRC

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



Catalog Number	Pitch mm (Module)	No. of teeth	Shape	Total Length	Face width	Height	Height to pitch line	Allowable force (N)		Allowable force (kgf)		Backlash (mm)	Weight (kg)
				A	B	C	D	Bending strength	Surface durability	Bending strength	Surface durability		
MRGCPF5-500	CP5 (1.5915)	100	RF	500	15	20	18.41	5380	5000	548	509	0.04~0.14	1.08
MRGCPF10-500	CP10 (3.1831)	50		500	30	35	31.82	21500	20100	2190	2050	0.05~0.16	3.75

Catalog Number ● : J Series (Available-on-request)	Pitch mm (Module)	No. of teeth	Shape	Total Length	Face width	Height	Height to pitch line	Mounting hole dimensions					
				A	B	C	D	E	F	G	No. of holes	Screw size	
● MRGCPFD5-500J	CP5 (1.5915)	100	RD	500	15	20	18.41	8	25	150	4	M5	
● MRGCPFD10-500J	CP10 (3.1831)	50		500	30	35	31.82	14	25	150	4	M10	



Surface durability is 4 times higher than SRGCP Hardened Ground Racks, 2 times higher than KRGCP-H Hardened Ground Racks.

Counterbore dimensions			Allowable force (N)		Allowable force (kgf)		Backlash (mm)	Weight (kg)	Catalog Number ● : J Series (Available-on-request)
H	I	J	Bending strength	Surface durability	Bending strength	Surface durability			
6	10	6	5380	5000	548	509	0.04~0.14	1.06	● MRGCPFD5-500J
10.8	17.5	11	21500	20100	2190	2050	0.05~0.16	3.61	● MRGCPFD10-500J



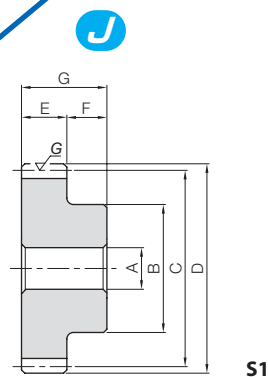
KSCPG Circular pitch 5, 10

CP Ground Spur Gears



Specifications	
Precision grade	JIS grade N6 (JIS B 1702-1: 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
Shape	S1

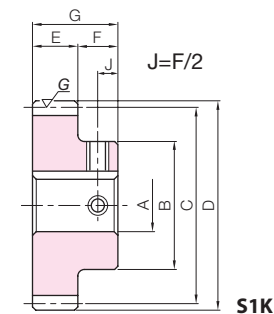
* The precision grade of J Series products is equivalent to the value shown in the table.



S1

Catalog Number	Pitch mm (Module)	No. of teeth	Profile shift coefficient	Mounting distance	Bore		Pitch dia.	Outside dia.	Face width		Total length	Distance traveled in one turn (mm)	Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)
					A _{H7}	B			E	F			Bending strength	Surface durability	Bending strength	Surface durability		
KSCPG5-20	CP5 (1.5915)	20	+0.425	35	10	25	31.83	36.37	15	15	30	100	44.7	21.3	4.55	2.17	0.04~0.14	0.14
KSCPG5-25		25	+0.438	39	10	35	39.79	44.37					58.6	35.6	5.98	3.63		0.25
KSCPG5-30		30	+0.451	43	15	40	47.75	52.37					72.8	54.3	7.42	5.54		0.33
KSCPG5-40		40	+0.478	51	15	55	63.66	68.37					101	104	10.3	10.6		0.63
KSCPG10-20	CP10 (3.1831)	20	+0.111	64	15	50	63.66	70.73	30	20	50	200	328	171	33.4	17.4	0.05~0.16	1.01
KSCPG10-25		25	+0.124	72	20	70	79.58	86.73					440	286	44.9	29.2		1.68
KSCPG10-30		30	+0.137	80	20	85	95.49	102.73					554	437	56.5	44.5		2.49
KSCPG10-40		40	+0.164	96	25	110	127.32	134.73					786	841	80.1	85.8		4.35

J Series



S1K



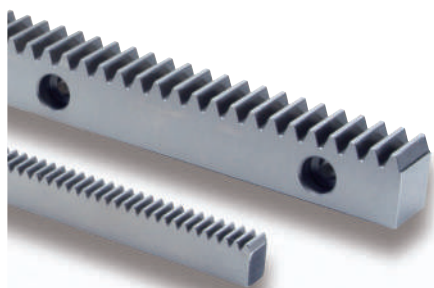
To order J Series products, please specify: **Catalog No. + J + BORE.**

Bore H7	* The product shapes of J Series items are identified by background color.																		
Keyway Js9	10	12	14	15	16	17	18	19	20	22	25	28	30	32	35	40	45	50	
Screw size	4×1.8		5×2.3				6×2.8				8×3.3			10×3.3		12×3.3	14×3.8		
Catalog Number	M4						M5				M6			M8			M10		
KSCPG5-20 J BORE	S1K	S1K																	
KSCPG5-25 J BORE	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K											
KSCPG5-30 J BORE				S1K	S1K	S1K	S1K	S1K	S1K	S1K									
KSCPG5-40 J BORE				S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K					
KSCPG10-20 J BORE				S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K						
KSCPG10-25 J BORE										S1K	S1K	S1K	S1K	S1K	S1K	S1K			
KSCPG10-30 J BORE										S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	
KSCPG10-40 J BORE											S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	



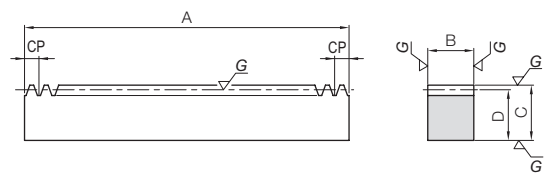
KRGCPF-H/KRGCPFD-H Circular pitch 5, 10

CP Hardened Ground Racks



Specifications	
Precision grade	KHK R 001 Grade 1 *
Gear teeth	Standard full depth
Pressure angle	20°
Material	SCM440
Heat treatment	Thermal refined, gear teeth induction hardened
Tooth hardness	50 to 60HRC

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

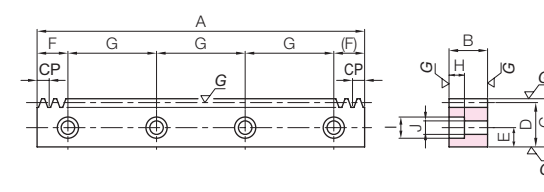


RF

Catalog Number	Pitch mm (Module)	No. of teeth	Shape	Total Length	Face width	Height	Height to pitch line	Allowable force (N)		Allowable force (kgf)		Backlash (mm)	Weight (kg)
				A	B	C	D	Bending strength	Surface durability	Bending strength	Surface durability		
KRGCPF5-500H	CP5 (1.5915)	100	RF	500	15	20	18.41	3660	2270	373	232	0.04~0.14	1.08
KRGCPF5-1000H		200		1000									2.17
KRGCPF10-500H	CP10 (3.1831)	50	RF	500	30	35	31.82	14600	9150	1490	933	0.05~0.16	3.75
KRGCPF10-1000H		100		1000									7.49

Catalog Number ● J Series (Available-on-request)	Pitch mm (Module)	No. of teeth	Shape	Total Length	Face width	Height	Height to pitch line	Mounting hole dimensions				
				A	B	C	D	E	F	G	No. of holes	Screw size
●KRGCPFD5-500HJ ●KRGCPFD5-1000HJ	CP5 (1.5915)	100	RD	500	15	20	18.41	8	25	150	4	M5
		200		1000					50	180	6	
●KRGCPFD10-500HJ ●KRGCPFD10-1000HJ	CP10 (3.1831)	50	RD	500	30	35	31.82	14	25	150	4	M10
		100		1000					50	180	6	

J Series



RD

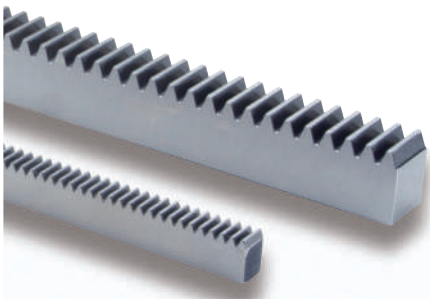


CP Ground Racks

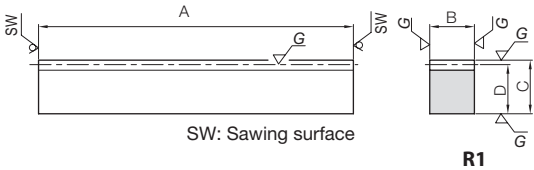
* CP30 and ground racks with total lengths up to (A) 1500mm and heights up to (C) 120mm are also available by request as custom-made products.

