

Suitability												
	Radial Load	Axial Load	Compound Load	Shield & Seal	Self Aligning	Rings Separable	High Speed	High Rigidity	Low Running Precision	Low Friction	Low Running Noise	Tapered Bore
● Very Good ● Good ● Possible ● Limited	Not Suitable ← One Way Double Way →											
Deep Groove Ball Bearing	●	●↔	●	●	○	○	●	●	●	●	●	○
Self-Aligning Ball Bearing	●	●	●	●	●	○	●	●	●	●	●	●
Angular Contact Ball Bearing	●	●←	●	○	○	○	●	●	●	●	●	○
Four-Point Ball Bearing	●	●↔	●	○	○	●	●	●	●	●	●	○
Cylindrical Roller Bearing	●	○	○	○	○	●	●	●	●	●	●	○
Needle Roller Bearing	●	○	○	●	○	●	●	●	●	●	●	○
Spherical Roller Bearing	●	●↔	●	●	●	○	●	●	●	●	●	●
Taper Roller Bearing	●	●←	●	○	○	●	●	●	●	●	●	○
Thrust Cylindrical Bearing	○	●↔	○	○	○	●	●	●	●	●	●	○
Thrust Cylindrical Roller Bearing	○	●←	○	○	○	●	●	●	●	●	●	○
Thrust Needle Roller Bearing	○	●←	○	○	○	●	●	●	●	●	●	○
Thrust Spherical Roller Bearing		●←	●	○	○	●	●	●	●	●	●	○
Self-Aligning Roller Bearing	●	●↔	●	○	●	○	●	●	●	●	●	○

Bearing Material

Material	Chinese Standard	Equivalent		
		AISI / SAE / ASTM	DIN	JIS
High Carbon Chromium Steel	GCr15	SAE52100	100Cr6	SUJ2
Stainless Steel	9Cr18	AISI440C	X102CrMo17	SUS440C
*Cold Rolled Low Carbon	ST14	ASTM366	1623	3141

Chemical Composition

Material	Chemical Composition (Symbol)						
	C	Si	Mn	P	S	Cr	Mo
High Carbon Chromium Steel	0.95-1.05	0.15-0.35	≤0.45	≤0.025	≤0.025	1.40-1.65	≤0.08
Stainless Steel	0.95-1.20	≤1.00	≤1.00	≤0.04	≤0.03	16.00-18.00	≤0.75
*Cold Rolled Low Carbon	≤0.08	≤0.02	≤0.4	≤0.02	≤0.03	≤0.06	—

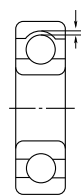
* Cold Rolled Low Carbon is used in drawn cup outer ring of one way clutch bearings.

Internal Radial Clearance

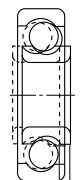
Internal clearance is the distance between outer ring, inner ring and rolling element. It is an important factor that has significant influence on noise, vibration, heat and fatigue life of a bearing. As such, it is critical to select the proper clearance considering the bearing fit, load, speed and operating temperature.

When measuring the internal radial clearance, the bearing is subject to a standard load in order to ensure full contact between all bearing components. Under such a load, the measured clearance is larger than the actual; this is due to elastic deformation. The difference is compensated by the factors given in the table below.

Bearing Internal Clearance



Radial Internal Clearance



Axial Internal Clearance

Internal Radial Clearance of Miniature Bearings

Clearance Mark	Unit μm					
	MC1	MC2	MC3	MC4	MC5	MC6
max	0	3	5	8	13	20
min	5	8	10	13	20	28

Note: 1. Standard clearance is MC3.
2. For measuring clearance, offset by compensation factor listed below.

Clearance Mark	Unit μm					
	MC1	MC2	MC3	MC4	MC5	MC6
Compensation Factor	1	1	1	1	2	2

Measuring load is as follows.
Miniature bearing 2.5N (0.25kgf)
Small bearings 4.4N (0.45kgf)

Internal Radial Clearance of Ball Bearings

Nominal Bore Diameter d (mm)	Unit μm									
	Clearance									
OVER	INCL.	C2	CN(CO)	C3	C4	C5	C2	CN(CO)	C3	C4
10 (Only)	18	0	7	2	13	8	23	14	29	20
10	18	0	9	3	18	11	25	18	33	25
18	24	0	10	5	20	13	28	20	36	28
24	30	1	11	5	20	13	28	23	41	30
30	40	1	11	6	20	15	33	28	46	40
40	50	1	11	6	23	18	36	30	51	45

Note: 1. For measuring clearance, offset by compensation factor listed below.

Bore Diameter of Nominal Bearing d (mm)	Measuring Load (N) (kgf)	Unit μm				
		Compensation Factor				
OVER	INCL.	C2	CN(CO)	C3	C4	C5
10 (Included)	18	24.5 (2.6)	3~4	4	4	4
18	50	49 (5)	4~5	5	6	6