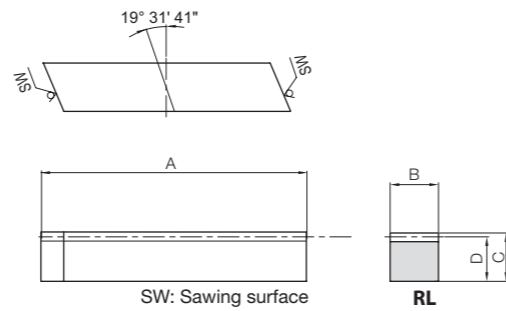




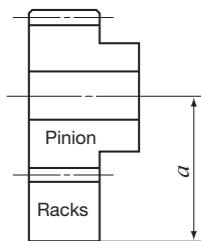
Specifications	
Precision grade	KHK R 001 grade 2
Reference section of gear	Normal plane
Gear teeth	Standard full depth
Normal pressure angle	20°
Helix angle/direction	19° 31' 41" left helix
Material	S45C
Heat treatment	—
Tooth hardness	(less than HB210)
Surface treatment	Black oxide coating



Catalog Number	Normal module (front pitch mm)	Effective No. of teeth	Shape	Total Length				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

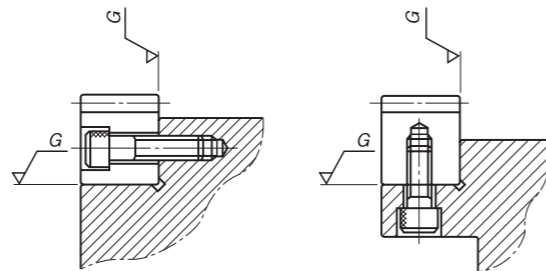
Points of Caution in Assembling

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.

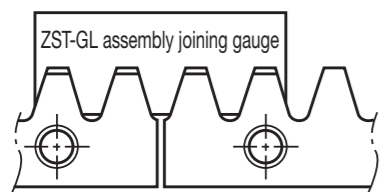


② Machined end type racks such as the ZST and ZSTD Series have pitch tolerance of -0.05 to -0.4mm at the end face. If you try to connect the racks without any space, the pitch will be too small and will cause problems. Please follow the following diagrams, "Connecting the Racks," for assembly.

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 μm 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



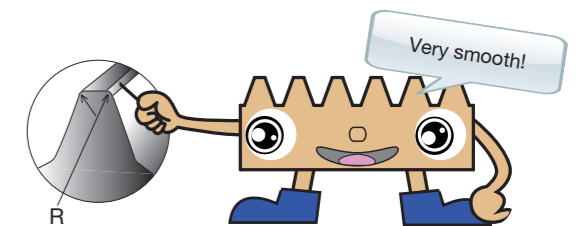
[NOTE] Please use the ZST-GL assembly gauge for the joining rack.



CP Racks & Pinions

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

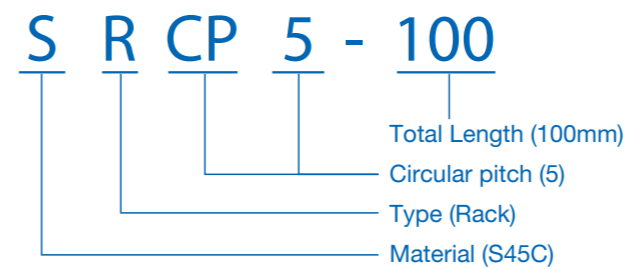
M Includes Made to Order



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



Material		Other Information	
M	SCM415	F	Racks with Machined Ends
K	SCM440	D	Racks with Bolt Holes
S	S45C	K	Racks with Drill Holes
SU	Stainless Steel	G	Ground Gears
F	SS400	H	Gear teeth induction hardened
Type		S	Pinion Shafts
R	Racks	HL	Laser hardened
RO	Round Racks		
S	Spur Gears		
TR(TS)	Tapered Racks (Spur Gears)		

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 <small>Note 1</small>	Pitch mm	Total Length mm Parentheses show no. of teeth	Material	Heat Treatment	Tooth Surface Finish	Gear accuracy <small>KHK R 001 Parentheses show JIS B 1702-1</small>	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/SRCPF	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.

