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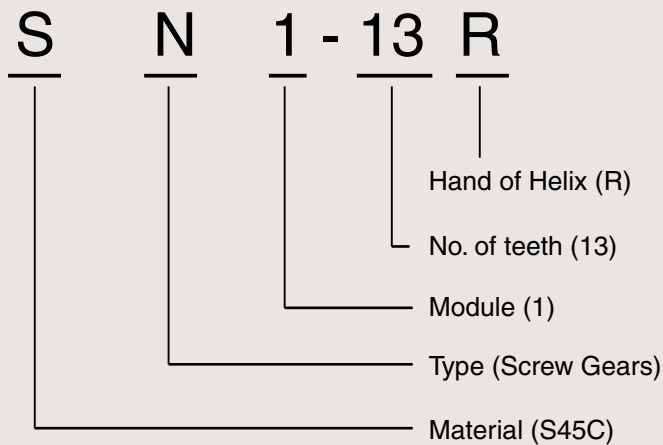
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## Catalog Number of KHK Stock Gears

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

# 8

# Screw Gears





# Screw Gears

## Many Types Are Offered for Changing Gear Train Directions.



### 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.

#### Main Features of Types of Screw Gears Offered

- ① In terms of materials, we offer high abrasion-resistant aluminum bronze (CAC702) AN series, chemical-resistant MC nylon (MC901) PN screw gears, superior antirust stainless steel (SUS303) SUN series and commonly used machine carbon steel (S45C) SN series.
- ② The helix angle of 45° is used with both right- hand and left-hand helixes so that any direction of rotation and axial thrusts can be selected. When the same helix hand is used as a set (right with right or left with left) they can be used as a skewed shaft drive, while the opposite hand set (right with left) can be used as a parallel shaft drive.
- ③ The efficiency depends on the application, but is approximately 80 to 90%. Because they have high friction, it is essential that lubrication. (gear oil JIS type 2, No. 5~7) is used.



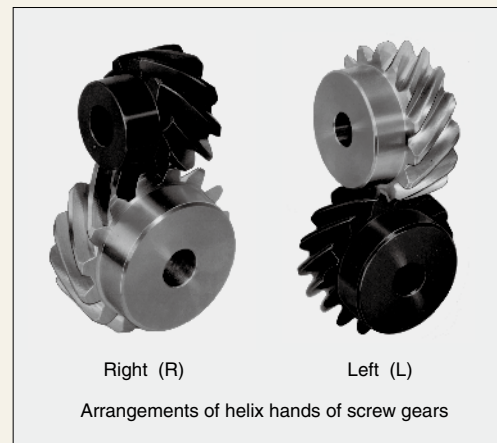
### Selection Hints

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



#### 2. Caution with Regard to Special Characteristics of Screw Gears

- ① SN steel screw gears made of S45C with black oxide finish are somewhat effective in preventing rust but are not rustproof.
- ② SUN stainless steel screw gears have high degrees of antirust property, but are not totally rustproof.
- ③ Due to the characteristics of MC nylon, PN plastic screw gears’ product quality may be affected by heat or moisture absorption.
- ④ AN aluminum-bronze screw gears’ material (CAC702) has the tendency to abrade and scuff when mated together. KHK recommends mating AN screw gears with those of different material for the best results.



### 3. 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 following are the equations used. (NOTE 1)

$$U_1 = 1.43d_1^2 f_z K_s \times 9.80665$$

Where

- $U_1$  : allowable tangential force (n)
- $d_1$  : standard pitch diameter of pinion (mm)
- $f_z$  : coefficient based on no. of teeth combination (see table below)
- $K_s$  : coefficient based on materials and sliding

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

Where

- $K_0$  : coefficient based on materials combination (see table below)
- $v_s$  : sliding speed (m/s)

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

Where

- $n$  : rotational speed ( $\text{min}^{-1}$ )
- $\beta$  : helix angle ( $45^\circ$ )

**NOTE 1:** The equations in Niemann Elements of "Mechanical Transmission" have been converted to SI units.

#### Value of $f_z$

$Z_2 \backslash Z_1$	10	13	15	20	26	30
10	1.557					
13	2.029	1.557				
15	2.287	1.823	1.557			
20	3.000	2.333	2.074	1.557		
26	3.755	3.000	2.658	2.029	1.557	
30	4.141	3.355	3.000	2.287	1.823	1.557

#### $K_0$ values depending on material combination

Catalog No.	Mating gear	$K_0$	The maximum allowable sliding speed	No. of teeth of mating gears	Rotation
SN	SN	0.0030	2.5	Same no. of teeth	100 $\text{min}^{-1}$
SUN	SN	0.0030 <small>NOTE 2</small>			
AN	SN	0.0050	5		
PN	SN	0.0030 <small>NOTE 2</small>			

**NOTE 2:**  $K_0$  values of SUN and PN are set by KHK.

### 4. Other Points to Consider in the Selection Process

Please see the similarly titled section for spur gears.



