



Designation: ~~B434-00~~ Designation: B 434 - 06

Standard Specification for Nickel-Molybdenum-Chromium-Iron Alloys (UNS N10003, UNS N10242)* Plate, Sheet, and Strip¹

This standard is issued under the fixed designation B 434; 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-molybdenum-chromium-iron alloys (UNS N10003 and UNS N10242)* plate, sheet, and strip 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, annealed, and descaled unless annealing is performed in an atmosphere yielding a bright finish.

1.2.2 *Plate*—Hot rolled, 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.~~

~~1.3 The values stated in SI 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:*

~~B880 Specification for General Requirements for Chemical Check Analysis Limits for Nickel, Nickel Alloys and Cobalt Alloys~~
~~ASTM Standards:~~³

~~E8 Test Methods for Tension Testing of Metallic Materials~~

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

~~E112 Test Methods for Determining the Average Grain Size~~⁴

~~E1473 Test Methods for Chemical Analysis of Nickel, Cobalt, and High-Temperature Alloys~~ B 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 *plate*, *n*—material $\frac{3}{16}$ in. (4.76 mm) and over in thickness.

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

4. Ordering Information

~~4. 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 General 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-434 in section II of that Code.

* New designation established in accordance with ASTM E527 Practice E 527 and SAE J1086, Recommended 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.

4.1 Material furnished under 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 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 *Dimensions*—Thickness (in decimals of an inch), width, and length (inch or fraction of an inch),

4.1.2

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

4.1.3— *State if certification or a report of test results is required,*

5.1.3 *Purchase Inspection*—State which tests or inspections are to be witnessed (Section 13), and

4.1.4—*State which tests or inspections are to be witnessed, and*

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

5.6. Chemical Composition

~~5.1~~6.1 The material shall conform to the requirements as to chemical composition prescribed in Table 1.

~~5.2~~6.2 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 ~~B 880~~Specification B 906.

6.7. Mechanical Properties and Other Requirements

~~6.1~~7.1 *Tensile Properties*—The material shall conform to the room temperature tensile properties prescribed in Table 2.

~~6.2~~7.2 *Grain Size for Sheet and Strip* —Sheet and strip shall conform to the grain size requirements given in Table 3.

~~7. Dimensions and Permissible Variations~~

~~7.1~~

8. Dimensions and Permissible Variations

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

Alloy	lb/in ³	g/cm ³
N10003	0.317	8.78
N10242	0.327	9.05

~~7.2~~

8.2 *Thickness:*

~~7.2.1~~ <https://standards.iteh.ai/catalog/standards/sist/d8be0bf6-0cdb-49be-b319-b3840bb54a15/astm-b434-06>

8.2.1 *Plate*—The permissible variations in thickness of plate shall be as prescribed in ~~Table 4~~Table A2.1 in Specification B 906.

~~7.2.2~~

8.2.2 *Sheet and Strip*—~~The permissible variations in thickness of sheet and strip shall be as prescribed in Table 5—~~ The permissible variations in thickness of sheet and strip shall be as prescribed in Table A2.2 in Specification B 906. The thickness shall be measured with the micrometer spindle 3/8 in. (9.525 mm) or more from any edge for material 1 in. (25.4 mm) or over in width and at any place on material under 1 in. in width.

TABLE 1 Chemical Requirements

Element	Composition, %	
	UNS N10242	UNS N10003
Chromium	7.0-9.0	6.0-8.0
Iron, max	2.0	5.0
Carbon	0.03 max	0.04-0.08
Silicon, max	0.80	1.00
Cobalt, max	1.00	0.20
Manganese, max	0.80	1.00
Tungsten, max	...	0.50
Vanadium, max	...	0.50
Molybdenum	24.0-26.0	15.0-18.0
Phosphorus, max	0.030	0.015
Sulfur, max	0.015	0.020
Aluminum plus titanium, max	...	0.50
Copper, max	0.50	0.35
Boron, max	0.006	0.010
Nickel	remainder	remainder
Aluminum, max	0.50	...