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Std. 8.1-1986

AMERICAN NATIONAL STANDARD

AFBMA STANDARD

BALL AND ROLLER BEARING

MOUNTING ACCESSORIES, METRIC DESIGN

Sponsor

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

Approved December 2, 1986

American National Standards Institute, Inc.

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FOREWORD

(This foreword is not a part of American National Standard ANSI/AFBMA Std. 8.1-1986, Ball and Roller Bearing Mounting Accessories, Metric Design).

This new Standard covers metric design ball and roller bearing mounting accessories presently in production in the U.S.A.

This Standard establishes dimensions and minimum physical properties of mounting accessories used for locating or fixing metric design ball and roller bearings to the shaft of a machine or mechanism. All components covered by this Standard are designed to metric dimensions. The equivalent U.S. Customary (inch) dimensions are provided for the convenience of those using that system.

The material in this Standard conforms, where possible, to Standards adopted by the International Standards Organization. Except as noted, ISO 2982-1972, Rolling bearings — Locknuts, narrow series, and lockwashers with straight inner tab and ISO 2983-1975, Rolling bearings — Locknuts, wide series, and lockwashers with bent inner tab have been incorporated into this ANSI/AFBMA Standard.

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 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 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 Lubrication Engineers
Anti-Friction Bearing Manufacturers Association
Hydraulic Institute
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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
- 8.2— 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
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- 13 — Rolling Bearing Vibration and Noise
- 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 Bearings, Inch Design
- 17 — Needle Rollers, Metric Design
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- 19 — Tapered Roller Bearings—Radial, Inch Design
- 20 — Metric Ball and Roller Bearings (Except Tapered Roller Bearings) Conforming to Basic Boundary Plans
- 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 — Spherical Plain Bearings, Joint Type

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.

METRIC DESIGN BALL AND ROLLER BEARING MOUNTING ACCESSORIES

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Metric Design Ball and Roller Bearings Mounting Accessories

1. SCOPE

Mounting accessories covered in this standard are used for the location or fixing of ball and roller bearings to the shaft of a machine or mechanism. The purpose of the standard is to establish dimensions and minimum physical properties of these components consistent and compatible with AFBMA, ANSI and ISO standards relating to ball and roller bearings. Products manufactured in accordance with this standard will fulfill the expected function when used with properly-designed shafts. This standard covers

1.1 Locknuts and Removal Nuts — Locknuts and removal nuts for ball bearings and cylindrical, spherical, and tapered roller bearings.

1.2 Locking Devices — Lockwashers and locking clamps for ball bearings and cylindrical, spherical, and tapered roller bearings.

1.3 Mounting Sleeves — Adapter sleeves and withdrawal sleeves for ball bearings and spherical roller bearings.

1.4 Shaft Dimensions — Recommended dimensions for threads, keyways, and reliefs for shafts.

1.5 General Information — Symbols, definitions, part numbers, materials, tolerances, and threads.

2. IDENTIFICATION CODE

2.1 DEFINITIONS

2.1.1. Locknuts and Removal Nuts

2.1.1.1 Bearing Locknut — A fastener with internal threads utilized to secure and/or position the inner ring of a rolling element bearing to a shaft or mounting sleeve. (Some sizes may be used as removal nuts.)

2.1.1.2 Removal Nut — A fastener with internal threads utilized to facilitate disassembly of a bearing from the withdrawal sleeve.

2.1.1.3 Face Runout — A dimensional characteristic denoting total indicator reading at the locknut face while locknut is rotated one rev-

olution on the axis of the thread pitch diameter. Also denoted as squareness of the face with the thread.

2.1.1.4 Slot — Slots are provided on the outer diameter (O.D.) of locknuts and removal nuts. These slots aid in turning with a spanner wrench or other types of turning tools and permit locking of the lock nut in final position.

2.1.1.5 Chamfer Face — The nut face adjoining the large O.D. chamfer, the face normally positioned against the lockwasher or bearing.

2.1.1.6 Face Parallelism — A term defining the parallel relationship between the chamfer face of the locknut and the opposite face of the locknut.

2.1.2 Locking Devices

2.1.2.1 Lockwasher — A washer used in conjunction with a bearing locknut to maintain in locking engagement the adjusted or tightened position of a bearing locknut with respect to the shaft or mounting sleeve. A washer key tang projects from the lockwasher bore to engage a key slot in the shaft or mounting sleeve. The O.D. periphery of the lockwasher is provided with a quantity of tangs, one of which is bent down into a locknut slot to provide the locking of the mounting system.

2.1.2.2 Key Tang — The tang projecting inwardly from the bore of lockwasher is designed to engage with a shaft or mounting sleeve key slot. The key tang is either bent at 90° to the face of lockwasher or is straight, depending on the type of lockwasher.

2.1.2.3 Locking Tang — A tang on the outer periphery of a lockwasher, which engages with a locknut slot. A quantity of equally-spaced tangs is provided, with an appropriate single tang bent into engagement with a locknut slot to complete the locking of the system.

2.1.2.4 Locking Clamp — A locking device bolted to the face of large locknuts after