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

AASHTO Designation: M 227M/M 227-19 (2023)

Technically Revised: 2019

Reviewed but Not Updated: 2023

Technical Subcommittee: 4f, Metals

ASTM Designation: A663/A663M-17



American Association of State Highway and Transportation Officials
555 12th Street NW, Suite 1000
Washington, D.C. 20004

Standard Specification for

Steel Bars, Carbon, Merchant Quality, Mechanical Properties

AASHTO Designation: M 227M/M 227-19 (2023)



Technically Revised: 2019

Reviewed but Not Updated: 2023

Technical Subcommittee: 4f, Metals

ASTM Designation: A663/A663M-17

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 constructional applications. (See Section 4.2.)
- 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 less than 75 mm [3 in.].
- 1.2.2. Bar size shapes with maximum dimensions less than 75 mm [3 in.].
- 1.2.3. Other bar sections with weight per foot less than 60.78 kg/m [40.84 lb/ft].
- 1.2.4. Flats 150 mm [6 in.] or less in width, more than 5.156 mm [0.203 in.] in thickness, and less than 60.78 kg/m or 77 cm² [40.84 lb/ft or 12 in.²] in cross-sectional area.
- 1.2.5. Flats over 50 to 200 mm [6 to 8 in.] inclusive in width, 6 mm [0.230 in.] in thickness, and under 60.78 kg/m or 77 cm² [40.84 lb/ft or 12 in.²] 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 M 255M/M 255.
- 1.4. This specification is applicable to orders in either SI units (as M 227M) or inch-pound units (as M 227). SI units and inch-pound units are not necessarily equivalent. Inch-pound units are shown in brackets in the text for clarity, but they are the applicable values when the material is ordered to M 227.

2. REFERENCED DOCUMENTS

- 2.1. *AASHTO Standards:*

- < M 255M/M 255, Steel Bars, Carbon, Hot-Wrought, Special Quality, Mechanical Properties
- < T 244, Mechanical Testing of Steel Products

2.2. *ASTM Standards:*

- < A29/A29M, Standard Specification for General Requirements for Steel Bars, Carbon and Alloy, Hot-Wrought
- < E290, Standard Test Methods for Bend Testing of Material for Ductility

3. ORDERING INFORMATION

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

- 3.1.1. Quantity (mass 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. GENERAL REQUIREMENTS

- 4.1. Material furnished under this specification shall conform to the requirements of the current edition of ASTM A29/A29M, except as stated in Sections 1.2 and 4.2.
- 4.2. Merchant quality bars shall be free from visible pipe; however, they may contain pronounced chemical segregation. Internal porosity, surface seams, and other surface irregularities may be present in this quality. Deoxidation practice and grain size are at the manufacturer's option.
- 4.3. Unless otherwise specified, the bars shall be furnished as rolled and not pickled, blast cleaned, or oiled.

5. MANUFACTURE

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