



Designation: F 799 – 02

## Standard Specification for Cobalt-28Chromium-6Molybdenum Alloy Forgings for Surgical Implants (UNS R31537, R31538, R31539)<sup>1</sup>

This standard is issued under the fixed designation F 799; 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 requirements of cobalt-28chromium-6molybdenum alloy (UNS R31537, R31538, R31539) high-strength forgings for the manufacture of surgical implants. The properties specified in this document specifically apply to finished or semifinished parts that receive no subsequent thermomechanical processing.

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.

1.3 Wrought material to be used as forging stock in the manufacture of forgings conforming to this specification, typically hot worked and unannealed with a surface finish suitable for forging, shall be fabricated and supplied in accordance with F 1537.

### 2. Referenced Documents

2.1 *ASTM Standards:*

**E 8** Test Methods for Tension Testing of Metallic Materials<sup>2</sup>

**E 18** Test Methods for Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials<sup>2</sup>

**E 112** Test Methods for Determining Average Grain Size<sup>2</sup>

**E 165** Test Method for Liquid Penetrant Examination<sup>3</sup>

**E 930** Test Methods for Estimating the Largest Grain Observed in a Metallographic Section (ALA Grain Size)<sup>2</sup>

**F 75** Specification for Cast Cobalt-Chromium-Molybdenum Alloy for Surgical Implant Applications<sup>4</sup>

**F 601** Practice for Fluorescent Penetrant Inspection of Metallic Surgical Implants<sup>4</sup>

**F 981** Practice for Assessment of Compatibility of Biomaterials for Surgical Implants with Respect to Effect of Materials on Muscle and Bone<sup>4</sup>

**F 1537** Specification for Wrought Cobalt-28Chromium-

6Molybdenum Alloys for Surgical Implants<sup>4</sup>

2.2 *ISO Standards:*<sup>5</sup>

ISO 6892 Metallic Materials—Tensile Testing at Ambient Temperature

2.3 *American Society for Quality Standard:*<sup>6</sup>

**ASQ C1** Specification of General Requirements for a Quality Program

### 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, date of issue, and alloy number,

3.1.3 Mechanical properties,

3.1.4 Form,

3.1.5 Applicable dimensions or drawing number,

3.1.6 Condition,

3.1.7 Special tests, if any, and

3.1.8 Other requirements.

### 4. Materials and Manufacture

4.1 Materials for forgings shall be bar, rod, or wire fabricated in accordance with Specification F 1537.

4.2 The material shall be forged by hammering, pressing, rolling, extruding, or upsetting, and shall be processed, if practicable, so as to cause metal flow during the hot-working operation to be in the most favorable direction for resisting stresses encountered in service, as may be indicated to the supplier by the purchaser.

4.3 Forgings shall be free of splits, scale, cracks, flaws, and other imperfections not consistent with good commercial practice.

4.4 Optional identification marks, including the purchaser's logo, material designation, heat code number, and impression number, may be placed upon each forging, the method and location of which shall be as specified by the purchaser.

<sup>1</sup> 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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<sup>2</sup> *Annual Book of ASTM Standards*, Vol 03.01.

<sup>3</sup> *Annual Book of ASTM Standards*, Vol 03.03.

<sup>4</sup> *Annual Book of ASTM Standards*, Vol 13.01.

<sup>5</sup> Available from American National Standards Institute, 25 W. 43rd St., 4th Floor, New York, NY 10036.

<sup>6</sup> Available from American Society for Quality, 600 N. Plankinton Ave., Milwaukee, WI 53203.

\*A Summary of Changes section appears at the end of this standard.