

Cylindrical Roller Bearings

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● Designs and Configurations

NACHI Cylindrical Roller Bearings are produced in a wide variety of designs and configurations.

● Conventional Design

Cylindrical Roller Bearings of conventional design are available in 10 configurations as shown in Fig. 1. Configurations N, NU, NN and NNU will not sustain axial loading. These configurations must be used as the float end bearing.

Configurations NF, NJ, NUH are designed with the capability of sustaining axial loading in one direction. Configuration NUH is basically an NU

bearing with an addition of a guide ring (an “L” ring).

The NUH dimensional data is the same as the NH bearing configuration.

Configuration NF, NJ, and NUH can sustain axial loading in one direction.

Configuration NH, NP, and NUP have bi-directional thrust load-carrying-capability.

- The suffix of the bearing number indicates:
 - E: high capacity
 - G: polyamide cage
- The bearing with polyamide cage should be used at less than 120°C operating temperature.

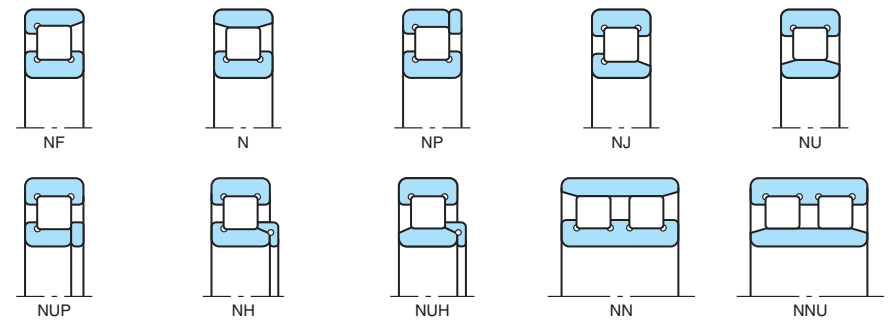


Fig 1. Cylindrical Roller Bearing Configurations

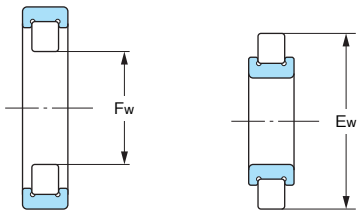
Table 1. Cylindrical Roller Bearing Standard Cage

Bearing series	Pressed Steel	Machined Brass
NU10	1007~1038	1040~10/500
NU2	203~ 228	230~ 264
NU22	2204~2226	2228~2252
NU3	304~ 324	326~ 352
NU23	2304~2319	2320~2340
NU4	405~ 416	417~ 430

● **Interchangeable Bearings**

Interchangeable cylindrical roller bearing means that a separable ring can be replaced by another ring of the bearing with the same bearing number without impairing the function of the bearing.

Table 2. Interchangeable Cylindrical Roller Bearings: Tolerance of Inscribed (Fw) and Circumscribed (Ew) Diameters



Unit: μm

Nominal bore dia. d (mm)		Tolerance of Fw		Tolerance of Ew	
Over	Incl.	High	Low	High	Low
—	20	+10	0	0	-10
20	50	+15	0	0	-15
50	120	+20	0	0	-20
120	200	+25	0	0	-25
200	250	+30	0	0	-30
250	315	+35	0	0	-35
315	400	+40	0	0	-40
400	500	+45	0	—	—

● **Radial Internal Clearance**

The initial radial internal clearance of the bearing should be determined for optimal bearing operation.

The following procedure should be observed to determine the proper initial radial internal clearance:

- Place the bearing in an upright position with inner/outer ring faces parallel.
- Place thumbs on inner ring bore and oscillate inner ring two or three times, pressing down firmly. This "seats" the inner ring and rollers.
- Position the individual roller assemblies so that a roller is at the top of inner ring - on both sides of the bearing.
- Press the two rollers inward to assure contact with the center guide ring as well as the inner ring raceway.
- With the rollers in correct position, insert a thin feeler gauge between the rollers and the raceway. **Caution : DO NOT ROLL THE BEARING.**
- Move it carefully over the top roller between the roller and outer raceway.
- Repeat this procedure, using progressively thicker feeler gauge until one is found that will not go through.
- The gauge thickness that preceded the "No-GO" gauge is the radial internal clearance.

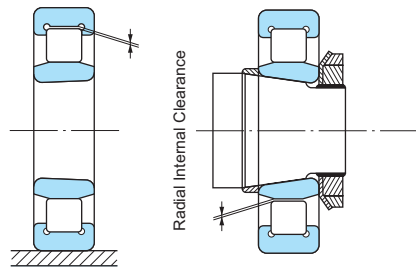
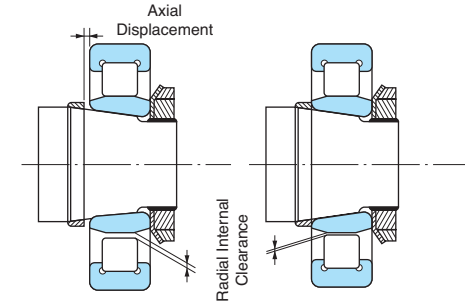


Table 3. Mounting cylindrical roller bearings with tapered bore



Unit: μm

Bearing Bore Diameter d (mm)		Radial Clearance Reduction (mm)		Axial displacement Taper 1:12			
				Direct Mounting on the shaft (mm)		With Adapter Assemblies (mm)	
Over	Incl.	min	max	min	max	max	min
40	50	0.025	0.030	0.40	0.50	0.55	0.60
50	65	0.030	0.035	0.50	0.55	0.60	0.70
65	80	0.030	0.040	0.50	0.65	0.60	0.75
80	100	0.035	0.045	0.55	0.70	0.70	0.85
100	120	0.040	0.050	0.65	0.80	0.75	0.90
120	140	0.045	0.055	0.70	0.85	0.85	1.00
140	160	0.045	0.060	0.70	0.95	0.85	1.05
160	180	0.050	0.065	0.80	1.00	0.90	1.15
180	200	0.055	0.070	0.85	1.10	1.00	1.20
200	225	0.065	0.080	1.00	1.25	1.15	1.35
225	250	0.070	0.085	1.10	1.30	1.20	1.45
250	280	0.075	0.095	1.15	1.45	1.30	1.60
280	315	0.080	0.100	1.25	1.55	1.35	1.65
315	355	0.095	0.115	1.45	1.75	1.60	1.90
355	400	0.100	0.125	1.55	1.90	1.65	2.05
400	450	0.115	0.140	1.80	2.20	1.90	2.30
450	500	0.130	0.160	2.00	2.50	2.10	2.60

Note: 1. The axial displacement values are applied for mounting on a solid shaft. In case of a hollow shaft, larger axial displacement should be applied.
 2. It is imperative to check radial internal clearance after mounting when ;
 - The initial unmounted radial internal clearance is in the lower half of the tolerance range.
 - There is a temperature difference between the inner and outer rings under operating conditions.
 Internal clearance after mounting must be above the values shown in the table.