

# Deep-groove Ball Bearings

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Because of their versatility, Single-row, Deep-groove Ball Bearings are the most popular of all the ball bearing types. NACHI Deep-groove Ball Bearings are available in a wide range of series defined by the JIS(ISO) standard dimension plan and are also made to meet specialized dimension and configuration requirements. NACHI Deep-groove Ball Bearings are manufactured in both standard precision grade (ISO Grade 0 - ABEC Grade 1) as well as in high-precision grades.

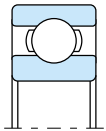
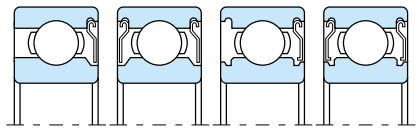
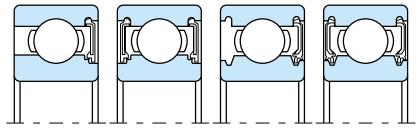
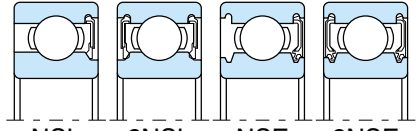
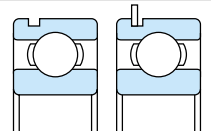
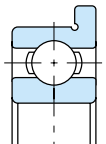
[Table 1](#) shows common, standard configurations of Single-row Deep-groove Ball Bearings.

[Table 2](#) shows a comparison of general characteristics of seal and shield designs for Single-row, Deep-groove Ball bearings.

## Attention

- (1) Deep-groove Ball Bearings can sustain radial, axial or composite loads.  
However when excessive axial load is applied, please consult with NACHI.
- (2) Because sealed or shielded bearings are designed for inner ring rotating applications, the filled grease may leak when they are used with a high speed outer ring rotating condition.  
In such a case, please contact NACHI.
- (3) When bearings with contact rubber seals are used in a severe operating condition such as high speed or high temperature, the filled grease may leak.  
In such a case, a design change or another kind of grease is required.
- (4) When a bearing is mounted on a shaft (into a housing), force should only be applied to the side face of the inner (outer) ring.
- (5) The sealed or shielded bearings should not be washed or heated before mounting.
- (6) It should be noted that mounting errors such as misalignment of the bearing rings cause an appreciable increase in noise level.
- (7) The bearings must always be subjected to a minimum load to prevent sliding movements occurring between the balls and the raceways.

**Table 1. Standard Configuration of Single-row, Deep-groove Ball Bearings**

Configuration *		Design	Cross section
Open (no seals, shields)		Consists of inner and outer rings, balls, and cage.	 <p>Open</p>
Sealed or shielded Bearings	Shield	One or two steel shields provide labyrinth clearance	 <p>Z    ZZ    ZE    ZZE</p>
	Non-contact Rubber Seal	One or two non-contact rubber seals provide labyrinth clearance	 <p>NK    2NK    NKE    2NKE</p>
	Contact Rubber Seal	One or two contact rubber seals in contact with inner ring	 <p>NSL    2NSL    NSE    2NSE</p>
Snap-ring Groove in Outer Ring	N: with snap-ring groove in outer ring. NR: with groove and snap ring in outer ring. (Use of snap ring allows easy mounting and simplified housing design.) Bearings may also be sealed or shielded.		 <p>N    NR</p>
Flanged Outer Ring	With flanged outer ring. Applicable to Extra-small and Miniature bearings. Bearings may also be sealed or shielded.		 <p>Flanged Type</p>

Note : One seal or shield type bearings may have a seal groove on the other side.

**Table 2. Comparison of Seal and Shield Characteristics**

Characteristics	Shield (Z, ZE)	Non-contact Rubber Seal (NK, NKE)	Contact Rubber Seal (NSL, NSE)
Friction torque	Low	Low	Higher than NK,NKE, Z and ZE
High speed	Excellent	Excellent	Good (There is some limitation)
Grease sealing	Good	Better than Z,ZE	<ul style="list-style-type: none"> <li>· Excellent at low speed</li> <li>· The grease may leak from the bearing at high speeds and high temperature.</li> <li>· The grease may leak in case of outer ring rotation.</li> </ul>
Dust proofing	Good	Better than Z,ZE	Excellent (Can be used in severe dust environments)
Water proofing	unsuitable	unsuitable	Excellent
Recommended operation temperature range for standard filled grease	-25 ~ 120°C	-25 ~ 120°C	-25 ~ 100°C