
Standard Specification for Steel Bars, Carbon, Hot-Wrought, Special Quality, Mechanical Properties

AASHTO Designation: M 255M/M 255-19 (2023)

Technically Revised: 2019

Reviewed but Not Updated: 2023

Technical Subcommittee: 4f, Metals

ASTM Designation: A675/A675M-14(2019)



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1. SCOPE

- 1.1. This specification covers hot-wrought, special quality, carbon steel bars and bar size shapes produced to mechanical property requirements and intended for general constructional applications.
- 1.2. The bars are available in nine strength grades designated 310, 345, 380, 415, 450, 485, 515, 550, and 620 [45, 50, 55, 60, 65, 70, 75, 80, and 90] corresponding to the minimum ultimate tensile strength in MPa [ksi]. The chemical composition is selected by the manufacturer to develop the required mechanical properties.
- 1.3. Hot-wrought, special quality, carbon steel bars subject to mechanical property requirements are hot wrought in straight lengths only. Sections and sizes available are covered in ASTM A29/A29M.
- 1.4. Some applications may require one or more of the available designations shown under Supplementary Requirements.
Note 1—Merchant quality, hot-wrought carbon steel bars subject to mechanical property requirements are covered in M 227M/M 227.
- 1.5. This specification is applicable to orders in either SI units (as M 255M) or inch-pound units (as M 255). 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 255.

2. REFERENCED DOCUMENTS

- 2.1. *AASHTO Standards:*
 - < M 227M/M 227, Steel Bars, Carbon, Merchant 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. TERMINOLOGY

3.1. *Definition:*

- 3.1.1. *special quality*—special quality bars are used when end use, method of fabrication, or subsequent processing treatment requires quality characteristics not available in merchant quality. Typical applications involve bending or machining for general constructional uses. Some end uses or fabricating procedures can necessitate one or more requirements, which are described in the Supplementary Requirements.

4. ORDERING INFORMATION

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

- 4.1.1. Quantity (mass or number of pieces);
- 4.1.2. Name of material (hot-wrought special quality bars);
- 4.1.3. Dimensions, including length;
- 4.1.4. Cross section (round, square, hexagon, equal leg angle, etc.);
- 4.1.5. AASHTO designation and date of issue;
- 4.1.6. Grade designation (Table 2);
- 4.1.7. Lead steel (if required) (Section 7.2);
- 4.1.8. Copper bearing steel (if required) (Section 7.3);
- 4.1.9. Test report (if required) (Section 10);
- 4.1.10. Supplementary Requirements or special requirements (if required); and
- 4.1.11. Application and processing.

Note 2—A typical ordering description is as follows: 5000 kg [10,000 lb] Hot-Wrought Special Quality Carbon Steel Bars, 25-mm diameter by 3 m [1 in. by 10 ft] Round, M 255M/M 255, Grade 345 [50], Copper Bearing, Test Report Required, S3 Special Straightness, Boiler Supports.

5. GENERAL REQUIREMENTS

- 5.1. Material furnished under this specification shall conform to the applicable requirements for the current edition of ASTM A29/A29M.

6. MATERIALS AND MANUFACTURE

- 6.1. *Melting Practice*—The steel shall be made by either or both of the primary processes of basic oxygen or electric furnace. The primary melting may incorporate separate degassing or refining and may be followed by secondary melting using electroslag remelting or vacuum-arc remelting. Where secondary melting is employed, the heat shall be defined as all of the ingots remelted from a single primary heat.