



Designation: F 1586 – 02

# Standard Specification for Wrought Nitrogen Strengthened 21 Chromium—10 Nickel— 3 Manganese—2.5 Molybdenum Stainless Steel Alloy Bar for Surgical Implants (UNS S31675)<sup>1</sup>

This standard is issued under the fixed designation F 1586; 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 ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

## 1. Scope

1.1 This specification covers the chemical, mechanical, and metallurgical requirements for wrought nitrogen strengthened 21 chromium—10 nickel—3 manganese—2.5 molybdenum stainless steel alloy bar for surgical implants.

1.2 The values stated in inch-pound units are to be regarded as the standard. The SI equivalents of the inch-pound units may be approximate.

## 2. Referenced Documents

### 2.1 ASTM Standards:

- A 262 Practices for Detecting Susceptibility to Intergranular Attack in Austenitic Stainless Steels<sup>2</sup>
- A 484 Specification for General Requirements for Stainless Steel Bars, Billets, and Forgings<sup>3</sup>
- A 751 Test Methods, Practices, and Terminology for Chemical Analysis of Steel Products<sup>2</sup>
- E 8 Test Methods for Tension Testing of Metallic Materials<sup>4</sup>
- E 10 Test Method for Brinell Hardness of Metallic Materials<sup>4</sup>
- E 18 Test Methods for Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials<sup>4</sup>
- E 45 Test Method for Determining the Inclusion Content of Steel<sup>4</sup>
- E 112 Test Methods for Determining Average Grain Size<sup>4</sup>
- E 354 Test Methods for Chemical Analysis of High-Temperature, Electrical, Magnetic, and Other Similar Iron, Nickel, and Cobalt Alloys<sup>5</sup>
- F 138 Specification for Wrought 18 Chromium–14 Nickel–2.5 Molybdenum Stainless Steel Bar and Wire for Surgical Implants (UNS 31673)<sup>6</sup>
- F 746 Test Method for Pitting or Crevice Corrosion of

Metallic Surgical Implant Materials<sup>6</sup>

### 2.2 Aerospace Material Specifications:

AMS 2248 Chemical Check Analysis Limits, Corrosion and Heat Resistant Steels and Alloys, Maraging and Other Highly-Alloyed Steels, and Iron Alloys<sup>7</sup>

### 2.3 ASQC Standard:

ASQ C1 Specification of General Requirements for a Quality Program<sup>8</sup>

### 2.4 ISO Standard:

ISO 6892 Metallic Materials Tensile Testing at Ambient Temperature<sup>9</sup>

## 3. General Requirements for Delivery

3.1 In addition to the requirements of this specification, all requirements of the current edition of Specification A 484 shall apply.

3.2 In cases in which a conflict exists between this specification and the standards listed in Section 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,

4.1.2 ASTM designation and date of issue,

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

4.1.4 Form,

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

4.1.6 Condition (see 5.1),

4.1.7 Finish (see 5.2),

4.1.8 Special tests (if applicable), and

4.1.9 Other requirements.

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

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<sup>2</sup> Annual Book of ASTM Standards, Vol 01.03.

<sup>3</sup> Annual Book of ASTM Standards, Vol 01.05.

<sup>4</sup> Annual Book of ASTM Standards, Vol 03.01.

<sup>5</sup> Annual Book of ASTM Standards, Vol 03.05.

<sup>6</sup> Annual Book of ASTM Standards, Vol 13.01.

<sup>7</sup> Available from Society of Automotive Engineers, Inc., 400 Commonwealth Dr., Warrendale, PA 15096-0001.

<sup>8</sup> Available from American Society for Quality, 600 N. Plankinton Ave., Milwaukee, WI 53203.

<sup>9</sup> Available from American National Standards Institute, 25 W. 43rd St., 4th Floor, New York, NY 10036.