



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

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1. Scope

1.1 This specification covers the requirements for wrought cobalt-20chromium-15tungsten-10nickel alloy used for surgical implants. The properties specified apply specifically to wrought bar, rod, wire, sheet, and strip, but do not apply to surgical fixation wire (see Specification F 1091).

1.2 The values stated in inch-pound units are to be regarded as the standard. The SI equivalents in parentheses are for information only.

2. Referenced Documents

2.1 ASTM Standards:

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

E 8 Test Methods 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 Alloys⁶

AMS 5759 Cobalt Alloy, Corrosion and Heat Resistant Bars, Forgings, and Rings, 52Co – 20 Cr – 10Ni – 15W, Solution Heat Treated⁶

2.3 ISO Standards

ISO 5832-5 Wrought Cobalt-Chromium-Tungsten-Nickel Alloy⁷

ISO 6892 Metallic Materials Tensile Testing at Ambient Temperature⁷

2.4 American Society for Quality (ASQ) Standard:

C1 Specification of General Requirements for a Quality Program⁸

3. Ordering Information

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

3.1.1 Quantity,

3.1.2 ASTM designation and date of issue,

3.1.3 Mechanical properties (see Section 6),

3.1.4 Form (bar, rod, wire, sheet, strip),

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

3.1.6 Condition (see 4.1),

3.1.7 Finish (see 4.2),

3.1.8 Other requirements.

4. Materials and Manufacture

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

4.2 *Finish*:

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

4.2.2 Types of finish available for sheet and strip are bright annealed, pickled, cold-rolled, polished, or as specified in the purchase order.

5. Chemical Requirements

5.1 The heat analysis shall conform to the chemical composition of Table 1. The supplier shall not ship material that is outside the limits specified in Table 1.

5.1.1 Requirements for the major and minor elemental

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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 Society of Automotive Engineers, Inc., 400 Commonwealth Dr., Warrendale, PA 15096-0001.

⁷ Available from American National Standards Association, 25 W. 43rd St., 4th Floor, New York, NY 10036.

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