

NEEDLE ROLLER CAGES FOR GENERAL USAGE



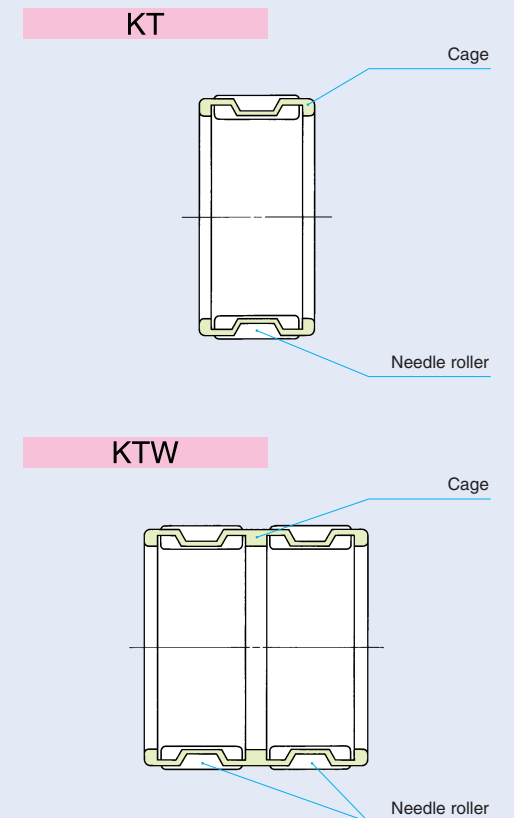
Structure and Features

IKO Needle Roller Cages for General Usage are bearings which display excellent rotational performance. Needle rollers with extremely small dimensional variations in diameter are incorporated and retained in their specially shaped cages with high rigidity and accuracy, which precisely guide the needle rollers.

When combined with shafts and housing bores that are heat treated and accurately ground as raceway surfaces, Needle Roller Cages for General Usage are particularly useful in small spaces.

In addition, since they are lightweight and have high rigidity as well as a large lubricant holding capacity, they can withstand severe operating conditions such as high speed rotation and shock loads, and they are used in a wide range of applications.

Structures of Needle Roller Cages for General Usage



Types

Needle Roller Cages for General Usage are available in two types, with single row needle rollers and double row needle rollers.

For applications such as crank shafts where these bearings are difficult to install, it is also possible to make split type bearings.

If such bearings are required, please contact IKO.

For Needle Roller Cages for Engine Connecting Rods (KT...EG and KTV...EG), see page C17.

Identification Number

The identification number of Needle Roller Cages for General Usage consists of a model code, dimensions and any supplemental codes. The arrangement examples are shown below.

Examples of identification number

Example 1

Model code	Dimensions	Supplemental code
KT	15 20 10	C3

Type of bearing: KT
 Roller set bore diameter (15mm): 15
 Roller set outside diameter (20mm): 20
 Cage width (10mm): 10
 Tolerance of mean value of roller dia. (Refer to Table 1.): C3

Example 2

Model code	Dimensions	Supplemental code
KTW	24 28 34	B4

Type of bearing: KTW
 Roller set bore diameter (24mm): 24
 Roller set outside diameter (28mm): 28
 Cage width (34mm): 34
 Tolerance of mean value of roller dia. (Refer to Table 1.): B4

Accuracy

The diameter tolerances of needle rollers of Needle Roller Cages for General Usage are classified by classification symbols shown in Table 1. If a classification symbol is not indicated in an identification number, the classification symbol "C3" is applied.

When two or more bearings are used in tandem arrangement on the same shaft, it is necessary to select bearings of the same classification symbol to obtain an even load distribution.

The tolerance of the cage width B_c is $-0.20 \sim -0.55$ mm.

Table 1 Diameter tolerances of needle rollers unit: μm

Classification symbol	Tolerance of mean value of needle roller diameter
C 3	0 ~ - 3
B 2	0 ~ - 2
B 4	- 2 ~ - 4
B 6	- 4 ~ - 6
B 8	- 6 ~ - 8
B10	- 8 ~ - 10

Fit

Radial clearances of Needle Roller Cages for General Usage are determined by the dimensional accuracy of the raceways and needle rollers. Table 2 shows the recommended fits for the operating conditions.

