



## Standard Specification for High-Carbon Anti-Friction Bearing Steel<sup>1</sup>

This standard is issued under the fixed designation A 295; 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 Department of Defense.*

### 1. Scope

1.1 This specification covers high-carbon bearing-quality steel to be used in the manufacture of anti-friction bearings.

1.2 Supplementary requirements of an optional nature are provided and when desired shall be so stated in the order.

1.3 The values stated in inch-pound units are to be regarded as the standard.

### 2. Referenced Documents

#### 2.1 ASTM Standards:

A 29/A 29M Specification for Steel Bars, Carbon and Alloy, Hot-Wrought and Cold-Finished, General Requirements for<sup>2</sup>

A 370 Test Methods and Definitions for Mechanical Testing of Steel Products<sup>3</sup>

A 751 Test Methods, Practices, and Terminology for Chemical Analysis of Steel Products<sup>3</sup>

A 892 Guide for Defining and Rating the Microstructure of High Carbon Bearing Steels<sup>2</sup>

E 45 Practice for Determining the Inclusion Content of Steel<sup>4</sup>

E 381 Method of Macroetch Testing, Inspection, and Rating Steel Products, Comprising Bars, Billets, Blooms, and Forgings<sup>4</sup>

E 1019 Test Methods for Determination of Carbon, Sulfur, Nitrogen, Oxygen, and Hydrogen in Steel and in Iron, Nickel, and Cobalt Alloys<sup>5</sup>

E 1077 Test Method for Estimating the Depth of Decarburization of Steel Specimens<sup>4</sup>

#### 2.2 Other Documents:

SAE J418a Grain Size Determination of Steel<sup>6</sup>

ISO 683, Part 17 Ball and Roller Bearing Steels<sup>7</sup>

### 3. Ordering Information

3.1 Orders for material under this specification should include the following information:

3.1.1 Quantity,

3.1.2 Grade identification,

3.1.3 Specification designation and year of issue,

3.1.4 Dimensions, and

3.1.5 Supplementary requirements, if included.

### 4. Process

4.1 The steel shall be made by a process that is capable of providing a high quality product meeting the requirements of this specification.

### 5. Chemical Composition and Analysis

5.1 Typical examples of chemical compositions are shown in Table 1. Other compositions may be specified.

5.2 An analysis of each heat of steel shall be made by the steel manufacturer in accordance with Test Methods, Practices, and Terminology A 751. The chemical composition thus determined shall conform to the requirements specified in Table 1 for the ordered grade or to other requirements agreed upon between manufacturer and purchaser.

5.3 Product analysis may be made by the purchaser in accordance with Test Methods, Practices, and Terminology A 751. Permissible variations in product analysis shall be in accordance with Specification A 29/A 29M.

### 6. Sizes, Shapes, and Dimensional Tolerances

6.1 The physical size and shape of the material shall be agreed upon between manufacturer and purchaser.

6.2 Dimensional tolerances for hot-rolled or hot-rolled and annealed bars, in straight lengths or coils, and cold-finished bars 0.500 in. (12.7 mm) and larger in diameter furnished under this specification shall conform to the requirements specified in the latest edition of Specification A 29/29M.

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee A-1 on Steel, Stainless Steel and Related Alloys, and is the direct responsibility of Subcommittee A01.28 on Bearing Steels.

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<sup>2</sup> Annual Book of ASTM Standards, Vol 01.05.

<sup>3</sup> Annual Book of ASTM Standards, Vol 01.03.

<sup>4</sup> Annual Book of ASTM Standards, Vol 03.01.

<sup>5</sup> Annual Book of ASTM Standards, Vol 03.06.

<sup>6</sup> Available from Society of Automotive Engineers, 400 Commonwealth Drive, Warrendale, PA 15096.

<sup>7</sup> Available from International Organization for Standardization (ISO), 1 rue de Varembe, Case postale 56, CH-1211, Genève 20, Switzerland.