



Designation: B 366 – 01^{ε1}

Standard Specification for Factory-Made Wrought Nickel and Nickel Alloy Fittings¹

This standard is issued under the fixed designation B 366; 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.

^{ε1} NOTE—Specification B 163 was added editorially to Table 1 in June 2001.

1. Scope

1.1 This specification covers wrought welding fittings for pressure piping, factory-made from nickel and nickel alloys. Threaded fittings as covered in ASME B16.11 are also covered by this specification. The term welding applies to butt-welding or socket-welding parts such as 45 and 90° elbows, 180° bends, caps, tees, reducers, lap-joint stub ends, and other types, as covered by ASME B16.9, ASME B16.11, ASME B16.28, MSS SP-43, MSS SP-95, and MSS SP-97.

1.1.1 Class WP fittings are those manufactured to the requirements of ASME B16.9, B16.11, or B16.28.

1.1.2 Class CR fittings are those manufactured to the requirements of MSS SP-43.

1.2 This specification does not apply to cast welding fittings.

1.3 Optional supplementary requirements are provided for fittings where a greater degree of examination is desired. These supplementary requirements call for additional tests. When desired, one or more of these may be specified in the order.

1.4 The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are for information only.

2. Referenced Documents

2.1 ASTM Standards:

B 127 Specification for Nickel-Copper Alloy (UNS N04400) Plate, Sheet, and Strip²

B 160 Specification for Nickel Rod and Bar²

B 161 Specification for Nickel Seamless Pipe and Tube²

B 162 Specification for Nickel Plate, Sheet, and Strip²

B 163 Specification for Seamless Nickel and Nickel Alloy Condenser and Heat-Exchanger Tubes²

B 164 Specification for Nickel-Copper Alloy Rod, Bar, and Wire²

B 165 Specification for Nickel-Copper Alloy (UNS N04400) Seamless Pipe and Tube²

B 166 Specification for Nickel-Chromium-Iron Alloys (UNS N06600, N06601, N06603, N06690, N06025, and N06045) and Nickel-Chromium-Cobalt-Molybdenum Alloy (UNS N06617) Rod, Bar, and Wire²

B 167 Specification for Nickel-Chromium-Iron Alloy (UNS N06600, N06601, N06690, N06025, and N06045) and Nickel-Chromium-Cobalt-Molybdenum Alloy (UNS N06617) Seamless Pipe and Tube²

B 168 Specification for Nickel-Chromium-Iron Alloys UNS N06600, N06601, N06603, N06690, N06025, and N06045 and Nickel-Chromium-Cobalt-Molybdenum Alloy UNS N06617 Plate, Sheet, and Strip²

B 333 Specification for Nickel-Molybdenum Alloy Plate, Sheet, and Strip²

B 335 Specification for Nickel-Molybdenum Alloy Rod²

B 407 Specification for Nickel-Iron-Chromium Alloy Seamless Pipe and Tube²

B 408 Specification for Nickel-Iron-Chromium Alloy Rod and Bar²

B 409 Specification for Nickel-Iron-Chromium Alloy Plate, Sheet, and Strip²

B 423 Specification for Nickel-Iron-Chromium-Molybdenum-Copper Alloy (UNS N08825 and N08221) Seamless Pipe and Tube²

B 424 Specification for Ni-Fe-Cr-Mo-Cu Alloy (UNS N08825 and UNS N08221) Plate, Sheet, and Strip²

B 425 Specification for Ni-Fe-Cr-Mo-Cu Alloy (UNS N08825 and UNS N08221) Rod and Bar²

B 434 Specification for Nickel-Molybdenum-Chromium-Iron Alloys (UNS N10003, UNS N10242) Plate, Sheet, and Strip²

B 435 Specification for UNS N06002, UNS N06230, and UNS R30556 Plate, Sheet, and Strip²

B 443 Specification for Nickel-Chromium-Molybdenum-Columbium Alloy (UNS N06625) and Nickel-Chromium-Molybdenum-Silicon Alloy (UNS N06219) Plate, Sheet, and Strip²

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.

Current edition approved May 10, 2001. Published July 2001. Originally published as B 366 – 61. Last previous edition B 366 – 01.

² Annual Book of ASTM Standards, Vol 02.04.



