



Designation: B622 – 23

Standard Specification for Seamless Nickel and Nickel-Cobalt Alloy Pipe and Tube¹

This standard is issued under the fixed designation B622; 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 seamless pipe and tube of nickel and nickel-cobalt alloys. covers seamless pipe and tube of nickel and nickel-cobalt alloys.

1.2 Alloys that can currently be certified to this specification are (UNS N10001, UNS N10242, UNS N10665, UNS N12160, UNS N10675, UNS N10276, UNS N06455, UNS N06007, UNS N08320, UNS N06975, UNS N06002, UNS N06985, UNS N06022, UNS N06035, UNS N06044, UNS N08135, UNS N06255, UNS N06058, UNS N06059, UNS N06200, UNS N10362, UNS N06030, UNS N08031, UNS N08034, UNS R30556, UNS N08535, UNS N06250, UNS N06060, UNS N06230, UNS N06235, UNS N06686, UNS N10629, UNS N06210, UNS N10624, and UNS R20033)³.

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 Safety Data Sheet (SDS) for this product/material as provided by the manufacturer, to establish appropriate safety, health, and environmental practices, and determine the applicability of regulatory limitations prior to use.*

1.5 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

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-622 in Section II of that Code.

2. Referenced Documents

2.1 ASTM Standards:⁴

B829 Specification for General Requirements for Nickel and Nickel Alloys Seamless Pipe and Tube

B899 Terminology Relating to Non-ferrous Metals and Alloys

E8/E8M Test Methods for Tension Testing of Metallic Materials

E527 Practice for Numbering Metals and Alloys in the Unified Numbering System (UNS)

3. Terminology

3.1 Definitions:

3.1.1 For definitions of terms used in this specification, refer to Terminology B899.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *average diameter, n*—the average of the maximum and minimum outside diameters, or the maximum and minimum inside diameters, as determined at any cross section of the tube.

3.2.2 *pipe, n*—seamless tube conforming to the particular dimensions commercially known as standard pipe sizes (Appendix X2).

3.2.3 *tube, n*—a hollow product of round or any other cross section having a continuous periphery.

4. General Requirements

4.1 Material furnished under this specification shall conform to the applicable requirements of Specification B829 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 material ordered under this specification. Examples of such requirements include, but are not limited to the following:

5.1.1 Alloy (Table 1).

5.1.2 Dimensions:

⁴ 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.

