



Standard Specification for Wrought Cobalt-20Nickel-20Chromium-3.5Molybdenum- 3.5Tungsten-5Iron Alloy for Surgical Implant Applications (UNS R30563)¹

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1. Scope

1.1 This specification covers the requirements for a wrought cobalt-20nickel-20chromium-3.5molybdenum-3.5tungsten-5 iron alloy in the form of bars, wires, and forgings used for the manufacture of surgical implants.

1.2 The values stated in inch-pound units are to be regarded as the standard. The SI units given 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 18 Test Methods for Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials³

E 92 Test Method for Vickers Hardness of Metallic Materials³

E 112 Test Methods for Determining Average Grain Size³

E 140 Hardness Conversion Tables for Metals (Relationship Among Brinell Hardness, Vickers Hardness, Rockwell Hardness, Rockwell Superficial Hardness, Knoop Hardness, and Scleroscope Hardness)³

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

2.2 Aerospace Material Specification:

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

2.3 ISO Standard:

ISO 5832-8 Implant for Surgery—Metallic Materials—Part

8: Wrought Cobalt-Nickel-Chromium-Tungsten-Iron Alloy⁶

2.4 ASQ Standard:

CI Specification of General Requirements for a Quality Program⁷

3. Ordering Information

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

3.1.1 Quantity (weight or number of pieces),

3.1.2 Condition (4.1),

3.1.3 Finish (4.2),

3.1.4 Mechanical properties (if applicable, for special conditions) (7.1),

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

3.1.6 Special tests, and

3.1.7 Supplementary requirements (if applicable),

3.1.8 Product uniformity, and

3.1.9 Additional tests or inspections, supplementary composition limits, if any, as required by the manufacturing process and intended application, and other supplementary requirements.

4. Materials and Manufacture

4.1 Condition:

4.1.1 Bar and wire shall be furnished to the implant manufacturer as specified, in the annealed, medium hard, hard, or, for special applications, extra hard condition, depending on the degree of cold work and aging treatment, if any.

4.1.2 Forging shall be furnished to the implant manufacturer as specified, in the forged or forged and solution heat-treated and aged condition.

4.2 *Finish*—Surface finish shall be as specified and required by the subsequent manufacturing process and the intended application, if pertinent.

5. Chemical Composition

5.1 The heat analysis shall conform to the requirements as

⁶ Available from American National Standards Institute, 11 W. 42nd St., 13th Floor, New York, NY 10036.

⁷ Available from American Society for Quality, 161 West Wisconsin Ave., Milwaukee, WI 53203.

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² *Annual Book of ASTM Standards*, Vol 01.01.

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

⁴ *Annual Book of ASTM Standards*, Vol 03.05.

⁵ Available from Society of Automotive Engineers, 400 Commonwealth Drive, Warrendale, PA 15096.