



Designation: ~~B582-02~~ Designation: B 582 - 07

Standard Specification for Nickel-Chromium-Iron-Molybdenum-Copper Alloy Plate, Sheet, and Strip¹

This standard is issued under the fixed designation B 582; 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 The specification² covers plate, sheet, and strip of nickel-chromium-iron-molybdenum-copper alloys (UNS N06007, N06975, N06985, and N06030)* as shown in Table 1, for use in general corrosive service.

1.2 The following products are covered under this specification:

1.2.1 *Sheet and Strip*—Hot or cold rolled, solution annealed, and descaled unless solution anneal is performed in an atmosphere yielding a bright finish.

1.2.2 *Plate*—Hot or cold rolled, solution annealed, and descaled.

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.

1.4 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to become familiar with all hazards including those identified in the appropriate Material Safety Data Sheet (MSDS) for this product/material as provided by the manufacturer; to establish appropriate safety and health practices, and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 *ASTM Standards:*³

B880 Specification for General Requirements for Chemical Check Analysis Limits for Nickel, Nickel Alloys and Cobalt Alloys

E8 Test Methods for Tension Testing of Metallic Materials

E18 Test Methods for Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials⁴

E29 Practice for Using Significant Digits in Test Data to Determine Conformance with Specifications

E55 Practice for Sampling Wrought Nonferrous Metals and Alloys for Determination of Chemical Composition

E140 Hardness Conversion Tables for Metals (Relationship Between Brinell Hardness, Vickers Hardness, Rockwell Hardness, Rockwell Superficial Hardness, and Knoop Hardness)⁴

E1473 Test Methods for Chemical Analysis of Nickel, Cobalt, and High-Temperature Alloys⁶ 906 Specification for General Requirements for Flat-Rolled Nickel and Nickel Alloys Plate, Sheet, and Strip

3. Terminology

3.1 *Definitions of Terms Specific to This Standard:*

3.1.1 *cold-rolled plate* cold-rolled plate, *n*—material $\frac{3}{16}$ to $\frac{3}{8}$ in. (4.76 to 9.52 mm), inclusive, in thickness.

3.1.2 *hot-rolled plate* hot-rolled plate, *n*—material $\frac{3}{16}$ in. (4.76 mm) and over in thickness.

3.1.3 *plate* plate, *n*—material $\frac{3}{16}$ in. (4.76 mm) and over in thickness.

3.1.4 *sheet and strip* sheet and strip, *n*—material under $\frac{3}{16}$ in. (4.76 mm) in thickness.

4. Ordering Information

4.1 It is the responsibility of the purchaser to specify all requirements that are necessary for material ordered under this specification. Examples of such requirements include, but are not limited to, the following:

4.1.1 General Requirements

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² For ASME Boiler and Pressure Vessel Code applications, see related Specification SB-582 in Section II of that Code.

* New designation established in accordance with ASTM E 527 and SAE J1086, Practice for Numbering Metals and Alloys (UNS).

³ For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards*, Vol 02.04, volume information, refer to the standard's Document Summary page on the ASTM website.

TABLE 1 Chemical Requirements

| Element | Composition Limits, % | | | |
|----------------------|------------------------|------------------------|------------------------|------------------------|
| | Alloy N06007 | Alloy N06975 | Alloy N06985 | Alloy N06030 |
| Nickel | remainder ^A | 47.0 to 52.0 | remainder ^A | remainder ^A |
| Chromium | 21.0 to 23.5 | 23.0 to 26.0 | 21.0 to 23.5 | 28.0 to 31.5 |
| Iron | 18.0 to 21.0 | remainder ^A | 18.0 to 21.0 | 13.0 to 17.0 |
| Molybdenum | 5.5 to 7.5 | 5.0 to 7.0 | 6.0 to 8.0 | 4.0 to 6.0 |
| Copper | 1.5 to 2.5 | 0.70 to 1.20 | 1.5 to 2.5 | 1.0 to 2.4 |
| Manganese | 1.0 to 2.0 | 1.0 max | 1.0 max | 1.5 max |
| Cobalt, max | 2.5 | ... | 5.0 | 5.0 |
| Carbon, max | 0.05 | 0.03 | 0.015 | 0.03 |
| Tungsten | 1.0 max | ... | 1.5 max | 1.5 to 4.0 |
| Silicon, max | 1.0 | 1.0 | 1.0 | 0.8 |
| Phosphorus, max | 0.04 | 0.03 | 0.04 | 0.04 |
| Sulfur, max | 0.03 | 0.03 | 0.03 | 0.02 |
| Columbium + tantalum | 1.75 to 2.50 | ... | 0.50 max | 0.30 to 1.50 |
| Titanium | ... | 0.70–1.50 | ... | ... |

^A The composition of the remainder element shall be determined arithmetically by difference.

4.1 Materials furnished to this specification shall conform to the applicable requirements of Specification B 906 unless otherwise provided herein.

5. Ordering Information

5.1 It is the responsibility of the purchaser to specify all requirements that are necessary for material ordered under this specification. Examples of such requirements include, but are not limited to, the following:

5.1.1 *Alloy*—Table 1,

4.1.2

5.1.2 *Dimensions*—Thickness (in decimals of an inch), width, and length (inch or fractions of an inch),

4.1.3

5.1.3 *Optional Requirement, Plate*—How the plate is to be cut (see 7.1 and Table 2),

4.1.4—How the plate is to be cut (see 8.1 and Specification B 906, Table A2.3),

5.1.4 *Certification*—State if certification or a report of test results is required (Section (Specification B 906+6),

4.1.5

5.1.5 *Purchaser Inspection*—State which tests or inspections are to be witnessed (Section (Specification B 906+4), and

4.1.6

5.1.6 *Samples for Product (Check) Analysis*—State whether samples should be furnished (Section 56).

5. Chemical Composition

5.1

6. Chemical Composition

6.1 *Heat Analysis*—The material shall conform to the composition limits specified in Table 1.

5.2

6.2 *Product (Check) Analysis*—If a product (check) analysis is made by the purchaser, the material shall conform to the requirements specified in Table 1 subject to the permissible tolerances in Specification B 880: B 906.

6.7. Mechanical Properties and Other Requirements

6.1.7.1 *Tensile Properties*—The material shall conform to the mechanical property requirements prescribed in Table 3 Table 2.

6.2

7.2 *Hardness*—The hardness values given in Table 3 Table 2 are informative only.

7. Edges

7.1

8. Edges

8.1 Plates shall have sheared or cut machined, abrasive cut, powder cut, or inert arc cut edges, as specified.

7.2 Sheet 8.2 Sheet and strip shall have sheared or slit edges.

8.9. Permissible Variations in Dimensions

8.1.9.1 *Weight*—For calculation of mass or weight, the following densities shall be used: