ABEC Tolerances

This information is provided as a guide and to aid you in understanding ABEC/ISO Standards. You should consult a bearing manufacturer for your specific bearing applications.

The ABEC and ISO bearing standards are primarily concerned with bearing tolerances. While tolerance is an important factor in the performance of a bearing, there are many other factors that also affect the suitability of a bearing to its application.

ABEC and ISO standards do not cover: radial play, raceway curvature, surface finish, material, ball complement, number, size or precision level, retainer type, lubrication, torque, cleanliness at assembly, packaging and other factors that may be essential to the desired bearing performance.

ABEC and ISO Standards

Precision ball bearings are manufactured to standards established by the Annular Bearing Engineers Committee (ABEC) of the American Bearing Manufacturers Association (ABMA). These standards have been accepted by the American National Standards Institute (ANSI) and conform essentially to the standards set by the International Standards Organization (ISO).

- Inner ring ABEC/ISO tolerances •
- Outer ring ABEC/ISO tolerances
- ABEC runout measurement •

ABEC/ISO Inner Ring Tolerances

ABEC/ISO Tolerance Chart	Dimensions in Inches (mm)										
INNER RING TOLERANCES Inches (mm)											
	TYPE	OD SIZE	ABEC 1 ISO Normal	ABEC 3 ISO P6	ABEC 5 ISO P5	ABEC 7 ISO P4					
MEAN BORE TOLERANCE	ALL	0 to .709 0 to 18	0 to0003 0 to008	0 to0002 0 to005	0 to0002 0 to005	0 to0002 0 to005					
2 PT OUT OF ROUNDNESS*	ALL	0 to .709 0 to 18	NS	NS	.0001 .003	.0001 .003					
BORE TAPER*	ALL	0 to .709 0 to 18	NS	NS	.0001 .003	.0001 .003					
RADIAL RUNOUT*	ALL	0 to .709 0 to 18	.0003 .008	.0002 .005	.00015 .004	.0001 .003					
FACE RUNOUT WITH BORE*	ALL	0 to .709 0 to 18	NS	NS	.0003 .008	.0001 .003					
FACE RUNOUT*	ALL	0 to .709 0 to 18	NS	NS	.0003 .008	.0001 .003					
WIDTH VARIATION*	ALL	0 to .709 0 to 18	NS	NS	.0002 .005	.0001 .003					
RING WIDTH TOLERANCE	ALL	0 to 1.1811 0 to 30	0 to005 0 to125	0 to005 0 to125	0 to001 0 to025	0 to001 0 to025					
Maximum Allowed Value NS = Not Specified											

ADEC/ICO Talavanaa Chart

ABEC/ISO Outer Ring Tolerances

ABEC/ISO Tolerance Chart Dimensions in Inches (mm)											
INNER RING TOLERANCES Inches(mm)											
	TYPE	OD SIZE	ABEC 1 ISO Normal	ABEC 3 ISO P6	ABEC 5 ISO P5	ABEC 7 ISO P4					
MEAN OD TOLERANCE	ALL	0 to .709 0 to 18 .709 to 1.1811 18 to 30	+0 to0003 +0 to008 +0 to0004 +0 to010	+0 to0003 +0 to008 +0 to0003 +0 to008	+0 to0002 +0 to005 +0 to0002 +0 to005	+0 to0002 +0 to005 +0 to0002 +0 to005					
MAX OD TOLERANCE LIMITS	OPEN SHIELDED	0 to .709 0 to 18 .709 to 1.1811 18 to 30 0 to .709 0 to 18 .709 to 1.1811 18 to 30	+.0001 to - .0004 +.003 to010 +.0001 to - .0005 +.025 to010 +.0002 to - .0005 +.005 to012 +.0002 to - .0006 +.005 to015	+.0001 to - .0004 +003 to010 +.0001 to - .0004 +025 to010 +.0002 to - .0005 +.005 to012 +.0005 to012	+0 to0002 +0 to005 +0 to002 +.000 to005 +.00004 to - .00024 +001 to006 +.00004 to - .00024 +.001 to006	+0 to0002 +0 to005 +0 to0002 +0 to005 +.00004 to00024 +001 to006 +.00004 to00024 +001 to006					
OD 2P OUT OF ROUNDNESS	OPEN	0 to .709 0 to 18 .709 to 1.1811 18 to 30mm	NS NS	NS NS	.0001 .0025 .0001 .0025	.0001 .0025 .0001 .0025					
	SHIELDED	0 to 1.1811 0 to 30	NS	NS	.0002 .005	.0002 .005					
OD TAPER*	OPEN	0 to 1.1811 0 to 30	NS	NS	.0001 .0025	.0001 .0025					
	SHIELDED	0 to 1.1811 0 to 30	NS	NS	.0002 .005	.0002 .005					
RADIAL RUNOUT*	ALL	0 to 1.1811 0 to 30	.0006 .015	.0004 .010	.0002 .005	.00015 .004					
OD RUNOUT WITH FACE*	ALL	0 to .709 0 to 18	NS	NS	.0003 .008	.00015 .004					
FACE RUNOUT*	STRAIGHT	0 to 1.1811 0 to 30	NS	NS	.0003 .008	.0002 .005					
	FLANGED	0 to -1.1811 0 to 30	NS	NS	.0003 .008	.0003 .008					
WIDTH VARIATION*	ALL	0 to 1.1811 0 to 30	NS	NS	0 to002 0 to005	0 to0001 0 to003					
FLANGE WIDTH TOLERANCE		0 to 1.1811 0 to 30	0 to002 0 to050	0 to002 0 to050	0 to002 0 to050	0 to002 0 to050					
FLANGE DIAMETER TOLERANCE		0 to 1.1811 0 to 30	+005 to002 +.125 to050	+005 to002 +.125 to050	0 to001 0 to025	0 to001 0 to025					

* Maximum Allowed Value

NS = Not Specified

ABEC Runout

The tolerances shown in the ABEC and ISO tables are specific for basic bearing dimensions and require no further explanation. The following information may also help the design engineer use the **runout** values shown for different tolerance ratings.

RADIAL RUNOUT

Outer ring: The total indicator reading during one complete revolution of the outer ring with the inner ring remaining stationary.

Inner ring: The total indicator reading during one complete revolution of the inner ring with the outer ring remaining stationary.

FACE RUNOUT

Inner ring: The total indicator reading during one complete revolution of the inner ring with the outer ring remaining stationary.

Outer ring: The total indicator reading during one complete revolution of the outer ring with the inner ring remaining stationary.

FACE RUNOUT WITH BORE

The total indicator reading during one complete revolution of the inner ring.

O.D. RUNOUT WITH FACE

The total indicator reading during one complete revolution of the outer ring. The outer ring is positioned against 2 stops oriented at 90° to each other.