TABLE 1 Permissible Raw Materials

Marking ^A		Product and ASTM Designation ^B				
Corrosion-Resistant Fittings	ASME Pressure Fittings	Alloy	UNS Designation	Pipe or Tube	Plate, Sheet, or Strip	Bar Forging and Forging Stock
CRN	WPN	Ni	N02200	B 161	B 162	B 160, B 564
CRNL	WPNL	Ni, Low C	N02201	B 161	B 162	B 160
CRNC ^C	WPNC ^C	Ni-Cu	N04400	B 165	B 127	B 164, B 564
CR HX	WPHX	Ni-Cr-Mo-Fe	N06002	B 619, B 622, B 626	B 435	B 572
CR HG	WPHG	Ni-Cr-Fe-Mo-Cu	N06007	B 619, B 622, B 626	B 582	B 581
CR HC 22	WPHC22	Low C-Ni-Mo-Cr	N06022	B 619, B 622, B 626	B 575	B 574, B 564
CRV602	WPV602	Ni-Cr-Fe	N06025	B 163, B 167	B 168	B 166
CR HG 30	WPHG30	Ni-Cr-Fe-Mo-Cu	N06030	B 619, B 622, B 626	B 582	B 581
CRV45TM	WPV45TM	Ni-Cr-Fe	N06045	B 163, B 167	B 168	B 166
CR2120	WP2120	Ni-Cr-Mo low C	N06058	B 619, B 622, B 626	B 575	B 564, B 574
CR5923	WP5923	Low C-Ni-Cr-Mo	N06059	B 619, B 622, B 626	B 575	B 564, B 574
CR HC 2000	WPHC2000	Low C-Ni-Cr-Mo-Cu	N06200	B 619, B 622, B 626	B 575	B 564, B 574
CRM21	WPM21	Low C-Ni-Cr-Mo-Ta	N06210	B 619, B 622, B 626	B 575	B 564, B 574
CRH230	WPH230	Ni-Cr-W-Mo	N06230	B 619, B 622, B 626	B 435	B 572, B 564
CR HC 4	WPHC4	Low C-Ni-Mo-Cr	N06455	B 619, B 622, B 626	B 575	B 574
CRNCI	WPNCI	Ni-Cr-Fe	N06600	B 167, B 516, B 517	B 168	B 166, B 564
CR603GT	WP603GT	Ni-Cr-Fe-Al	N06603	B 163, B 167, B 516, B 517	B 168	B 166, B 564
CRNCMC	WPNCMC	Ni-Cr-Mo-Cb	N06625	B 444, B 704, B 705	B 443	B 446, B 564
CRIN686	WPIN686	Low C-Ni-Cr-Mo	N06686	B 163, B 619, B 622, B 626	B 575	B 564, B 574
CR626Si	WP626Si	Ni-Cr-Mo-Si	N06219	B 444, B 704, B 705	B 443	B 446, B 564
CR HG3	WPHG3	Ni-Cr-Fe-Mo-Cu	N06985	B 619, B 622, B 626	B 582	B 581
CR20CB	WP20CB	Cr-Ni-Fe-Mo-Cu-Cb stabilized	N08020	B 464, B 468, B 729	B 463	B 472, B 473, B 462
CR3127	WP3127	Low C-Ni-Fe-Cr-Mo-Cu	N08031	B 619, B 622, B 626	B 625	B 564, B 649
CRH120	WPH120	Ni-Cr-Fe	N08120	B 407, B 514, B 515	B 409	B 408, B 564
CR330	WP330	Ni-Fe-Cr-Si	N08330	B 535, B 710	B 536	B 511, B 512
CR6XN	WP6XN	Fe-Ni-Cr-Mo-N	N08367	B 675, B 676, B 690	B 688	B 472, B 564, B 691, B 462
CRNIC	WPNIC	Ni-Fe-Cr	N08800	B 407, B 514, B 515	B 409	B 408, B 564
CRNIC10	WPNIC10	Ni-Fe-Cr	N08810	B 407, B 514, B 515	B 409	B 408, B 564
CRNIC11	WPNIC11	Ni-Fe-Cr	N08811	B 407	B 409	B 408, B 564
CRNICMC	WPNICMC	Ni-Fe-Cr-Mo-Cu	N08825	B 423, B 704, B 705	B 424	B 425, B 564
CR904L	WP904L	Low C-Ni-Fe-Cr-Mo-Cu	N08904	B 673, B 674, B 677	B 625	B 649
CR1925	WP1925	Low C-Ni-Fe-Cr-Mo-Cu	N08925	B 673, B 674, B 677	B 625	B 649
CR1925N	WP1925N	Low C-Ni-Fe-Cr-Mo-Cu-N	N08926	B 673, B 674, B 677	B 625	B 649
CR HB	WPHB	Ni-Mo	N10001	B 619, B 622, B 626	B 333	B 335
CR HN	WPHN	Ni-Mo-Cr-Fe	N10003	B 619, B 622, B 626	B 434	B 573
CR H242	WPH242	Ni-Mo-Cr-Fe	N10242	B 619, B 622, B 626	B 434	B 573, B 564
CR HC 276	WPHC276	Low C-Ni-Mo-Cr	N10276	B 619, B 622, B 626	B 575	B 574, B 564
CRB10	WPB10	Low C-Ni-Mo-Cr-Fe	N10624	B 619, B 622, B 626	B 333	B 335, B 564
CRVB4	WPVB4	Ni-Mo	N10629	B 619, B 622, B 626	B 333	B 335, B 564
CR HB2	WPHB-2	Ni-Mo	N10665	B 619, B 622, B 626	B 333	B 335, B 564
CR HB3	WPHB-3	Ni-Mo	N10675	B 619, B 622, B 626	B 333	B 335, B 564
CRH160	WPH160	Ni-Co-Cr-Si	N12160	B 619, B 622, B 626	B 435	B 564, B 572
CR3033	WP3033	Low C-Cr-Ni-Fe-N	R20033	B 619, B 622, B 626	B 625	B 564, B 649, B 472
CRH556	WPH556	Ni-Fe-Cr-Co	R30556	B 619, B 622, B 626	B 435	B 572

