



Designation: B 815 – 97

Standard Specification for Cobalt-Chromium-Nickel-Molybdenum-Tungsten Alloy (UNS R31233) Rod¹

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1. Scope

1.1 This specification covers cobalt-chromium-nickel-molybdenum-tungsten alloy UNS R31233 in the form of rod for wear applications and general corrosion service.

1.2 The following products are covered under this specification:

1.2.1 Rods $\frac{3}{16}$ to $\frac{3}{4}$ in. (9.76 to 19.05 mm) exclusive in diameter, hot or cold finished, solution-annealed, and pickled or mechanically descaled; and

1.2.2 Rods $\frac{3}{4}$ to $3\frac{1}{2}$ in. (19.05 to 88.9 mm) inclusive in diameter, hot or cold finished, solution annealed, ground, or turned.

1.3 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are for information only.

2. Referenced Documents

2.1 *ASTM Standards:*

E 8 Test Methods for Tension Testing of Metallic Materials²

E 29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications³

E 55 Practice for Sampling Wrought Nonferrous Metals and Alloys for Determination of Chemical Composition⁴

E 1473 Test Methods for Chemical Analysis of Nickel, Cobalt, and High-Temperature Alloys⁵

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *rod*—product of round solid section furnished in straight lengths.

4. Ordering Information

4.1 It is the responsibility of the purchaser to specify all requirements that are necessary for the safe and satisfactory performance of material ordered under this specification.

Examples of such requirements include, but are not limited to, the following:

4.1.1 *Alloy.*

4.1.2 *Dimensions*—Nominal diameter and length. The shortest usable multiple length shall be specified (Table 1).

4.1.3 *Certification*— State whether certification or a report of test results is required (Section 15).

4.1.4 *Purchaser Inspection*—State which tests or inspections are to be witnessed (Section 13).

4.1.5 *Samples for Product (Check) Analysis*—State whether samples should be furnished (9.2.2).

5. Chemical Composition

5.1 The material shall conform to the chemical composition requirements prescribed in Table 2.

5.2 If a product (check) analysis is made by the purchaser, the material shall conform to the requirements specified in Table 2 subject to the permissible tolerances given in Table 3.

6. Mechanical Properties and Other Requirements

6.1 The mechanical properties of the material at room temperature shall conform to those given in Table 4.

7. Dimensions, Mass, and Permissible Variations

7.1 *Diameter*—The permissible variations from the specified diameter shall be as prescribed in Table 5.

7.2 *Out-of-Roundness*— The permissible variation in roundness shall be as prescribed in Table 5.

7.3 *Machining Allowances*—When the surfaces of finished material are to be machined, the following allowances are suggested for normal machining operations:

7.3.1 *As-Finished (Annealed and Descaled)*—For diameters of $\frac{5}{16}$ to $\frac{11}{16}$ in. (7.94 to 17.46 mm) inclusive, an allowance of $\frac{1}{16}$ in. (1.59 mm) on the diameter should be made for finish machining.

7.4 *Length:*

7.4.1 Unless multiple, nominal, or cut lengths are specified, random mill lengths shall be furnished.

7.4.2 The permissible variations in length of multiple, nominal, or cut length rod shall be as prescribed in Table 1. Where rods are ordered in multiple lengths, a $\frac{1}{4}$ -in. (6.35-mm) length addition shall be permitted for each uncut multiple length.

¹ This specification is under the jurisdiction of ASTM Committee B-2 on Nonferrous Metals and Alloys and is the direct responsibility of Subcommittee B02.07 on Refined Nickel and Cobalt and Their Alloys.

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² *Annual Book of ASTM Standards*, Vol 03.01.

³ *Annual Book of ASTM Standards*, Vol 14.02.

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

⁵ *Annual Book of ASTM Standards*, Vol 03.06.