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Thin Section Ball Bearings Inch Design ANSI/ABMA 26.2:1994

Secretariat

American Bearing
Manufacturers Association

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THIN SECTION BALL BEARINGS

INCH DESIGN

1 Scope

This standard specifies the boundary dimensions and the tolerances for boundary dimensions, running accuracies and internal clearances for thin section ball bearings of single row radial contact, angular contact and four-point angular contact types.

2 References

ANSI/ABMA Standard 1, Terminology for Anti-Friction Ball and Roller Bearings and Parts.

ANSI/ABMA Standard 4, Tolerance Definitions and Gauging Practices for Ball and Roller Bearings.

ANSI/ABMA Standard 7, Shaft and Housing Fits for Metric Radial Ball and Roller Bearings (except Tapered Roller Bearings) Conforming to Basic Boundary Plans.

ANSI/ABMA Standard 9, Load Ratings and Fatigue Life for Ball Bearings.

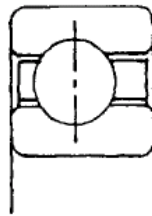
3 Terminology

3.1 Types of bearings

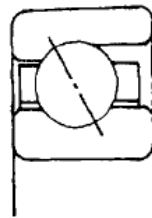
3.1.1 Thin section ball bearing, radial contact (Type C). A deep groove ball bearing, or filling slot ball bearing, designed to support primarily radial load.

3.1.2 Thin section ball bearing, angular contact (Type A). A non-separable angular contact ball bearing with a counter-bored outer ring and a nominal 30° axial contact angle.

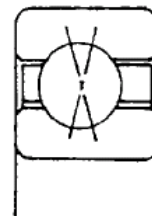
3.1.3 Thin section ball bearing, four-point contact (Type X). A four point contact ball bearing with a nominal 30° radial contact angle.



Type C



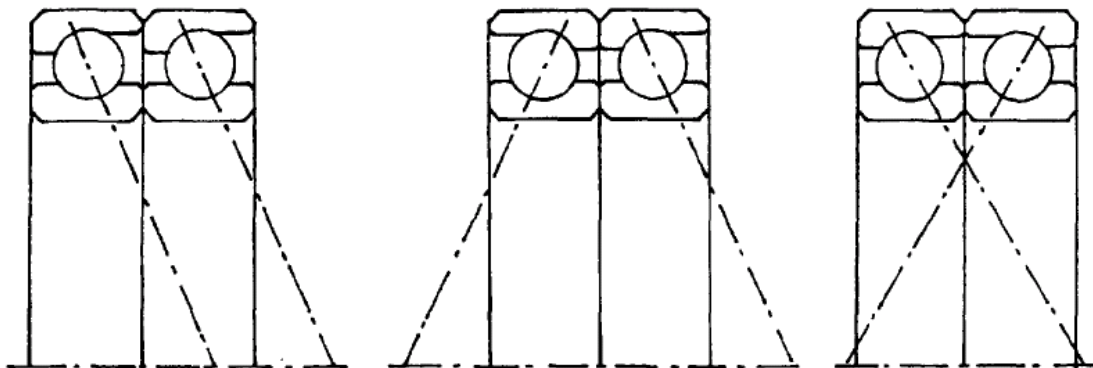
Type A



Type X

Figure 1 - Types of thin section bearings

3.1.4 Thin section ball bearing with closures. Any one of the preceding three design types with a contact seal or grease shield fitted on one or both sides.



Tandem Arrangement

Back-to-Back Arrangement

Face-to-Face Arrangement

Figure 2 - Duplex bearing arrangements

3.1.5 Thin section ball bearing, duplex. Two angular contact (Type A) bearings modified by the manufacturer for side-by-side mounting in a face-to-face, back-to-back, or tandem arrangement.

4 Definitions

4.1 General dimension and tolerance definitions are given in ANSI/ABMA Standard 4, Tolerance Definitions and Gauging Practices for Ball and Roller Bearings. Tolerance definitions specific to this standard and not included in ANSI/ABMA Standard 4 are defined in the following clauses:

4.2 Single plane average bore diameter (or outside diameter), d_{ap} (D_{ap}): Arithmetic average of the largest, smallest and many other measured single bore diameters (or outside diameters) in a single radial plane.

4.3 Single plane average bore diameter (or outside diameter) deviation, Δd_{ap} (ΔD_{ap}): Difference between a single plane average bore diameter (or outside diameter) and the nominal bore diameter (or outside diameter).

5 Symbols and nomenclature

d	=	nominal bore diameter
d_{ap}	=	single plane average bore diameter
Δd_{ap}	=	single plane average bore diameter deviation
D	=	nominal outside diameter
D_{ap}	=	single plane average outside diameter
ΔD_{ap}	=	single plane average outside diameter deviation
B	=	nominal inner ring width
B_s	=	single inner ring width
ΔB_s	=	deviation of a single inner ring width
C	=	nominal outer ring width
C_s	=	single outer ring width
ΔC_s	=	deviation of a single outer ring width
K_i	=	inner ring raceway to bore thickness variation
K_e	=	outer ring raceway to outside surface thickness variation
S_i	=	raceway parallelism with inner ring face
S_e	=	raceway parallelism with outer ring face
$r_{s \min}$	=	smallest single chamfer dimension
$r_{s \max}$	=	largest single chamfer dimension
$r_{as \max}$	=	largest permissible single shaft and housing fillet radius.
G_r	=	radial internal clearance

6 Boundary dimensions

The bearings covered in Table 1 include those in general use. The seven ball bearing Diameter Series (AA, A, B, C, D, F, and G) are unique in that the bearing cross-section in each series remains constant irrespective of the bore diameter. The three Width Series for each Diameter Series provide an extra width which may be necessary to accommodate an integral seal or shield on one or both sides of a bearing.

These bearing designs are based on inch standards and a soft-conversion to metric units is provided in Annex A. The sizes shown in the table are selected to limit the number of bearing and component sizes, as much as possible, to promote economic production and yet provide a sufficient number of sizes and proportions to satisfy present and future needs of bearing users. These tables do not contain any indication as to availability of bearings.

7 Tolerances

7.1 General. The tolerance limits shown in Tables 2 through 9 are based on long established practice. They include tolerances for boundary dimensions and limits for runouts and normal radial internal clearance. See Clause 4 for tolerance definitions.

The radial internal clearance limits are valid for bearings which are not mounted, and with zero measuring load.

[illegible]