

IKO Stainless Steel made CAM FOLLOWERS

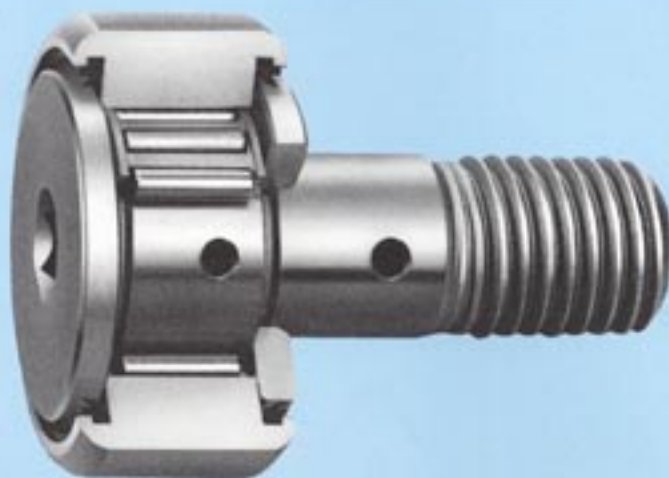
CF...F

CAT-5794



Superior Corrosion Resistance - IKO Stainless Steel made CAM FOLLOWERS

CF...F



Steel parts are all stainless steel made !

A stud, an outer ring, needle rollers, a side plate and a nut are made from stainless steel. This series, therefore, is superior in corrosion resistance and suitable for applications in which oil can not be used or humidity/moisture is high.

CF...FBUUR

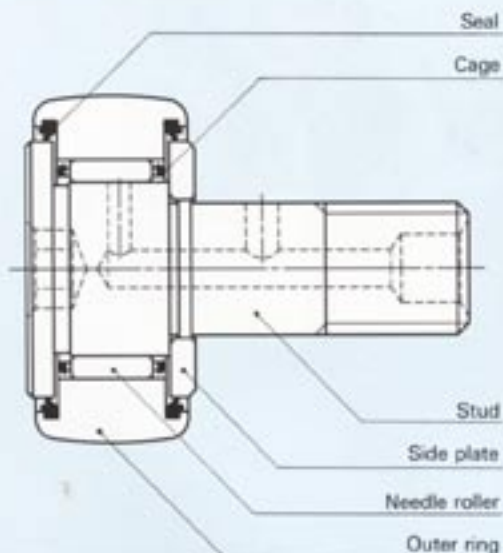


Fig. 1 Structure of stainless steel made Cam Follower

●Crowned outer rings moderate edge loads.....

As the outer ring runs directly on a mating track, the outer surface of outer ring is crowned (applicable for CF6 and over) in order to moderate the edge load due to mounting error.

●Easy mounting is achieved with the use of a hexagon socket hole.....

On the flanged head of stud, a hexagon socket hole is prepared for easy assembling with a hexagon bar wrench.

●Superior rotating performance is obtained with caged needle rollers.....

Needle rollers are guided precisely by a cage. The friction coefficient, therefore, is small and this series is suitable for use at high rotating speeds.

●Stable long life and high reliability are ensured by minimal radial clearance....

The internal radial clearance is made minimal to increase the loading zone. Enhanced resistance to shock loads ensures stable long life.

Types

In  Stainless Steel made Cam Followers, two types are available as shown in Table 1.

Table 1 Types

Type	Crowned outer ring ⁽¹⁾	Cylindrical outer ring ⁽²⁾
Shield type	CF--FBR	CF--FB
Sealed type	CF--FBUUR	CF--FBUU

Note⁽¹⁾: Applicable for CF6 and over
⁽²⁾: Applicable for CF5 and below


Shield type Cam Follower

The narrow clearances between the outer ring and stud flange, and the outer ring and side plate, respectively, achieve labyrinth effect.

Sealed type Cam Follower

Special synthetic rubber seals are assembled in the outer ring, and make contact with the stud flange, and the side plate to prevent intrusion of foreign matters.

Grease

A good quality lithium soap base grease is prepacked in  Stainless Steel made Cam Followers. The applicable temperature range is shown in Table 2.



 Stainless Steel made Cam Followers having a stud dia. 10mm or less can not be re-lubricated.