Counterbore dimensions			Allowable force (N)		Allowable force (kgf)		Backlash (mm)	Weight (kg)	Catalog Number
H	I	J	Bending strength	Surface durability	Bending strength	Surface durability			
6	10	6	3660	2270	373	232	0.04~0.14	1.06 2.13	● KRGCPFD5-500HJ ● KRGCPFD5-1000HJ
10.8	17.5	11	14600	9150	1490	933	0.05~0.16	3.61 7.28	● KRGCPFD10-500HJ ● KRGCPFD10-1000HJ





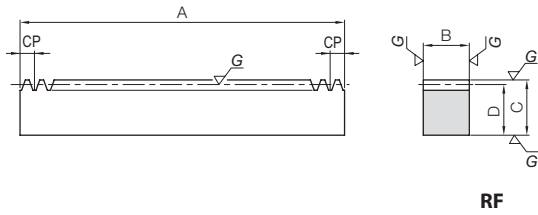
Specifications	
Precision grade	KHK R 001 grade 1
Gear teeth	Standard full depth
Pressure angle	20°
Material	SCM440
Heat treatment	Thermal refining only
Tooth hardness	225 to 352HB



Catalog Number	Pitch mm (Module)	Effective number of teeth	Shape	Total Length	Face width	Height	Height to pitch line	Allowable force (N)		Allowable force (kgf)	
				A	B	C	D	Bending strength	Surface durability	Bending strength	Surface durability
KRGCP5-100	CP5 (1.5915)	18	R1	98	15	20	18.41	3660	1560	373	159
KRGCP10-100	CP10 (3.1831)	8		98	30	35	31.82	14600	6230	1490	635

Catalog Number	Pitch mm (Module)	No. of teeth	Shape	Total Length	Face width	Height	Height to pitch line	Allowable force (N)		Allowable force (kgf)	
				A	B	C	D	Bending strength	Surface durability	Bending strength	Surface durability
KRGCPF5-500 KRGCPF5-1000	CP5 (1.5915)	100 200	RF	500 1000	15	20	18.41	3660	1560	373	159
KRGCPF10-500 KRGCPF10-1000	CP10 (3.1831)	50 100		500 1000	30	35	31.82	14600	6230	1490	635

Catalog Number	Pitch mm (Module)	No. of teeth	Shape	Total Length	Face width	Height	Height to pitch line	Mounting hole dimensions				
				A	B	C	D	E	F	G	No. of holes	Screw size
● : J Series (Available-on-request)												
● KRGCPFD5-500J ● KRGCPFD5-1000J	CP5 (1.5915)	100 200	RD	500 1000	15	20	18.41	8	25.00 50.00	150 180	4 6	M5
● KRGCPFD10-500J ● KRGCPFD10-1000J	CP10 (3.1831)	50 100		500 1000	30	35	31.82	14	25.00 50.00	150 180	4 6	M10

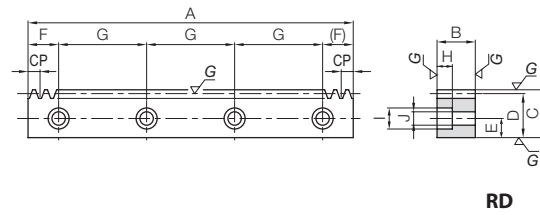


Backlash (mm)	Weight (kg)	Catalog Number
0.04~0.14	0.21	KRGCP5-100
0.05~0.16	0.73	KRGCP10-100

Backlash (mm)	Weight (kg)	Catalog Number
0.04~0.14	1.08 2.17	KRGCPF5-500 KRGCPF5-1000
0.05~0.16	3.75 7.49	KRGCPF10-500 KRGCPF10-1000

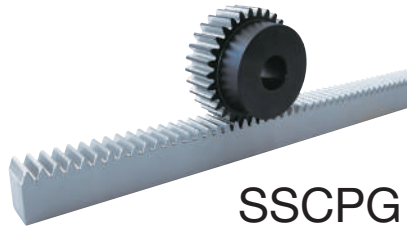
Counterbore dimensions			Allowable force (N)		Allowable force (kgf)		Backlash (mm)	Weight (kg)	Catalog Number
H	I	J	Bending strength	Surface durability	Bending strength	Surface durability			
6	10	6	3660	1560	373	159	0.04~0.14	1.06 2.13	● KRGCPFD5-500J ● KRGCPFD5-1000J
10.8	17.5	11	14600	6230	1490	635	0.05~0.16	3.61 7.28	● KRGCPFD10-500J ● KRGCPFD10-1000J

J Series



* CP30 and ground racks with total lengths up to (A) 1500mm and heights up to (C) 120mm are also available by request as custom-made products.

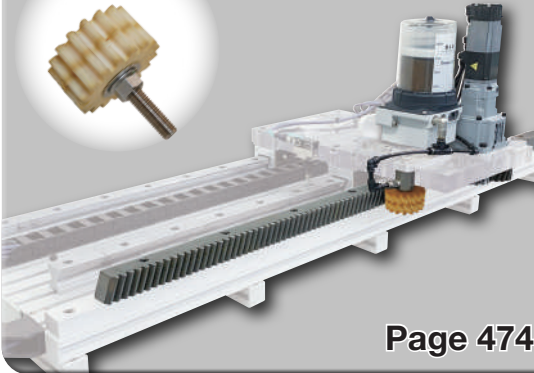
Recommended Mating Pinions



SSCPG

Please see Page 282 for more details.

DLS Schmiersysteme
Rack & Pinion Lubrication System
 PUSCP lubricated spur gear

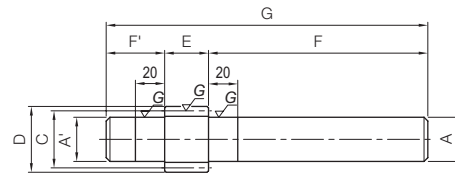


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Specifications	
Precision grade	JIS grade N7 (JIS B1702-1: 1998)*
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	Thermal refined, gear teeth induction hardened
Tooth hardness	50 to 60HRC
Surface treatment	Black oxide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



S7

Catalog Number	Pitch mm (Module)	No. of teeth	Profile shift coefficient	Shape	Shaft diameter (L)		Pitch dia.	Outside dia.	Face width	Shaft diameter (R)	
					A'	F'				A	F
SSCPGS5-15	CP5 (1.5915)	15	0	S7	19.2	25	23.87	27.06	15	19.2	100
SSCPGS5-20		20	0		27.2		31.83	35.01		27.2	
SSCPGS5-25		25	0		30.2		39.79	42.97		30.2	
SSCPGS10-10	CP10 (3.1831)	10	+0.5	S7	25.2	40	31.83	41.38	30	25.2	150
SSCPGS10-15		15	0		35.2		47.75	54.11		35.2	
SSCPGS10-20		20	0		40.2		63.66	70.03		40.2	

Recommended mating rack



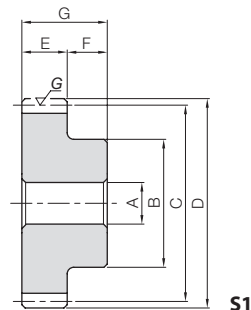
Please see Page 284 for more details.

Total Length G	Distance traveled in one turn (mm)	Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog Number
		Bending strength	Surface durability	Bending strength	Surface durability			
140	75	21.2	8.49	2.16	0.87	0.04~0.19	0.34	SSCPGS5-15 SSCPGS5-20 SSCPGS5-25
	100	32.0	16.6	3.26	1.70		0.66	
	125	43.2	27.8	4.40	2.83		0.85	
220	100	121	25.9	12.4	2.64	0.05~0.21	0.97	SSCPGS10-10 SSCPGS10-15 SSCPGS10-20
	150	169	67.9	17.3	6.93		1.87	
	200	256	133	26.1	13.6		2.64	



Specifications	
Precision grade	JIS grade N7 (JIS B 1702-1: 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.



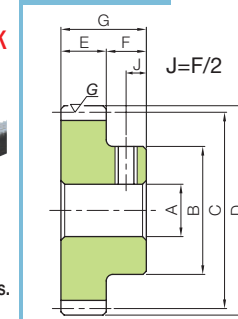
S1

Catalog Number	Pitch mm (Module)	No. of teeth	Shape	Bore		Pitch dia.	Outside dia.	Face width	Hub width	Total length	Distance traveled in one turn (mm)	Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)
				A _{H7}	B							Bending strength	Surface durability	Bending strength	Surface durability		
SSCPG5-20	CP5 (1.5915)	20	S1	8	25	31.83	35.01	15	15	30	100	24.8	13.7	2.53	1.40	0.04~0.19	0.14
SSCPG5-25		25		10	32	39.79	42.97				125	33.5	23.0	3.41	2.34		0.22
SSCPG5-30		30		10	38	47.75	50.93				150	42.3	35.0	4.32	3.57		0.33
SSCPG5-40		40		12	50	63.66	66.85				200	60.4	66.9	6.16	6.82		0.58
SSCPG10-20	CP10 (3.1831)	20	S1	15	50	63.66	70.03	30	20	50	200	198	110	20.2	11.2	0.05~0.21	0.99
SSCPG10-25		25		20	60	79.58	85.94				250	268	184	27.3	18.7		1.49
SSCPG10-30		30		20	75	95.49	101.86				300	339	280	34.5	28.5		2.26
SSCPG10-40		40		25	80	127.32	133.69				400	483	535	49.3	54.6		3.59
SSCPG15-20	CP15 (4.7746)	20	S1	25	75	95.49	105.04	50	27	77	300	744	399	75.9	40.7	0.05~0.22	3.45
SSCPG15-25		25		25	100	119.37	128.92				375	1005	667	102	68.0		5.76
SSCPG15-30		30		25	110	143.24	152.79				450	1270	1020	130	104		8.04
SSCPG20-20	CP20 (6.3662)	20	S1	25	100	127.32	140.06	60	30	90	400	1590	880	162	89.7	0.05~0.22	7.50
SSCPG20-25		25		30	130	159.15	171.89				500	2140	1470	219	150		12.0
SSCPG20-30		30		30	150	190.99	203.72				600	2710	2240	276	228		17.2

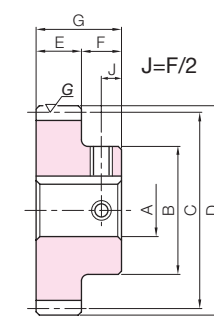
Recommended mating rack



Please see Page 284 for more details.



