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Features



KHK stock screw gears come in four materials, S45C, SUS303, CAC702 (old JIS A & BC2) and MC nylon, in modules 1~4 and numbers of teeth from 10 to 30.

Catalog Number	Module	Material	Heat Treatment	Tooth Surface Finish	Precision JIS B 1702-1:1998	Secondary Operations	Features
SN	1~4	S45C	—	Cut	N9	○	Many lineups are available at a low price. The teeth can be additionally hardened.
SUN	1~3	SUS303	—	Cut	N9	○	Stainless steel gears with rust resistance.
AN	1~3	CAC702 (A & BC2)	—	Cut	N9	○	Aluminum bronze made gears with excellent wear resistance.
PN	1~3	MC901	—	Cut	N10	○	Nylon gears can be used with no lubrication.

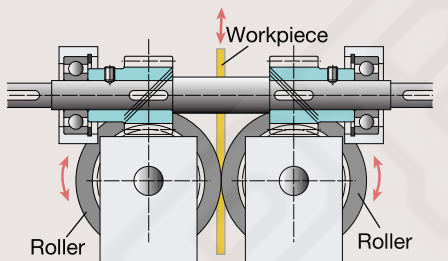
○ Possible △ Partly possible × Not possible

Application Examples



KHK stock screw gears are used in various labor-saving machines including conveyor machine and transport.

■ Design example of feeding device (not a design for machinery or a device in actual use)



Rotate the roller in reverse with one input shaft and move the pinched workpiece vertically

Selection Hints



Please select the most suitable products by carefully considering the characteristics of items and contents of the product tables. Since screw gears come in right- or left-hand helix, make sure to include the letter "R" or "L" in the catalog number when you order.

1. Caution in Selecting the Mating Gears

Screw gears are used for offset shafts. Whether the shafts are paralleled offset or skewed offset depends on the helix directions of the mating gears.

Direction of shaft	Arrangement of helix hands
Skewed Axes	RH-RH or LH-LH
Parallel Axes	RH-LH



Right (R)



Left (L)

Arrangements of helix directions of screw gears

2. Caution in Selecting Gears Based on Gear Strength

The allowable surface strengths listed in the product pages were derived using the Niemann formula as reference values. (Used with skewed shafts) There is a paucity of data on the strength of screw gears. The values of constant K_0 used in the calculations, which depend on the material of the mating gears, are our estimates. The mathematic expression below shows the Niemann formula to determine allowable tangential force F_t (kgf) and allowable torque T (kgf-m) on a basic circle.

$$F_t = 1.43 d_1^2 f_z K_s$$

$$T = \frac{F_t d_1}{2000}$$

Here, d_1 : standard pitch diameter of pinion (mm)
 f_z : coefficient based on no. of teeth combination
 K_s : coefficient based on materials and sliding speed

$$K_s = K_0 \frac{2}{2 + V_s}$$

Here, K_0 : coefficient based on material selection
 V_s : sliding speed (m/s)

$$V_s = \frac{\pi n d_1}{60000 \cos \beta}$$

Here, n : rotational speed (rpm)
 β : helix angle (45°)

■ f_z value

$Z_1 \backslash Z_2$	10	13	15	20	26	30
10	1.538					
13	2.005	1.538				
15	2.279	1.786	1.538			
20	2.963	2.329	2.053	1.538		
26	3.695	2.963	2.588	2.005	1.538	
30	4.161	3.350	2.963	2.279	1.786	1.538

■ Setting values depending on usage conditions

Catalog Number	Mating gear	K_0 value	Maximum allowable sliding speed m/s	No. of teeth of mating gears	Rotational Speed
SN	SN	0.0030	2.5	Same no. of teeth	100rpm
SUN	SN	0.0030 Note 1	2.5 Note 1		
AN	SN	0.0050	5		
PN	SN	0.0030 Note 1 (0.0021)	2.5 Note 1 (1.0)		

[NOTE 1] K_0 values and the maximum allowable sliding speed of SUN & PN products are set by KHK. Screw gears are basically used with lubrication. In case of using PN products without lubrication, the parenthetical values shown in the table are applied.

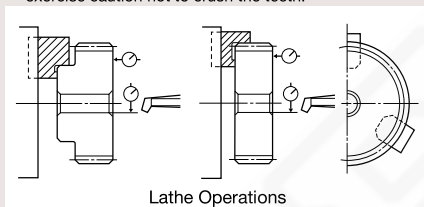
Application Hints



In order to use KHK stock screw gears safely, read the Application Hints carefully before proceeding. Please refer to Page 40 for “Cautions on Handling” and Page 41 for “Cautions on Starting”.

1. Caution on Performing Secondary Operations

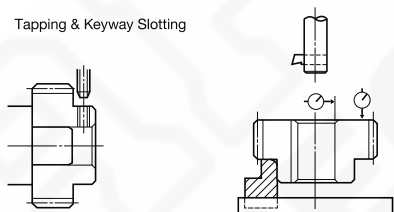
- ① If re boring, it is important to pay special attention to locating the center in order to avoid runout.
- ② The reference datum for gear machining is the bore. Therefore, use the bore for locating the center. If it is too difficult to do for small bores, the alternative is to use one spot on the bore and the runout of the side surface.
- ③ If reworking using scroll chucks, we recommend the use of new or rebored jaws for improved precision. Please exercise caution not to crush the teeth.



Lathe Operations

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

Tapping & Keyway Slotting



2. Points of Caution during Assembly

- ① The recommended center distance tolerance of KHK stock screw gears is H7 for ground gears and H8 for cut gears. The amount of backlash is given in the product table for each gear.

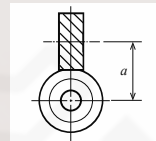
$$a = \frac{d_1 + d_2}{2}$$

Where

a : Center distance

d_1 : Pitch diameter of pinion

d_2 : Pitch diameter of gear

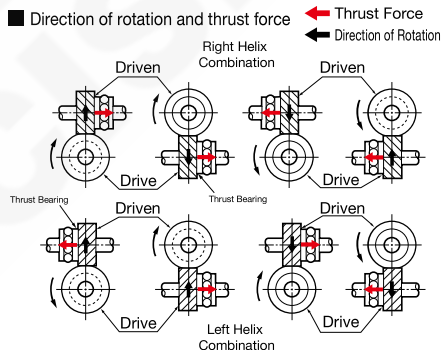


- ② Total Length Tolerance for Screw Gears

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

[NOTE] PN Plastic Screw Gears are excluded.

- ③ Due to the helix of screw gears, they produce axial thrust forces. The bearings must be selected properly to be able to handle these thrust forces. The directions of thrust change with the direction of helix and the direction of rotation as illustrated below.



[NOTE] For parallel shaft applications, see the Application Hints for KHK Helical Gears (Page 193).

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.