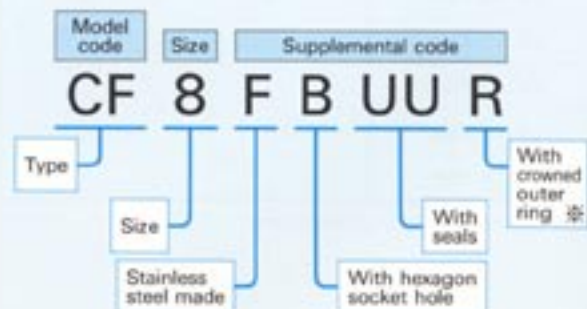
Table 2 Applicable temperature range of grease-prepacked Cam Followers


Type Stud dia. mm	Shield type	Sealed type
3	-20°C~+110°C	-20°C~+80°C
4		
5		
6	-20°C~+120°C	-20°C~+120°C
8		
10		
12	Without grease	-20°C~+120°C
16		
18		
20		

Identification Number

The identification number of  Stainless Steel made Cam Followers consists of a model code, a size and any supplemental codes as shown below.

Example of identification number



 Applicable for CF6 and over

1 kgf = 9.807 N = 2.20465 lbs.
 1 mm = 0.03937 inch

● Accuracy

Tolerances of **303** Stainless Steel made Cam Followers are shown in Table 3. The radial internal clearance is shown in Table 4.

When special accuracy is required, please consult **303**.

Table 3 Accuracy

unit: μm

Items		Type	Crowned outer ring	Cylindrical outer ring
Outside dia. of outer ring D			0 -50	JIS Class 0
Stud dia. d_1			h7	
Width of outer ring C			0 -120	
Radial runout of assembled bearing outer ring (Max.)	$6\text{mm} < D \leq 30\text{mm}$		15	
	$30\text{mm} < D \leq 50\text{mm}$		20	
	$50\text{mm} < D \leq 80\text{mm}$		25	

Table 4 Radial internal clearance

unit: μm

Identification number	Radial internal clearance	
	Minimum	Maximum
CF 3 FB	3	17
CF 4 FB		
CF 5 FB		
CF 6 FBR	5	20
CF 8 FBR	5	25
CF 10 FBR		
CF 12 FBR		
CF 16 FBR		
CF 18 FBR	10	30
CF 20 FBR		

Remark: Also applicable to sealed type.

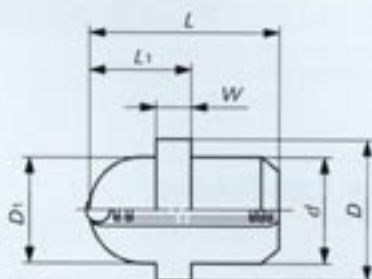
● Accessories

A hexagon nut is attached to each Cam Follower when delivered.

With **CF12** and upwards, a grease nipple (See Table 5.) and a grease plug are attached.

Grease can be supplied with a straight type grease gun as specified by JIS B 9808, by applying the gun to the nipple head from the front.

Table 5 Dimensions of grease nipple



Code number	Dimensions of grease nipple (mm)						Applicable Cam Followers
	d	D	D_1	L	L_1	W	
NPT 6	6	8	6	11	6	2	CF 12 FBR - CF 18 FBR
NPT 8	8	10	6	16	7	3	CF 20 FBR

Remark: Also applicable to sealed type.

● Fit

Recommended tolerance of the mounting hole for the stud of **303** Stainless Steel made Cam Follower is **H7**. However, when a large shock load is applied, it is recommended to make the clearance smaller because the stud of Cam Follower is mounted in a cantilever position in general.

● Maximum Allowable Load

The applicable load on Cam Follower is sometimes limited by the bending strength and shearing strength of stud instead of the load rating of needle roller bearing, because the Cam Follower is mounted in a cantilever position. Maximum allowable loads shown in dimension tables are the allowable loads limited by the bending and shearing strength.

● Track Capacity

The track capacity is defined as the load which can be continuously applied on a Cam Follower placed on a steel track without causing deformation and indentation (dent) on the track surface. Track capacities shown in Table 6 are applicable when the hardness of the mating track surface is HRC40 (Tensile strength 127 kgf/mm²). When the hardness of the mating surface differs from HRC40, multiply the value in Table 6 with a track capacity factor shown in Table 7.

If lubrication between the outer ring and the mating track surface is insufficient, seizure and/or wear may occur depending on the application. Therefore, it is needed to pay attention to lubrication and surface roughness of mating track especially in case of high speed rotations such as with cam mechanisms.

Table 6 Track capacity

unit:kgf

Identification number	Track capacity	
	Crowned outer ring	Cylindrical outer ring
CF 3 FB	—	140
CF 4 FB	—	180
CF 5 FB	—	230
CF 6 FBR	110	—
CF 8 FBR	140	—
CF 10 FBR	160	—
CF 12 FBR	250	—
CF 16 FBR	310	—
CF 18 FBR	370	—
CF 20 FBR	530	—

Remarks: Also applicable to sealed type.


Table 7 Track capacity factor

Hardness HRC	Tensile strength kgf/mm ²	Track capacity factor	
		Crowned outer ring	Cylindrical outer ring
20	77	0.22	0.37
25	86	0.31	0.46
30	97	0.45	0.58
35	110	0.65	0.75
38	120	0.85	0.89
40	127	1.00	1.00
42	136	1.23	1.15
44	146	1.52	1.32
46	156	1.85	1.51
48	167	2.27	1.73
50	179	2.80	1.99
52	192	3.46	2.29
54	205	4.21	2.61
56	219	5.13	2.97
58	234	6.26	3.39

● Mounting

● Make the center axis of mounting hole perpendicular to the moving direction of Cam Follower and match the side shoulder accurately with the seating surface (dimension "f" surface in the dimension table). Then fix the Cam Follower with a nut. When tightening the nut, the tightening torque should not exceed the value shown in the dimension table.

When there are possibilities of loosening, a special nut such as a lock-nut, a spring washer or a self-locking nut should be used.

●  mark on the flange head of stud indicates the oil hole position on the raceway. Avoid locating the oil hole within the loading zone. (Refer to Fig. 2.)

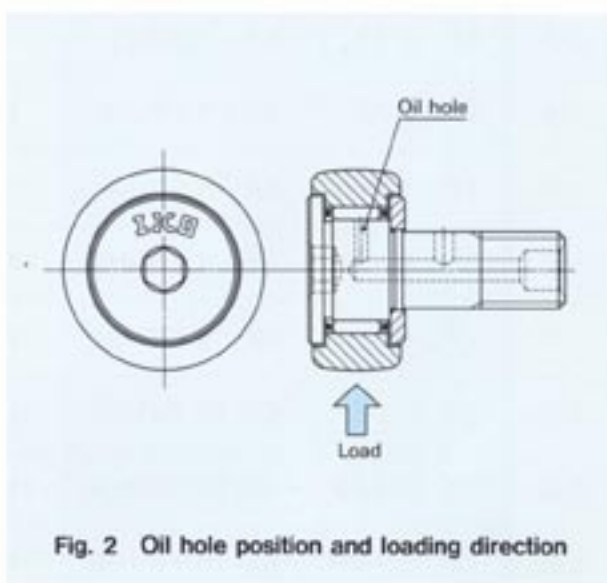


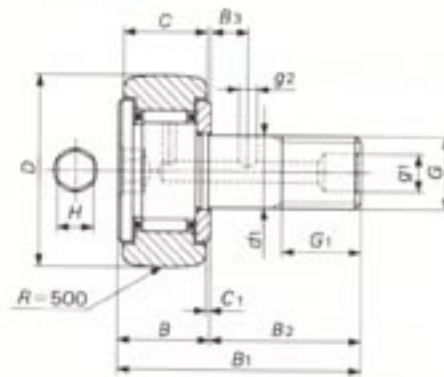
Fig. 2 Oil hole position and loading direction

1 kgf = 9.807 N = 2.20465 lbs.