## Application Hints

In order to use KHK stock screw gears safely, read the Application Hints carefully before proceeding. Also "1. Caution on Performing Secondary Operations", "3. Notes on Starting Operations", "4. Other Points to Consider in Applications" in the spur gear section should be consulted.

### 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~H8. The amount of backlash is given in the product table for each gear.

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

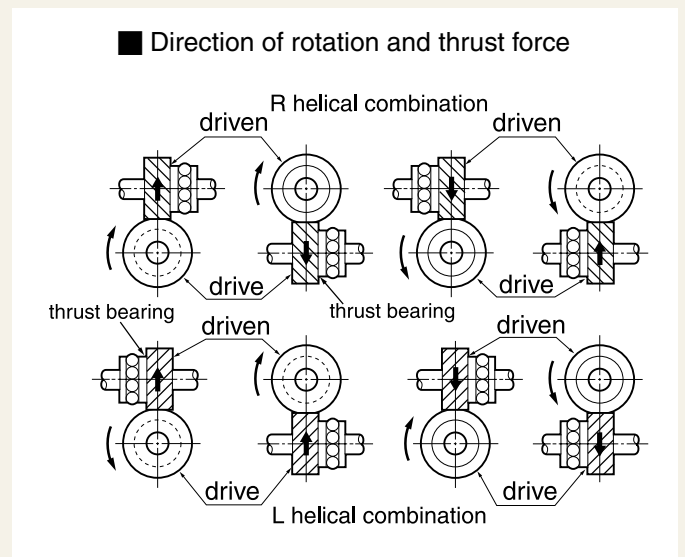
Where

- $a$  = 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
Above	Below	
	30	0 -0.10
30	100	0 -0.15

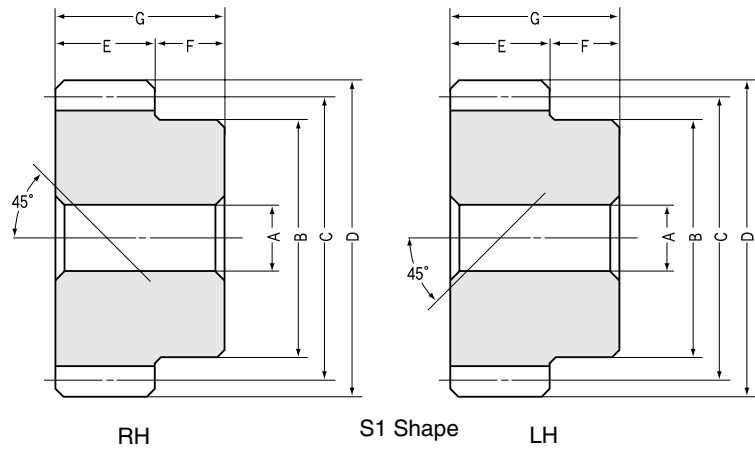
③ Due to the helix of screw gears, they produce axial thrust forces. The bearings must be selected properly to be able to handle these thrust forces. The directions of thrust change with the hand of helix and the direction of rotation as illustrated below.



**CAUTION:** For parallel shaft applications, see the Application Hints for KHK Helical Gears.



# SN Steel Screw Gears Modules 1~2



## Module 1, 1.5, 2

Catalog No.	Module	No. of teeth	Direction of helix	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length
					AH7	B	C	D	E	F	G
SN1-13R SN1-13L	m1	13	R L	S1	6	15	18.38	20.38	10	10	20
SN1-15R SN1-15L		15	R L	S1	6	18	21.21	23.21	10	10	20
SN1-20R SN1-20L		20	R L	S1	8	25	28.28	30.28	10	10	20
SN1-26R SN1-26L		26	R L	S1	10	30	36.77	38.77	10	10	20
SN1-30R SN1-30L		30	R L	S1	10	35	42.43	44.43	10	10	20
SN1.5-10R SN1.5-10L	m1.5	10	R L	S1	8	16	21.21	24.21	15	10	25
SN1.5-13R SN1.5-13L		13	R L	S1	10	23	27.58	30.58	15	10	25
SN1.5-15R SN1.5-15L		15	R L	S1	10	25	31.82	34.82	15	10	25
SN1.5-20R SN1.5-20L		20	R L	S1	12	30	42.43	45.43	15	10	25
SN1.5-26R SN1.5-26L		26	R L	S1	12	40	55.15	58.15	15	10	25
SN1.5-30R SN1.5-30L	30	R L	S1	12	45	63.64	66.64	15	10	25	
SN2-10R SN2-10L	m2	10	R L	S1	12	22	28.28	32.28	20	15	35
SN2-13R SN2-13L		13	R L	S1	12	30	36.77	40.77	20	15	35
SN2-15R SN2-15L		15	R L	S1	12	35	42.43	46.43	20	15	35
SN2-20R SN2-20L		20	R L	S1	15	45	56.57	60.57	20	15	35
SN2-26R SN2-26L		26	R L	S1	20	60	73.54	77.54	20	15	35
SN2-30R SN2-30L	30	R L	S1	20	65	84.85	88.85	20	15	35	

