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**AMERICAN NATIONAL STANDARD
AFBMA STANDARD**

**TERMINOLOGY FOR ANTI-FRICTION
BALL AND ROLLER BEARINGS AND PARTS**

Sponsor

**The Anti-Friction Bearing
Manufacturers Association, Inc.**

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FOREWORD

(This foreword is not part of ANSI/AFBMA Standard 1-1990, Terminology for Anti-Friction Ball and Roller Bearings and Parts.)

The purpose of this American National Standard is to provide a convenient set of definitions of fundamental rolling bearing terms in common use in the U.S.A.

Suggestions for the improvement of this standard gained through experience with its use will be welcomed. These should be sent to the American National Standards Institute, Inc., 1430 Broadway, New York, NY 10018.

The officers of Accredited Standard Committee B3 of the American National Standards Institute and the organizations represented at the time this standard was submitted are as follows:

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Hydraulic Institute
National Machine Tool Builders Association
Society of Tribologists and Lubrication Engineers
U.S. Department of Defense, DISC
U.S. Department of the Navy

TERMINOLOGY FOR ANTI-FRICTION BALL AND ROLLER BEARINGS AND PARTS

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Terminology for Anti-Friction Ball and Roller Bearing and Parts

1. Scope and field of application

The purpose of this standard is to provide a convenient reference to the fundamental rolling bearing terminology in common use in the U.S.A. Users seeking more rigorous definitions and more detailed descriptions are referred to the appropriate ANSI/AFBMA Standards or the ISO 5593. Terms described in this standard are compatible with the definitions in ISO 5593.

2. References

ANSI/AFBMA Standard 4	— Tolerance Definitions and Gaging Practices
ANSI/AFBMA Standard 7	— Shaft and Housing Fits for Metric Radial Ball and Roller Bearings (Except Tapered Roller Bearings) Conforming to Basic Boundary Plans
ANSI/AFBMA Standard 8.1	— Ball and Roller Bearing Mounting Accessories, Metric Design
ANSI/AFBMA Standard 8.2	— Ball and Roller Bearing Mounting Accessories, Inch Design
ANSI/AFBMA Standard 9	— Load Ratings and Fatigue Life for Ball Bearings
ANSI/AFBMA Standard 10	— Metal Balls
ANSI/AFBMA Standard 11	— Load Ratings and Fatigue Life for Roller Bearings
ANSI/AFBMA Standard 12.1	— Instrument Ball Bearings, Metric Design
ANSI/AFBMA Standard 12.2	— Instrument Ball Bearings, Inch Design
ANSI/AFBMA Standard 13	— Rolling Bearing Vibration and Noise
ANSI/AFBMA Standard 14	— Housing for Bearings With Spherical Outside Surfaces
ANSI/AFBMA Standard 15	— Ball Bearings With Spherical Outside Surfaces and Extended Inner Ring Width (Includes Eccentric Locking Collars)
ANSI/AFBMA Standard 16.1	— Airframe Ball, Roller and Needle Roller Bearings, Metric Design
ANSI/AFBMA Standard 16.2	— Airframe Ball, Roller and Needle Roller Bearings, Inch Design
ANSI/AFBMA Standard 17	— Needle Rollers, Metric Design
ANSI/AFBMA Standard 18.1	— Needle Roller Bearings—Radial, Metric Design
ANSI/AFBMA Standard 18.2	— Needle Roller Bearings—Radial, Inch Design
ANSI/AFBMA Standard 19.1	— Tapered Roller Bearings, Radial, Metric Design
ANSI/AFBMA Standard 20	— Radial Bearings of Ball Cylindrical Roller and Spherical Roller Types, Metric Design
ANSI/AFBMA Standard 21.1	— Thrust Needle Roller and Cage Assemblies and Thrust Washers, Metric Design
ANSI/AFBMA Standard 21.2	— Thrust Needle Roller and Cage Assemblies and Thrust Washers, Inch Design
ANSI/AFBMA Standard 22.1	— Spherical Plain Radial Bearings, Joint Type, Metric Design
ANSI/AFBMA Standard 22.2	— Spherical Plain Radial Bearings, Joint Type, Inch Design
ANSI/AFBMA Standard 23.2	— Thrust Bearings of Tapered Roller Type, Inch Design
ANSI/AFBMA Standard 24.1	— Thrust Bearings of Ball, Cylindrical Roller and Spherical Roller Types, Metric Design
ANSI/AFBMA Standard 24.2	— Thrust Bearings of Ball and Cylindrical Roller Types, Inch Design
ISO 5593	— Rolling Bearings—Vocabulary

