



Designation: F 90 – 97

Standard Specification for Wrought Cobalt-20 Chromium-15 Tungsten-10 Nickel Alloy for Surgical Implant Applications (UNS R30605)¹

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1. Scope

1.1 This specification covers the requirements for wrought cobalt-20 chromium-15 tungsten-10 nickel alloy bar, wire, 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 480/A 480M Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip²

A 484/A 484M Specification for General Requirements for Stainless and Heat-Resisting Bars, Billets, and Forgings³

A 555/A 555M Specification for General Requirements for Stainless Steel Wire and Wire Rods²

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

E 8 Test Method for Tension Testing of Metallic Materials³

E 354 Test Methods for Chemical Analysis of High-Temperature, Electrical, Magnetic, and Other Similar Iron, Nickel, and Cobalt Alloys⁴

F 981 Practice for Assessment of Compatibility of Biomaterials for Surgical Implants with Respect to Effect of Materials in Muscle and Bone⁵

F 1091 Specification for Wrought Cobalt-Chromium Alloy Surgical Fixation Wire⁵

2.2 Aerospace Material Specification:

AMS 2269 Chemical Check Analysis Limits, Wrought Nickel Alloys and Cobalt Alloys⁵

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 editions of Specifications A 480/A 480M, A 484/A 484M, and A 555/A 555M shall apply.

3.2 In the case where a conflict exists between this specification and those listed in 2.1-2.3, 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 (bar, wire, sheet, strip),

4.1.4 Condition (see 6.1),

4.1.5 Finish (see 6.2),

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

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

4.1.8 Other requirements.

5. Manufacture

5.1 *Condition*—Bar, wire, sheet, and strip shall be furnished to the implant manufacturer, as specified, in the annealed or cold-worked condition.

5.2 Finish:

5.2.1 Types of finish available for bar and wire are bright-annealed, pickled, cold-drawn, ground, ground and polished or as specified in the implant manufacturer's purchase order.

5.2.2 Types of finish available for sheet and strip are brightannealed, pickled, cold-rolled, polished or as specified in the implant manufacturer's purchase order.

6. Chemical Requirements

6.1 The heat analysis shall conform to the requirements as to chemical composition specified in Table 1.

6.1.1 Requirements for the major and minor elemental constituents are listed in Table 1. Also listed are important residual elements. Analysis for elements not listed in Table 1 is not required to certify compliance with this specification.

6.2 *Product Analysis*—Product analysis tolerances do not broaden the specified heat analysis requirements, but cover

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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 03.05.

⁵ *Annual Book of ASTM Standards*, Vol 13.01.

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