S1T



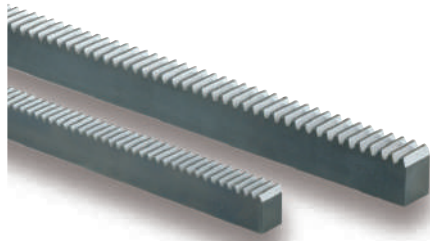
S1K

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	55	60	65	70	75	80											
Screw size		—	4×1.8		5×2.3			6×2.8			8×3.3			10×3.3		12×3.3	14×3.8		16×4.3	18×4.4		20×4.9		22×5.4													
Catalog Number		M5	M4					M5					M6			M8			M10			M12			M16												
SSCPG5-20 J BORE	S1T	S1K	S1K																																		
SSCPG5-25 J BORE		S1K	S1K	S1K	S1K	S1K	S1K																														
SSCPG5-30 J BORE		S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K																										
SSCPG5-40 J BORE			S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K																						
SSCPG10-20 J BORE						S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K																						
SSCPG10-25 J BORE												S1K	S1K	S1K	S1K	S1K	S1K	S1K																			
SSCPG10-30 J BORE												S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K																	
SSCPG10-40 J BORE													S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K																	
SSCPG15-20 J BORE														S1K	S1K	S1K	S1K	S1K	S1K	S1K																	
SSCPG15-25 J BORE														S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K															
SSCPG15-30 J BORE														S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K							
SSCPG20-20 J BORE														S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K									
SSCPG20-25 J BORE																S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K			
SSCPG20-30 J BORE																	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K			

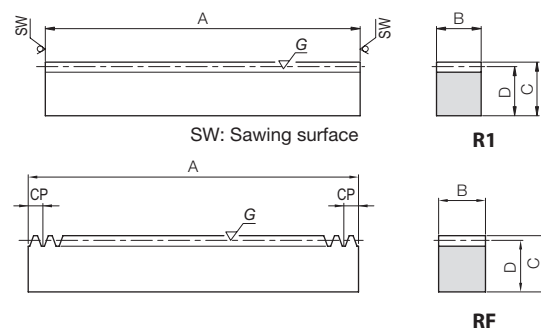


CP Hardened Ground Racks



Specifications	
Precision grade	KHK R 001 Grade 3 *
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.

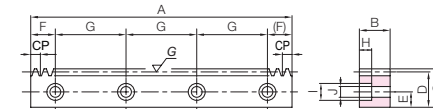


Catalog Number	Pitch mm (Module)	Effective number of teeth	Shape	Total Length		Face width	Height	Height to pitch line	Allowable force (N)		Allowable force (kgf)	
				A	B				Bending strength	Surface durability	Bending strength	Surface durability
SRGCP5-100	CP5 (1.5915)	18	R1	98	15	20	18.41	2290	1460	233	149	
SRGCP10-100	CP10 (3.1831)	8		98	30	35	31.82	9150	5860	933	597	
SRGCP15-100	CP15 (4.7746)	5		103	50	50	45.23	22900	14200	2330	1450	
SRGCP20-100	CP20 (6.3662)	3		98	60	60	53.63	36600	23400	3730	2390	

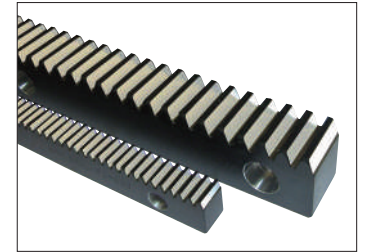
Catalog Number	Pitch mm (Module)	No. of teeth	Shape	Total Length		Face width	Height	Height to pitch line	Allowable force (N)		Allowable force (kgf)	
				A	B				Bending strength	Surface durability	Bending strength	Surface durability
SRGCPF5-500	CP5 (1.5915)	100	RF	500	15	20	18.41	2290	1460	233	149	
SRGCPF5-1000		200		1000								
SRGCPF10-500	CP10 (3.1831)	50		500	30	35	31.82	9150	5860	933	597	
SRGCPF10-1000		100		1000								
SRGCPF15-500	CP15 (4.7746)	33	RF	495	50	50	45.23	22900	14200	2330	1450	
SRGCPF15-1000		67		1005								
SRGCPF20-500	CP20 (6.3662)	25	RF	500	60	60	53.63	36600	23400	3730	2390	
SRGCPF20-1000		50		1000								

Catalog Number ● : J Series (Available-on-request)	Pitch mm (Module)	No. of teeth	Shape	Total Length	Face width	Height	Height to pitch line	Mounting hole dimensions				
				A	B	C	D	E	F	G	No. of holes	Screw size
●SRGCPFD5-500J ●SRGCPFD5-1000J	CP5 (1.5915)	100 200	RD	500 1000	15	20	18.41	8	25 50	150 180	4 6	M5
●SRGCPFD10-500J ●SRGCPFD10-1000J	CP10 (3.1831)	50 100		500 1000	30	35	31.82	14	25 50	150 180	4 6	M10
●SRGCPFD15-500J ●SRGCPFD15-1000J	CP15 (4.7746)	33 67		495 1005	50	50	45.23	20	27.5 62.5	220 220	3 5	M14
●SRGCPFD20-500J ●SRGCPFD20-1000J	CP20 (6.3662)	25 50		500 1000	60	60	53.63	23	30 60	220 220	3 5	M16

J Series



RD



Backlash (mm)	Weight (kg)	Catalog Number
0.04~0.19	0.21	SRGCP5-100
0.05~0.21	0.73	SRGCP10-100
0.05~0.22	1.83	SRGCP15-100
0.05~0.22	2.48	SRGCP20-100

Backlash (mm)	Weight (kg)	Catalog Number
0.04~0.19	1.08 2.17	SRGCPF5-500 SRGCPF5-1000
0.05~0.21	3.75 7.49	SRGCPF10-500 SRGCPF10-1000
0.05~0.22	8.79 17.8	SRGCPF15-500 SRGCPF15-1000
0.05~0.22	12.6 25.3	SRGCPF20-500 SRGCPF20-1000

Counterbore dimensions			Allowable force (N)		Allowable force (kgf)		Backlash (mm)	Weight (kg)	Catalog Number ● : J Series (Available-on-request)
H	I	J	Bending strength	Surface durability	Bending strength	Surface durability			
6	10	6	2290	1460	233	149	0.04~0.19	1.06 2.13	● SRGCPFD5-500J ● SRGCPFD5-1000J
10.8	17.5	11	9150	5860	933	597	0.05~0.21	3.61 7.29	● SRGCPFD10-500J ● SRGCPFD10-1000J
15.2	23	16	22900	14200	2330	1450	0.05~0.22	8.47 17.3	● SRGCPFD15-500J ● SRGCPFD15-1000J
17.5	26	18	36600	23400	3730	2390	0.05~0.22	12.2 24.5	● SRGCPFD20-500J ● SRGCPFD20-1000J

* CP30 and ground racks with total lengths up to (A) 1500mm and heights up to (C) 120mm are also available by request as custom-made products.

Recommended Mating Pinions



SSCPGS

Please see Page 282 for more details.

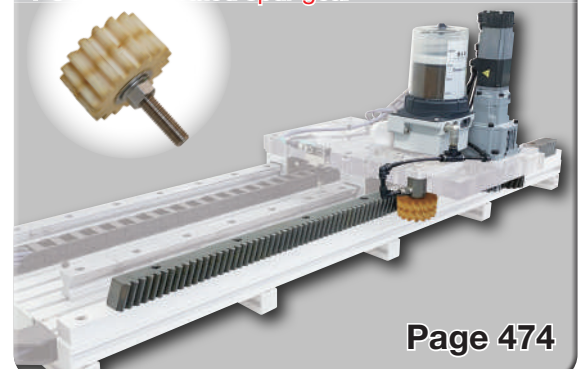


SSCPG

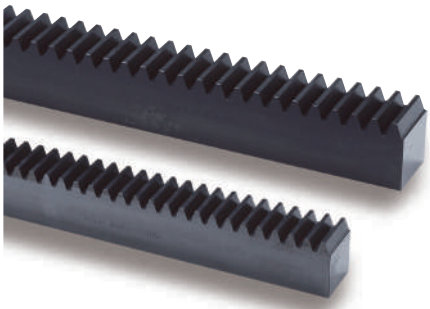
Please see Page 282 for more details.

