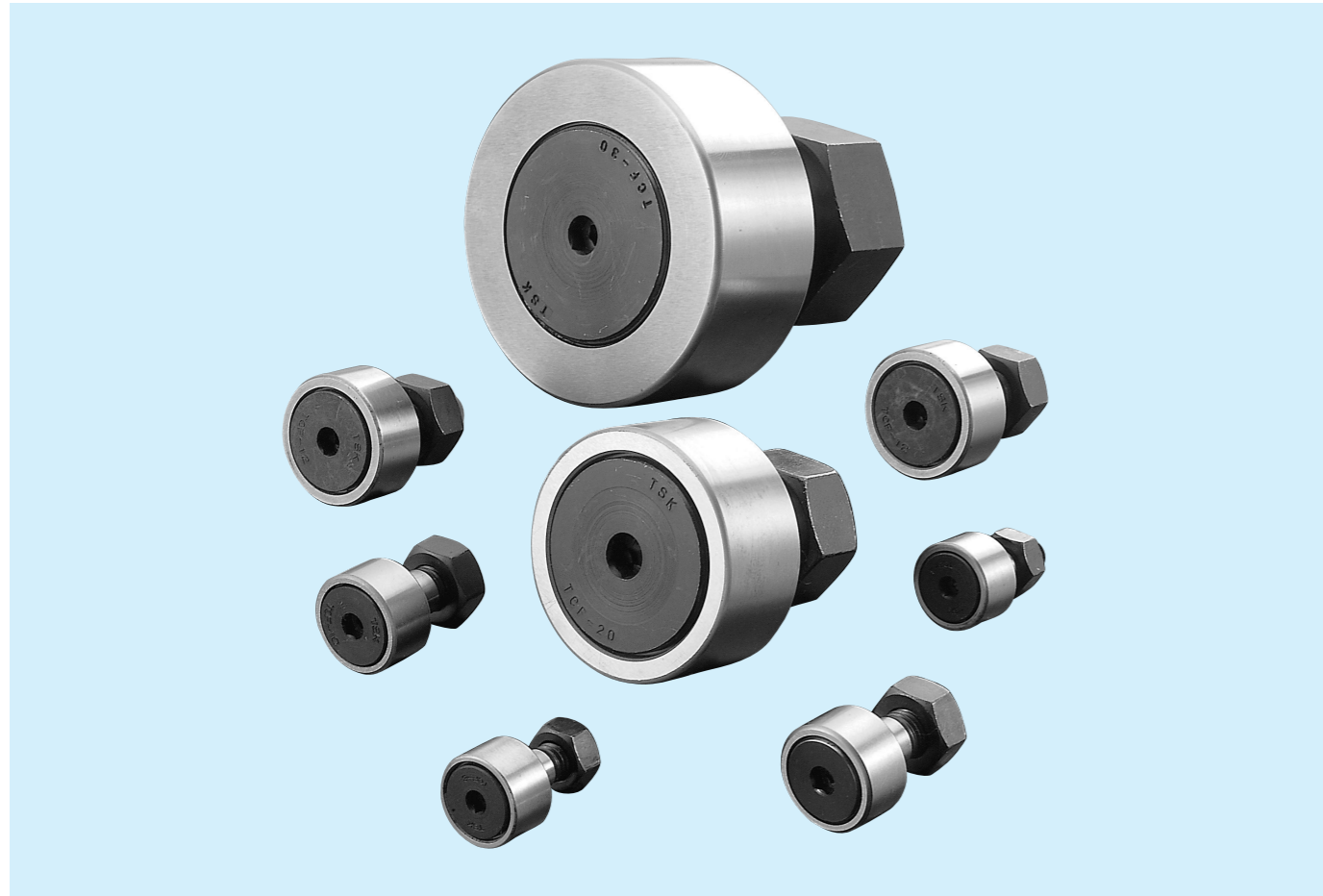


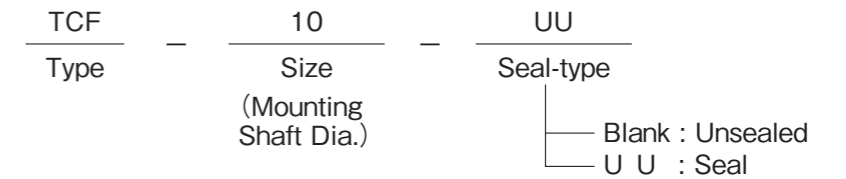
# TSK Cam Followers



**Structure & Advantages** The cam follower is a compact and mighty bearing composed of both the set-in needle bearing and a stud. An outer ring contacting the surface of a counterpart rotates smoothly and can do high-speed rotation, too. The cam followers are widely used as the mechanism of cam, linear motion or index feeding in the industrial machines such as automatic and special-purpose machines.

**Code Name**

Code Name is arranged in the following way.



