

**ANSI/ABMA  
Std. 7 - 1995  
(Revision and redesignation of  
ANSI/AFBMA Std. 7 - 1988)**

**AMERICAN NATIONAL STANDARD  
ABMA STANDARD**

**SHAFT AND HOUSING FITS FOR  
METRIC RADIAL BALL AND ROLLER BEARINGS  
(EXCEPT TAPERED ROLLER BEARINGS)  
CONFORMING TO BASIC BOUNDARY PLAN**

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## FOREWORD

This foreword is not a part of ANSI/ABMA Standard 7 - 1995, Shaft and Housing Fits for Metric Ball and Roller Bearings (Except Tapered Roller Bearings) Conforming to Basic Boundary Plan.

This American National Standard provides the general selection of shaft and housing fits for metric radial ball and roller bearings of tolerance classes ABEC-1 and RBEC-1. Bearing type, loading and other design requirements influence the criteria for shaft and housing fits.

The dimensions, tolerances and clearances stated in this standard are based on metric units and are found in Part I of the various tables. A soft conversion to U.S. customary (inch-pound) units is provided in Part II of the various tables for the convenience of the user.

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, 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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G.T. Satterfield, Secretary

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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 Plan
- 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, Cylinder 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
- 22.2 - Spherical Plain Radial Bearings, Joint Type - Inch Design
- 23.2 - Thrust Bearings of Tapered Roller Type - Inch Design
- 24.1 - Thrust Bearings of Ball, Cylindrical Roller and Spherical Roller Types - Metric Design
- 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  
Shaft and Housing Fits for Metric Radial Ball and Roller Bearings  
(Except Tapered Roller Bearings)  
Conforming to Basic Boundary Plan**

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# SHAFT AND HOUSING FITS FOR METRIC RADIAL BALL AND ROLLER BEARINGS (EXCEPT TAPERED ROLLER BEARINGS) CONFORMING TO BASIC BOUNDARY PLAN

## 1. Scope

This standard covers the general selection of shaft and housing fits for metric radial ball and roller bearings of tolerance classes ABEC 1 - RBEC 1 as influenced by the type and extent of bearing loading and other design requirements. Other tolerance classes are not covered by this standard.

Recommendations for the fitting practices of some particular types of ball and roller bearings are covered in other ANSI/ABMA standards. These include:

ANSI/ABMA Std. No.	
12.1 & 12.2	Instrument Ball Bearings
16.1 & 16.2	Airframe Ball, Roller and Needle Roller Bearings
18.1 & 18.2	Needle Roller Bearings
19.1 & 19.2	Tapered Roller Bearings
26.2	Thin Section Ball Bearings

This standard can also be used as a guide for determining shaft and housing dimensions for inch design ball and roller bearings by using the recommended shaft and housing fits for metric bearings and applying the appropriate bore and O.D. tolerances for the inch design bearings, except those bearings covered by ANSI/ABMA Standard 15.

## 2. Conformity with Other ANSI Standards

In the size range 0-2500 mm, the deviations used in this standard for shaft and housing seats conform to American National Standard ANSI B4.2, "Preferred Metric Limits and Fits".

## 3. Description of Shaft and Housing Tolerance Classifications

In the size range described in 2 above, the tolerance classifications are designated by a letter and a numeral. A lower case letter is used for shafts and a capital letter is used for housings. Numerals indicate the degree of accuracy - the smaller numerals representing closer tolerances than the larger. The letters indicate the location of the shaft and housing limits relative to the inner ring bore and outer ring outside diameter tolerance ranges indicated in Figures 1 and 2 by the symbols KB and hB respectively.

Figures 1 and 2 show graphically how the various tolerance classifications result in clearance or interference depending upon how the diameters of the mating parts interact in specific cases.