



Designation: F2591 – 06 (Reapproved 2022)

Standard Specification for Bearing, Roller, Tapered, Single Row of Rollers (Metric Series)¹

This standard is issued under the fixed designation F2591; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

This standard has been approved for use by agencies of the U.S. Department of Defense.

1. Scope

1.1 This specification covers requirements for metric series, tapered roller bearings with a single row of rollers.

1.2 *Intended Use*—The bearings covered in this specification are intended to be used in general industrial and vehicle applications where the operating temperature does not exceed 120 °C (250 °F).

1.3 This specification contains many of the requirements of DS3225, which was originally developed by the Department of Defense and maintained by the Defense Supply Center in Richmond. The following government activity codes may be found in the Department of Defense, Standardization Directory SD-1.²

Preparing Activity
DLA-GS4

Custodians
Army-AT
Navy-MC
Air Force-99

Review Activities
Army-AV
Navy –MC, SH
Air Force-84
Other-NS

1.4 The values stated in SI units are to be regarded as standard. No other units of measurement are included in this standard.

1.5 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.6 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

¹ This specification is under the jurisdiction of ASTM Committee F34 on Rolling Element Bearings and is the direct responsibility of Subcommittee F34.04 on Automotive/Industrial Bearing.

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² The Military codes that are listed in SD-1 give the address and phone numbers of the DoD contacts. These are found in the DoD's ASSIST website <http://assist.daps.dla.mil/online/start/>.

2. Referenced Documents

2.1 *ABMA Standard*:³

ABMA 19.1 Tapered Roller Bearings—Radial, Metric Design

2.2 *ISO Standard*:⁴

ISO 5593 Rolling Bearings—Vocabulary

2.3 *Military Standard*:⁵

MIL-C-11796 Corrosion Preventative Compound, Petrolatum, Hot Application

2.4 *SAE Standard*:⁶

SAE AMS-STD-66 Steel: Chemical Composition and Hard- enability

3. Terminology

3.1 *Definitions*:

3.1.1 For definitions of terms used in this specification refer to ISO 5593.

3.1.2 *effective load center*—dimension (a) locates a point on the inner ring (cone) axis that is the center of pressure of all resisting forces set up by the bearing rollers. All moments should be calculated from this point when determining bearing loading and shaft stresses. A minus value of (a) indicates that the center is inside the inner ring (cone) backface.

3.1.3 *K factor*—the K Factor is the ratio of the basic radial dynamic load rating to the basic static load rating.

3.1.4 *contact angle*—these bearing have a contact angle (α) between 10 and 19 degrees. The contact angle is the angle between the line of action of the roller load and a plane perpendicular to the bearing axis.

4. Ordering Information

4.1 Procurement documents should specify the following:

4.1.1 Title, number, and date of this specification,

³ Available from Techstreet, 777 E. Eisenhower Parkway, Ann Arbor , MI 48108.

⁴ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036.

⁵ Available from DLA Document Services, Building 4/D, 700 Robbins Ave., Philadelphia, PA 19111-5094, <http://quicksearch.dla.mil>.

⁶ Available from Society of Automotive Engineers (SAE), 400 Commonwealth Dr., Warrendale, PA 15096-0001.

4.1.2 Part Number (see 8.1),

4.1.3 Nominal dimensions of bearing (bore, outside diameter, bearing width),

4.1.4 Quantity required,

4.1.5 Inspection records required, and

4.1.6 Required packaging.

5. Materials and Manufacture

5.1 *Material:*

5.1.1 *Outer Ring (Cup), Inner Ring (Cone) and Rollers*—Bearing quality, carburizing grade alloy or through-hardening grade alloy steel in accordance with SAE AMS-STD-66.

5.1.2 *Cage*—Carbon steel (stamped) or powdered process steel (for example, Sinta Forge) may be used.

6. Physical Properties

6.1 *Hardness*—Outer ring (cup), inner ring (cone) and rollers shall be hardened to 58 HRC to 64 HRC.

7. Dimensions, Mass, and Permissible Variations

7.1 *Dimensions:*

7.1.1 Dimensions D_b , D_a , d_b , d_a are recommended shaft and housing shoulder diameters.

7.1.2 Dimensions R and r are the maximum fillet radii on the shaft and the housing respectively, which will be cleared by the bearing corner. See Fig. 1 and Table 1.

7.2 *Tolerances*—Precision grade (Class B) shall be specified only when technically justified.

7.2.1 *Standard Grade (Class K)*—See Tables 2-5.

7.2.2 *Precision Grade (Class B)*—See Tables 6-9.

7.3 *Cage Clearance*—Designers should provide a clearance of 3.2 mm minimum between the outside edge of the cage and the housing counterbore.

8. Part Number

8.1 *Part Number*—The Part number shall consist of DS3225, followed by the dash number, followed by -K for a standard grade bearing or -B for a precision grade bearing.

8.1.1 *Examples:*

8.1.1.1 DS3225-15-K is a standard grade, 75 mm bore, 145 mm OD, 51 mm wide single row tapered roller bearing.

8.1.1.2 DS3225-15-B is a precision grade, 75 mm bore, 145 mm OD, 51 mm wide single row tapered roller bearing.

8.1.2 The ABMA (American Bearing Manufacturers Association) outer and inner numbers are for reference only and are not to be used for ordering purposes.

9. Lubrication

9.1 *Lubrication*—Unless specified otherwise, bearings shall be furnished without lubrication.

10. Preservation, Packaging and Packing

10.1 Packaging and packing shall be as specified in the acquisition document.

10.2 *Preservation:*

10.2.1 *Commercial Use*—Manufacturer shall coat bearing with rust preventative film.

10.2.2 *DoD Use*—Unless specified otherwise, bearings shall be furnished with preservative in accordance with MIL-C-11796, Class 3.

11. Keywords

11.1 bearing; DS3225; single row bearing; tapered roller bearing

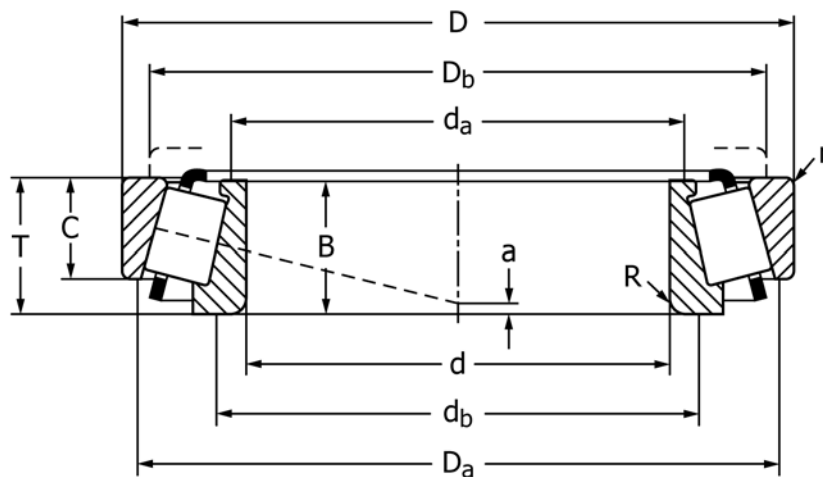


FIG. 1 Schematic Drawing, Metric Series, Single Row, Tapered Roller Bearing