1 mm = 0.03937 inch

IICO Stainless Steel Made Cam Followers

Stud dia.: 3~20mm



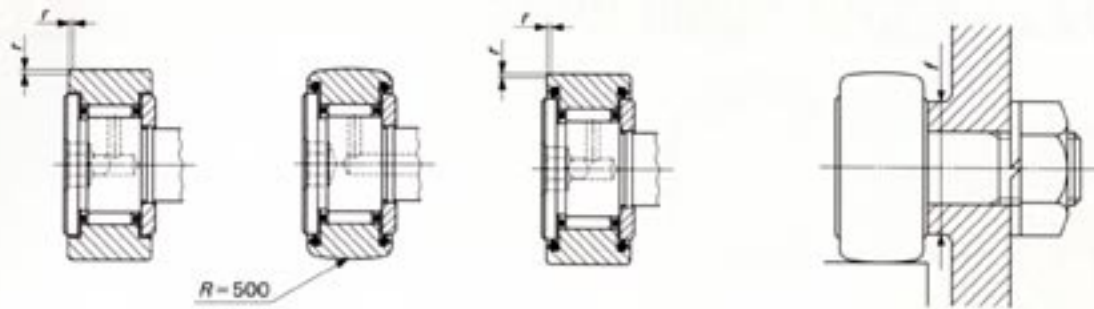
CF---FBR

Stud dia. mm	Identification number		Weight (Ref.) g	Boundary dimensions mm							
	Shield type	Sealed type		D	C	d ₁	G	G ₁	B	B ₁	B ₂
3	CF 3 FB	CF 3 FBUU	4.3	10	7	3	M 3×0.5	5	8	17	9
4	CF 4 FB	CF 4 FBUU	7.4	12	8	4	M 4×0.7	6	9	20	11
5	CF 5 FB	CF 5 FBUU	10.3	13	9	5	M 5×0.8	7.5	10	23	13
6	CF 6 FBR	CF 6 FBUUR	18.5	16	11	6	M 6×1	8	12.2 max	28.2 max	16
8	CF 8 FBR	CF 8 FBUUR	28.5	19	11	8	M 8×1.25	10	12.2 max	32.2 max	20
10	CF 10 FBR	CF 10 FBUUR	45	22	12	10	M10×1.25	12	13.2 max	36.2 max	23
12	CF 12 FBR	CF 12 FBUUR	95	30	14	12	M12×1.5	13	15.2 max	40.2 max	25
16	CF 16 FBR	CF 16 FBUUR	170	35	18	16	M16×1.5	17	19.6 max	52.1 max	32.5
18	CF 18 FBR	CF 18 FBUUR	250	40	20	18	M18×1.5	19	21.6 max	58.1 max	36.5
20	CF 20 FBR	CF 20 FBUUR	460	52	24	20	M20×1.5	21	25.6 max	66.1 max	40.5

Note(1): Minimum allowable value of chamfer "r"

(2): Allowable rotational speed applies to shield type Cam Followers lubricated with grease. When lubricated with oil, a maximum of 130% of the values are allowable. For sealed types, a maximum of 80% of the values are allowable.

Remark: Stainless Steel Made Cam Followers CF10 and downwards can not be re-lubricated.



CF...FB

CF...FBUUR

CF...FBUU

B_3	C_1	g_1	g_2	H	n (min ⁻¹)	Shoulder dimension	Maximum tightening torque	Basic dynamic load rating	Basic static load rating	Maximum allowable load	Allowable rotational speed (2)
						f mm	kgf·m	C kgf	C_0 kgf	kgf	rpm
—	0.5	—	—	2	0.2	6.8	0.03	120	80	39	50 000
—	0.5	—	—	2.5	0.3	8.3	0.08	170	130	85	34 000
—	0.5	—	—	3	0.3	9.3	0.23	200	180	130	28 000
—	0.6	—	—	3	0.3	11	0.3	300	300	200	22 000
—	0.6	—	—	4	0.3	13	0.8	340	380	380	17 000
—	0.6	—	—	5	0.3	16	1.2	440	560	560	14 000
6	0.6	6	3	6	0.6	21	2.2	650	800	800	11 000
8	0.8	6	3	6	0.6	26	5.8	980	1 500	1 500	8 500
8	0.8	6	3	8	1	29	8.5	1 200	2 060	2 060	7 000
9	0.8	8	4	8	1	34	12	1 690	2 820	2 820	6 500

1kgf = 9.807 N = 2.20465 lbs.
1mm = 0.03937 inch

CF...F

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