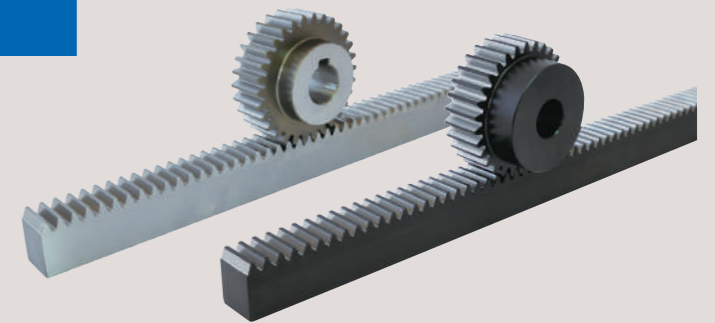
[NOTE 1] The catalog numbers of the above racks with (F) suffix have both ends machined so that they can be butted against each other. The items with (D) have mounting screw holes for immediate assembly.

- 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.

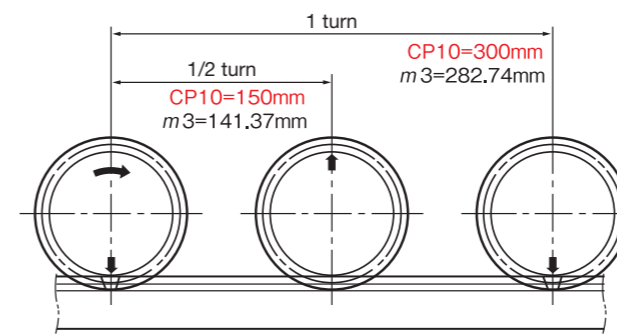
CP racks & pinions are ideal for linear positioning.

CP Racks & Pinions

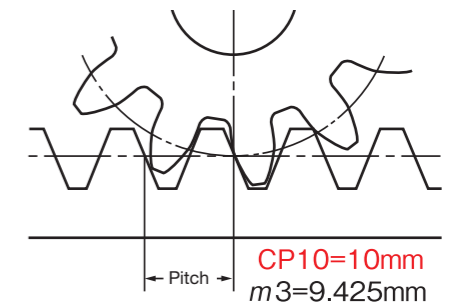
The design can be made easier by setting the moving length of one rotation of a pinion to an integer (mm). Circular pitch racks solve these problems. This problem is solved by CP racks and pinions where one rotation of a pinion moves it precisely 50, 100, 150, ... 600 mm, etc. The following table lists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



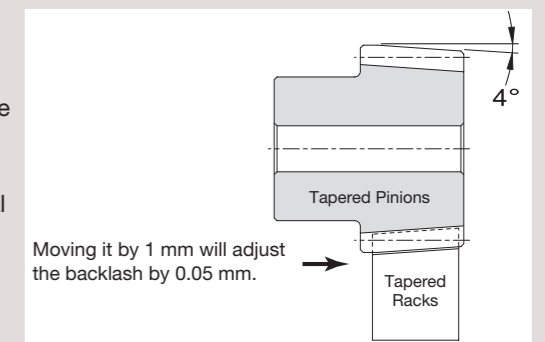
Features of Tapered Racks & Pinions

- 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.

* For product details, please see Page 274.

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.