Table 2 Recommended fits of shaft to the housing bore diameter G6

Operating conditions	Shaft	
	$F_w \leq 68\text{mm}$	$F_w > 68\text{mm}$
When high operating accuracy is required. When shock loads and oscillating motions are applied.	j5	h5
For general use	h5	g5
When the temperature is high, or mounting errors are large.	g6	f6

Remark When setting the required radial clearance according to the operating conditions, the clearance can easily be obtained by selecting and matching the tolerances of needle rollers, shaft and housing bore. When variation of the clearance does not create any problems, h6 and G7 are used for shaft and housing bore, respectively.

Specifications of shaft and housing

For the raceways, a surface hardness of 58~64HRC and a surface roughness $0.2 \mu\text{m}R_a$ or less are desirable. However, when the operating conditions are not severe, a surface roughness $0.8 \mu\text{m}R_a$ or less can be used.

When the surface hardness is low, it is necessary to correct the load rating by the hardness factor specified on page A20.

Operating temperature range

For synthetic resin cages, "N" is added at the end of the identification number. The operating temperature range for Needle Roller Cages for General Usage is $-20^\circ\text{C} \sim +120^\circ\text{C}$. However, the maximum allowable temperature for synthetic resin cages is $+110^\circ\text{C}$, and when they are continuously operated, it is $+100^\circ\text{C}$.

Mounting

The dimensions related to mounting of Needle Roller Cages for General Usage are shown in Figs. 1 and 2. When mounting Needle Roller Cages for General Usage, they are axially positioned by using, for example, Cir-clips for shaft and housing bore (WR and AR on page L13) as shown in Figs. 3, 4 and 5.

For high rotational speed applications, a heat treated and ground spacer is positioned between the cage and the cir-clip as shown in Fig. 5 so that the cage does not make direct contact with the cir-clip. In this case, the cir-clip is normally mounted on the non-rotating side.

Fig. 3 shows a mounting example in the case of outer ring rotation, and Figs. 4 and 5 show examples in the case of inner ring rotation.

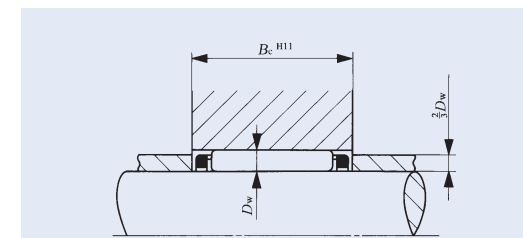


Fig.1

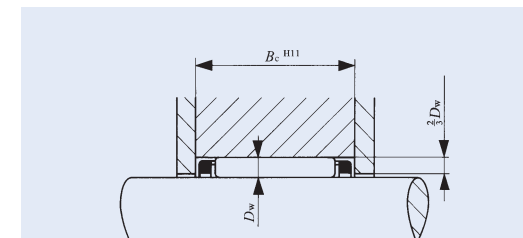


Fig.2

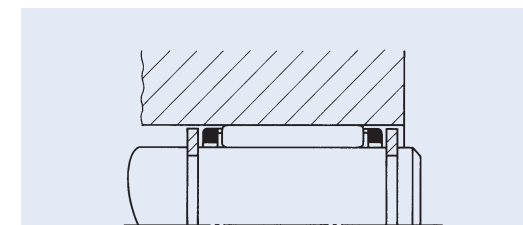


Fig.3

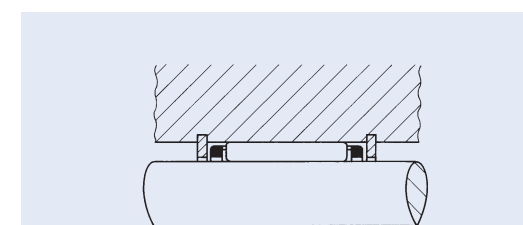


Fig.4

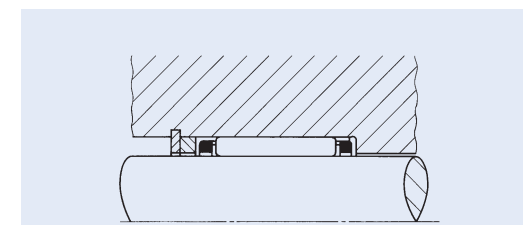
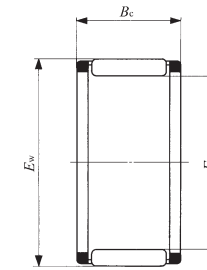


