



Standard Specification for Castings, Nickel and Nickel Alloy¹

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1. Scope

1.1 This specification covers nickel, nickel-copper, nickel-copper-silicon, nickel-molybdenum, nickel-chromium, and nickel-molybdenum-chromium alloy castings for corrosion-resistant service.

1.2 The values stated in either inch-pound units or SI units are to be regarded separately as standard. Within the text, the SI units are shown in brackets. The values stated in each system are not exact equivalents; therefore, each system must be used independently of the other. Combining values from the two systems may result in nonconformance with the specification. Inch-pound units are applicable for material ordered to Specification A 494 and SI units for material ordered to Specification A 494M.

2. Referenced Documents

2.1 ASTM Standards:

- A 370 Test Methods and Definitions for Mechanical Testing of Steel Products²
- A 488/A488M Practice for Steel Castings, Welding, Qualifications of Procedures and Personnel³
- A 732/A732M Specification for Castings, Investment, Carbon and Low-Alloy Steel for General Application, and Cobalt Alloy for High Strength at Elevated Temperatures³
- A 781/A781M Specification for Castings, Steel and Alloy, Common Requirements, for General Industrial Use³
- E 8 Test Methods for Tension Testing of Metallic Materials⁴
- E 29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications⁵
- E 30 Test Methods for Chemical Analysis of Steel, Cast Iron, Open-Hearth Iron, and Wrought Iron⁶
- E 38 Methods for Chemical Analysis of Nickel-Chromium and Nickel-Chromium-Iron Alloys⁷
- E 76 Test Methods for Chemical Analysis of Nickel-Copper Alloys⁶

¹ This specification is under the jurisdiction of ASTM Committee A-1 on Steel, Stainless Steel, and Related Alloys and is the direct responsibility of Subcommittee A01.18 on Castings.

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² Annual Book of ASTM Standards, Vol 01.03.

³ Annual Book of ASTM Standards, Vol 01.02.

⁴ Annual Book of ASTM Standards, Vol 03.01.

⁵ Annual Book of ASTM Standards, Vol 14.02.

⁶ Annual Book of ASTM Standards, Vol 03.05.

⁷ Discontinued, see 1989 Annual Book of ASTM Standards, Vol 03.05.

E 354 Test Methods for Chemical Analysis of High-Temperature, Electrical, Magnetic, and Other Similar Iron, Nickel, and Cobalt Alloys⁶

2.2 Military Standards:⁸

NAVSEA T9074–AS-GIB-010/271 Requirements for Non-destructive Testing Methods

NAVSEA S9074–AR-GIB-010/2718 Requirements for Fabrication Welding and Inspection, and Casting Inspection and Repair for Machinery, Piping, and Pressure Vessels

3. Terminology

3.1 Definitions:

3.1.1 *master heat*—a single furnace charge of refined alloy which may either be poured directly into castings or into remelt alloy for individual melts.

3.1.2 *melts*—a single furnace charge poured into castings. When master heats are used to prepare melts, a melt analysis shall be reported.

4. General Conditions for Delivery

4.1 Material furnished to this specification shall conform to the requirements of Specification A 781/A 781M, including any supplementary requirements that are indicated in the purchase order. Failure to comply with the general requirements of Specification A 781/A 781M constitutes nonconformance with this specification. In case of conflict between the requirements of this specification and Specification A 781/A 781M, this specification shall prevail.

5. Ordering Information

5.1 Orders for castings to this specification should include the following information:

5.1.1 Quantity, in pieces, and

5.1.2 Grade designation (Table 1) and class (Table 2).

5.2 The purchaser shall specify any of the following information required to describe adequately the desired material:

5.2.1 Heat treat condition (see 6.1 and 6.2),

5.2.2 Repair welding (see 11)

5.2.3 Source inspection requirements, if any (see Specification A 781/A 781M),

5.2.4 Marking-for-identification requirements, if any (see 13.1), and

5.2.5 Supplementary requirements desired, including the

⁸ Available from DODSSP, Building 4/Section D, 700 Robbins Avenue Philadelphia, PA 19111-5098