DLS Schmiersysteme
Rack & Pinion Lubrication System

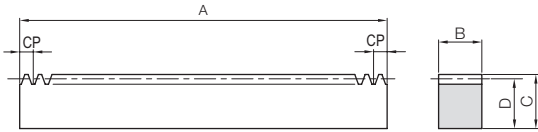
PUSCP lubricated spur gear



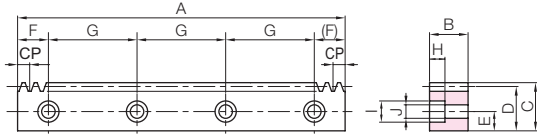
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Specifications	
Precision grade	KHK R 001 grade 5
Gear teeth	Standard full depth
Pressure angle	20°
Material	SCM440
Heat treatment	Thermal refined, gear teeth induction hardened
Tooth hardness	50 to 60HRC
Surface treatment	Black oxide coating



RF



RD



Catalog Number	Pitch mm (Module)	No. of teeth	Shape	Total Length	Face width	Height	Height to pitch line	Allowable force (N)		Allowable force (kgf)	
				A	B	C	D	Bending strength	Surface durability	Bending strength	Surface durability
KRCPF5-1000H	CP5 (1.5915)	200	RF	1000	15	20	18.41	3330	1850	339	189
KRCPF10-1000H	CP10 (3.1831)	100			30	35	31.82	13300	7710	1360	786

Backlash (mm)	Weight (kg)	Catalog Number
0.05~0.31	2.17	KRCPF5-1000H
0.10~0.41	7.49	KRCPF10-1000H

Catalog Number	Pitch mm (Module)	No. of teeth	Shape	Total Length	Face width	Height	Height to pitch line	Mounting hole dimensions				
				A	B	C	D	E	F	G	No. of holes	Screw size
KRCPFD5-1000HJ	CP5 (1.5915)	200	RD	1000	15	20	18.41	8	50	180	6	M5
KRCPFD10-1000HJ	CP10 (3.1831)	100			30	35	31.82	14				M10

Counterbore dimensions			Allowable force (N)		Allowable force (kgf)		Backlash (mm)	Weight (kg)	Catalog Number
H	I	J	Bending strength	Surface durability	Bending strength	Surface durability			
6	10	6	3330	1850	339	189	0.05~0.31	2.13	KRCPFD5-1000HJ
10.8	17.5	11	13300	7710	1360	786	0.10~0.41	7.29	KRCPFD10-1000HJ

* CP30 and ground racks with total lengths up to (A) 1500mm and heights up to (C) 120mm are also available by request as custom-made products.

Recommended Mating Pinions



KSSCP-H

Please see Page 288 for more details.

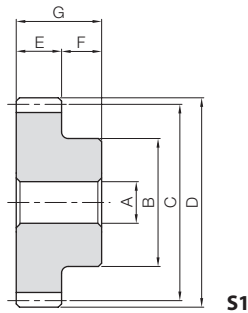




KSSCP Circular pitch 5, 10



Thermal Refined Spur Gears



S1



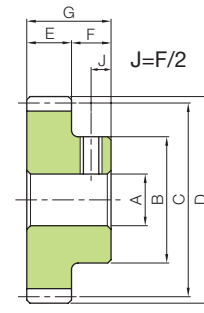
Specifications	
Precision grade	JIS grade N8 (JIS B 1702-1: 1998)
Gear teeth	Standard full depth
Pressure angle	20°
Material	SCM440
Heat treatment	Thermal refined
Tooth hardness	225 to 352HB
Surface treatment	Black oxide coating
Shape	S1

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

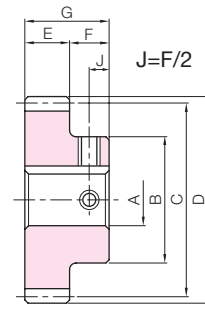
H To order Hardened Plus, please specify **Catalog No. + H**. **Example: KSSCP5-20H**

Catalog Number		Pitch mm (Module)	No. of teeth	Bore A _{H7}	Hub dia. B	Pitch dia. C	Outside dia. D	Face width E	Hub width F	Total length G	Distance traveled in one turn (mm)	Allowable torque						Backlash (mm)	Weight (kg)
												Bending strength		Surface durability		Surface durability 			
												N·m	kgf·m	N·m	kgf·m	N·m	kgf·m		
KSSCP5-20		CP5 (1.5915)	20	8	25	31.83	35.01	15	15	30	100	41.8	4.27	12.7	1.30	17.0	1.73	0.09~0.27	0.14
KSSCP5-25			25	10	32	39.79	42.97				125	56.5	5.76	20.8	2.12	28.8	2.93		0.22
KSSCP5-30			30	10	38	47.75	50.93				150	71.4	7.28	30.5	3.11	44.3	4.52		0.33
KSSCP5-40			40	12	50	63.66	66.85				200	102	10.4	56.1	5.72	86.2	8.79		0.58
KSSCP10-20		CP10 (3.1831)	20	15	50	63.66	70.03	30	20	50	200	335	34.1	110	11.2	141	14.4	0.14~0.37	0.99
KSSCP10-25			25	20	60	79.58	85.94				250	452	46.1	180	18.3	239	24.4		1.49
KSSCP10-30			30	20	75	95.49	101.86				300	571	58.2	265	27.0	368	37.5		2.26
KSSCP10-40			40	20	80	127.32	133.69				400	814	83.0	487	49.7	718	73.2		3.66

J Series



S1T



S1K



To order J Series products, please specify: **Catalog No. + J + BORE**. **Example: KSSCP5-20J10**

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	40	45	50	
Keyway Js9	—	4×1.8	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Screw size	—	—	4×1.8	—	5×2.3	—	—	—	—	6×2.8	—	—	8×3.3	—	—	—	10×3.3	12×3.3	14×3.8	—
Catalog Number	M5	—	—	—	M4	—	—	—	—	M5	—	—	M6	—	—	—	M8	—	M10	—
KSSCP5-20 J BORE	* S1T	S1K	S1K	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
KSSCP5-25 J BORE	—	* S1K	S1K	S1K	S1K	S1K	S1K	—	—	—	—	—	—	—	—	—	—	—	—	—
KSSCP5-30 J BORE	—	* S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	—	—	—	—	—	—	—	—	—
KSSCP5-40 J BORE	—	—	* S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	—	—	—	—	—	—
KSSCP10-20 J BORE	—	—	—	—	* S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	—	—	—	—	—
KSSCP10-25 J BORE	—	—	—	—	—	—	—	—	—	* S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	—	—	—
KSSCP10-30 J BORE	—	—	—	—	—	—	—	—	—	* S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	—
KSSCP10-40 J BORE	—	—	—	—	—	—	—	—	—	* S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K

To order J Series Hardened Plus products, please specify: Catalog No. + H + J + BORE. Example: KSSCP5-20HJ10

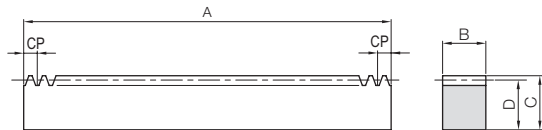
“*” is a product with the original bore diameter, so Hardened Plus is not available. See Page 22 for more details on Hardened Plus.



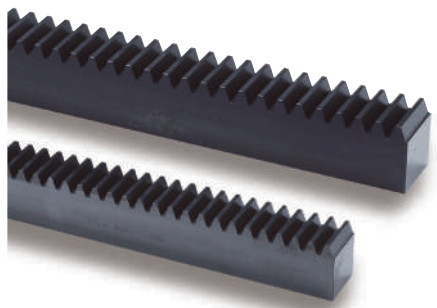
KRCPF/KRCPFD Circular pitch 5, 10



Thermal Refined Racks



RF



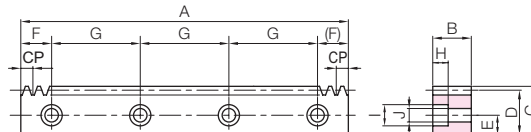
Specifications	
Precision grade	KHK R 001 Grade 4 *
Gear teeth	Standard full depth
Pressure angle	20°
Material	SCM440
Heat treatment	Thermal refining only
Tooth hardness	225 to 352HB
Surface treatment	Black oxide coating

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

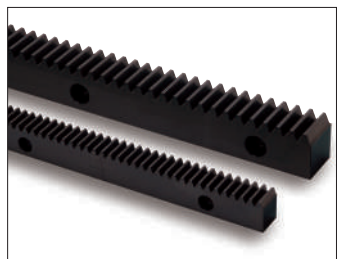
Catalog Number	Pitch mm (Module)	No. of teeth	Shape	Total Length				Allowable force (N)				Allowable force (kgf)	
				A	B	C	D	Bending strength	Surface durability	Bending strength	Surface durability		
KRCPF5-500	CP5 (1.5915)	100	RF	500	15	20	18.41	3660	1040	373	106		
KRCPF5-1000		200		1000	15	20	18.41	3660	1040	373	106		
KRCPF10-500	CP10 (3.1831)	50	RF	500	30	35	31.82	14600	4480	1490	457		
KRCPF10-1000		100		1000	30	35	31.82	14600	4480	1490	457		

Catalog Number	Pitch mm (Module)	No. of teeth	Shape	Total Length				Mounting hole dimensions				Screw size
				A	B	C	D	E	F	G	No. of holes	
● KRCPFD5-500J	CP5 (1.5915)	100	RD	500	15	20	18.41	8	25	150	4	M5
● KRCPFD5-1000J		200		1000	15	20	18.41	8	50	180	6	
● KRCPFD10-500J	CP10 (3.1831)	50	RD	500	30	35	31.82	14	25	150	4	M10
● KRCPFD10-1000J		100		1000	30	35	31.82	14	50	180	6	

J Series



RD



CP Thermal Refined Racks

Backlash (mm)	Weight (kg)	Catalog Number
0.09~0.27	1.08 2.17	KRCPF5-500 KRCPF5-1000
0.14~0.37	3.75 7.49	KRCPF10-500 KRCPF10-1000

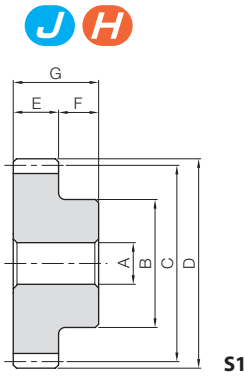
Counterbore dimensions			Allowable force (N)		Allowable force (kgf)		Backlash (mm)	Weight (kg)	Catalog Number
H	I	J	Bending strength	Surface durability	Bending strength	Surface durability			
6	10	6	3660	1040	373	106	0.09~0.27	1.06 2.13	● KRCPFD5-500J ● KRCPFD5-1000J
10.8	17.5	11	14600	4480	1490	457	0.14~0.37	3.61 7.29	● KRCPFD10-500J ● KRCPFD10-1000J





