



Designation: A 663/A 663M – 89 (Reapproved 2000)

Standard Specification for Steel Bars, Carbon, Merchant Quality, Mechanical Properties¹

This standard is issued under the fixed designation A 663/A 663M; 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 hot-wrought merchant quality carbon steel bars and bar size shapes produced to mechanical property requirements and intended for noncritical construction applications (see 7.2).

1.2 Merchant quality hot-wrought steel bar is available in the following ranges of size and section:

1.2.1 Rounds, squares, and hexagons with diameters or distance across flats under 3 in. [75 mm].

1.2.2 Bar size shapes with maximum dimensions under 3 in. [75 mm].

1.2.3 Other bar sections with weight per foot under 40.84 lb/ft [60.78 kg/m].

1.2.4 Flats 6 in. [152 mm] or under in width, over 0.203 in. [over 5 mm in thickness up to 150 mm in width] in thickness, and under 40.84 lb/ft or 12 in.² [77.4 cm²] in cross-sectional area.

1.2.5 Flats over 6 in. to 8 in., inclusive in width, 0.230 in. and over [over 6 mm in thickness and over 50 mm through 200 mm in width] in thickness and under 40.84 lb/ft [60.78 kg/m] or 12 in.² [77.4 cm²] in cross-sectional area.

1.2.6 Hot-wrought merchant quality carbon steel bars subject to mechanical property requirements are hot wrought in straight lengths only.

1.3 Some applications may require one or more of the available designations shown under supplementary requirements.

NOTE 1—Special quality hot-wrought carbon steel bars subject to mechanical property requirements are covered in Specification A 675/A 675M.

1.4 The values stated in either inch-pound units or SI units are to be regarded separately as the standard. Within the text, the SI units are shown in brackets. The values stated in each system are not equivalents, therefore each system must be used

independently of the other. Combining values from the two systems may result in nonconformance with the specification.

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 for²

A 370 Test Methods and Definitions for Mechanical Testing of Steel Products³

A 675/A 675M Specification for Steel Bars, Carbon, Hot-Wrought, Special Quality, Mechanical Properties²

E 290 Test Method for Semi-Guided Bend Test for Ductility of Metallic Materials⁴

3. Ordering Information

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

- 3.1.1 Quantity (weight or number of pieces),
- 3.1.2 Dimensions (cross-sectional shape, size, and length),
- 3.1.3 Name of material (merchant quality carbon steel bars),
- 3.1.4 Specification number and date of issue,
- 3.1.5 Grade designation,
- 3.1.6 Copper bearing steel (if required),
- 3.1.7 Heat analysis or test report (request, if required),
- 3.1.8 Application and processing, and
- 3.1.9 Supplementary requirements (if required).

4. Manufacture

4.1 The steel shall be made by the open-hearth, basic-oxygen, or electric-furnace process.

5. Chemical Composition

5.1 The steel shall conform on heat analysis to the following chemical requirements:

Phosphorus, max, percent	0.04
Sulfur, max, percent	0.05
Copper, when copper steel is specified, min, percent	0.20

¹ This specification is under the jurisdiction of Committee A01 on Steel, Stainless Steel and Related Alloys and is the direct responsibility of Subcommittee A01.15 on Bars.

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² *Annual Book of ASTM Standards*, Vol 01.05.

³ *Annual Book of ASTM Standards*, Vol 01.03.

⁴ *Annual Book of ASTM Standards*, Vol 03.01.