**CAUTION:** For skewed shaft applications, RH and RH or LH and LH are meshed to make up a set of screw gears or crossed-helical gears. For parallel shaft applications, mesh opposite hands of helical gear sets. See the Selection Hints on page 278.

**CAUTION:** The maximum allowable sliding speed of SN gears mated to SN gears is 2.5 m/s due to heat buildup.



## Specifications

Precision grade	JIS N9 grade (JIS B1702-1: 1996) OLD JIS 5 grade (JIS B1702: 1976)	Heat treatment	—
Reference section of gear	Normal plane	Surface treatment	Black oxide
Gear teeth	Standard full depth	Tooth surface finish	Cut
Normal pressure angle	20°	Datum reference surface for gear cutting	Bore
Helix angle	45°	Secondary Operations	Possible
Material	S45C		

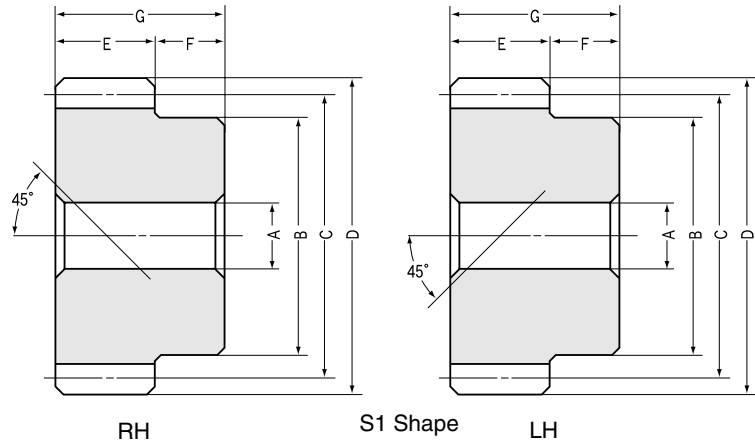
Allowable torque (N · m) <i>NOTE 1</i>		Allowable torque (kgf · m)		Backlash (mm) <i>NOTE 2</i>	Weight (kg)	Catalog No.
Bending strength	Surface durability	Bending strength	Surface durability			
—	0.19	—	0.020	0.08~0.18	0.03	SN1-13R SN1-13L
—	0.29	—	0.030	0.08~0.18	0.04	SN1-15R SN1-15L
—	0.66	—	0.070	0.08~0.18	0.08	SN1-20R SN1-20L
—	1.42	—	0.14	0.10~0.22	0.13	SN1-26R SN1-26L
—	2.14	—	0.22	0.10~0.22	0.17	SN1-30R SN1-30L
—	0.29	—	0.030	0.08~0.20	0.05	SN1.5-10R SN1.5-10L
—	0.62	—	0.060	0.10~0.22	0.08	SN1.5-13R SN1.5-13L
—	0.93	—	0.10	0.10~0.22	0.12	SN1.5-15R SN1.5-15L
—	2.14	—	0.22	0.10~0.22	0.21	SN1.5-20R SN1.5-20L
—	4.51	—	0.46	0.12~0.26	0.36	SN1.5-26R SN1.5-26L
—	6.75	—	0.69	0.12~0.26	0.48	SN1.5-30R SN1.5-30L
—	0.66	—	0.070	0.10~0.22	0.11	SN2-10R SN2-10L
—	1.42	—	0.14	0.12~0.26	0.21	SN2-13R SN2-13L
—	2.14	—	0.22	0.12~0.26	0.31	SN2-15R SN2-15L
—	4.84	—	0.49	0.12~0.26	0.52	SN2-20R SN2-20L
—	10.1	—	1.03	0.14~0.30	0.90	SN2-26R SN2-26L
—	15.0	—	1.53	0.14~0.30	1.20	SN2-30R SN2-30L

**NOTE 1:** The allowable torques shown in the table are calculated from the Niemann formula. Please see the "Selection Hints"(page 278) for further details.