^A When WP fittings are of welded construction or made from welded pipe, the symbol shall be supplemented with W or WX as applicable. If ultrasonic examination in accordance with 4.2.4.2 or 4.2.5.1 is used, the symbol shall be supplemented with WU or WXU as applicable.

^B See 2.1 and 4.1.

^C Yield strength shall be 25 000 psi (172 MPa) min, for all hot-formed, annealed fittings made from WPNC material.

B 444 Specification for Nickel-Chromium-Molybdenum-Columbium Alloy (UNS N06625) and Nickel-Chromium-Molybdenum-Silicon Alloy (UNS N06219) Pipe and Tube²

B 446 Specification for Nickel-Chromium-Molybdenum-Columbium Alloy (UNS N06625) and Nickel-Chromium-Molybdenum-Silicon Alloy (UNS N06219) Rod and Bar²

B 462 Specification for Forged or Rolled UNS N06030, UNS N06022, UNS N06200, UNS N08020, UNS N08024, UNS N08026, UNS N08367, UNS N10276, UNS N10665, UNS N10675 and UNS R20033 Alloy Pipe Flanges,

Forged Fittings, and Valves and Parts for Corrosive High-Temperature Service²

B 463 Specification for UNS N08020, UNS N08026, and UNS N08024 Alloy Plate, Sheet, and Strip²

B 464 Specification for Welded UNS N08020, N08024, and N08026 Alloy Pipe²

B 468 Specification for Welded UNS N08020, N08024, and N08026 Alloy Tubes²

B 472 Specification for UNS N06030, UNS N06022, UNS N06200, UNS N08020, UNS N08026, UNS N08024, UNS N08926, UNS N08367, UNS N10276, UNS N10665, UNS