**Track Load Capacity**

The track load capacity means the allowable load which permits continual motion over a long period of time without deforming or scratching the material of an opposite track by the contact of the outer ring of a cam follower with the opposite. If the hardness of the opposite material is different from HRC40, please calculate the value of Track Load Capacity by multiplying the value in Table 1 by the coefficient of Track Load Capacity in the table of dimension at page 249.

**Allowable Stud Load**

The limitation of allowable load on a cam follower is determined by three factors. They are the capacities of needle roller bearing, track load and stud. The value of stud is shown in the table of dimension (P.249) under the name of stud allowable load.

Table1 Track Load Capacity Coefficient

Hardness HRC	Elongation kgf/mm <sup>2</sup>	Track Load Capacity Coefficient	Hardness HRC	Elongation kgf/mm <sup>2</sup>	Track Load Capacity Coefficient
20	77	0.37	46	156	1.51
25	86	0.46	48	167	1.73
30	97	0.58	50	179	1.99
35	110	0.75	52	192	2.29
38	120	0.89	54	205	2.61
40	127	1.00	56	219	2.97
42	136	1.15	58	234	3.39
44	146	1.32			

**Accuracy**

Please refer to Table 2 for the tolerance of a cam follower. Table 3 indicates the degree of the precision of outer ring. Table 4 shows the value of the radial clearance.

Table 2 Deviation Unit  $\mu\text{m}$

Terminology	Metric System
Outer Ring Dia. D	Table 3
Stud Dia. d	h 7
Width W	0~-120

Table 3 Accuracy of Outer Ring (JIS Class 0) Unit  $\mu\text{m}$

Dimensions mm		Tolerance of Outer Dia.		Tolerance of Radial runout (MAX)
Over	Under	Up	Down	
6	18	0	-8	15
18	30	0	-9	15
30	50	0	-11	20
50	80	0	-13	25
80	120	0	-15	35

Note Dm : The arithmetical mean of two measured points of the outer ring diameters.

Table 4 Radial Clearance Unit  $\mu\text{m}$

Type	JIS C2		Type	JIS C2	
	Min	Max		Min	Max
TCF 6	5	20	TCF 16 TCF 18 TCF 20	10	30
TCF 8 TCF 10 TCF 12	5	25	TCF 24 TCF 30	10	40

**Setting**

When mounting a hole for the stud, the hole should be bored so precisely that the stud will fit tightly. Tolerances are generally based on JIS H7. In case a cam follower is used with a heavy load and shock, it is necessary to bore a hole with absolutely no clearance. The center line of a mounting hole should be at a right angle from the setting surface with a chamfer of C0.5. The size of the setting surface should be larger than the outer diameter of stud. As the mark TSK on the stud indicates the direction to the oil hole, set the stud so that heavy loads are not set above this mark.

**Load Rating & Life**

**Basic Dynamic Load Rating**

It is the radial load which is constant direction and magnitude, under which 90% of a certain number of cam followers make 1,000,000 revolutions without fatigue.

**Life**

The calculation formula for the rating life is given below.

$$L = \left( \frac{ft \cdot C}{fw \cdot pc} \right)^{\frac{10}{3}} \times 10^6$$

$$Lh = \frac{10^6 \times L}{60 \cdot n}$$

L=Rating Life  
 C=Basic Dynamic Load Rating kgf  
 PC=Radial Load kgf  
 ft=Temperature Factor (Ref.: Fig.1)  
 fw=Load Factor (Ref.: Table 5)  
 The life time can be calculated by the following fomula at the time determinating rating life (L) shown above and the value of rpm.  
 L h=Life Time (hr)  
 n = rpm

Fig.1 Temperature Coefficient

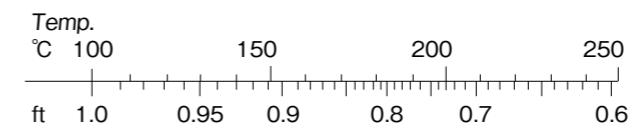


Table 5 Load Coefficient

Load Coefficient	fw
Smooth Movement Without Impact	1~1.2
Normal Movement With Some Impact	1.2~1.5
Movement With Heavy Impact	1.5~3

**Basic Static Load Rating & Static Safety Factor**

As the basic static load rating (Co) is the allowable limit for maintaining the accuracy of the bearing against the static load, the load must not exceed this value.

Therefore, it is necessary to set the static allowable load factor (fs) to the proper value according to the conditions of usage or the required accuracy. The value of fs can be calculated by the formula shown below.

The values for fs are presented in Table 6.

$$fs = \frac{Co}{Po}$$

fs = Static Safety Factor  
 Co = Basic Static Load Rating (kgf)  
 Po = Load (kgf)

Table 6 Static Safety Factors

Bearing Usage Conditions	fs
High Speed Rotation	3
Movement With Vibration, Shock	2
Normal Movement	1.5
Other Conditions	1