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



# SN Steel Screw Gears Modules 2.5~4



## Module 2.5, 3, 4

Catalog No.	Module	No. of teeth	Direction of helix	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length
					A <sub>H7</sub>	B	C	D	E	F	G
SN2.5-10R SN2.5-10L	m2.5	10	R L	S1	12	26	35.36	40.36	22	16	38
SN2.5-13R SN2.5-13L		13	R L	S1	15	35	45.96	50.96	22	16	38
SN2.5-15R SN2.5-15L		15	R L	S1	15	40	53.03	58.03	22	16	38
SN2.5-20R SN2.5-20L		20	R L	S1	20	60	70.71	75.71	22	16	38
SN2.5-26R SN2.5-26L		26	R L	S1	20	70	91.92	96.92	22	16	38
SN2.5-30R SN2.5-30L		30	R L	S1	20	80	106.07	111.07	22	16	38
SN3-10R SN3-10L	m3	10	R L	S1	15	34	42.43	48.43	25	18	43
SN3-13R SN3-13L		13	R L	S1	20	45	55.15	61.15	25	18	43
SN3-15R SN3-15L		15	R L	S1	20	50	63.64	69.64	25	18	43
SN3-20R SN3-20L		20	R L	S1	20	60	84.85	90.85	25	18	43
SN3-26R SN3-26L		26	R L	S1	20	80	110.31	116.31	25	18	43
SN3-30R SN3-30L		30	R L	S1	20	90	127.28	133.28	25	18	43
SN4-10R SN4-10L	m4	10	R L	S1	20	45	56.57	64.57	30	20	50
SN4-13R SN4-13L		13	R L	S1	20	60	73.54	81.54	30	20	50
SN4-15R SN4-15L		15	R L	S1	20	70	84.85	92.85	30	20	50
SN4-20R SN4-20L		20	R L	S1	20	90	113.14	121.14	30	20	50
SN4-26R SN4-26L		26	R L	S1	20	100	147.08	155.08	30	20	50
SN4-30R SN4-30L		30	R L	S1	20	110	169.71	177.71	30	20	50

**CAUTION:** For skewed shaft applications, RH and RH or LH and LH are meshed to make up a set of screw gears or crossed-helical gears. For parallel shaft applications, mesh opposite hands of helical gear sets. See the Selection Hints on page 278.

**CAUTION:** The maximum allowable sliding speed of SN gears mated to SN gears is 2.5 m/s due to heat buildup.



## Specifications

Precision grade	JIS N9 grade (JIS B1702-1: 1996) OLD JIS 5 grade (JIS B1702: 1976)	Heat treatment	—
Reference section of gear	<b>Normal plane</b>	Surface treatment	<b>Black oxide</b>
Gear teeth	<b>Standard full depth</b>	Tooth surface finish	<b>Cut</b>
Normal pressure angle	20°	Datum reference surface for gear cutting	<b>Bore</b>
Helix angle	45°	Secondary Operations	<b>Possible</b>
Material	<b>S45C</b>		

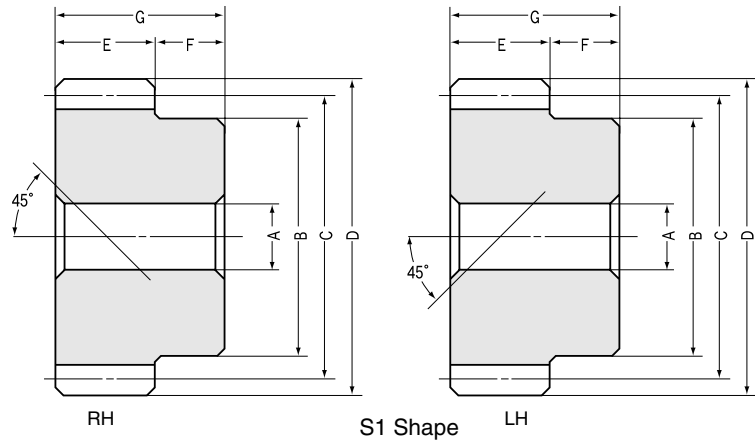
Allowable torque (N · m) <i>NOTE 1</i>		Allowable torque (kgf · m)		Backlash (mm) <i>NOTE 2</i>	Weight (kg)	Catalog No.
Bending strength	Surface durability	Bending strength	Surface durability			
—	1.26	—	0.13	0.12~0.24	0.20	<b>SN2.5-10R</b> <b>SN2.5-10L</b>
—	2.69	—	0.27	0.14~0.28	0.35	<b>SN2.5-13R</b> <b>SN2.5-13L</b>
—	4.03	—	0.41	0.14~0.28	0.49	<b>SN2.5-15R</b> <b>SN2.5-15L</b>
—	9.07	—	0.92	0.14~0.28	0.95	<b>SN2.5-20R</b> <b>SN2.5-20L</b>
—	18.8	—	1.91	0.16~0.34	1.50	<b>SN2.5-26R</b> <b>SN2.5-26L</b>
—	27.7	—	2.83	0.16~0.34	2.10	<b>SN2.5-30R</b> <b>SN2.5-30L</b>
—	2.14	—	0.22	0.12~0.26	0.34	<b>SN3-10R</b> <b>SN3-10L</b>
—	4.51	—	0.46	0.14~0.32	0.55	<b>SN3-13R</b> <b>SN3-13L</b>
—	6.75	—	0.69	0.14~0.32	0.78	<b>SN3-15R</b> <b>SN3-15L</b>
—	15.0	—	1.53	0.14~0.32	1.00	<b>SN3-20R</b> <b>SN3-20L</b>
—	30.8	—	3.14	0.18~0.38	2.50	<b>SN3-26R</b> <b>SN3-26L</b>
—	45.4	—	4.62	0.18~0.38	3.30	<b>SN3-30R</b> <b>SN3-30L</b>
—	4.84	—	0.49	0.16~0.34	0.70	<b>SN4-10R</b> <b>SN4-10L</b>
—	10.1	—	1.03	0.18~0.38	1.30	<b>SN4-13R</b> <b>SN4-13L</b>
—	15.0	—	1.53	0.18~0.38	1.90	<b>SN4-15R</b> <b>SN4-15L</b>
—	33.0	—	3.37	0.18~0.38	3.30	<b>SN4-20R</b> <b>SN4-20L</b>
—	66.7	—	6.80	0.20~0.44	5.20	<b>SN4-26R</b> <b>SN4-26L</b>
—	97.1	—	9.90	0.20~0.44	6.70	<b>SN4-30R</b> <b>SN4-30L</b>

