



ABEC Grade

When choosing the ABEC grade, the factors to be considered are: radial and axial runout requirements; bore and O.D. fits; and audible noise level. The table below shows the bore and O.D. size tolerances and the radial runout limits for each ABEC grade. Grades 5 and 7 are preferred for most standard applications.

ABEC Grade	O.D. Size	Radial Runout		Mean Diameter Tolerance	
		Inner Ring	Outer Ring	Bore	O.D.
1*	0-18mm (0-.7086 in.)	.00040	.00060	+0.000 -0.003	+0.000 -0.003
	over 18-30mm (over .7086-1.1811 in.)	.00040	.00060	+0.000 -0.004	+0.000 -0.004
3P	0-30mm (0-1.1811 in.)	.00020	.00040	+0.000 -0.002	+0.000 -0.003
5P	0-30mm (0-1.1811 in.)	.00015	.00020	+0.000 -0.002	+0.000 -0.002
7P	0-30mm (0-1.1811 in.)	.00010	.00015	+0.000 -0.002	+0.000 -0.002
9P	0-18mm (0-.7086 in.)	.00005	.00005	+0.000 -0.001	+0.000 -0.001
	over 18-30mm (over .7086-1.1811 in.)	.00010	.00010	+0.000 -0.001	+0.000 -0.0015

*ABEC 1 miniature and instrument bearings of both the metric and inch configurations meet the tolerances of ABMA Standard 20 for ABEC 1 metric series bearings.

The charts on pages 54–55 provide a complete description of the tolerances controlled by the ABEC level. Normally, race finish and race geometry are superior in ABEC 5P and higher. NHBB recommends these grades for precision assemblies where low noise (mechanical or audible), minimal runout and long life are important considerations for noise sensitive applications.

Radial Play

Radial Play is the free internal radial looseness between the balls and the races with no load applied to the bearing in any direction. Radial play is necessary to accommodate differential thermal expansions, the effects of interference fits, and to control axial play and deflection. The chart on page 35 of the Engineering Section shows the suggested radial play for some typical applications.

Lubricant

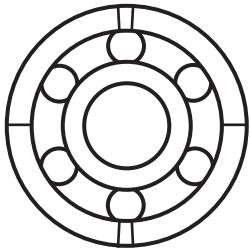
There are literally hundreds of lubricants available for ball bearings; selecting the optimal one is critical. Each has a particular characteristic which makes it suitable for a specific application. Unless torque is a problem, grease is preferred for prelubrication since it is less susceptible to migration and leakage. Grease can increase bearing torque by a factor of 1.2 to 5.0 depending on the grease type and quantity used. See pages 38-40 for further information.



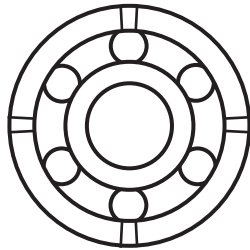
Marking

The following figures illustrate the standard marking system used for NHBB Precision Bearing Division ball bearings per MIL-STD-1647. Shown below are the markings for 440C Stainless Steel and the markings for 52100 Chrome Alloy Steel.

ABEC 5, 7 and higher tolerances

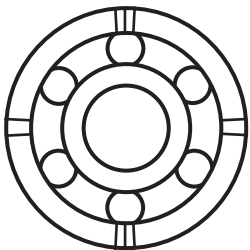


440C

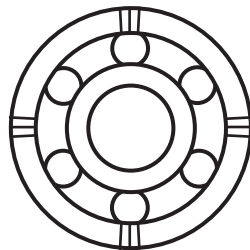


52100

ABEC 1*, 3 and 3P tolerances



440C



52100

*ABEC 1 miniature and instrument bearings of both the metric and inch configurations meet the tolerances of ABMA Standard 20 for ABEC 1 metric series bearings.

Packaging

NHBB's bearings are normally packaged in plastic vials, 8 or more per vial. If prelubrication or protective coating is not specified, oil per MIL-L-6085 (NHBB code LO1) will be used to prevent corrosion.

Vial Pack (No Code) — 8 or more per vial.

Pill Pack (Code P) — One bearing per sealed, plastic compartment. Connected in strips of 4.

Unit Pack (Code U) — Individual bearing placed in a plastic bag; bag is sealed; 10 or more packed in a paperboard box.

Other packaging options are available to suit your specific needs. See page 3 for more information.