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

TABLE 1 Chemical Requirements^A

	Composition Limits, %																								
	Ni	Cr	Mo	Fe	W	C	Si	Co	Mn	V	P max	S max	Ti	Cu	Cb (Nb) +Ta	Al	Zr	La	N	B	Cb (Nb)	Ta	Ni+ Mo	Mg	
Ni-Mo Alloys N10001	remainder	1.0	26.0-30.0	4.0-6.0	...	0.05	1.0	2.5	1.0	0.2-0.4	0.04	0.03
N10665	remainder	1.0	26.0-30.0	2.0	...	0.02	0.10	1.0	1.0	...	0.04	0.03
N10675	65.0 min	1.0-3.0	27.0-32.0	1.0-3.0	3.0	0.01	0.10	3.0	3.0	0.20	0.030	0.010	0.20	0.20	0.20	0.50	0.10	...	...	...	0.20	0.20	94.0-98.0	...
N10629	remainder	0.5-1.5	26.0-30.0	1.0-6.0	...	0.01	0.05	2.5	1.5	...	0.04	0.01	...	0.5	...	0.1-0.5	...	...	...	...	...	...	...	...
N10624	remainder	6.0-10.0	21.0-25.0	5.0-8.0	...	0.01	0.10	1.0	1.0	...	0.025	0.01	...	0.5	...	...	...	...	...	...	...	...	...	...
Ni-Mo-Cr-Fe Alloy N10242	remainder	7.0-9.0	24.0-26.0	2.0	...	0.03	0.80	1.00	0.80	0.030	0.015	0.015	0.50	0.50	0.50	0.50	...	...	...	0.006	...	...	...	...
Low C Ni-Cr-Mo Alloys N10276	remainder	14.5-16.5	15.0-17.0	4.0-7.0	3.0-4.5	0.010	0.08	2.5	1.0	0.35	0.04	0.03	...	...	...	...	...	...	...	...	...	...	...	...
N06022	remainder	20.0-22.5	12.5-14.5	2.0-6.0	2.5-3.5	0.015	0.08	2.5	0.50	0.35	0.02	0.02	...	...	...	...	...	...	...	...	...	...	...	...
N06035	remainder	32.25-34.25	7.60-9.00	2.00	0.60	0.050	0.60	1.00	0.50	0.20	0.030	0.015	...	0.30	...	0.40	...	...	...	...	...	...	...	...
N06044	balance	43.5-45.3	0.80-1.20	0.3	...	0.02	0.20	...	0.07-0.30	...	0.020	0.020	0.10-0.30	...	...	0.30	...	...	...	...	...	...	...	...
N06058	balance	20.0-23.0	18.5-21.0	1.5	0.3	0.010	0.10	0.3	0.50	...	0.015	0.010	...	0.50	...	0.40	...	...	0.02-0.15	...	...	...	...	...
N06059	balance	24.0-24.0	15.0-16.5	1.5	...	0.010	0.10	0.3	0.5	...	0.015	0.010	...	0.50	...	0.1-0.4	...	...	...	...	...	...	...	...
N06455	remainder	14.0-18.0	14.0-17.0	3.0	...	0.015	0.08	2.0	1.0	...	0.04	0.03	0.70	...	...	...	...	...	...	...	...	...	...	...
Ni-Cr-Fe-Mo-Cu Alloys N06007	remainder	21.0-23.5	5.5-7.5	18.0-21.0	1.0	0.05	1.0	2.5	1.0-2.0	...	0.04	0.03	...	1.5-2.5	1.75-2.5	...	...	...	...	...	...	...	...	...
N06975	47.0-52.0	23.0-26.0	5.0-7.0	remainder	...	0.03	1.0	...	1.0	...	0.03	0.03	0.70-1.50	0.70-1.20	...	...	...	...	...	...	...	...	...	...
N06985	remainder	21.0-23.5	6.0-8.0	18.0-21.0	1.5	0.015	1.0	5.0	1.0	...	0.04	0.03	...	1.5-2.5	0.50	...	...	...	...	...	...	...	...	...
N06030	remainder	28.0-31.5	4.0-6.0	13.0-17.0	1.5-4.0	0.03	0.8	5.0	1.5	...	0.04	0.02	...	2.5	0.30-1.50	...	...	...	...	...	...	...	...	...
N06255	47.0-52.0	23.0-26.0	6.0-9.0	remainder	3.0	0.03	1.0	...	1.0	...	0.03	0.03	0.69	1.2	...	...	...	...	...	...	...	...	...	...
N06250	50.0-54.0	20.0-23.0	10.1-12.0	remainder	0.25-1.25	0.020	0.09	...	1.00	...	0.030	0.005	...	0.25-1.25	...	...	...	...	...	...	...	...	...	...
Ni-Fe-Cr-Mo Alloys N08320	25.0-27.0	21.0-23.0	4.0-6.0	remainder	...	0.05	1.0	...	2.5	...	0.04	0.03	4xC min	...	...	...	...	...	...	...	...	...	...	...
N08135	33.0-38.0	20.5-23.5	4.0-5.0	remainder	0.20-0.80	0.030	0.75	...	1.00	...	0.03	0.03	...	...	...	...	...	...	...	...	...	...	...	...
Ni-Cr-Fe-Mo Alloys																									

