Designation: F 1537 – 00

Standard Specification for Wrought Cobalt - 28Chromium - 6Molybdenum Alloys for Surgical Implants (UNS R31537, UNS R31538, and UNS R31539)[1]

This standard is issued under the fixed designation F 1537; 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 (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This specification covers the requirements for three wrought cobalt - 28chromium - 6molybdenum alloys used for surgical implants. The properties specified apply specifically to wrought bar, rod, and wire.

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:*

E 8 Test Methods for Tension Testing of Metallic Materials[2]

E 18 Test Methods for Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials[2]

E 112 Test Methods for Determining Average Grain Size[2]

E 354 Test Methods for Chemical Analysis of High Temperature, Electrical, Magnetic, and Other Similar Iron, Nickel, and Cobalt Alloys[3]

F 75 Specification for Cast Cobalt-Chromium Molybdenum Alloy for Surgical Implant Applications[4]

2.2 *Aerospace Material Specifications:*

AMS 2269 Chemical Check Analysis Limits, Nickel, Nickel Alloys and Cobalt Alloys[5]

AMS 2248 Chemical Check Analysis Limits, Corrosion and Heat Resistant Steels and Alloys, Maraging and Other Highly-Alloyed Steels, and Iron Alloys[5]

AMS 2630 Ultrasonic Inspection[5]

2.3 *American Society for Quality Standard:*

ASQ C1 Specification of General Requirements for a Quality Program[6]

3. Significance and Use

3.1 The purpose of this specification is to characterize the chemical, mechanical, and metallurgical requirements of wrought cobalt - 28chromium - 6 molybdenum bar, rod, and wire.

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 alloy number,

4.1.3 Mechanical properties (See Section 7),

4.1.4 Form (bar, rod or wire),

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

4.1.6 Condition (See Section5,

4.1.7 Special tests (if any), and

4.1.8 Other requirements.

5. Condition

5.1 Product shall be furnished as specified below:

5.1.1 The annealed condition is typically supplied as a hot rolled and annealed product.

5.1.2 The hot worked condition is typically supplied as a hot rolled and unannealed product.

5.1.3 The warm worked condition is typically supplied as a thermomechanically processed product to achieve a strainhardened structure.

5.1.4 Other conditions may be provided as agreed upon between purchaser and supplier.

6. Chemical Requirements

6.1 The cobalt-28chromium-6molybdenum alloys 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 for the applicable alloy.

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.

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

[6] Available from American Society for Quality, 611 East Wisconsin Avenue, Milwaukee, WI 53203.