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Std. 19.1-1987

AMERICAN NATIONAL STANDARD

AFBMA STANDARD

TAPERED ROLLER BEARINGS – RADIAL

METRIC DESIGN

Sponsor

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

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American National Standards Institute, Inc.

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FORWARD

(This forward is not a part of American National Standard for Tapered Roller Bearings - Radial, Metric Design, ANSI/AFBMA Standard 19.1)

This new standard includes only information pertinent to tapered roller bearings designed in the metric system. Similar information for other types of bearings including thrust and radial tapered roller bearings in the inch design are covered in separate American National Standards.

The boundary dimension tables of this standard contain the bearings in common use, selected from ISO 355, and bearings designed to meet anticipated future means.

The various part numbering systems are explained and cross referenced in this standard. Tolerances for boundary dimensions, and runouts, as well as recommended fitting practices for industrial and automotive applications, are provided.

Copies of ISO Standards concerning Rolling Contact Bearings (Ball and Roller Bearings) are available from the American National Standards Institute, Inc., 1430 Broadway, New York, NY 10018.

Suggestions for 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 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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American Society of Agricultural Engineers
American Society of Lubrication Engineers
Anti-Friction Bearings Manufacturers Association
Hydraulic Institute
National Machine Tool Builders Association
Society of Automotive Engineers
U.S. Department of Defense, DISC
U.S. Department of the Navy

AFBMA Standards
for
Ball and Roller Bearings
and Balls

- 1 — Terminology
- 4 — Tolerance Definitions and Gaging Practices for Ball & 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 — 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 (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)
- 16.2 — Airframe Ball, Roller and Needle Roller Bearing, Inch Design
- 17 — Needle Rollers, Metric Design
- 18.1 — Needle Roller Bearings — Radial, Metric Design
- 18.2 — Needle Roller Bearings — Radial, Inch Design
- 19 — Tapered 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 — Metric Thrust Needle Roller and Cage Assemblies and Thrust Washers
- 21.2 — Thrust Bearings of Ball, Cylindrical Roller, Tapered Roller and Needle Roller Types, Inch Design
- 22.2 — Spherical Plain Bearings, Joint Type — 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.

Tapered Roller Bearings – Radial Metric Design

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Tapered Roller Bearings – Radial Metric Design

1. SCOPE

This standard covers metric design radial tapered roller bearings of various types, part numbering systems, boundary dimensions, tolerances, and fitting practices. Tapered roller thrust bearings are covered in a separate AFBMA standard.

General AFBMA standards which apply to various types of bearings should be consulted for tolerance definitions, gaging practices, mounting accessories, and method of evaluating load ratings.

2. PART NUMBERING SYSTEMS

2.1 Identification Code. Metric design tapered roller bearings are numbered in an identical manner or reference is made to the universal number by all producers. Therefore, an identification code to provide a universal language for describing and identifying these products is not required.

2.1.1 Listed Bearing Numbers. Bearings contained in the Boundary Dimension Tables (2-5) of this standard are identified either with the Designation Numbering System described in 2.3 or the Modern Numbering System described in Appendix A.

2.1.2 Individual Component Part Numbers. Unlike other bearing types, tapered roller bearing cones and cups are individually numbered. The cone is assembled with rollers and a cage, and when used with a cup, makes a complete bearing assembly. Both cone and cup numbers are required to identify a complete bearing assembly. The cone number followed by the cup number is the preferred practice.

2.2 Existing Numbering Systems. Bearing manufacturers have used various part numbering systems. For reference purposes the more commonly used systems are described in Appendix

A. Appendix B provides a cross-reference between the AFBMA Standard 19.1 Designation Numbering System and that used in ISO 355.

2.3 AFBMA Standard 19.1 Designation Numbering System. The following describes a part numbering system for metric tapered roller bearings conforming to ISO 355 titled "Rolling bearings – Metric tapered roller bearings – Boundary dimensions and series designations." Part numbers assigned under this system are used to identify the bearings included in the Boundary Dimension Tables (2-5).

The component number of a metric tapered roller bearing consists of five (5) Sections as follows:

SCHEMATIC ARRANGEMENT OF PART NUMBERING SYSTEM (WITH EXAMPLES)

COMPONENT NUMBER						
Section 1	Series Number			Section 3	Section 4	Section 5
	Dimension Series					
Metric Component Designator	Angle Series	Diameter Series	Width Series	Cone Bore mm	Component Designator	Modification Suffix
	J	2	B	D		
J	2	B	D	020	10	

2.3.1 Section 1 – Metric Component Designator. The prefix "J" designates a metric tapered roller bearing.

2.3.2 Section 2 – Dimension Series. Bearings with similar geometrical characteristics are assigned to the same dimension series. Each dimension series is designated by a combination of three symbols, the first for angle range (angle series), the second for outside diameter to bore diameter relationship range (diameter series), and the third for width to section height relationship range (width series). Dimension series symbols are assigned according to the following tabulations and formulas.