**NOTE 1:** The allowable torques shown in the table are calculated from the Niemann formula. Please see the "Selection Hints"(page 278) for further details.

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



# SUN Stainless Steel Screw Gears Modules 1~3



## Module 1~3

Catalog No.	Module	No. of teeth	Direction of helix	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length
					AH7	B	C	D	E	F	G
SUN1-13R SUN1-13L	m1	13	R L	S1	6	15	18.38	20.38	10	10	20
SUN1-15R SUN1-15L		15	R L	S1	6	18	21.21	23.21	10	10	20
SUN1.5-10R SUN1.5-10L	m1.5	10	R L	S1	8	16	21.21	24.21	15	10	25
SUN1.5-13R SUN1.5-13L		13	R L	S1	10	23	27.58	30.58	15	10	25
SUN1.5-15R SUN1.5-15L		15	R L	S1	10	25	31.82	34.82	15	10	25
SUN2-10R SUN2-10L	m2	10	R L	S1	12	22	28.28	32.28	20	15	35
SUN2-13R SUN2-13L		13	R L	S1	12	30	36.77	40.77	20	15	35
SUN2-15R SUN2-15L		15	R L	S1	12	35	42.43	46.43	20	15	35
SUN2.5-10R SUN2.5-10L	m2.5	10	R L	S1	12	26	35.36	40.36	22	16	38
SUN2.5-13R SUN2.5-13L		13	R L	S1	15	35	45.96	50.96	22	16	38
SUN2.5-15R SUN2.5-15L		15	R L	S1	15	40	53.03	58.03	22	16	38
SUN3-10R SUN3-10L	m3	10	R L	S1	15	34	42.43	48.43	25	18	43
SUN3-13R SUN3-13L		13	R L	S1	20	45	55.15	61.15	25	18	43
SUN3-15R SUN3-15L		15	R L	S1	20	50	63.64	69.64	25	18	43

**CAUTION:** For skewed shaft applications, RH and RH or LH and LH are meshed to make up a set of screw gears or crossed-helical gears. For parallel shaft applications, mesh opposite hands of helical gear sets. See the Selection Hints on page 278.





## Specifications

Precision grade	JIS N9 grade (JIS B1702-1: 1996) OLD JIS 5 grade (JIS B1702: 1976)	Heat treatment	—
Reference section of gear	<b>Normal plane</b>	Surface treatment	—
Gear teeth	<b>Standard full depth</b>	Tooth surface finish	<b>Cut</b>
Normal pressure angle	<b>20°</b>	Datum reference surface for gear cutting	<b>Bore</b>
Helix angle	<b>45°</b>	Secondary Operations	<b>Possible</b>
Material	<b>SUS303</b>		

\*Available on special order: Same gears except made from SUS304.

