



Standard Specification for Cobalt-28 Chromium-6 Molybdenum Casting Alloy and Cast Products for Surgical Implants (UNS R30075)¹

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1. Scope

1.1 This specification covers the requirements for cobalt-28 chromium-6 molybdenum casting alloy in, shot, bar, or ingot form for surgical implant applications.

1.2 This specification also describes the chemical analysis requirements for investment castings produced from the alloy described in this specification. This specification is not concerned with any other specific requirements or recommendations for investment castings.

1.3 Requirements for powder produced from the alloy described in this specification are provided in Specification F 1377.

1.4 The values stated in inch-pound units are to be regarded as the standard.

2. Referenced Documents

2.1 ASTM Standards:

E 8 Test Methods of Tension Testing of Metallic Materials²

E 18 Test Methods for Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials²

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 (Nonporous) for Surgical Implants with Respect to Effect of Materials in Muscle and Bone⁴

F 1377 Specification for Cobalt-28 Chromium-6 Molybdenum Powder for Coating of Orthopedic Implants (UNS-R 30075)⁴

2.2 Aerospace Material Specification:

AMS 2248 Chemical Check Analysis Limits, Wrought Heat, and Corrosion-Resistant Steels and Alloys⁵

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

2.3 American Society for Quality Standard:

ASQ CI General Requirements for a Quality Program⁶

3. Significance and Use

3.1 This specification characterizes the composition and properties in the starting material (for example, remelt alloy), used to investment cast cobalt-28 chromium-6 molybdenum alloy surgical implants.

4. Ordering Information

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

4.1.1 Quantity (weight),

4.1.2 ASTM designation,

4.1.3 Mechanical properties (if applicable),

4.1.4 Form (shot, bar, ingot),

4.1.5 Applicable dimensions or print number,

4.1.6 Condition,

4.1.7 Special tests, and

4.1.8 Other requirements.

5. Chemical Requirements

5.1 The heat analysis shall conform to the requirements as to chemical composition prescribed in Table 1. The product analysis tolerances shall conform to the requirements prescribed in Table 2. Product analysis tolerances do not broaden the specified heat analysis, but cover variation between laboratories in the measurement of chemical content.

5.2 Investment castings produced from alloy conforming to this specification shall also conform to the chemical requirements of Table 1.

5.3 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.

5.4 For referee purposes, Test Methods E 354 shall be used.

6. Mechanical Requirements

6.1 Tensile Properties:

6.1.1 Materials shall conform to the mechanical property requirements given in Table 3 when tested in accordance with Test Methods E 8.

¹ This specification is under the jurisdiction of ASTM Committee F-4 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, 400 Commonwealth Drive, Warrendale, PA 15096.

⁶ Available from American Society for Quality, 611 East Wisconsin Ave., Milwaukee, WI 53203.