NOTE—Periodically new rolling bearing standards are approved by ANSI and/or AFBMA. The most recent listing of approved standards should be consulted, if more detailed information than contained in this Standard is required.

3. Descriptions

Term	Figure	Description
ABEC 1, ABEC 3, ABEC 5, ABEC 7, ABEC 9		The class or degree of precision of radial ball bearings.

Term	Figure	Description
Adapter Assembly	31	An assembly consisting of the adapter sleeve, locknut and lockwasher or lockplate.
Adapter Sleeve	27	An axially slotted sleeve with a cylindrical bore, a tapered outside surface and a male screw thread at its small end. Use (with a locknut and a lockwasher) for the mounting of a bearing with tapered bore on a cylindrical outside surface of a shaft.
Airframe (rolling) Bearing		A rolling bearing which, by reason of design or execution, is intended for use in the general structure of an aircraft, including its control systems.
Alignable Bearing		See External Aligning Bearing.
Aligning Housing Ring		A ring used between an aligning outer ring and a housing bore, having a spherical inside surface matching the spherical outside surface of the outer ring.
Aligning Housing Washer (thrust bearing)	7	A housing washer having a spherical back face to accommodate permanent angular misalignment between its axis and the axis of its housing.
Aligning Outer Ring	11,12	A bearing outer ring having a spherical outside surface to accommodate permanent angular misalignment between its axis and the axis of its housing.
Aligning Seat Washer (thrust bearing)	7	A washer used between an aligning housing washer and the thrust supporting surface of a housing, one face of which has a concave spherical surface matching the spherical back face of the aligning housing washer.
Angular Contact Bearing	3,8,9,10	A radial rolling bearing with a nominal contact angle greater than 0° up to and including 45°.
Annular Bearing		See Radial Bearing.
Axial Internal Clearance (bearing capable of taking axial load in both directions, non-preloaded)		The arithmetical mean of the axial distances through which one of the rings or washers may be displaced relative to the other, from one axial extreme position to the opposite extreme position, without being subjected to any external load. The mean value includes displacements with the rings or washers in different angular positions relative to each other and with the set of rolling elements in different angular positions in relation to the rings or washers.
Axial Load		A load acting in a direction parallel with the bearing axis.

Term	Figure	Description
Back Face	3,8,9,13	That face of a bearing ring which is intended to support axial load.
Ball	1	A spherical rolling element.
Ball Bearing	1,3,4,5,7	A rolling bearing with balls as rolling elements.
Ball (Roller) Complement		All of the balls (the rollers) in a particular rolling bearing.
Ball Grade		A specific combination of dimensional, form, surface roughness and sorting tolerances for balls.
Basic Dynamic Radial (Axial) Load Rating		That constant stationary radial load (constant centric axial load) which a rolling bearing can theoretically endure for a basic rating life of one million revolutions. In the case of a single row angular contact bearing, the radial load rating refers to the radial component of that load which causes a purely radial displacement of the bearing rings in relation to each other.
Basic Rating Life		The rating life associated with 90% reliability.
Cage		A bearing part which partly surrounds all or several of the rolling elements and moves with them. Its purpose is to space the rolling elements and generally also to guide and/or retain them in the bearing.
Cage Pocket		An aperture or gap in a rolling bearing cage to accommodate one or more rolling elements.
Cage Prong		A cantilever cage bar projecting from the annular body of a rolling bearing cage or from one part of a two-piece cage.
Cage Stay		One of several parts used to join the two annular parts of a two-piece cage and to maintain them at a specified distance from each other.
Cam Follower		See Track Roller.
Capped Bearing	11,12	A rolling bearing which is fitted with one or two seals, one or two shields or with one seal and one shield.
Center Rib	15,23	A central integral rib of a bearing ring with two raceways, for example, a double cone.
Chamfer	5,6	A surface of a bearing ring or bearing washer joining the bore or outside surface with one of the faces of the ring or washer.

