



Standard Specification for Nickel-Iron-Chromium Alloy Rod and Bar¹

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1. Scope

1.1 This specification² covers UNS N08120, UNS N08800, UNS N08810, and UNS N08811* in the form of hot-worked and cold-worked rod and bar. Alloy UNS N08800 is normally employed in service temperatures up to and including 1100°F (593°C). Alloys UNS N08120, UNS N08810, and UNS N08811 are normally employed in service temperatures above 1100°F (593°C) where resistance to creep and rupture is required, and they are annealed to develop controlled grain size for optimum properties in this temperature range.

1.2 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 112 Test Methods for Determining the Average Grain Size³

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 *bar*—material of rectangular (flats), hexagonal, or square solid section up to and including 10 in. (254 mm) in width and ⅛ in. (3.2 mm) and over in thickness in straight lengths.

3.1.1.1 *Discussion*—Hot-worked rectangular bar in widths 10 in. (254 mm) and under may be furnished as hot-rolled plate with sheared or cut edges in accordance with Specification

B 408, provided the mechanical property requirements of Specification B 408 are met.

3.1.2 *rod*—material of round solid section furnished in straight lengths.

4. Ordering Information

4.1 Orders for material to this specification should include information with respect to the following:

4.1.1 ASTM designation, and year of issue.

4.1.2 Alloy designation or UNS number.

4.1.3 *Section*—Rod (round) or bar (square, hexagonal, or rectangular).

4.1.4 *Dimensions*—Dimensions including length (Section 8, Tables 1-4 incl).

4.1.5 *Condition* (Table 5 and Appendix Appendix X1).

4.1.6 *Finish* (Appendix X1).

4.1.7 *Quantity* (feet or number of pieces).

4.1.8 *Certification*—State if certification or a report of test results is required (Section 16).

4.1.9 *Samples for Product (Check) Analysis*—State whether samples for product (check) analysis should be furnished.

4.1.10 *Purchaser Inspection*—If purchaser wishes to witness tests or inspection of material at place of manufacture, the purchase order must so state indicating which test or inspections are to be witnessed.

5. Materials and Manufacture

5.1 *Heat Treatment*—The final heat treatment of UNS N08120 shall be 2150°F (1177°C) minimum, UNS N08810, 2050°F (1121°C) minimum, and UNS N08811, 2100°F (1149°C) minimum.

6. Chemical Composition

6.1 The material shall conform to the composition limits specified in Table 6.

6.2 If a product (check) analysis is performed by the purchaser, the material shall conform to the product (check) analysis variations in Table 6.

7. Mechanical Properties and Other Requirements

7.1 *Mechanical Properties*—The material shall conform to the mechanical properties specified in Table 5.

7.2 *Grain Size*—Annealed UNS Alloys N08120, N08810, and N08811 shall conform to an average grain size of ASTM No. 5 or coarser.

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.

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² For ASME Boiler and Pressure Vessel Code applications see related Specification SB-408 in Section II of that Code.

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

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.