



Designation: B 621 – 95a

Standard Specification for Nickel-Iron-Chromium-Molybdenum Alloy (UNS N08320) Rod¹

This standard is issued under the fixed designation B 621; 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 specification² covers nickel-iron chromium-molybdenum alloy (UNS N08320)* rod for use in general corrosive service.

1.2 The following products are covered under this specification:

1.2.1 Rods $\frac{5}{16}$ to $\frac{3}{4}$ in. (7.94 to 19.05 mm) excl in diameter, hot or cold finished, solution annealed and pickled or mechanically descaled.

1.2.2 Rods $\frac{3}{4}$ to $3\frac{1}{2}$ in. (19.05 to 88.9 mm) incl 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 Materials³

E 29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications⁴

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

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

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

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

5. Chemical Composition

5.1 The material shall conform to the composition limits specified 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 in Table 3.

6. Mechanical Properties and Other Requirements

6.1 The mechanical properties of the material at room temperature shall conform to those shown 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 *Matching 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) incl, 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, an additional $\frac{1}{4}$ in.

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 Alloys Containing Nickel or Cobalt, or Both, as Principal Constituents.

² For ASME Boiler and Pressure Vessel Code applications see related Specification SB-621 in Section II of that Code.

* New designation established in accordance with ASTM E527 and SAE J1086, Recommended Practice for Numbering Metals and Alloys (UNS).

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³ *Annual Book of ASTM Standards*, Vol 03.01.

⁴ *Annual Book of ASTM Standards*, Vol 14.02.

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