



Standard Specification for Steel Bars, Carbon, Hot-Wrought, Special Quality¹

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This standard has been approved for use by agencies of the Department of Defense.

1. Scope

1.1 This specification covers hot-wrought special quality carbon steel bars. Special quality bar applications include forging, heat treating, cold drawing, machining, and many structural uses. A guide for the selection of steel bars is contained in Practice A 400.

1.2 The bars shall be furnished in the grades specified in Table 1. Sections and sizes of bar steel available are covered in Specification A 29/A 29M. Hot-wrought special quality carbon steel bars are produced in cut lengths and coils; the manufacturer should be consulted regarding sections and sizes available in coils, produced to a chemical composition.

1.3 Merchant quality hot-wrought carbon steel bars are covered in Specification A 575.

1.4 Some end uses may require superior surface quality, or special chemical restrictions, metallurgical characteristics, heat treatment, or surface finishes which the purchaser may obtain by designating one or more of the available Supplementary Requirements.

1.5 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 for²

A 400 Practice for Steel Bars, Selection Guide, Composition and Mechanical Properties²

A 575 Specification for Steel Bars, Carbon, Merchant Quality, M-Grades²

E 45 Practice for Determining the Inclusion Content of Steel³

E 527 Practice for Numbering Metals and Alloys (UNS)⁴

2.2 SAE Standard:

SAE J 1086 Recommended Practice for Numbering Metals and Alloys (UNS)⁵

3. Ordering Information

3.1 Orders under this specification should include the following, as required, to describe adequately the desired material:

3.1.1 Quantity (weight or number of bars),

3.1.2 Name of material (hot-wrought carbon steel bars),

3.1.3 Dimensions,

3.1.4 ASTM specification number and date of issue,

3.1.5 Deoxidation practice (see 4.2.1),

3.1.6 Grade designation or chemical composition limits (see 5.1 and Table 1),

3.1.7 Coarse or fine grain steel (4.2.2),

3.1.8 Test reports, if required (Section 7),

3.1.9 Additions to the specification and Supplementary Requirements, if required, and

3.1.10 End use.

NOTE 1—A typical ordering description is as follows: 10 000 lb, carbon steel bars, hot rolled 1 000 in. diameter by 10 ft, ASTM A 576 dated ___, killed steel, Grade 1018, test reports required, coarse grain Supplementary Requirement S10, welded industrial fan hubs and shafts.

4. Materials and Manufacture

4.1 *Melting Practice*—The steel shall be made by one or more of the following primary processes: open-hearth, 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.

4.2 Deoxidation:

4.2.1 Unless otherwise specified, the steel shall be rimmed, capped, semi-killed, or killed at the manufacturer's option.

4.2.2 If killed steel is specified, the purchaser may designate that the steel be made to coarse or fine austenitic grain size (see S10 or S11).

NOTE 2—Assured coarse grain size is not always possible since certain

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

³ *Annual Book of ASTM Standards*, Vol 03.01.

⁴ *Annual Book of ASTM Standards*, Vol 01.01.

⁵ Available from Society of Automotive Engineers, 400 Commonwealth Drive, Warrendale, PA 15096.