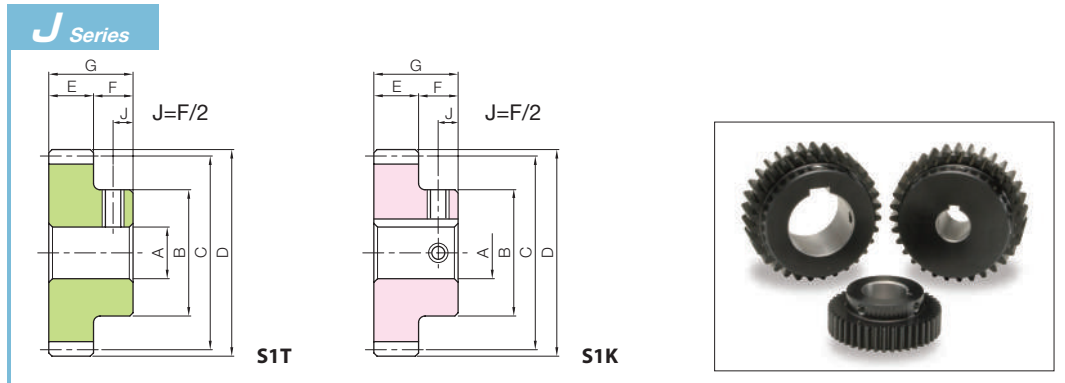
Specifications	
Precision grade	JIS grade N8 (JIS B1702-1: 1998)*
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	(less than 194HB)
Surface treatment	Black oxide coating
Shape	S1

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



To order Hardened Plus, please specify **Catalog No. + H**. Example: **SSCP2.5-20H**

Catalog Number	Pitch mm (Module)	No. of teeth	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Distance traveled in one turn (mm)	Allowable torque						Backlash (mm)	Weight (kg)	
											Bending strength		Surface durability		Surface durability 				
											N·m	kgf·m	N·m	kgf·m	N·m	kgf·m			
SSCP2.5-20		CP2.5 (0.7958)	20	6	13	15.92	17.51				50	4.14	0.42	0.48	0.049	1.60	0.16	0~0.14	0.022
SSCP2.5-25			25	8	17	19.89	21.49				62.5	5.58	0.57	0.83	0.085	2.74	0.28		0.034
SSCP2.5-30			30	8	21	23.87	25.46	10	10	20	75	7.06	0.72	1.30	0.13	4.20	0.43		0.054
SSCP2.5-40			40	10	28	31.83	33.42				100	10.1	1.03	2.64	0.27	8.30	0.85		0.098
SSCP5-20		CP5 (1.5915)	20	8	25	31.83	35.01				100	24.8	2.53	3.52	0.36	11.0	1.12	0.09~0.25	0.14
SSCP5-25			25	10	32	39.79	42.97				125	33.5	3.42	6.06	0.62	18.6	1.89		0.22
SSCP5-30			30	10	38	47.75	50.93	15	15	30	150	42.3	4.32	9.45	0.96	28.6	2.92		0.33
SSCP5-40			40	12	45	63.66	66.85				200	60.4	6.16	18.7	1.91	55.7	5.68		0.54
SSCP10-20		CP10 (3.1831)	20	15	50	63.66	70.03				200	198	20.2	30.8	3.14	91.1	9.29	0.14~0.35	0.99
SSCP10-25			25	20	60	79.58	85.94				250	268	27.3	52.7	5.37	154	15.7		1.49
SSCP10-30			30	20	75	95.49	101.86	30	20	50	300	339	34.5	81.7	8.33	238	24.2		2.26
SSCP10-40			40	20	80	127.32	133.69				400	483	49.3	160	16.4	464	47.3		3.66
SSCP15-20		CP15 (4.7746)	20	22	75	95.49	105.04				300	744	75.9	116	11.9	338	34.5	0.20~0.47	3.52
SSCP15-25			25	25	100	119.37	128.92	50	27	77	375	1000	102	199	20.3	573	58.5		5.76
SSCP15-30			30	25	110	143.24	152.79				450	1270	130	308	31.4	885	90.2		8.04
SSCP20-20			20	25	100	127.32	140.06				400	1590	162	264	26.9	759	77.4		7.50
SSCP20-25		CP20 (6.3662)	25	30	130	159.15	171.89	60	30	90	500	2140	219	449	45.8	1290	131	0.22~0.54	12.0
SSCP20-30			30	30	150	190.99	203.72				600	2710	276	693	70.7	1990	202		17.2



To order J Series products, please specify: **Catalog No. + J + BORE**. Example: **SSCP2.5-20J6**

Bore H7		* The product shapes of J Series items are identified by background color.																											
Keyway Js9	6	8	10	12	14	15	16	17	18	19	20	22	25	28	30	32	35	40	45	50	55	60	65	70	75	80			
Screw size	—		4×1.8		5×2.3				6×2.8				8×3.3			10×3.3		12×3.3	14×3.8		16×4.3	18×4.4		20×4.9		22×5.4			
Catalog Number	M4	M5	M4						M5				M6			M8		M10		M12		M14		M16					
SSCP2.5-20 J BORE	* S1T																												
SSCP2.5-25 J BORE		* S1T																											
SSCP2.5-30 J BORE		* S1T																											
SSCP2.5-40 J BORE			* S1K	* S1K	* S1K	* S1K																							
SSCP5-20 J BORE		* S1T	* S1K	* S1K																									
SSCP5-25 J BORE			* S1K	* S1K	* S1K	* S1K	* S1K	* S1K																					
SSCP5-30 J BORE			* S1K	* S1K	* S1K	* S1K	* S1K	* S1K	* S1K	* S1K	* S1K																		
SSCP5-40 J BORE				* S1K	* S1K	* S1K	* S1K	* S1K	* S1K	* S1K	* S1K	* S1K																	
SSCP10-20 J BORE					* S1K	* S1K	* S1K	* S1K	* S1K	* S1K	* S1K	* S1K	* S1K	* S1K															
SSCP10-25 J BORE											* S1K	* S1K	* S1K	* S1K	* S1K	* S1K	* S1K												
SSCP10-30 J BORE											* S1K	* S1K	* S1K	* S1K	* S1K	* S1K	* S1K	* S1K	* S1K										
SSCP10-40 J BORE											* S1K	* S1K	* S1K	* S1K	* S1K	* S1K	* S1K	* S1K	* S1K	* S1K									
SSCP15-20 J BORE												* S1K	* S1K	* S1K	* S1K	* S1K	* S1K	* S1K	* S1K	* S1K									
SSCP15-25 J BORE													* S1K	* S1K	* S1K	* S1K	* S1K	* S1K	* S1K	* S1K	* S1K	* S1K	* S1K						
SSCP15-30 J BORE													* S1K	* S1K	* S1K	* S1K	* S1K	* S1K	* S1K	* S1K	* S1K	* S1K	* S1K	* S1K					
SSCP20-20 J BORE														* S1K	* S1K	* S1K	* S1K	* S1K	* S1K	* S1K	* S1K	* S1K	* S1K	* S1K					
SSCP20-25 J BORE															* S1K	* S1K	* S1K	* S1K	* S1K	* S1K	* S1K	* S1K	* S1K	* S1K	* S1K	* S1K			
SSCP20-30 J BORE																* S1K	* S1K	* S1K	* S1K	* S1K	* S1K	* S1K	* S1K	* S1K	* S1K	* S1K			

To order J Series Hardened Plus products, please specify:
Catalog No. + H + J + BORE.
Example: SSCP2.5-40HJ12

To order J Series Hardened Plus products, please specify: **Catalog No. + H + J + BORE**. Example: **SSCP2.5-40HJ12**

“*” is a product with the original bore diameter, so Hardened Plus is not available. See Page 22 for more details on Hardened Plus.

SSCP-CP hardened spur gear recommended mating rack



SRCPF-H/SRCPFD-H
CP Hardened Racks

Please see Page 292 for more details.

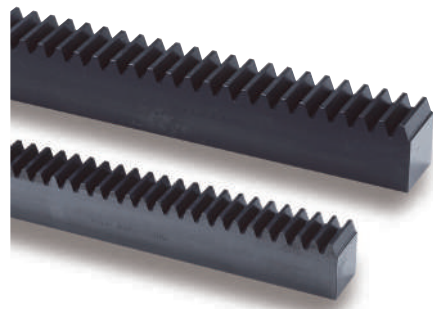
SSCP-CP spur gear recommended mating rack



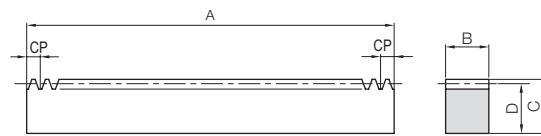
SRCP/SRCPF/SRCPFD(K)
CP Racks

Please see Page 296 for more details.

