



Designation: F 562 – 00

Standard Specification for Wrought Cobalt-35 Nickel-20 Chromium-10 Molybdenum Alloy for Surgical Implant Applications UNS R 30035¹

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1. Scope

1.1 This specification covers requirements of wrought cobalt-35 nickel-20 chromium-10 molybdenum alloy in the form of bars and wires, used for the manufacture of surgical implants. This alloy depends on combinations of work-strengthening, and work-strengthening and aging to attain a variety of combinations of strength and ductility.

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

2. Referenced Documents

2.1 ASTM Standards:

E 8 Test Methods for Tension Testing of Metallic Materials²

E 112 Test Methods for Determining the Average Grain Size²

E 354 Test Methods for Chemical Analysis of High-Temperature, Electrical, Magnetic, and Other Similar Iron, Nickel, and Cobalt Alloys³

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

2.2 Federal Standard:

Federal Test Method No. 151 Metals; Test Methods⁵

2.3 Aerospace Material Specifications:

AMS 2269 Chemical Check Analysis Limits—Wrought Nickel Alloys and Cobalt Alloys⁶

2.4 American Society for Quality Standard:

ASQC1 Specification of General Requirements for a Quality Program⁷

2.5 Society of Automotive Engineers:

SAE J1086 Practice for Numbering Metals and Alloys (UNS)⁶

3. Terminology

3.1 Description of Term Specific to This Standard:

3.1.1 *capability*—the word capability is used to indicate the ability of cold worked material to attain specific mechanical properties after thermal aging treatment.

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 and date of issue,

4.1.3 Form (1.1),

4.1.4 Condition (5.1),

4.1.5 Mechanical properties (if applicable),

4.1.6 Finish (9.2),

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

4.1.8 Special tests, and

4.1.9 Special requirements.

5. Materials and Manufacture

5.1 *Condition*—Bar and wire shall be furnished, as specified, in the solution-annealed, cold-worked, or cold-worked and aged condition.

6. Chemical Requirements

6.1 The cobalt-35 nickel-20 chromium-10 molybdenum alloy shall conform to the chemical requirements prescribed in Table 1. The supplier shall not ship material that is outside the limits 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 verify compliance with this specification.

6.2 *Product Analysis*—The product analysis is either for the purpose of verifying the composition of a heat or lot or to determine variations in the composition within the heat.

6.2.1 Acceptance or rejection of a heat or lot of material

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 03.01.

³ Annual Book of ASTM Standards, Vol 03.05.

⁴ Annual Book of ASTM Standards, Vol 13.01.

⁵ Available from Standardization Documents Order Desk, Bldg. 4 Section D, 700 Robbins Ave., Philadelphia, PA 19111-5094, Attn: NPODS.

⁶ Available from Society of Automotive Engineers, Inc., 400 Commonwealth Drive, Warrendale, PA 15096-0001.

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