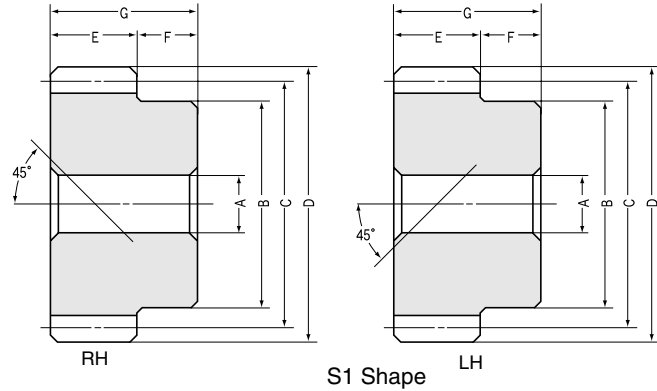
Allowable torque (N · m) <i>NOTE 1</i>		Allowable torque (kgf · m)		Backlash (mm) <i>NOTE 2</i>	Weight (kg)	Catalog No.
Bending strength	Surface durability	Bending strength	Surface durability			
—	0.19	—	0.020	0.08~0.18	0.03	<b>SUN1-13R</b> <b>SUN1-13L</b>
—	0.29	—	0.030	0.08~0.18	0.04	<b>SUN1-15R</b> <b>SUN1-15L</b>
—	0.29	—	0.030	0.08~0.20	0.05	<b>SUN1.5-10R</b> <b>SUN1.5-10L</b>
—	0.62	—	0.060	0.10~0.22	0.09	<b>SUN1.5-13R</b> <b>SUN1.5-13L</b>
—	0.93	—	0.10	0.10~0.22	0.12	<b>SUN1.5-15R</b> <b>SUN1.5-15L</b>
—	0.66	—	0.070	0.10~0.22	0.11	<b>SUN2-10R</b> <b>SUN2-10L</b>
—	1.42	—	0.14	0.12~0.26	0.22	<b>SUN2-13R</b> <b>SUN2-13L</b>
—	2.14	—	0.22	0.12~0.26	0.31	<b>SUN2-15R</b> <b>SUN2-15L</b>
—	1.26	—	0.13	0.12~0.24	0.20	<b>SUN2.5-10R</b> <b>SUN2.5-10L</b>
—	2.69	—	0.27	0.14~0.28	0.36	<b>SUN2.5-13R</b> <b>SUN2.5-13L</b>
—	4.03	—	0.41	0.14~0.28	0.49	<b>SUN2.5-15R</b> <b>SUN2.5-15L</b>
—	2.14	—	0.22	0.12~0.26	0.35	<b>SUN3-10R</b> <b>SUN3-10L</b>
—	4.51	—	0.46	0.14~0.32	0.59	<b>SUN3-13R</b> <b>SUN3-13L</b>
—	6.75	—	0.69	0.14~0.32	0.80	<b>SUN3-15R</b> <b>SUN3-15L</b>

**NOTE 1:** The allowable torques shown in the table are calculated from the Niemann formula. Please see the "Selection Hints" (page 278) for further details.

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



# AN Aluminum-Bronze Screw Gears Modules 1~4



## Module 1~4

Catalog No.	Module	No. of teeth	Direction of helix	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length
					AH7	B	C	D	E	F	G
AN1-13R AN1-13L	m1	13	R L	S1	6	15	18.38	20.38	10	10	20
AN1-15R AN1-15L		15	R L	S1	6	18	21.21	23.21	10	10	20
AN1.5-10R AN1.5-10L	m1.5	10	R L	S1	8	16	21.21	24.21	15	10	25
AN1.5-13R AN1.5-13L		13	R L	S1	10	23	27.58	30.58	15	10	25
AN1.5-15R AN1.5-15L		15	R L	S1	10	25	31.82	34.82	15	10	25
AN2-10R AN2-10L	m2	10	R L	S1	12	22	28.28	32.28	20	15	35
AN2-13R AN2-13L		13	R L	S1	12	30	36.77	40.77	20	15	35
AN2-15R AN2-15L		15	R L	S1	12	35	42.43	46.43	20	15	35
AN2.5-10R AN2.5-10L	m2.5	10	R L	S1	12	26	35.36	40.36	22	16	38
AN2.5-13R AN2.5-13L		13	R L	S1	15	35	45.96	50.96	22	16	38
AN2.5-15R AN2.5-15L		15	R L	S1	15	40	53.03	58.03	22	16	38
AN3-10R AN3-10L	m3	10	R L	S1	15	34	42.43	48.43	25	18	43
AN3-13R AN3-13L		13	R L	S1	20	45	55.15	61.15	25	18	43
AN3-15R AN3-15L		15	R L	S1	20	50	63.64	69.64	25	18	43
AN4-10R AN4-10L	m4	10	R L	S1	20	45	56.57	64.57	30	20	50
AN4-13R AN4-13L		13	R L	S1	20	60	73.54	81.54	30	20	50
AN4-15R AN4-15L		15	R L	S1	20	70	84.85	92.85	30	20	50

**CAUTION:** For skewed shaft applications, RH and RH or LH and LH are meshed to make up a set of screw gears or crossed-helical gears. For parallel shaft applications, mesh opposite hands of helical gear sets. Please see the "Selection Hints" on page 278.