TABLE 1 Continued

	Composition Limits, %																								
	Ni	Cr	Mo	Fe	W	C	Si	Co	Mn	V	P max	S max	Ti	Cu	Cb (Nb)+Ta	Al	Zr	La	N	B	Cb (Nb)	Ta	Ni+Mo	Mg	
N06002	remainder	20.5-23.0	8.0-10.0	17.0-20.0	0.20-1.0	0.05-0.15	1.0	0.5-2.5	1.0	...	0.04	0.03	...	...	...	...	...	...	...	...	...	...	...	...	...
N06060	54.0-60.0	19.0-22.0	12.0-14.0	remainder	0.25-1.25	0.03	0.50	...	1.50	...	0.030	0.005	...	0.25-1.25	0.50-1.25	...	...	...	...	...	...	...	...	...	...
Ni-Cr-Mo-Cu Alloy N06235	remainder	30.0-32.5	5.0-6.2	1.5	0.60	0.02-0.06	0.2-0.6	1.0	0.3-0.65	...	0.03	0.015	0.5	3.5-4.0	...	0.2-0.4	...	...	...	...	1.0	...	...	...	...
Ni-Fe-Cr-Co Alloy R30556	19.0-22.5	21.0-23.0	2.5-4.0	remainder	2.0-3.5	0.05-0.15	0.20-0.80	16.0-21.0	0.50-2.00	...	0.04	0.015	...	...	...	0.10-0.50	0.001-0.10	0.005-0.10	0.10-0.30	0.02	0.30	0.3-1.25	...	...	...
Ni-Cr-W-Mo Alloys N06230	remainder	20.0-24.0	1.0-3.0	3.0	13.0-15.0	0.05-0.15	0.25-0.75	5.0	0.30-1.00	...	0.03	0.015	...	...	...	0.50	...	0.005-0.050	...	0.015	...	...	...	...	...
Low C-Ni-Cr-Mo-Cu Alloy N06200	remainder	22.0-24.0	15.0-17.0	3.0	...	0.010	0.08	2.0	0.50	...	0.025	0.010	...	1.3-1.9	...	0.50	...	...	...	...	...	...	...	...	...
Low C-Ni-Mo-Cr Alloy N10362	remainder	13.8-15.6	21.5-23.0	1.25	...	0.010	0.08	...	0.60	...	0.025	0.010	...	...	...	0.50	...	...	...	...	...	...	...	...	...
Low C-Ni-Fe-Cr-Mo-Cu Alloys N08031	30.0-32.0	26.0-28.0	6.0-7.0	balance	...	0.015	0.3	...	2.0	...	0.020	0.010	...	1.0-1.4	...	...	...	...	0.15-0.25	...	...	...	...	...	...
N08034	33.5-35.0	26.0-27.0	6.0-7.0	balance	...	0.01	0.1	...	1.0-4.0	...	0.020	0.010	...	0.5-1.5	...	0.3	...	...	0.10-0.25	...	...	...	...	...	...
N08535	29.0-36.5	24.0-27.0	2.5-4.0	remainder	...	0.03	0.50	...	1.0	...	0.03	0.03	...	1.50	...	...	...	...	...	...	...	...	...	...	...
Low C-Ni-Cr-Mo-W Alloy N06686	remainder	19.0-23.0	15.0-17.0	5.0	3.0-4.4	0.010	0.08	...	0.75	...	0.04	0.02	0.02-0.25	...	...	...	...	...	...	...	...	...	...	...	...
Ni-Co-Cr-Si Alloy N12160	remainder	26.0-30.0	1.0 max	3.5	1.0	0.15	2.4-3.0	27.0-33.0	1.5	...	0.030	0.015	0.20-0.80	...	...	...	...	...	...	...	1.0	...	...	...	...
Cr-Ni-Fe-N Alloy R20033	30.0-33.0	31.0-35.0	0.50-2.0	balance	...	0.015	0.50	...	2.0	...	0.02	0.01	...	0.3-1.20	...	...	...	...	0.35-0.60	...	...	...	...	...	...

TABLE 1 *Continued*

		Composition Limits, %																							
		Ni	Cr	Mo	Fe	W	C	Si	Co	Mn	V	P max	S max	Ti	Cu	Cb (Nb) +Ta	Al	Zr	La	N	B	Cb (Nb)	Ta	Ni+ Mo	Mg
Low C-Ni- Mo-Cr-Ta Alloy N06210	remainder	18.0- 20.0	18.0- 20.0	18.0- 20.0	1.0	...	0.015	0.08	1.0	0.5	0.35	0.02	0.02	...		...		...	...	...	...	...	1.5- 2.2		

^A Values in the table are maximums unless a range or minimum is indicated.