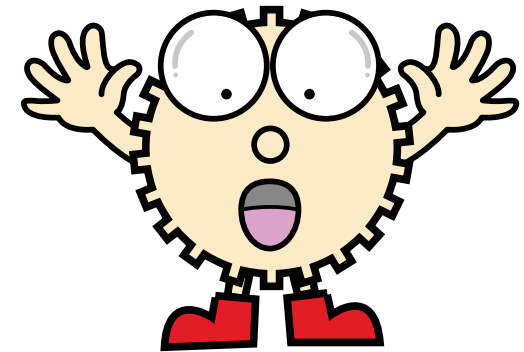




# Screw Gears

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

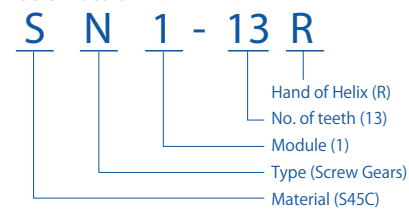
SN Steel Screw Gears	SUN Stainless Steel Screw Gears	AN Aluminum-Bronze Screw Gears	PN Plastic Screw Gears
 <i>Newly added</i>			
m1 ~ 4 Page 328	m1 ~ 3 Page 332	m1 ~ 4 Page 334	m1.5 ~ 3 Page 336
			



## Catalog Number of KHK Stock Gears

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

(Example) Screw Gears



**Material**  
 S S45C  
 SU SUS303  
 A CAC702  
 P MC901

**Type**  
 N Screw Gears

### Feature Icons

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

## Characteristics



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

Catalog No.	Module	Material	Heat Treatment	Tooth Surface Finish	Precision JIS B 1702-1-1998	Secondary Operations	Features
<b>SN</b>	1 ~ 4	S45C	—	Cut	N9	○	Popular screw gears. Additionally, gear tooth induction hardening secondary operations can be performed.
<b>SUN</b>	1 ~ 3	SUS303	—	Cut	N9	○	Suitable for food machinery due to SUS303's rust resistant qualities.
<b>AN</b>	1 ~ 4	CAC702 (Al/BC2)	—	Cut	N9	○	Aluminum bronze made products have excellent wear resistance.
<b>PN</b>	1.5 ~ 3	MC901	—	Cut	N9	○	Light-weight products made of MC Nylon can be used without lubrication.

○ Possible △ Partly possible × Not possible

## Selection Hints

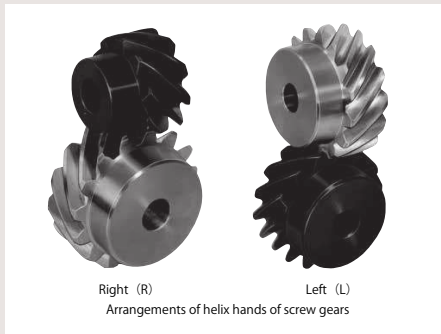


Please select the most suitable products by carefully considering the characteristics of items and contents of the product tables. It is also important to read all applicable "CAUTION" notes shown below before the final selection. Since screw gears come in right- or left-hand helix, make sure to include the letter "R" or "L" in the catalog number when you order.

### 1. Caution in Selecting the Mating Gears

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

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

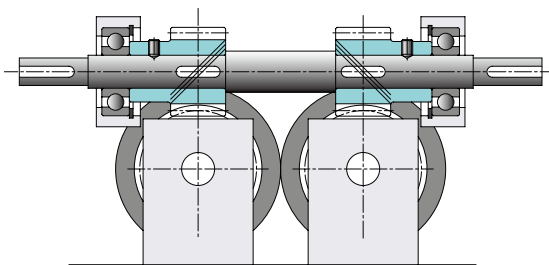


**Trusted quality achieved by years of experience.**  
Efficient production by lapping cutting processes.



Gear cutting by a Hobbing Machine

## Application Example



Feed by rollers \* (It rotates 2 rollers by one input shaft.)

\* The illustration above is a design example, not a design for machinery or a device in actual use.

## Application Hints



In order to use KHK stock screw gears safely, read the Application Hints carefully before proceeding. Also, please refer to the "Application Hints" in the technical information section on KHK stock spur gears (Page 32) when performing secondary operations.

### 1. Points of Caution in Assembling

① KHK stock screw gears are designed to give the proper backlash when assembled using the center distance given by the formula below with a tolerance of H7 to H8. The amount of backlash is given in the product table for each gear.

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

Where  
 $a$  : Center distance  
 $d_1$  : Pitch diameter of pinion  
 $d_2$  : Pitch diameter of gear

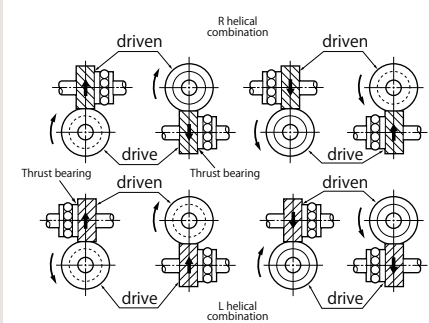
② Overall length tolerance of Screw Gears

Total Length (mm)	Tolerance
up to 30	0 -0.10
30 up to 100	0 -0.15

(CAUTION) PN Plastic Screw Gears are excluded.

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

### Direction of rotation and thrust force



(CAUTION) For parallel shaft applications, see the Application Hints for KHK Helical Gears. (Page 167).

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

The allowable surface strength listed in the product pages were derived using the Niemann formula as reference values (for the case of skewed offset shafts).

There is paucity of data on the strength of screw gears. The values of constant  $K_0$  used in the calculations, which depend on the material of the mating gears, are our estimates. The mathematic expression below shows the Niemann formula to determine allowable tangential force  $F_t$  (kgf) and allowable torque  $T$  (kgf, m) on a basic circle.

$$F_t = 1.43 d_1^{1/2} f_z K_s$$

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

Where

$d_1$  : standard pitch diameter of pinion (mm)

$f_z$  : coefficient based on no. of teeth combination

$K_s$  : coefficient based on materials and sliding

$$K_s = K_0 \frac{2}{2 + \sqrt{v_s}}$$

Where

$K_0$  : coefficient based on material selection

$v_s$  : sliding speed (m/s)

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

Where

$n$  : rotation (rpm)

$\beta$  : helix angle ( $45^\circ$ )

### Value of $f_z$

Z <sub>2</sub> \ Z <sub>1</sub>	10	13	15	20	26	30
10	1.538					
13	2.005	1.538				
15	2.279	1.786	1.538			
20	2.963	2.329	2.053	1.538		
26	3.695	2.963	2.588	2.005	1.538	
30	4.161	3.350	2.963	2.279	1.786	1.538

### $K_0$ values depending on material combination

Catalog No.	Mating gear	$K_0$	The maximum allowable sliding speed m/s	No. of teeth of mating gears	Rotation
<b>SN</b>	SN	0.0030	2.5	Same no. of teeth	100rpm
<b>SUN</b>	SN	0.0030 Note 1	2.5 Note 1		
<b>AN</b>	SN	0.0050	5		
<b>PN</b>	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.