- N10675, and UNS R20033 Nickel Alloy Billets and Bars for Reforging²
- B 473 Specification for UNS N08020, UNS N08026, and UNS N08024 Nickel Alloy Bar and Wire²
- B 511 Specification for Nickel-Iron-Chromium-Silicon Alloy Bars and Shapes²
- B 512 Specification for Nickel-Chromium-Silicon Alloy (UNS N08330) Billets and Bars²
- B 514 Specification for Welded Nickel-Iron-Chromium Alloy Pipe²
- B 515 Specification for Welded UNS N08800, UNS N08810, and UNS N08811 Alloy Tubes²
- B 516 Specification for Welded Nickel-Chromium-Iron Alloy (UNS N06600, UNS N06603, UNS N06025, and UNS N06045) Tubes²
- B 517 Specification for Welded Nickel-Chromium-Iron Alloy (UNS N06600, UNS N06603, UNS N06025, and UNS N06045) Pipe²
- B 535 Specification for Nickel-Iron-Chromium-Silicon Alloys (UNS N08330 and UNS N08332) Seamless Pipe and Tube²
- B 536 Specification for Nickel-Iron-Chromium-Silicon Alloys (UNS N08330 and N08332) Plate, Sheet, and Strip²
- B 564 Specification for Nickel Alloy Forgings²
- B 572 Specification for UNS N06002, UNS N06230, and UNS R30556 Rod²
- B 573 Specification for Nickel-Molybdenum-Chromium-Iron Alloy (UNS N10003, UNS N10242) Rod²
- B 574 Specification for Low-Carbon Nickel-Molybdenum-Chromium, Low-Carbon Nickel-Chromium-Molybdenum, Low-Carbon Nickel-Molybdenum-Chromium-Tantalum, Low-Carbon Nickel-Chromium-Molybdenum-Copper, and Low-Carbon Nickel-Chromium-Molybdenum-Tungsten Alloy Rod²
- B 575 Specification for Low-Carbon Nickel-Molybdenum-Chromium, Low-Carbon Nickel-Chromium-Molybdenum, Low-Carbon Nickel-Chromium-Molybdenum-Copper, Low-Carbon Nickel-Chromium-Molybdenum-Tantalum, and Low-Carbon Nickel-Chromium-Molybdenum-Tungsten Alloy Plate, Sheet, and Strip²
- B 581 Specification for Nickel-Chromium-Iron-Molybdenum-Copper Alloy Rod²
- B 582 Specification for Nickel-Chromium-Iron-Molybdenum-Copper Alloy Plate, Sheet, and Strip²
- B 619 Specification for Welded Nickel and Nickel-Cobalt Alloy Pipe²
- B 622 Specification for Seamless Nickel and Nickel-Cobalt Alloy Pipe and Tube²
- B 625 Specification for UNS N08904, UNS N08925, UNS N08031, UNS N08932, UNS N08926, and UNS R20033 Plate, Sheet, and Strip²
- B 626 Specification for Welded Nickel and Nickel-Cobalt Alloy Tube²
- B 649 Specification for Ni-Fe-Cr-Mo-Cu Low-Carbon Alloy (UNS N08904), Ni-Fe-Cr-Mo-Cu-N Low-Carbon Alloys (UNS N08925, UNS N08031, and UNS N08926), and Cr-Ni-Fe-N Low Carbon Alloy (UNS R20033) Bar and Wire²
- B 673 Specification for UNS N08904, N08925, and N08926 Welded Pipe²
- B 674 Specification for UNS N08904, N08925, and N08926 Welded Tube²
- B 675 Specification for UNS N08367 Welded Pipe²
- B 676 Specification for UNS N08367 Welded Tube²
- B 677 Specification for UNS N08904, N08925, and N08926 Seamless Pipe and Tube²
- B 688 Specification for Chromium-Nickel-Molybdenum-Iron (UNS N08366 and UNS N08367) Plate, Sheet, and Strip²
- B 690 Specification for Iron-Nickel-Chromium-Molybdenum Alloys (UNS N08366 and UNS N08367) Seamless Pipe and Tube²
- B 691 Specification for Iron-Nickel-Chromium-Molybdenum Alloys (UNS N08366 and UNS N08367) Rod, Bar, and Wire²
- B 704 Specification for Welded UNS N06625, N06219, and UNS N08825 Alloy Tubes²
- B 705 Specification for Nickel-Alloy (UNS N06625, N06219, and N08825) Welded Pipe²
- B 710 Specification for Nickel-Iron-Chromium-Silicon Alloy Welded Pipe²
- E 165 Test Method for Liquid Penetrant Examination³
- E 1916 Guide for Identification and/or Segregation of Mixed Lots of Metals⁴
- 2.2 *ASME Standards:*
- B16.9 Wrought Steel Butt Welding Fittings⁵
- B16.11 Forged Steel Fittings, Socket-Welding and Threaded⁵
- B16.28 Wrought Steel Butt Welding Short Radius Elbows and Returns⁵
- H34.1 Nickel Seamless Pipe and Tubing⁵
- H34.2 Nickel-Copper Alloy Seamless Pipe and Tubing⁵
- H34.3 Nickel-Chromium-Iron Alloy Seamless Pipe and Tubing⁵
- 2.3 *Manufacturers Standardization Society of the Valve and Fittings Industry Standards:*
- MSS SP-25 Standard Marking Systems for Valves, Fittings, Flanges, and Unions⁶
- MSS SP-43 Standard Practice for Light Weight Stainless Steel Butt Welding Fittings⁶
- MSS SP-95 Sewage (D) Nipples and Bull Plugs⁶
- MSS SP-97 Forged Carbon Steel Branch Outlet Fittings—Socket Welding, Threaded and Butt Welding Ends⁶
- Boiler and Pressure Vessel Code, Section VIII, Division 1, Pressure Vessels and Section IX, Welding Qualifications⁵
- 2.5 *AWS Standards:*

³ Annual Book of ASTM Standards, Vol 03.03.

⁴ Annual Book of ASTM Standards, Vol 03.06.

⁵ Available from American Society of Mechanical Engineers, 345 E. 47th St., New York, NY 10017.

⁶ Available from Manufacturers' Standardization Society of the Valve and Fittings Industry, 1815 N. Fort Myer Drive, Arlington, VA 22209.