



Designation: F 139 – 00

Standard Specification for Wrought-18 Chromium-14 Nickel-2.5 Molybdenum Stainless Steel Sheet and Strip for Surgical Implants (UNS S31673)¹

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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 the requirements for wrought 18 chromium-14 nickel-2.5 molybdenum stainless steel sheet and strip used for the manufacture of surgical implants.

1.2 The values stated in inch-pound units are to be regarded as the standard.

2. Referenced Documents

2.1 ASTM Standards:

A 262 Practices for Detecting Susceptibility to Intergranular Attack in Austenitic Stainless Steels²

A 480/A480M Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip²

A 751 Test Methods, Practices, and Terminology for Chemical Analysis of Steel Products²

E 45 Test Methods for Determining the Inclusion Content of Steel³

E 112 Test Methods for Determining the Average Grain Size³

F 981 Practice for Assessment of Compatibility of Biomaterials for Surgical Implants With Respect to Effect of Materials on Muscle and Bone⁴

2.2 ISO Standard:

ISO 5832-1 Implants for Surgery—Metallic Materials—Part 1: Wrought Stainless Steel⁵

2.3 American Society for Quality Control (ASQC) Standard:

C1 Specification of General Requirements for a Quality Program⁶

3. General Requirements for Delivery

3.1 In addition to the requirements of this specification, all requirements of the current edition of Specification A 480/A 480M shall apply.

3.2 In the case where a conflict exists between this specification and those listed in 2.1 and 2.2, this specification shall take precedence.

4. Ordering Information

4.1 Inquiries and orders for material under this specification shall include the following information:

4.1.1 Quantity (weight or number of pieces),

4.1.2 ASTM designation,

4.1.3 Form (sheet or strip),

4.1.4 Condition (see 5.1),

4.1.5 Mechanical properties (if applicable, for special conditions),

4.1.6 Finish (see 5.2),

4.1.7 Applicable dimensions including size, thickness, width, and length (exact, random, multiples) or print number, and

4.1.8 Special requirements.

5. Materials and Manufacture

5.1 Condition:

5.1.1 Sheet and strip shall be furnished as specified, in the annealed or cold-worked condition (see Table 1).

5.2 Finish:

5.2.1 Types of finish available in sheet and strip are dull cold rolled, bright cold rolled, intermediate polished, general-purpose polished, dull satin-finished, high luster finish, mirror finish, or as specified in the purchase order.

6. Chemical Composition

6.1 The heat analysis shall conform to the requirements as to chemical composition specified in Table 2.

6.1.1 The compositional requirement shall meet the following:

$$\% \text{Cr} + 3.3 \times \% \text{Mo} \geq 26.0 \quad (1)$$

6.1.2 Requirements for the major and minor elemental

¹ This specification is under the jurisdiction of ASTM Committee F04 on Medical and Surgical Materials and Devices and is the direct responsibility of Subcommittee F04.12 on Metallurgical Materials.

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

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

⁴ *Annual Book of ASTM Standards*, Vol 13.01.

⁵ Available from American National Standards Institute (ANSI), 25 W. 43rd St., 4th Floor, New York, NY 10036.

⁶ Available from American Society for Quality Control, 161 W. Wisconsin Ave., Milwaukee, WI 53203.