CP Hardened Racks

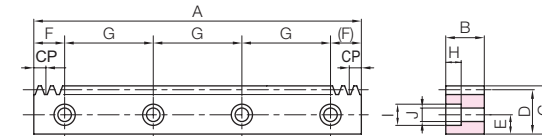


Specifications	
Precision grade	KHK R 001 grade 5
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	Gear teeth induction hardened
Tooth hardness	50 to 60HRC
Surface treatment	Black oxide coating



RF

J Series



RD



Catalog Number	Pitch mm (Module)	No. of teeth	Shape	Total Length	Face width	Height	Height to pitch line	Allowable force (N)		Allowable force (kgf)	
				A	B	C	D	Bending strength	Surface durability	Bending strength	Surface durability
SRCPF5-1000H	CP5 (1.5915)	200	RF	1000	15	20	18.41	2080	1200	212	122
SRCPF10-1000H	CP10 (3.1831)	100		1000	30	35	31.82	8320	4980	848	508
SRCPF15-1000H	CP15 (4.7746)	67		1005	50	50	45.23	20800	12400	2120	1260
SRCPF20-1000H	CP20 (6.3662)	50		1000	60	60	53.63	33300	20800	3390	2120

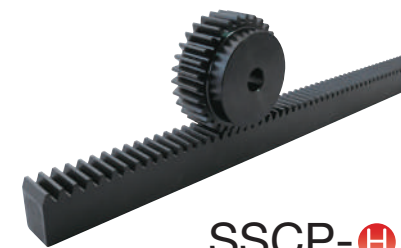
Backlash (mm)	Weight (kg)	Catalog Number
0.05~0.29	2.17	SRCPF5-1000H
0.10~0.39	7.49	SRCPF10-1000H
0.16~0.51	17.8	SRCPF15-1000H
0.18~0.58	25.3	SRCPF20-1000H

Catalog Number	Pitch mm (Module)	No. of teeth	Shape	Total Length	Face width	Height	Height to pitch line	Mounting hole dimensions				
				A	B	C	D	E	F	G	No. of holes	Screw size
● SRCPFD5-1000HJ	CP5 (1.5915)	200	RD	1000	15	20	18.41	8	50	180	6	M5
● SRCPFD10-1000HJ	CP10 (3.1831)	100		1000	30	35	31.82	14	50	180	6	M10
● SRCPFD15-1000HJ	CP15 (4.7746)	67		1005	50	50	45.23	20	62.5	220	5	M14
● SRCPFD20-1000HJ	CP20 (6.3662)	50		1000	60	60	53.63	23	60	220	5	M16

Counterbore dimensions			Allowable force (N)		Allowable force (kgf)		Backlash (mm)	Weight (kg)	Catalog Number
H	I	J	Bending strength	Surface durability	Bending strength	Surface durability			● : J Series (Available-on-request)
6	10	6	2080	1200	212	122	0.05~0.29	2.13	●SRCPFD5-1000HJ ●SRCPFD10-1000HJ ●SRCPFD15-1000HJ ●SRCPFD20-1000HJ
10.8	17.5	11	8320	4980	848	508	0.10~0.39	7.29	
15.2	23	16	20800	12400	2120	1260	0.16~0.51	17.3	
17.5	26	18	33300	20800	3390	2120	0.18~0.58	24.5	

* CP30 and ground racks with total lengths up to (A) 1500mm and heights up to (C) 120mm are also available by request as custom-made products.

Recommended Mating Pinions

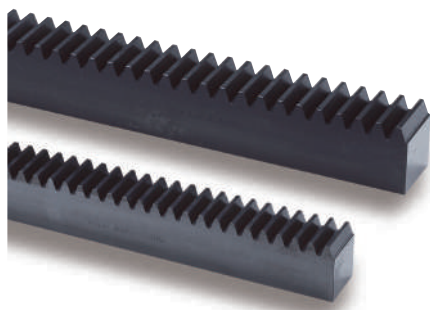


SSCP-H

Please see Page 290 for more details.

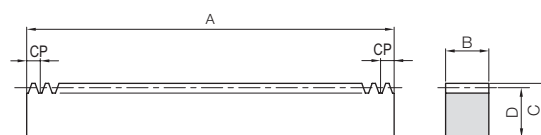


CP Laser Hardened Racks



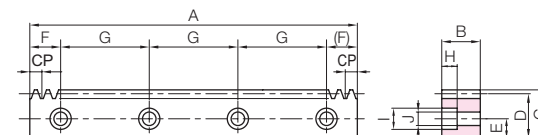
Specifications	
Precision grade	KHK R 001 Grade 4 *
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	Gear teeth laser hardened
Tooth hardness	55 to 65HRC
Surface treatment	Black oxide coating

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



RF

J Series



RD



Catalog Number	Pitch mm (Module)	No. of teeth	Shape	Total Length	Face width	Height	Height to pitch line	Allowable force (N)		Allowable force (kgf)	
				A	B	C	D	Bending strength	Surface durability	Bending strength	Surface durability
SRCPF5-1000HL	CP5 (1.5915)	200	RF	1000	15	20	18.41	2290	1040	232	106
SRCPF5-1500HL		300		1500							
SRCPF5-2000HL		410		2050							
SRCPF10-1000HL	CP10 (3.1831)	100		1000	30	35	31.82	9150	4330	933	441
SRCPF10-1500HL		150		1500							
SRCPF10-2000HL		205		2050							
SRCPF15-1000HL	CP15 (4.7746)	67		1005	50	50	45.23	22900	10700	2333	1095
SRCPF15-1500HL		100		1500							
SRCPF15-2000HL		136		2040							
SRCPF20-1000HL	CP20 (6.3662)	50		1000	60	60	53.63	36600	18100	3732	1843
SRCPF20-1500HL		75		1500							
SRCPF20-2000HL		102		2040							

Backlash (mm)	Weight (kg)	Catalog Number
0.09~0.25	2.17	SRCPF5-1000HL
	3.25	SRCPF5-1500HL
	4.44	SRCPF5-2000HL
0.14~0.35	7.49	SRCPF10-1000HL
	11.2	SRCPF10-1500HL
	15.4	SRCPF10-2000HL
0.20~0.47	17.8	SRCPF15-1000HL
	26.6	SRCPF15-1500HL
	36.2	SRCPF15-2000HL
0.22~0.54	25.3	SRCPF20-1000HL
	37.9	SRCPF20-1500HL
	51.5	SRCPF20-2000HL

Catalog Number ● : J Series (Available-on-request)	Pitch mm (Module)	No. of teeth	Shape	Total Length	Face width	Height	Height to pitch line	Mounting hole dimensions				
				A	B	C	D	E	F	G	No. of holes	Screw size
● SRCPFD5-1000HLJ	CP5 (1.5915)	200	RD	1000	15	20	18.41	8	50	180	6	M5
● SRCPFD5-1500HLJ		300		1500								
● SRCPFD5-2000HLJ		410		2050								
● SRCPFD10-1000HLJ	CP10 (3.1831)	100		1000	30	35	31.82	14	50	180	6	M10
● SRCPFD10-1500HLJ		150		1500								
● SRCPFD10-2000HLJ		205		2050								
● SRCPFD15-1000HLJ	CP15 (4.7746)	67		1005	50	50	45.23	20	62.5	220	5	M14
● SRCPFD15-1500HLJ		100		1500								
● SRCPFD15-2000HLJ		136		2040								
● SRCPFD20-1000HLJ	CP20 (6.3662)	50		1000	60	60	53.63	23	60	220	5	M16
● SRCPFD20-1500HLJ		75		1500								
● SRCPFD20-2000HLJ		102		2040								

Counterbore dimensions			Allowable force (N)		Allowable force (kgf)		Backlash (mm)	Weight (kg)	Catalog Number ● : J Series (Available-on-request)
H	I	J	Bending strength	Surface durability	Bending strength	Surface durability			
6	10	6	2290	1040	232	106	0.09~0.25	2.13 3.20 4.38	●SRCPFD5-1000HLJ ●SRCPFD5-1500HLJ ●SRCPFD5-2000HLJ
10.8	17.5	11	9150	4330	933	441	0.14~0.35	7.29 10.9 14.9	●SRCPFD10-1000HLJ ●SRCPFD10-1500HLJ ●SRCPFD10-2000HLJ
15.2	23	16	22900	10700	2333	1095	0.20~0.47	17.3 25.9 35.2	●SRCPFD15-1000HLJ ●SRCPFD15-1500HLJ ●SRCPFD15-2000HLJ
17.5	26	18	36600	18100	3732	1843	0.22~0.54	24.5 36.8 50.0	●SRCPFD20-1000HLJ ●SRCPFD20-1500HLJ ●SRCPFD20-2000HLJ

Recommended Mating Pinions

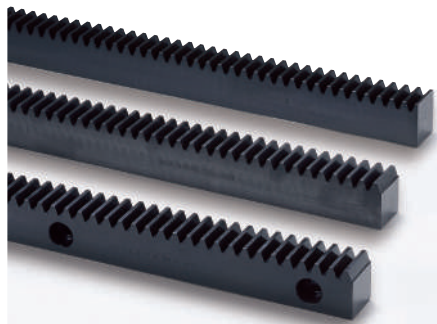


SSCP-H

Please see Page 290 for more details.

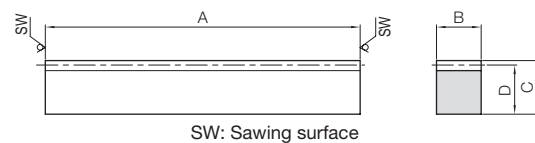
* CP30 and ground racks with total lengths up to (A) 1500mm and heights up to (C) 120mm are also available by request as custom-made products.