Fig.5

NEEDLE ROLLER CAGES FOR GENERAL USAGE



KT

Shaft dia. 15 – 18mm

Shaft dia. mm	Identification number	Mass (Ref.) g	Boundary dimensions mm			Basic dynamic load rating C N	Basic static load rating C ₀ N	Allowable rotational speed ⁽¹⁾ rpm
			F _w	E _w	B _c			
15	KT 15199	4.4	15	19	9	6 120	6 950	35 000
	KT 151910	4.9	15	19	10	6 630	7 720	35 000
	KT 151911	5.5	15	19	11	6 850	8 040	35 000
	KT 151913	6.4	15	19	13	8 250	10 200	35 000
	KT 151917	8.2	15	19	17	10 900	14 600	35 000
	KT 151918	8.7	15	19	18	11 500	15 600	35 000
	KT 152010	6.3	15	20	10	7 580	7 920	35 000
	KT 152115	11.9	15	21	15	12 600	13 500	35 000
16	KT 162010	5.2	16	20	10	6 930	8 330	30 000
	KT 162013	6.8	16	20	13	8 620	11 000	30 000
	KT 162016	8.3	16	20	16	10 700	14 600	30 000
	KT 162017	8.7	16	20	17	11 400	15 700	30 000
	KT 162118	12	16	21	18	14 000	17 700	30 000
	KT 162120	13.6	16	21	20	14 700	18 900	30 000
	KT 162125	16.6	16	21	25	18 300	25 100	30 000
	KT 162212	9.7	16	22	12	10 500	10 900	30 000
	KT 162214	11.5	16	22	14	11 600	12 500	30 000
	KT 162217	13.8	16	22	17	14 200	16 100	30 000
	KT 162220	16.5	16	22	20	15 900	18 600	30 000
	KT 162420	23.5	16	24	20	18 500	19 000	30 000
17	KT 172110	5.5	17	21	10	7 220	8 950	30 000
	KT 172113	7.2	17	21	13	8 980	11 800	30 000
	KT 172115	8.2	17	21	15	10 400	14 400	30 000
	KT 172117	9.3	17	21	17	11 800	16 900	30 000
	KT 172220	14	17	22	20	15 500	20 500	30 000
	KT 172311	9.6	17	23	11	10 100	10 500	30 000
	KT 172315	13.1	17	23	15	13 300	15 100	30 000
KT 172418	18.6	17	24	18	16 500	18 000	30 000	

Note⁽¹⁾ Allowable rotational speed applies to oil lubrication. For grease lubrication, a maximum of 50% of this value is allowable.

Shaft dia. mm	Identification number	Mass (Ref.) g	Boundary dimensions mm			Basic dynamic load rating C N	Basic static load rating C ₀ N	Allowable rotational speed ⁽¹⁾ rpm
			F _w	E _w	B _c			
18	KT 18228	4.7	18	22	8	6 060	7 270	30 000
	KT 182210	5.8	18	22	10	7 500	9 560	30 000
	KT 182213	7.6	18	22	13	9 330	12 700	30 000
	KT 182216	9.2	18	22	16	11 600	16 700	30 000
	KT 182412	11	18	24	12	11 800	13 100	30 000
	KT 182416	14.8	18	24	16	15 100	17 900	30 000
	KT 182417	15.7	18	24	17	16 000	19 400	30 000
	KT 182420	18.7	18	24	20	17 900	22 400	30 000
	KT 182517	18.8	18	25	17	16 700	18 600	30 000
	KT 182519	21	18	25	19	18 700	21 400	30 000
	KT 182522	24.5	18	25	22	20 600	24 200	30 000
	KT 182614	18.1	18	26	14	14 600	14 400	30 000
	KT 182620	26	18	26	20	20 000	21 600	30 000