



ANSI/AFBMA
Std. 24.1—1989

AMERICAN NATIONAL STANDARD
AFBMA STANDARD

**THRUST BEARINGS OF BALL, CYLINDRICAL ROLLER
AND SPHERICAL ROLLER TYPES—METRIC DESIGN**

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

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American National Standards Institute, Inc.

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FOREWORD

(This foreword is not a part of ANSI/AFBMA Standard 24.1—1989, Thrust Bearings of Ball, Cylindrical Roller, & Spherical Roller Types, Metric Design.)

This American National Standard consolidates the boundary dimensions, tolerance limits and fitting and mounting practices for inch design ball, cylindrical roller, and spherical roller type thrust bearings which have been in general use in the USA in recent years. Many of the boundary dimensions are formerly found in ANSI/AFBMA Standard 21—1977.

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., 1430 Broadway, New York, NY 10018.

The standard was processed and approved for submittal to ANSI by Accredited Standards Committee B3, Ball and Roller Bearings. Committee approval of the standard does not necessarily imply that all Committee members voted for its approval.

The officers of Accredited Standards 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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Anti-Friction Bearing Manufacturers Association
Hydraulic Institute
National Machine Tool Builders Association
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AFBMA Standards
for
Ball and Roller Bearings
and Balls

- 1 — Terminology
- 4 — Tolerance Definitions and Gaging Practices
- 7 — Shaft and Housing Fits for Metric Radial Ball and Roller Bearings (Except Tapered Roller Bearings) Conforming to Basic Boundary Plans
- 8.1 — Ball and Roller Bearing Mounting Accessories, Metric Design
- 8.2 — Ball and Roller Bearing 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
- 14 — Housing 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
- 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
- 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

An AFBMA Standard is intended as a guide to aid the manufacturer, the consumer and the general public. The existence of an AFBMA 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. AFBMA Standards are subject to revision or withdrawal at any time and users who refer to an AFBMA Standard should satisfy themselves that they have the latest information from the Association.

THRUST BEARINGS OF BALL, CYLINDRICAL ROLLER & SPHERICAL ROLLER TYPES—METRIC DESIGN

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AFBMA STANDARD 21.4

THRUST BEARINGS OF BALL, CYLINDRICAL ROLLER & SPHERICAL ROLLER TYPES—METRIC DESIGN

1. SCOPE

This standard for thrust bearings of ball, cylindrical roller and spherical roller types of metric design covers:

- Identification Code
- Symbols and Nomenclature
- Boundary Dimensions
- Tolerances
- Mounting Dimensions

All bearings and components in this standard are not necessarily available. For availability, consult bearing manufacturers.

Other Applicable standards should be consulted for tolerance definitions, gaging practices and methods of evaluating load ratings.

This standard only covers external dimensions. Functional interchangeability between different makes of standard bearings or components of the same size may depend on bearing features which are not standardized. Hence, the substitution of one make of standard bearing for another should only be made after careful comparison of their characteristics and consideration of the requirements of the particular application.

2. IDENTIFICATION CODE

2.1 Scope of Code

This code identifies and, as far as possible, describes each thrust bearing or component on the basis of complete dimensional interchangeability. This code establishes a universal language for describing and identifying metric design thrust bearings and components of the types covered in this standard in order to facilitate communications between the user and the manufacturer. The code is also intended to simplify the handling by user personnel of identical bearings made by different manufacturers, whose identification numbers may be different.

This code applies only to those thrust bearings or components whose boundary dimensions and tolerances conform to this standard.

2.2 Code

The identification code for thrust bearings of ball, cylindrical roller and spherical roller types of metric design is made up of three parts:

1. A one, two, three or four digit number identifying the bearing bore in millimetres.
2. The letter T identifying a thrust bearing followed by one or two arbitrarily chosen letters identifying the type of thrust bearing as shown in Table 1 and 2.
3. An arbitrarily chosen two digit number identifying the bearing series within its class as shown in Table 3.

3. SYMBOLS AND NOMENCLATURE

- d = bore diameter of shaft washer, single direction bearing, nominal
- Δd_{mp} = single plane mean bore diameter deviation of central shaft washer, single direction bearing
- d_1 = outside diameter of shaft washer, single direction bearing, nominal
- d_{1smax} = largest single outside diameter of shaft washer
- d_2 = bore diameter of central shaft washer, double direction bearing, nominal
- Δd_{2mp} = single plane mean bore diameter deviation of central shaft washer, double direction bearing
- d_3 = outside diameter of central shaft washer, nominal
- d_{3smax} = largest single outside diameter of central shaft washer
- D = outside diameter of housing washer, nominal
- ΔD_{mp} = single plane mean outside diameter deviation
- D_1 = bore diameter of housing washer, nominal
- D_{1smin} = smallest single bore diameter of housing washer