



# Standard Specification for Highly Loaded Anti-Friction Bearing Steel<sup>1</sup>

This standard is issued under the fixed designation A1089/A1089M; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

## 1. Scope

1.1 This specification covers bars, billets, and blooms of bearing-quality steel to be used in the manufacture of highly loaded 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 either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with the standard.

## 2. Referenced Documents

### 2.1 *ASTM Standards:*<sup>2</sup>

[A29/A29M Specification for General Requirements for Steel Bars, Carbon and Alloy, Hot-Wrought](#)

[A751 Test Methods, Practices, and Terminology for Chemical Analysis of Steel Products](#)

[E381 Method of Macroetch Testing Steel Bars, Billets, Blooms, and Forgings](#)

[E588 Practice for Detection of Large Inclusions in Bearing Quality Steel by the Ultrasonic Method](#)

[E1019 Test Methods for Determination of Carbon, Sulfur, Nitrogen, and Oxygen in Steel, Iron, Nickel, and Cobalt Alloys by Various Combustion and Fusion Techniques](#)

[E2283 Practice for Extreme Value Analysis of Nonmetallic Inclusions in Steel and Other Microstructural Features](#)

### 2.2 *Other Document:*<sup>3</sup>

[ISO 4967 Steel—Determination of Content of Nonmetallic Inclusions—Micrographic Method Using Standard Diagrams](#)

<sup>1</sup> This specification is under the jurisdiction of ASTM Committee A01 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> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto:service@astm.org). For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

<sup>3</sup> Available from International Organization for Standardization (ISO), 1, ch. de la Voie-Creuse, CP 56, CH-1211 Geneva 20, Switzerland, <http://www.iso.org>.

## 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 basic oxygen or electric furnace process, with vacuum degassing and suitable shrouding, that provides a high quality product meeting the requirements of this specification. The use of a vacuum-arc remelt or an electro-slag remelt process is not required but is not excluded.

## 5. Chemical Composition and Analysis

5.1 The chemical composition shall be agreed upon between the manufacturer and purchaser.

5.2 All compositions shall meet the element maximums of [Table 1](#).

5.3 An analysis of each heat of steel shall be made by the steel manufacturer in accordance with Test Methods, Practices, and Terminology [A751](#). The chemical composition thus determined shall conform to the requirements specified.

5.4 Product analysis may be made by the purchaser in accordance with Test Methods, Practices, and Terminology [A751](#). Permissible variations in product analysis shall be in accordance with Specification [A29/A29M](#).

## 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 shall conform to the requirements specified in Specification [A29/A29M](#). For sizes and shapes not covered by Specification [A29/A29M](#), dimensional tolerances shall be agreed upon between manufacturer and purchaser.

## 7. Quality Tests

7.1 The supplier shall be held responsible for the quality of the material furnished and shall make the necessary tests to