Designation: A 968/A 968M – 96 (Reapproved 2001)

Standard Specification for Chromium, Chromium-Nickel, and Silicon Alloy Steel Bars and Shapes for Corrosion and Heat-Resisting Service[1]

This standard is issued under the fixed designation A 968/A 968M; 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.

1. Scope

1.1 This specification covers hot- and cold-finished alloy steel bars having a chromium content equal to or less than 11.0 % including rounds, squares, hexagons, and hot-rolled or extruded shapes for use in corrosion and heat-resisting service.

1.2 Some steels covered by this specification, especially the high silicon-containing steels, because of their particular alloy content and specialized properties, may require special care in their fabrication and welding. Specific procedures are of fundamental importance, and it is presupposed that all parameters will be in accordance with approved test methods capable of producing the desired properties in the finished fabrication.

1.3 The values stated in either inch-pound units or SI units are to be regarded separately as standard. The values stated in each system are not exact equivalents; therefore, each system must be used independently of the other. Combining values from the two systems may result in nonconformance with this specification.

1.4 This specification and the applicable material specifications are expressed in both inch-pound and SI units. However, unless the order specifies the applicable "M" specification designation (SI units), the material shall be furnished in inch-pound units.

2. Referenced Documents

2.1 *ASTM Standards:*

A 484/A 484M Specification for General Requirements for Stainless Steel Bars, Billets, and Forgings[2]

A 751 Test Methods, Practices, and Terminology for Chemical Analysis of Steel Products[2]

E 527 Practice for Numbering Metals and Alloys (UNS)[3]

2.2 *SAE Standard:*

SAE J 1086 Recommended Practice for Numbering Metals and Alloys[4]

3. Ordering Information

3.1 It is the responsibility of the purchaser to specify all requirements that are necessary for material ordered under this specification. Such requirements may include, but are not limited to, the following:

3.1.1 Quantity (weight or number of pieces);

3.1.2 Dimensions, including diameter or thickness (and width), shape or form, applicable prints or sketches, length, and so forth;

3.1.3 Type or UNS designation (see Table 1);

3.1.4 ASTM designation and edition year if other than latest edition;

3.1.5 Heat-treated condition (see Section 5);

3.1.6 Finish (see Manufacture section of Specification A 484/A 484M);

3.1.7 Supplementary requirements invoked for special services;

3.1.8 Whether bars are to be rolled as bars or cut from strip or plate;

3.1.9 Preparation for delivery (see Preparation for Delivery section of Specification A 484/A 484M);

3.1.10 Marking requirements (see Marking section of Specification A 484/A 484M);

3.1.11 Surface preparation of shapes (see Manufacture section of Specification A 484/A 484M); and

3.1.12 The intended use of the material, if the purchaser considers this useful information.

NOTE 1—A typical ordering description is as follows: 5000 lb [2000 kg]; 1.000-in. [25-mm] round bar by 10 to 12 ft [3 to 4 m]; UNS S70003; to Specification A XXX [A XXX]; annealed; centerless ground; plus any optional supplementary requirements; such as, for example, special marking instructions.

4. General Requirements

4.1 In addition to the requirements of this specification, all requirements of the current editions of Specification A 484/A 484M shall apply. Failure to comply with the general requirements of Specification A 484/A 484M constitutes nonconformance with this specification.

5. Heat Treatment

5.1 UNS S70003 shall be furnished in the solution annealed

[1] This specification is under the jurisdiction of ASTM Committee A01 on Steel, Stainless Steel, and Related Alloys and is the direct responsibility of Subcommittee A01.17 on Flat-Rolled and Wrought Stainless.

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[2] *Annual Book of ASTM Standards*, Vol 01.03.

[3] *Annual Book of ASTM Standards*, Vol 01.01.

[4] Available from Society of Automotive Engineers, 400 Commonwealth Drive, Warrendale, PA 15096.

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TABLE 1 Chemical Composition, %[A]

Grade	. . .
UNS Designation[B]	S70003
C	0.02
Mn	2.0
P	0.025
S	0.010
Si	6.5 to 8.0
Ni	22.0 to 25.0
Cr	8.0 to 11.0
Mo	0.50

[A] Maximum, unless range or minimum is indicated.
[B] Refer to Practice E 527 and Recommended Practice SAE J 1086.

condition with subsequent light drawing and straightening permitted.

6. Chemical Composition

6.1 Chemical composition shall be reported to the purchaser, or his representative, and shall conform to the requirements specified in Table 1.

6.2 When a product analysis is performed or requested by the purchaser, the tolerance limits as described in Specification A 484/A 484M apply.

6.3 Methods and practices relating to chemical analysis required by this specification shall be in accordance with Test Methods, Practices, and Terminology A 751.

7. Mechanical Properties

7.1 The material shall conform to the mechanical property requirements specified in Table 2 for the grade ordered. At least one room-temperature test shall be performed by the manufacturer on a sample from at least one bar or shape from each lot of material.

7.2 The yield strength shall be determined by the offset (0.2 %) method as prescribed in Test Methods and Definitions A 370.

7.3 Hardness measurements, when required, shall be made at a location midway between the surface and the center of the cross section.

8. Certification

8.1 The material manufacturer's certificate of compliance certifying that the material was manufactured and tested in accordance with this specification, together with a report of the results required by this specification and the purchase order, shall be furnished at the time of shipment. The certification shall be positively relatable to the lot of material represented.

9. Product Marking

9.1 Marking requirements shall be in accordance with Specification A 484/A 484M.

TABLE 2 Mechanical Test Requirements

Grade	UNS Designation[A]	Tensile Strength, min, ksi (MPa)	0.2 % Yield Strength, min, ksi (MPa)	Elongation in 2 in. or 50 mm, min, %	Hardness, max[B]	
					Brinell	Rockwell B
. . .	S70003	78 (540)	35 (240)	40	217	95

[A] Refer to Practice E 527 and Recommended Practice SAE J 1086.
[B] Either Brinell or Rockwell B is permissible.

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