Term	Figure	Description
Combined Load		See Equivalent Radial Load.
Concave Roller	24	A roller, the outside surface of which, has a concave curvature in a plane containing its axis.
Cone	13	An inner ring of a tapered roller bearing.
Conrad Ball Bearing	1	See Deep Groove Ball Bearing.
Contact Angle	3	The angle between a plane perpendicular to a bearing axis (a radial plane) and the line of action (the nominal line of action) of the resultant of the forces transmitted by a bearing ring or washer to a rolling element.
Contact Point or Line	3,13,14	The point (line) of contact between a ball (roller) and one raceway.
Convex Roller	23	A roller the outside surface of which has a convex curvature in a plane containing its axis.
Corner		See Chamfer.
Counterbored Outer Ring	3	An outer ring of a groove ball bearing with one shoulder completely or partly removed.
Cross Corner Width		The nominal axial distance from one face of the inner ring to the opposite face of the outer ring with all axial clearance removed.
Crossed Roller Bearing		An angular contact rolling bearing with one row of rollers, each roller positioned crosswise in relation to the adjacent rollers, such that an axial load in one direction is supported by half the roller set (every second roller) while an axial load in the opposite direction is carried by the other half of the roller set.
Crowned Raceway		A basically cylindrical or conical raceway which has a continuous slightly convex curvature in a plane perpendicular to the direction of rolling to prevent stress concentration at the ends of contacts between the rollers and raceways.
Crowned Roller		A basically cylindrical roller or basically tapered roller the outside surface of which has a continuous slightly convex curvature in a plane containing the roller axis, to prevent stress concentration at the ends of the contacts between the roller and the raceways.
Cup	13,16	An outer ring of a tapered roller bearing.

Term	Figure	Description
Cylindrical Roller	2	A roller the generatrix of the outside surface of which is basically a straight line parallel with the roller axis.
Cylindrical Roller (Radial) Bearing	14	A radial rolling bearing with cylindrical rollers as rolling elements.
Deep Groove Ball Bearing	1,4	A radial ball bearing in which each ring has uninterrupted raceway grooves with a cross-section matching about 1/3 of the ball circumference.
Diametral Clearance		See Radial Internal Clearance.
Dimension Series		A combination of a width series or a height with a diameter series and, for tapered roller bearings, an angle series.
Double Cone	15	A bearing cone having two raceways.
Double Cup	16	A bearing cup having two raceways.
Double Direction Thrust (Rolling) Bearing		A thrust rolling bearing intended to support axial load in both directions.
Double Row Bearing, Ball or Roller	4,15,16,23	A rolling bearing with two rows of rolling elements.
Double Sealed		A seal on each side of the bearing.
Double Shielded		A shield on each side of the bearing.
Drawn Cup	18	A bearing outer ring, commonly of a needle roller radial bearing, made of sheet metal drawn to shape with one end closed (closed end drawn cup) or both ends open.
Drawn Cup Needle Roller Bearing	18	A needle roller radial bearing with a thin pressed steel outer ring (drawn cup), which may have one closed end or both ends open. Usually employed without inner ring.
Duplex Ball Bearings	8,9	Two single row angular contact bearings selected dimensionally to be a functionally matched pair or set.
Duplex Ball Bearings, Back-to-Back	9	An arrangement of two rolling bearings mounted side by side with the back faces of their outer rings adjacent.
Duplex Ball Bearings, Face-to-Face (Front-to-Front)	8	An arrangement of two rolling bearings mounted side by side with the front faces of their outer rings adjacent.