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Standard Specification for Ni-Fe-Cr-Mo-Cu Alloy (UNS N08825, UNS N08221, and UNS N08221)N06845) Plate, Sheet, and Strip¹

This standard is issued under the fixed designation B424; 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.

This standard has been approved for use by agencies of the Department of Defense.

1. Scope*

1.1 This specification² covers rolled nickel-iron-chromium-molybdenum-copper alloy (UNS N08825, UNS N08221, and UNS N08221)*N06845)³ plate, sheet, and strip.

1.2 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.3 *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:*⁴

B425 Specification for Ni-Fe-Cr-Mo-Cu Alloy (UNS N08825, UNS N08221, N08821, and UNS N06845) Rod and Bar

B906 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:* Descriptions of Terms Specific to This Standard—The terms given in Table 1 shall apply.

4. General Requirements

4.1 Material furnished under this specification shall conform to the applicable requirements of Specification B906.

5. Ordering Information

5.1 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:

5.1.1 ASTM designation and year of issue.

5.1.2 Alloy name or UNS number.

5.1.3 *Condition*—Table 3 and Appendix X1.

5.1.4 *Finish*—Appendix X1.

5.1.5 *Dimensions*—Thickness, width, and length.

5.1.6 *Quantity*.

5.1.7 *Optional Requirements*:

¹ This specification is under the jurisdiction of ASTM Committee B02 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 For ASME Boiler and Pressure Vessel Code applications, see related Specification SB-424 in Section II of that Code.

*New designation established in accordance with ASTM E527 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* volume information, refer to the standard's Document Summary page on the ASTM website.

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*A Summary of Changes section appears at the end of this standard.

TABLE 1 Product Description

Product	Thickness, in. (mm)
Hot-rolled plate ^A	3/16 (4.76) and over
Cold-rolled plate ^A	3/16 to 3/8 (4.8 to 9.5), incl
Hot-rolled sheet ^A	0.018 to 0.250 (0.46 to 6.4), incl
Cold-rolled sheet ^B	0.018 to 0.250 (0.46 to 6.4), incl
Cold-rolled strip ^B	0.005 to 0.250 (0.13 to 6.4), incl

^A Material 3/16 to 1/4 in. (4.8 to 6.4 mm), incl, in thickness may be furnished as sheet or plate provided the material meets the specification requirements for the condition ordered.

^B Material under 48 in. (1219 mm) in width may be furnished as sheet or strip provided the material meets the specification requirements for the condition ordered.

TABLE 2 Chemical Requirements^A

Element	UNS N08825	UNS N08221	UNS N06845
Nickel	38.0 to 46.0	39.0 to 46.0	
Nickel	38.0 to 46.0	39.0 to 46.0	44.0 to 50.0
Chromium	19.5 to 23.5	20.0 to 22.0	
Chromium	19.5 to 23.5	20.0 to 22.0	20.0 to 25.0
Iron	22.0 min ^A	balance ^B	Remainder ^B
Iron	22.0 min ^B	Balance ^B	Remainder ^B
Manganese	1.0 max	1.0 max	
Manganese	1.0	1.0	0.5
Carbon	0.05 max	0.025 max	
Carbon	0.05	0.025	0.05
Copper	1.5 to 3.0	1.5 to 3.0	
Copper	1.5 to 3.0	1.5 to 3.0	2.0 to 4.0
Silicon	0.5 max	0.5 max	
Silicon	0.5	0.5	0.5
Sulfur	0.03 max	0.03 max	
Sulfur	0.03	0.03	0.010
Aluminum	0.2 max	0.2 max	
Aluminum	0.2	0.2	...
Titanium	0.6 to 1.2	0.6 to 1.0	
Titanium	0.6 to 1.2	0.6 to 1.0	...
Molybdenum	2.5 to 3.5	5.0 to 6.5	5.0 to 7.0
Tungsten	2.0 to 5.0

^A Maximum unless range or minimum is given. Where ellipses (...) appear in this table, there is no requirement and analysis for the element need not be determined or reported.

^B Element shall be determined arithmetically by difference.

5.1.7.1 *Sheet and Strip*—Whether to be furnished in coil, in cut straight lengths, or in random straight lengths.

5.1.7.2 *Strip*—Whether to be furnished with commercial slit edge, square edge, or round edge.

5.1.7.3 *Plate*—Whether to be furnished specially flattened (see 8.7); also how plate is to be cut (Table 4).

5.1.8 *Certification*—State if certification is required (Specification B906, section on Material Test Report and Certification).

5.1.9 *Samples for Product (Check) Analysis*—Whether samples for product (check) analysis should be furnished (see Specification B906, section on Sampling).

5.1.10 *Purchaser Inspection*—If the purchaser wishes to witness tests or inspection of material at the place of manufacture, the purchase order must so state, indicating which tests or inspections are to be witnessed (Specification B906, section on Inspection).

6. Chemical Composition

6.1 The material shall conform to the composition limits specified in Table 2.

6.2 If a product (check) analysis is performed by the purchaser, the material shall conform to the product (check) analysis per Specification B906.

7. Mechanical Properties

7.1 *Mechanical Properties*—The material shall conform to the mechanical properties specified in Table 3.

8. Dimensions and Permissible Variations

8.1 *Thickness and Weight*:

8.1.1 *Plate*—For plate up to 2 in. (50.8 mm), inclusive, in thickness, the permissible variation under the specified thickness and permissible excess in overweight shall not exceed the amounts prescribed in Specification B906, Permissible Variations in Thickness and Overweight of Rectangular Plates Table.