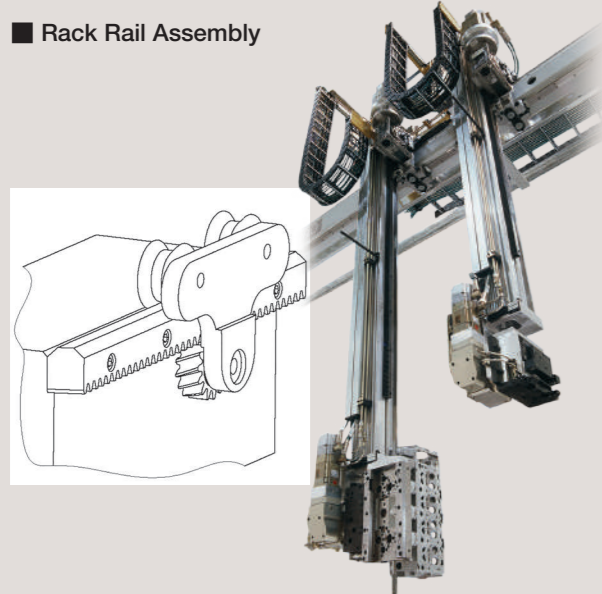


Application Examples

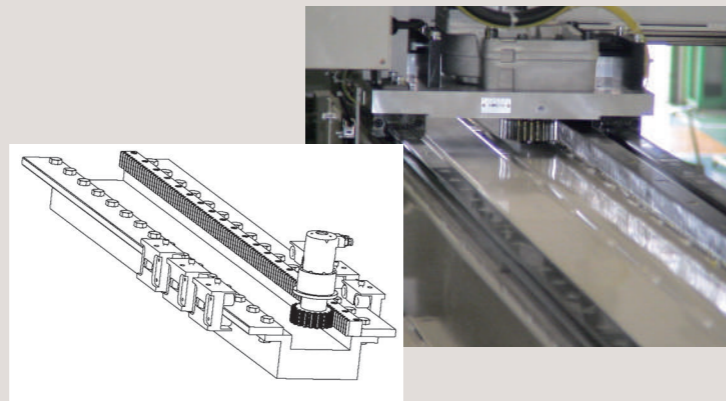


KHK stock CP racks & pinions are adopted in driving devices for all kinds of linear systems, including transport devices.

Rack Rail Assembly



Rack Drive Linear Guide



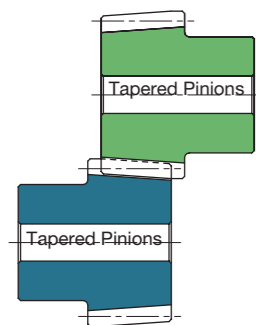
Cleaning machine manufactured by Kan Manufactory Co., Ltd.



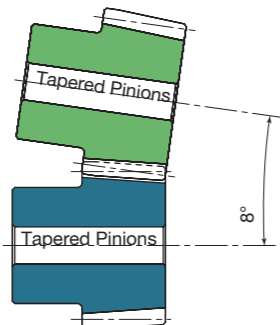
SRCPF-H racks and SSCP spur gears used in cleaning device with automatic transport for automobile parts

Examples of using tapered spur gears

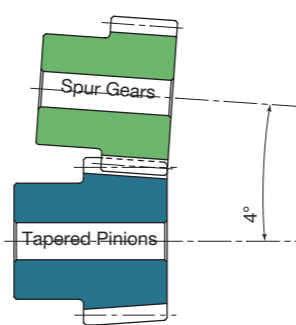
Changing the assembly direction of the tapered spur gear or assembling it with a general spur gear will allow it to be used at the axial angle shown below.



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 tapered 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

- ① KHK stock CP racks are mated with CP spur gears having the same pitch. Since CP2.5 (m0.796), CP5 (m1.592) and CP10 (m3.183) are very close in size to m0.8, m1.5 and m3 respectively, selecting the proper mating gear should be verified to make sure that the items are correct. Otherwise, complications could arise.
- ② STRCPF and STRCPFD Tapered 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	Racks										Pinion									
	MRGCPF MRGCPFD	KRGCPF-H KRGCPFD-H KRCPF-H KRCPF	KRGCP KRGCPF KRCPF	SRGCP SRGCPF SRCPF-H	SRCPF-HL SRCPF-HL	SRCP/SRCPF SRCPFD SRCPFK 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)

Item	Formula of spur and helical gears on surface durability (JGMA402-01)																		
	MRGCPF MRGCPFD	KRGCPF-H KRGCPFD-H KRCPF-H KRCPF	KRGCP KRGCPF KRCPF	SRGCP SRGCPF SRCPF-H	SRCPF-HL SRCPF-HL	SRCP/SRCPF SRCPFD SRCPFK 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 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.

- ① Pitch Error of Racks (KHK R 001) → Page 219
- ② Precision of Rack Blanks → Page 220
- ③ 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.

- ① 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.
- ② 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.
- ③ 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.

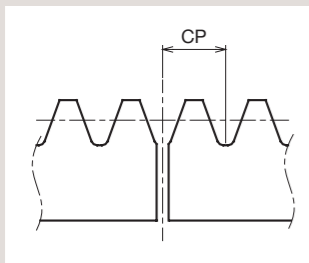
E-mail: info@khkgears.net

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

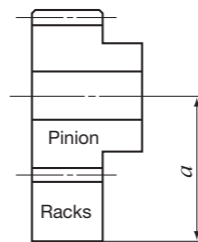
CP	Tolerance
CP	-0.05 -0.25
CP2.5	-0.1 -0.3
CP5	-0.1 -0.4
CP10	
CP15	
CP20	

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

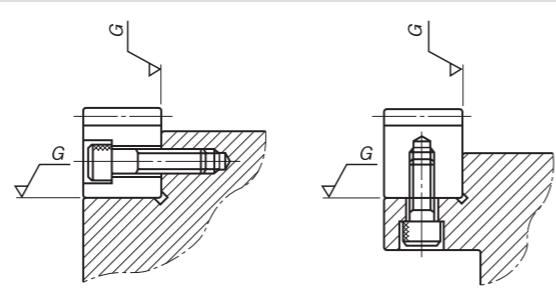
- ① The recommended assembly distance tolerance of KHK stock CP racks is H7 for ground racks and H8 for cut racks. The backlash values are given in the table on Page 220. Make sure that the mounting distance stays constant for the length of the rack.

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



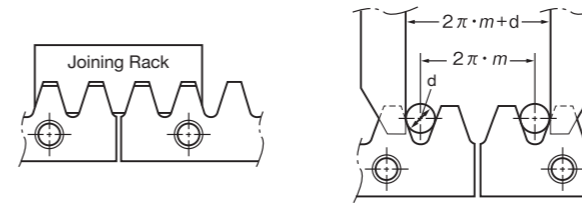
[NOTE] Pinions are assumed to be standard stock spur gears ($x=0$).

- 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.

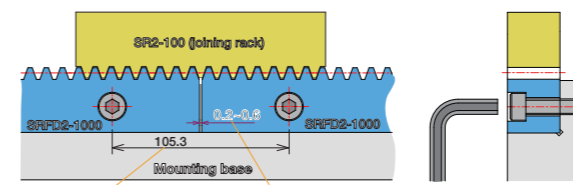
As an example of Rack Joining, we recommend the following method.



[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.

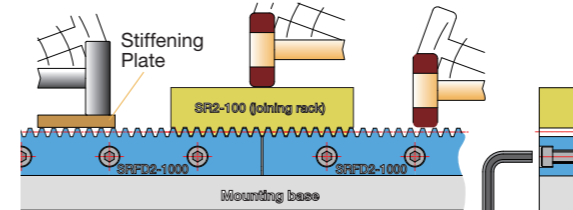
How to mount racks on a mounting base (For SRFD2-1000)

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

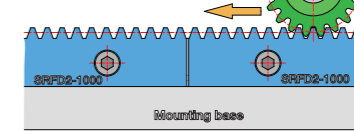


Dimensions Table F Value x 2 SRFD2-1000 is designed to have a gap of 0.2 to 0.6 mm.

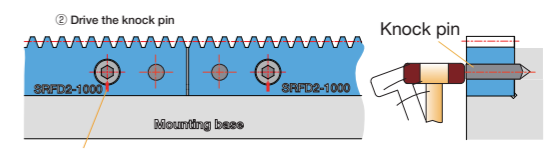
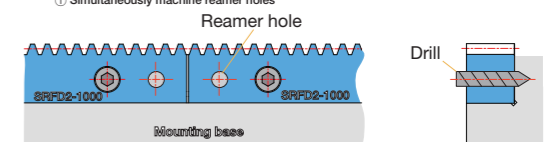
2. Securing to the mounting base
Tap with a plastic hammer, bring it into close contact with the mounting base, and further tighten the bolt. (When using a metal hammer, be careful not to damage the gear teeth by using a stiffening plate, etc.)



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



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?
 - Is there proper lubrication been supplied? (Be sure to avoid zero-backlash.)
- 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.