Specifications	
Precision grade	KHK R 001 Grade 4 *
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	(less than HB210)
Surface treatment	Black oxide coating

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



R1

Catalog Number	Pitch mm (Module)	Effective number of teeth	Shape	Total Length	Face width	Height	Height to pitch line	Allowable force (N)		Allowable force (kgf)		Backlash (mm)	Weight (kg)
				A	B	C	D	Bending strength	Surface durability	Bending strength	Surface durability		
SRCP2.5-100	CP2.5 (0.7958)	38	R1	98	10	12	11.2	763	143	77.8	14.5	0.00~0.14	0.086
SRCP5-100	CP5 (1.5915)	18		98	15	20	18.41	2290	468	233	47.7	0.09~0.25	0.21
SRCP10-100	CP10 (3.1831)	8		98	30	35	31.82	9150	1870	933	191	0.14~0.35	0.73
SRCP15-100	CP15 (4.7746)	5		103	50	50	45.23	22900	4530	2330	462	0.20~0.47	1.83
SRCP20-100	CP20 (6.3662)	3		98	60	60	53.63	36600	7480	3730	763	0.22~0.54	2.48

Catalog Number	Pitch mm (Module)	No. of teeth	Shape	Total Length	Face width	Height	Height to pitch line	Allowable force (N)		Allowable force (kgf)		Backlash (mm)	Weight (kg)
				A	B	C	D	Bending strength	Surface durability	Bending strength	Surface durability		
SRCPF2.5-500	CP2.5 (0.7958)	200	RF	500	10	12	11.2	763	143	77.8	14.5	0.00~0.14	0.44
SRCPF2.5-1000		400		1000	10	12	11.2	763	143	77.8	14.5	0.00~0.14	0.88
SRCPF5-500	CP5 (1.5915)	100		500	15	20	18.41	2290	468	233	47.7	0.09~0.25	1.08
SRCPF5-1000		200		1000	15	20	18.41	2290	468	233	47.7	0.09~0.25	2.17
SRCPF5-1500		300		1500	15	20	18.41	2290	468	233	47.7	0.09~0.25	3.25
SRCPF5-2000		410		2050	15	20	18.41	2290	468	233	47.7	0.09~0.25	4.44
SRCPF10-500	CP10 (3.1831)	50	RF	500	30	35	31.82	9150	1870	933	191	0.14~0.35	3.75
SRCPF10-1000		100		1000	30	35	31.82	9150	1870	933	191	0.14~0.35	7.49
SRCPF10-1500		150		1500	30	35	31.82	9150	1870	933	191	0.14~0.35	11.2
SRCPF10-2000		205		2050	30	35	31.82	9150	1870	933	191	0.14~0.35	15.4
SRCPF15-500	CP15 (4.7746)	33	RF	495	50	50	45.23	22900	4530	2330	462	0.20~0.47	8.79
SRCPF15-1000		67		1005	50	50	45.23	22900	4530	2330	462	0.20~0.47	17.8
SRCPF15-1500		100		1500	50	50	45.23	22900	4530	2330	462	0.20~0.47	26.6
SRCPF15-2000		136		2040	50	50	45.23	22900	4530	2330	462	0.20~0.47	36.2
SRCPF20-500	CP20 (6.3662)	25	RF	500	60	60	53.63	36600	7480	3730	763	0.22~0.54	12.6
SRCPF20-1000		50		1000	60	60	53.63	36600	7480	3730	763	0.22~0.54	25.3
SRCPF20-1500		75		1500	60	60	53.63	36600	7480	3730	763	0.22~0.54	37.9
SRCPF20-2000		102		2040	60	60	53.63	36600	7480	3730	763	0.22~0.54	51.5

Catalog Number	Pitch mm (Module)	No. of teeth	Shape	Total Length	Face width	Height	Height to pitch line	Mounting hole dimensions				
				A	B	C	D	E	F	G	No. of holes	Screw size
● SRCPFK2.5-500J	CP2.5 (0.7958)	200	RA	500	10	12	11.2	5	25	150	4	M4
● SRCPFD5-500J	CP5 (1.5915)	100	RD	500	15	20	18.41	8	25	150	4	M5
● SRCPFD5-1000		200		1000	15	20	18.41	8	50	180	6	
● SRCPFD5-1500		300		1500	15	20	18.41	8	30	180	9	
● SRCPFD5-2000		410		2050	15	20	18.41	8	35	180	12	
● SRCPFD10-500J	CP10 (3.1831)	50		500	30	35	31.82	14	25	150	4	M10
● SRCPFD10-1000		100		1000	30	35	31.82	14	50	180	6	
● SRCPFD10-1500		150		1500	30	35	31.82	14	30	180	9	
● SRCPFD10-2000		205		2050	30	35	31.82	14	35	180	12	
● SRCPFD15-500J	CP15 (4.7746)	33	RD	495	50	50	45.23	20	27.5	220	3	M14
● SRCPFD15-1000		67		1005	50	50	45.23	20	62.5	220	5	
● SRCPFD15-1500		100		1500	50	50	45.23	20	90	220	7	
● SRCPFD15-2000		136		2040	50	50	45.23	20	30	220	10	
● SRCPFD20-500J	CP20 (6.3662)	25		500	60	60	53.63	23	30	220	3	M16
● SRCPFD20-1000		50		1000	60	60	53.63	23	60	220	5	
● SRCPFD20-1500		75		1500	60	60	53.63	23	90	220	7	
● SRCPFD20-2000		102		2040	60	60	53.63	23	30	220	10	

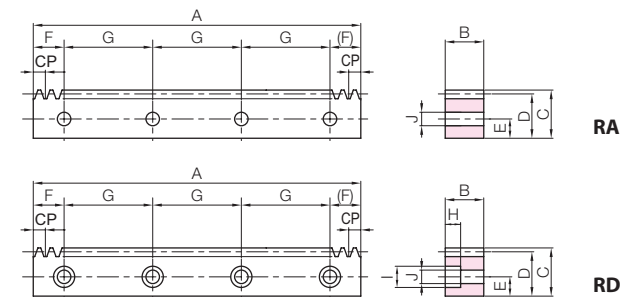
Recommended Mating Pinions



SSCP

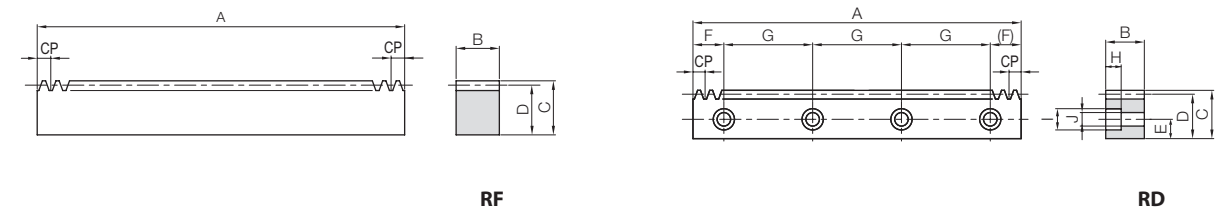
Please see Page 290 for more details.

J Series



RA

RD



RF

RD

Counterbore dimensions			Allowable force (N)		Allowable force (kgf)		Backlash (mm)	Weight (kg)	Catalog Number
H	I	J	Bending strength	Surface durability	Bending strength	Surface durability			
-	-	4.5	763	143	77.8	14.5	0.00~0.14	0.43	● SRCPFK2.5-500J
6	10	6	2290	468	233	47.7	0.09~0.25	1.06 2.13 3.20 4.38	● SRCPFD5-500J SRCPFD5-1000 SRCPFD5-1500 SRCPFD5-2000
10.8	17.5	11	9150	1870	933	191	0.14~0.35	3.61 7.29 10.9 14.9	● SRCPFD10-500J SRCPFD10-1000 SRCPFD10-1500 SRCPFD10-2000
15.2	23	16	22900	4530	2330	462	0.20~0.47	8.47 17.3 25.9 35.2	● SRCPFD15-500J SRCPFD15-1000 SRCPFD15-1500 SRCPFD15-2000
17.5	26	18	36600	7480	3730	763	0.22~0.54	12.2 24.5 36.8 50.0	● SRCPFD20-500J SRCPFD20-1000 SRCPFD20-1500 SRCPFD20-2000



SUSCP Circular pitch 5, 10

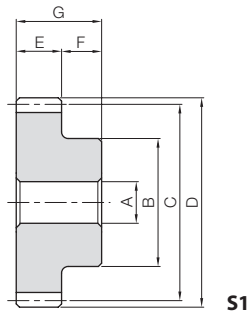


Stainless Steel Spur Gears



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)

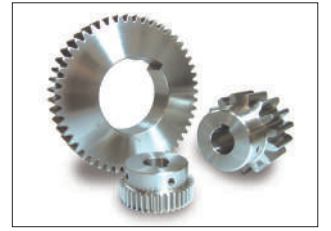
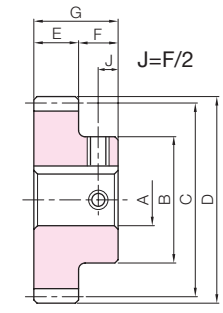
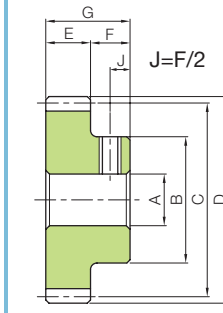
* The precision grade of J Series products is equivalent to the value shown in the table.



