

NTN bearing internal clearance is how to choose.

Nominal Bore Diameter d mm		Measuring Load N (kgf)		Adjustment of internal clearance				
over	incl.			C2	CN	C3	C4	C5
10 ¹	18	24.5	(2.5)	3~4	4	4	4	4
18	50	49	(5)	4~5	5	6	6	6
50	200	147	(15)	6~8	8	9	9	9

The internal clearance of a bearing under operating

Criteria for selecting bearing internal clearance

A bearing's life is theoretically maximum when operating clearance is slightly negative at steady operation. In reality it is however difficult to constantly maintain this optimal condition. If the negative clearance becomes larger by fluctuating operating conditions, heat will be produced and life will decrease severely. Under ordinary circumstances study must be needed to have a clearance slightly larger than zero.

For ordinary operating conditions, use fitting for ordinary loads. If rotational speed and operating temperature are ordinary, selecting normal clearance enables you to obtain the proper operating clearance Table 8.2 gives examples applying internal clearances other than CN (normal) clearance.

Operating conditions	Applications	Selected clearance
With heavy or shock load, high fit.	Railway vehicle axles	C3
	Vibration screens	C3, C4
With indeterminate load, both inner and outer rings are tight fit.	Railway vehicle traction motors	C4
	Tractors and final reduction gear	C4
Shaft or inner ring is heated.	Paper making machines and driers	C3, C4
	Table rollers for rolling mill	C3
Required low noise and vibration when rotating.	Small electric motors	C2, CM
Adjustment of clearance to minimize shaft runout	Main spindles of lathes (Double-row cylindrical roller bearings)	C9NA, C0NA
Loose fit for both inner and outer rings	Roll neck of steel mill	C2

Calculation of operating clearance.

Operating clearance of a bearing possible calculated from initial bearing internal clearance decrease in internal clearance thanks interference and decrease in internal clearance due to difference in temperature of the inner and outer rings.

$\epsilon_{eff} = \epsilon_o - \epsilon_f - \epsilon_t - \dots - \epsilon_{8.1}$

where,.

ϵ_{eff} : Effective internal clearance, mm.

ϵ_o : Bearing internal clearance, mm.

ϵ_f : Reduced amount of clearance thanks to interference, mm.

Adjustment of radial internal clearance based on.

conditions (effective clearance) is usually smaller than the initial clearance before being installed and operated. This is because of several factors including bearing fit, the difference in temperature between the inner and outer rings, etc. As a bearing's operating clearance has an effect on bearing life, heat generation, vibration, noise, etc.; care must be taken in selecting the most suitable operating clearance.