



Designation: B818-98a Designation: B 818 - 03 (Reapproved 2008)

Standard Specification for Cobalt-Chromium-Nickel-Molybdenum-Tungsten Alloy (UNS R31233) Plate, Sheet and Strip¹

This standard is issued under the fixed designation B 818; 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 specification covers cobalt-chromium-nickel-molybdenum-tungsten alloy UNS R31233 in the form of rolled plate, sheet, and strip for wear applications and general corrosion 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 solution-annealing is performed in an atmosphere yielding a bright finish.

1.2.2 *Plate*—Hot 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.

1.3 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.

1.4 *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 Alloys²*

E8 Test Methods for Tension Testing of Metallic Materials

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

E1473 Test Methods for Chemical Analysis of Nickel, Cobalt, and High-Temperature Alloys B 906 Specification for General

<https://standards.iteh.ai/catalog/standards/sist/8e2e3b65-5061-4d7c-be92-0d0d4708> 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*—material $\frac{3}{16}$ in. (4.76 mm) and over in thickness.

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

4. General Requirements

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

¹ This specification is under the jurisdiction of ASTM Committee B-2B02 on Nonferrous Metals and Alloys and is the direct responsibility of Subcommittee B02.07 on Refined Nickel and Cobalt and Their Alloys.

Current edition approved Oct. 10, 1998; Nov. 1, 2008. Published November 1998-2008. Originally published as B818-91 approved in 1991. Last previous edition B818-98 approved in 2003 as B 818 - 03.

² 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 02.04, volume information, refer to the standard's Document Summary page on the ASTM website.

performance of material ordered under this specification. Examples of such requirements include, but are not limited to, the following:

- 4.1.1 5.1.1 Alloy.
- 4.1.2
- 5.1.2 Dimensions—Thickness (in decimals of an inch), width, and length (inch or fraction of an inch).
- 4.1.3
- 5.1.3 Certification—State if a report of test results is required (see Section 15).
- 4.1.4—State if a report of test results is required (see Specification B 906, Section 21).
- 5.1.4 Optional Requirement—Plate; state how plate is to be cut (see 7.7.1 and Table 1).
- 4.1.5—Plate; state how plate is to be cut (see Specification B 906, Table A2.3).
- 5.1.5 Purchase Inspection—State which tests or inspections are to be witnessed (see Section 13).
- 4.1.6—State which tests or inspections are to be witnessed (see Specification B 906, Section 18).
- 5.1.6 Samples, for Product (Check) Analysis—State whether samples should be furnished (see 9.2.2).

5.—State whether samples should be furnished (see Specification B 906, Section 7.2.2).

6. Chemical Composition

- 5.1 The6.1 The material shall conform to the requirements as to chemical composition prescribed in Table 21.
- 5.2 If a product (check) analysis is made by the purchaser, the material shall conform to the requirements specified in Table 2 subject to the permissible tolerances per B880
- 6.2 If a product (check) analysis is made by the purchaser, the material shall conform to the requirements specified in Table 1 and 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 32.

7.

8. Dimensions, Mass, and Permissible Variations

- 7.1
- 8.1 Thickness:

TABLE 1 Permissible Variations in Width of Sheet and Strips

Specified Thickness, in. (mm)	Specified Width, in. (mm)	Permissible Variations in Width, in. (mm) %
+	—	—
Boron	0.015 max	
Carbon	Sheet Sheet	0.02–0.10 0.02–0.10
Chromium	23.5–27.5	
0.187 (4.75) and under	–2 (50.8) and over	0
Iron	1.0–5.8) and over	0
0.125 (3.18)	0	
Manganese	0.1–1.5	
	Strip (Slit Edges)	4.0–6.0
Molybdenum	Strip (Slit Edges)	4.0–6.0
Nitrogen	0.03–0.12	
Over 0.020 to 0.075 (0.51 to 1.90), incl	24 (610) and under	
Nickel	7.0–11.0) and under	
0.007 (0.18)	0.007 (0.18)	
Phosphorous	0.030 max	
Over 0.075 to 0.100 (1.90 to 2.54), incl	24 (610) and under	X
Sulfur	0.020 max and under	X
0.009 (0.23)	0.009 (0.23)	
Silicon	0.05–1.00	
Over 0.100 to 0.125 (2.54 to 3.18), incl	24 (610) and under	–3.0
Tungsten	1.0) and under	–3.0
0.012 (0.30)	0.012 (0.30)	
Cobalt	Remainder ⁴	

⁴ See Specification B 906.