**CAUTION:** The maximum allowable sliding speed of AN gears mated to SN gears is 5m/s due to heat buildup.



## Aluminum-Bronze Screw Gears

### Specifications

Precision grade	JIS N9 grade (JIS B1702-1: 1996) OLD JIS 5 grade (JIS B1702: 1976)	Heat treatment	—
Reference section of gear	<b>Normal plane</b>	Surface treatment	—
Gear teeth	<b>Standard full depth</b>	Tooth surface finish	<b>Cut</b>
Normal pressure angle	<b>20°</b>	Datum reference surface for gear cutting	<b>Bore</b>
Helix angle	<b>45°</b>	Secondary Operations	<b>Possible</b>
Material	<b>CAC702 (formerly JIS A(BC2))</b>		

**CAUTION:** A(BC2) is aluminum bronze.

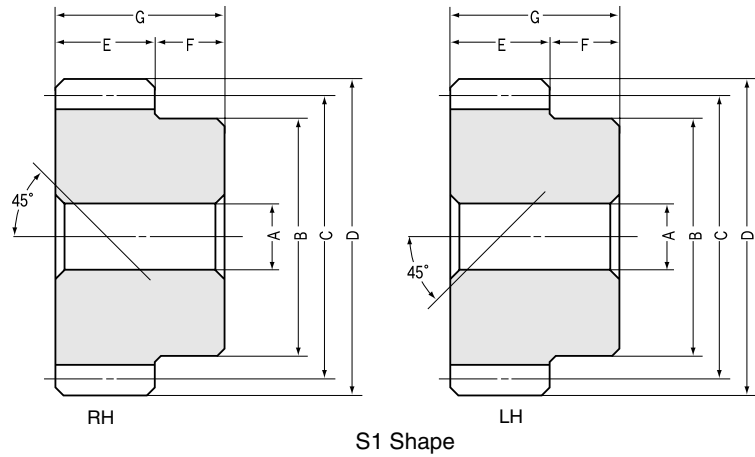
Allowable torque (N · m) <i>NOTE 1</i>		Allowable torque (kgf · m)		Backlash (mm) <i>NOTE 2</i>	Weight (kg)	Catalog No.
Bending strength	Surface durability	Bending strength	Surface durability			
—	0.31	—	0.030	0.08~0.18	0.03	<b>AN1-13R</b> <b>AN1-13L</b>
—	0.48	—	0.050	0.08~0.18	0.05	<b>AN1-15R</b> <b>AN1-15L</b>
—	0.48	—	0.050	0.08~0.20	0.05	<b>AN1.5-10R</b> <b>AN1.5-10L</b>
—	1.03	—	0.10	0.10~0.22	0.08	<b>AN1.5-13R</b> <b>AN1.5-13L</b>
—	1.55	—	0.16	0.10~0.22	0.11	<b>AN1.5-15R</b> <b>AN1.5-15L</b>
—	1.10	—	0.11	0.10~0.22	0.11	<b>AN2-10R</b> <b>AN2-10L</b>
—	2.36	—	0.24	0.12~0.26	0.22	<b>AN2-13R</b> <b>AN2-13L</b>
—	3.56	—	0.36	0.12~0.26	0.31	<b>AN2-15R</b> <b>AN2-15L</b>
—	2.11	—	0.21	0.12~0.24	0.20	<b>AN2.5-10R</b> <b>AN2.5-10L</b>
—	4.48	—	0.46	0.14~0.28	0.35	<b>AN2.5-13R</b> <b>AN2.5-13L</b>
—	6.72	—	0.69	0.14~0.28	0.48	<b>AN2.5-15R</b> <b>AN2.5-15L</b>
—	3.56	—	0.36	0.12~0.26	0.34	<b>AN3-10R</b> <b>AN3-10L</b>
—	7.51	—	0.77	0.14~0.32	0.55	<b>AN3-13R</b> <b>AN3-13L</b>
—	11.3	—	1.15	0.14~0.32	0.77	<b>AN3-15R</b> <b>AN3-15L</b>
—	8.07	—	0.82	0.16~0.34	0.70	<b>AN4-10R</b> <b>AN4-10L</b>
—	16.9	—	1.72	0.18~0.38	1.30	<b>AN4-13R</b> <b>AN4-13L</b>
—	25.1	—	2.56	0.18~0.38	1.80	<b>AN4-15R</b> <b>AN4-15L</b>

**NOTE 1:** The allowable torques shown in the table are calculated from the Niemann formula. Please see the "Selection Hints" (page 278) for further details.

