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**AMERICAN NATIONAL STANDARD
ABMA STANDARD**

**TOLERANCE DEFINITIONS
AND GAUGING PRACTICES
FOR BALL AND ROLLER BEARINGS**

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FOREWORD

(This foreword is not part of ANSI/ABMA Standard 4, Tolerance Definitions and Gauging Practices for Ball and Roller Bearings.)

This American National Standard defines the terms used in other ANSI/ABMA standards specifying tolerances for boundary dimensions, running accuracy and internal clearance for rolling bearings. In addition, it specifies general conditions under which these tolerances apply and provides measurement and gauging methods for the measurement of dimensions, running accuracy and internal clearance of rolling bearings. Symbols for a number of the concepts defined in this standard are established.

This standard has been revised to conform with International Standards developed by the members of the International Organization for Standardization (ISO). In particular, the language and intent of ISO 1132 (Rolling bearings - Tolerances - Definitions), ISO 5593 (Rolling bearings - Vocabulary) and ISO Technical Report 9274 (Rolling bearings - Measuring and gauging principles and methods) have been followed.

Copies of ISO standards concerning rolling element (anti-friction) bearings are available from the American National Standards Institute.

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., 11 West 42nd Street, 13th Floor, New York, NY 10036.

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

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Hydraulic Institute
Association for Manufacturing Technology
Society of Tribologists and Lubrication Engineers
U.S. Department of Defense, DISC
U.S. Department of the Navy

**ABMA (formerly AFBMA) Standards
for
Ball and Roller Bearings**

- 1 - Terminology for Anti-Friction Ball and Roller Bearings and Parts
- 4 - Tolerance Definitions and Gauging Practices for Ball and Roller Bearings
- 7 - Shaft and Housing Fits for Metric Radial Ball and Roller Bearings (Except Tapered Roller Bearings)
Conforming to Basic Boundary Plans
- 8.1 - Mounting Accessories, Metric Design
- 8.2 - Mounting Accessories, Inch Design
- 9 - Load Ratings and Fatigue Life for Ball Bearings
- 10 - Metal Balls
- 11 - Load Ratings and Fatigue Life for Roller Bearings
- 12.1 - Instrument Ball Bearings, Metric Design
- 12.2 - Instrument Ball Bearings, Inch Design
- 13 - Rolling Bearing Vibration and Noise (Methods of Measuring)
- 14 - Housings for Bearings with Spherical Outside Surfaces
- 15 - Ball Bearings with Spherical Outside Surfaces and Extended Inner Ring Width (Includes Eccentric Locking Collars)
- 16.1 - Airframe Ball, Roller, and Needle Roller Bearings, Metric Design
- 16.2 - Airframe Ball, Roller, and Needle Roller Bearings, Inch Design
- 17 - Needle Rollers, Metric Design
- 18.1 - Needle Roller Bearings, Radial, Metric Design
- 18.2 - Needle Roller Bearings, Radial, Inch Design
- 19.1 - Tapered Roller Bearings, Radial, Metric Design
- 19.2 - Tapered Roller Bearings, Radial, Inch Design
- 20 - Radial Bearings of Ball, Cylindrical Roller and Spherical Roller Types, Metric Design
- 21.1 - Thrust Needle Roller and Cage Assemblies and Thrust Washers, Metric Design
- 21.2 - Thrust Needle Roller and Cage Assemblies and Thrust Washers, Inch Design
- 22.1 - Spherical Plain Radial Bearings, Joint Type - Metric Design
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- 24.2 - Thrust Bearings of Ball and Cylindrical Roller Types - Inch Design
- 25.2 - Rolling Bearings, Linear Motion, Recirculating Ball, Sleeve Type - Inch Series
- 26.2 - Thin Section Ball Bearings - Inch Design

An ABMA Standard is intended as a guide to aid the manufacturer, the consumer, and the general public. The existence of an ABMA Standard does not in any respect preclude anyone, whether he has approved the standard or not, from manufacturing, marketing, purchasing, or using products, processes, or procedures not conforming to the standard. ABMA Standards are subject to revision or withdrawal at any time and users who refer to an ABMA Standard should satisfy themselves that they have the latest information from the Association.

**American National Standard
ABMA Standard
Tolerance Definitions and Gauging Practices
for Ball and Roller Bearings**

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Bore diameter variation	V_{ds}	2.2.1.4	
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Mean bore diameter deviation	Δ_{dm}	2.2.1.6	
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Mean bore diameter variation	V_{dmp}	2.2.1.10	3.2.1
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Outside diameter variation	V_{Ds}	2.2.2.4	
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Mean outside diameter deviation	Δ_{Dm}	2.2.2.6	
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Tolerance Definitions and Gauging Practices for Ball and Roller Bearings

1. Scope

This standard includes:

(1) Terms and definitions of tolerances for the boundary dimensions, running accuracy and internal clearance of ball and roller bearings listed in other ANSI/ABMA and ISO standards.

(2) Description of methods of measuring, which are commonly used by bearing users and which, as a rule, give an accuracy sufficient for practical purposes.

2. Terms and definitions

2.1 General

2.1.1 Applicability of tolerances: The tolerances apply exclusively to the concept of boundary dimensions, running accuracy and internal clearance defined in sections 2.2, 2.3 and 2.4 of this standard.

2.1.2 Absolute dimensions: At a temperature of +20°C (+68°F) and provided that the bearing parts are completely unstressed by external forces, including measuring loads and the gravitational force on the part itself, a boundary dimension of a bearing or bearing part shall not deviate from the nominal dimension by more than the tolerances to be applied. In order to assure correlation between the bearing dimensions and the absolute unit of length, the gauges and measuring instruments shall, at suitable intervals, be adjusted or calibrated by means of master gauges, whose calibration is traceable to those used by the National Institute of Standards and Technology.

2.1.3 Tolerance terms: All specified tolerances apply to the finished bearing or component.

The term "nominal size" (diameter, width height), "deviation", and "tolerance" conform with those defined in ANSI Standard B4.2, Preferred Metric Limits and Fits. Figure 1 illustrates those and other terms.

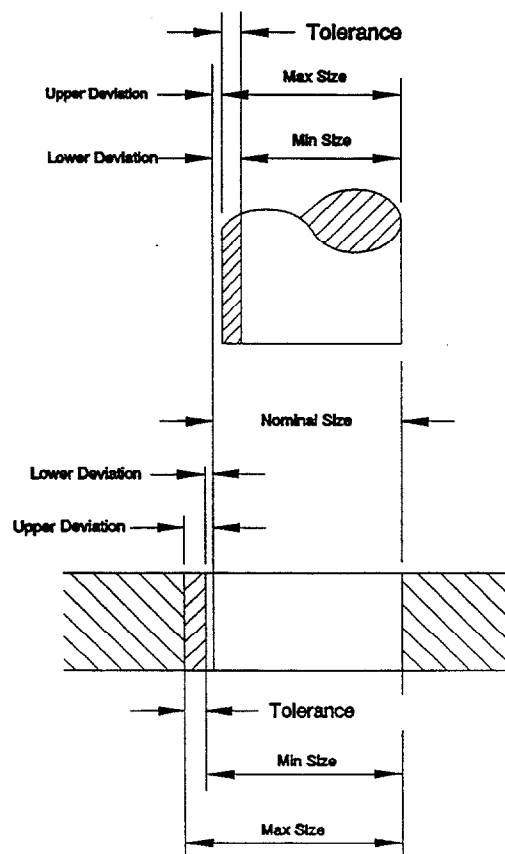


Figure 1
Illustration of definitions