Catalog Number	Pitch mm (Module)	No. of teeth	Shape	Bore		Pitch dia.	Outside dia.	Face width	Hub width	Total length	Distance traveled in one turn (mm)	Allowable torque (N·m)		Allowable torque (kgf·m)	Backlash (mm)	Weight (kg)
				AH7	B							Bending strength	Surface durability	Bending strength	Surface durability	
SUSCP5-20	CP5 (1.5915)	20	S1	8	25	31.83	35.01	15	15	30	100	13.7	2.50	1.40	0.25	0.14
SUSCP5-25		25		10	32	39.78	42.97					18.5	4.31	1.89	0.44	
SUSCP5-30		30		10	38	47.74	50.93					23.4	6.72	2.39	0.68	
SUSCP10-20	CP10 (3.1831)	20	S1	15	50	63.66	70.03	30	20	50	200	110	21.9	11.2	2.23	1.00
SUSCP10-25		25		20	60	79.57	85.94					148	37.4	15.1	3.82	
SUSCP10-30		30		20	75	95.49	101.86					187	58.0	19.1	5.92	



J Series



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

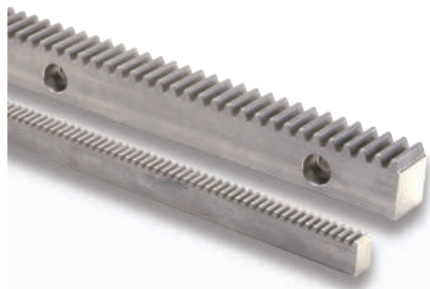
Bore H7		* The product shapes of J Series items are identified by background color.																	
Keyway Js9	8	10	12	14	15	16	17	18	19	20	22	25	28	30	32	35	40	45	
Screw size	—	4×1.8		5×2.3				6×2.8				8×3.3			10×3.3		12×3.3	14×3.8	
Catalog Number	M5	M4						M5				M6			M8			M10	
SUSCP5-20 J BORE	S1T	S1K	S1K																
SUSCP5-25 J BORE		S1K	S1K	S1K	S1K	S1K	S1K												
SUSCP5-30 J BORE		S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K								
SUSCP10-20 J BORE					S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K					
SUSCP10-25 J BORE											S1K	S1K	S1K	S1K	S1K	S1K	S1K		
SUSCP10-30 J BORE											S1K	S1K	S1K	S1K	S1K	S1K	S1K	S1K	



SURCPF/SURCPFD Circular pitch 5, 10

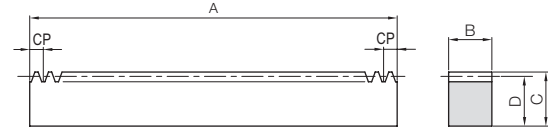


Stainless Steel Racks



Specifications	
Precision grade	KHK R 001 Grade 5 *
Gear teeth	Standard full depth
Pressure angle	20°
Material	SUS304
Heat treatment	Solution treated
Tooth hardness	(less than 187HB)

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

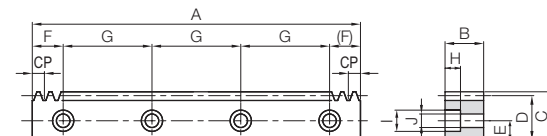


Catalog Number	Pitch mm (Module)	No. of teeth	Shape	Total Length	Face width	Height	Height to pitch line	Allowable force (N)		Allowable force (kgf)	
				A	B	C	D	Bending strength	Surface durability	Bending strength	Surface durability
SURCPF5-500	CP5 (1.5915)	100	RF	500	15	20	18.41	1090	263	111	26.8
SURCPF5-1000		200		1000							
SURCPF10-500	CP10 (3.1831)	50	RF	500	30	35	31.82	4370	1050	445	107
SURCPF10-1000		100		1000							

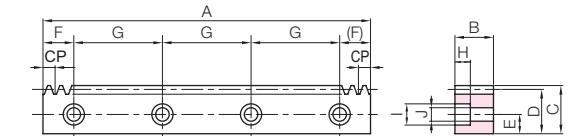
Catalog Number	Pitch mm (Module)	No. of teeth	Shape	Total Length	Face width	Height	Height to pitch line	Mounting hole dimensions				
				A	B	C	D	E	F	G	No. of holes	Screw size
● SURCPFD5-500J	CP5 (1.5915)	100	RD	500	15	20	18.41	8	25	150	4	M5
● SURCPFD5-1000		200		1000								
● SURCPFD10-500J	CP10 (3.1831)	50	RD	500	30	35	31.82	14	25	150	4	M10
● SURCPFD10-1000		100		1000								

CP Stainless Steel Racks

J Series



RD



RD

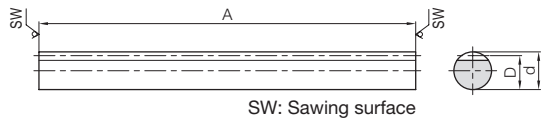
Backlash (mm)	Weight (kg)	Catalog Number
0.09~0.27	1.09 2.19	SURCPF5-500 SURCPF5-1000
0.14~0.37	3.78 7.57	SURCPF10-500 SURCPF10-1000

Counterbore dimensions			Allowable force (N)		Allowable force (kgf)		Backlash (mm)	Weight (kg)	Catalog Number
H	I	J	Bending strength	Surface durability	Bending strength	Surface durability			
6	10	6	1090	263	111	26.8	0.09~0.27	1.07 2.16	● SURCPFD5-500J ● SURCPFD5-1000
10.8	17.5	11	4370	1050	445	107	0.14~0.37	3.65 7.36	● SURCPFD10-500J ● SURCPFD10-1000





Specifications	
Precision grade	KHK R 001 grade 4
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	(less than HB210)
Surface treatment	Black oxide coating

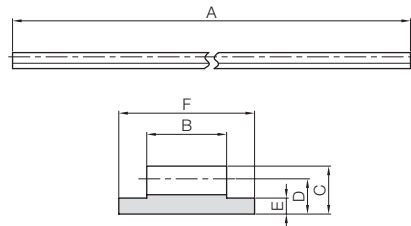


R2

Catalog Number	Pitch mm (Module)	Effective number of teeth	Shape	Total Length		Outside dia.	Height to pitch line	Allowable force (N)		Allowable force (kgf)		Backlash (mm)	Weight (kg)
				A	d _h			Bending strength	Surface durability	Bending strength	Surface durability		
SROCP2.5-500	CP2.5 (0.7958)	200	R2	505	10	9.2	13.41	474	91.8	48.3	9.36	0.00~0.14	0.30
SROCP5-500	CP5 (1.5915)	99		505	15			1650	324	169	33.1	0.09~0.25	0.65
SROCP10-1000	CP10 (3.1831)	99		1010	30			6610	1300	674	132	0.14~0.35	5.16



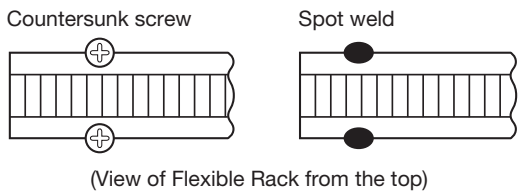
Specifications	
Precision grade	KHK R 001 grade 8
Gear teeth	Standard full depth
Pressure angle	20°
Material	SS400
Heat treatment	—
Tooth hardness	(less than 187HB)
Surface treatment	Black oxide coating



R3

Catalog Number	Pitch mm (Module)	Shape	Total Length		Face width	Height	Height to pitch line	Base thickness	Base width	Allowable force (N)		Weight (kg)
			A	B						Bending strength	Bending strength	
FRCP5-2000	CP5 (1.5915)	R3	2000	10	6	4.41	2	17	801	81.7		0.91
FRCP5-3000			3000									1.37
FRCP5-4000			4000									1.83

Installation Example of FRCP Metal Flex Rack



(View of Flexible Rack from the top)

Recommended Mating Pinions



SSCP

Please see Page 290 for more details.



Miter Gears

MMSGQ Ground Spiral Miter Gears	MMSG Ground Spiral Miter Gears	SMSG Ground Spiral Miter Gears	MMSA/MMSB Finished Bore Spiral Miter Gears	MMS Spiral Miter Gears	SMS Spiral Miter Gears	SMA/SMB/SMC Finished Bore Miter Gears
NEW					NEW	
Material: SCM415 m2~4 Page 310	Material: SCM415 m2~4 Page 312	Material: S45C m1~5 Page 314	Material: SCM415 m1~10 Page 316	Material: SCM415 m2~5 Page 318	Material: S45C m1~8 Page 320	Material: S45C m1~8 Page 322
MM Miter Gears	LM Sintered Metal Miter Gears	SM Miter Gears	SAM Angular Miter Gears	SUM Stainless Steel Miter Gears	SUMA Finished Bore Stainless Steel Miter Gears	PM Plastic Miter Gears
NEW		NEW				
Material: SCM415 m2~5 Page 324	Material: SMF5040 m0.8~1.5 Page 324	Material: S45C m1~8 Page 326	Material: S45C m1.5~3 Page 328	Material: SUS303 m1~4 Page 330	Material: SUS303 m1~4 Page 330	Material: MC901 m1~4 Page 332
DM Injection Molded Miter Gears	BB Sintered Metal Bushings	Nissei KSP Ground Spiral Miter				
Material: Duracon (R) (M90-44) m0.5~1.5 Page 332	Material: Oil-free copper alloy φ 5~8 Page 334	Material: SCM415 m1.5~6 Page 370				

Catalog Number of KHK Stock Gears

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

(Example) Miter Gears

M MS G 2 - 20 R

Direction of Helix (Right)
No. of Teeth (20)
Module (2)
Other Products (Ground Gears)
Type (Spiral Miter)
Material (SCM415)

Material
S S45C
M SCM415
SU Stainless Steel
L Sintered Metal Alloy
P MC901
D Polyacetal

Type
M Straight Miter Gears
MS Spiral Miter Gears
AM Angular Miter Gears

Other Information
G,GQ Ground Gears