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



# PN Plastic Screw Gears Module 1.5~3



## Module 1.5~3

Catalog No.	Module	No. of teeth	Direction of helix	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length
					A	B	C	D	E	F	G
PN1.5-10R PN1.5-10L	m1.5	10	R L	S1	6	16	21.21	24.21	15	10	25
PN1.5-13R PN1.5-13L		13	R L	S1	8	23	27.58	30.58	15	10	25
PN1.5-15R PN1.5-15L		15	R L	S1	8	25	31.82	34.82	15	10	25
PN1.5-20R PN1.5-20L		20	R L	S1	10	30	42.43	45.43	15	10	25
PN2-10R PN2-10L	m2	10	R L	S1	10	22	28.28	32.28	20	15	35
PN2-13R PN2-13L		13	R L	S1	10	30	36.77	40.77	20	15	35
PN2-15R PN2-15L		15	R L	S1	10	35	42.43	46.43	20	15	35
PN2-20R PN2-20L		20	R L	S1	12	45	56.57	60.57	20	15	35
PN2.5-10R PN2.5-10L	m2.5	10	R L	S1	10	26	35.36	40.36	22	16	38
PN2.5-13R PN2.5-13L		13	R L	S1	12	35	45.96	50.96	22	16	38
PN2.5-15R PN2.5-15L		15	R L	S1	12	40	53.03	58.03	22	16	38
PN2.5-20R PN2.5-20L		20	R L	S1	12	60	70.71	75.71	22	16	38
PN3-10R PN3-10L	m3	10	R L	S1	12	34	42.43	48.43	25	18	43
PN3-13R PN3-13L		13	R L	S1	15	45	55.15	61.15	25	18	43
PN3-15R PN3-15L		15	R L	S1	15	50	63.64	69.64	25	18	43
PN3-20R PN3-20L		20	R L	S1	15	60	84.85	90.85	25	18	43

**CAUTION:** For skewed shaft applications, RH and RH or LH and LH are meshed to make up a set of screw gears or crossed-helical gears. For parallel shaft applications, mesh opposite hands of helical gear sets. See the Selection Hints on page 278.

**CAUTION:** The quality of plastic gears (MC Nylon) can be affected by the temperature and humidity. Please see page 32 on "Characteristics of Plastic Gears" for additional information.



## Specifications

Precision grade	JIS N9 grade(JIS B1701-1998) OLD JIS grade 5 ( JIS B 1702-1976)	Material	MC901
Reference section of gear	Normal plane	Surface treatment	—
Gear teeth	Standard full depth	Tooth surface finish	Cut
Normal pressure angle	20°	Datum reference surface for gear cutting	Bore
Helix angle	45°	Secondary Operations	Possible

Allowable torque (N · m) <i>NOTE 1</i>		Allowable torque (kgf · m)		Backlash (mm) <i>NOTE 2</i>	Weight (kg)	Catalog No.
Bending strength	Surface durability	Bending strength	Surface durability			
—	0.29	—	0.030	0.14~0.30	0.0060	PN1.5-10R PN1.5-10L
—	0.62	—	0.060	0.14~0.30	0.012	PN1.5-13R PN1.5-13L
—	0.93	—	0.10	0.14~0.30	0.016	PN1.5-15R PN1.5-15L
—	2.14	—	0.22	0.14~0.30	0.026	PN1.5-20R PN1.5-20L
—	0.66	—	0.070	0.18~0.34	0.016	PN2-10R PN2-10L
—	1.42	—	0.14	0.18~0.34	0.031	PN2-13R PN2-13L
—	2.14	—	0.22	0.18~0.34	0.043	PN2-15R PN2-15L
—	4.84	—	0.49	0.20~0.36	0.075	PN2-20R PN2-20L
—	1.26	—	0.13	0.20~0.36	0.026	PN2.5-10R PN2.5-10L
—	2.69	—	0.27	0.20~0.36	0.05	PN2.5-13R PN2.5-13L
—	4.03	—	0.41	0.22~0.38	0.068	PN2.5-15R PN2.5-15L
—	9.07	—	0.92	0.22~0.38	0.14	PN2.5-20R PN2.5-20L
—	2.14	—	0.22	0.28~0.44	0.05	PN3-10R PN3-10L
—	4.51	—	0.46	0.30~0.46	0.09	PN3-13R PN3-13L
—	6.75	—	0.69	0.30~0.46	0.12	PN3-15R PN3-15L
—	15.0	—	1.53	0.30~0.46	0.19	PN3-20R PN3-20L

**NOTE 1:** The allowable torques shown in the table are calculated from the Niemann formula. Please see the "Selection Hints" (page 278) for further details.

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