



Designation: **B626–10** Designation: **B626 – 10^{ε1}**

Standard Specification for Welded Nickel and Nickel-Cobalt Alloy Tube¹

This standard is issued under the fixed designation B626; 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—The Si max for N06059 in Table 1 was corrected editorially in January 2012.

1. Scope*

1.1 This specification covers welded tubes made from the nickel and nickel-cobalt alloys (UNS N10001, UNS N10242, UNS N10665, UNS N12160, UNS N10629, UNS N10624, UNS N10675, UNS N10276, UNS N06455, UNS N06007, UNS N06975, UNS N08320, UNS N06985, UNS N06002, UNS N06022, UNS N06030, UNS N06035, UNS N06058, UNS N06059, UNS N06200, UNS N10362, UNS N06210, UNS N08031, UNS R30556, UNS N06230, UNS N06686, and UNS R20033)*R20033)² listed in Table 1 intended for heat exchanger and condenser tubes and tubes for general corrosive service for heat-resisting applications.

1.2 This specification covers tube $\frac{1}{8}$ to 3 $\frac{1}{2}$ in. (3.2 to 88.9 mm) in outside diameter and 0.015 to 0.148 in. (0.41 to 3.7 mm) inclusive, in wall thickness.

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:³

B751 Specification for General Requirements for Nickel and Nickel Alloy Welded Tube

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

3. General Requirements

3.1 Material furnished in accordance with this specification shall conform to the applicable requirements of the current edition of Specification B751 unless otherwise provided herein.

4. Classification

4.1 Five classes of tube are covered as follows:

4.1.1 *Class IA*—Welded, sized, solution annealed, and nondestructively tested in accordance with 4.2.1.

4.1.2 *Class IB*—Welded, sized, and solution annealed.

4.1.3 *Class IIA*—Welded, cold worked, solution annealed, and nondestructively tested in accordance with 4.2.1.

4.1.4 *Class IIB*—Welded, cold worked, and solution annealed.

4.1.5 *Class III*—Welded, cold worked, solution annealed, and nondestructively tested in accordance with 4.2.2.

4.2 *Nondestructive Tests:*

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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*New designations established in accordance with Practice E527 and SAE J1086, Practice for Numbering Metals and Alloys (UNS).

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

³ New designations established in accordance with Practice E527 and SAE J1086, Practice for Numbering Metals and Alloys (UNS).

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

TABLE 1 Chemical Requirements

	Composition Limits, %																						
	Fe	W	C	Si	Co	Mn	V	P	S	Ti	Cu	Cb (Nb) +Ta	Al	Zr	La	N	B	Cb (Nb)	Ta	Ni+ Mo	Mg		
Ni-Mo Alloys																							
N10001	4.0-6.0	..	0.05 max	1.0	2.5	1.0 max	0.2- 0.4	0.04	0.03	..	..	..	..	0.10 max	..	..	..	0.20 max	0.20 max	94.0- 98.0		
N10665	2.0 max	..	0.02 max	0.10	1.0	1.0 max	..	0.04	0.03	..	..	..	..	..	..	..	..	..	..	..	..	..
N10675	1.0-3.0	3.0 max	0.01 max	0.10	3.0	3.0 max	0.20 max	0.030	0.010	0.20 max	0.20 max	..	0.50 max	0.10 max	..	..	..	0.20 max	0.20 max	..	..	..
N10629	1.0-6.0	..	0.01 max	0.05	2.5	1.5 max	..	0.04	0.01	..	0.5 max	..	0.1- 0.5	..	..	..	..	..	..	..	..	..
N10624	5.0-8.0	..	0.01 max	0.10	1.0	1.0 max	..	0.025	0.01	..	0.5 max	..	..	..	..	..	..	..	..	..	..	..
Ni-Mo-Cr-Fe Alloy																							
N10242	2.0 max	..	0.03 max	0.80	1.00	0.80 max	..	0.030	0.015	0.50 max	0.50 max	..	0.50 max	..	..	..	0.006 max	..	..	..	..	..
Low C Ni- Cr-Mo Alloys																							
N10276	4.0-7.0	3.0- 4.5	0.010 max	0.08	2.5	1.0 max	0.35 max	0.04	0.03	..	..	..	..	..	..	..	..	..	..	..	..	..
N06022	2.0-6.0	2.5- 3.5	0.015 max	0.08	2.5	0.5 max	0.35 max	0.02	0.02	..	..	..	..	..	..	..	..	..	..	..	..	..
N06035	2.00 max	0.60 max	0.050 max	0.60	1.00	0.50 max	0.20 max	0.030	0.015	0.30 max	0.30 max	..	0.40 max	..	..	..	..	..	..	..	..	..
N06455	3.0 max	..	0.015 max	0.08	2.0	1.0 max	..	0.04	0.03	..	..	..	..	..	..	..	..	..	..	..	..	..
Ni-Cr-Fe- Mo-Cu Alloys																							
N06007	18.0-21.0	1.0 max	0.05 max	1.0	2.5	1.0- 2.0	..	0.04	0.03	..	1.5- 2.5	1.75- 2.5	..	..	..	..	..	..	..	..	..	..
N06975	remainder	..	0.03 max	1.0	..	1.0 max	..	0.03	0.03	0.70- 1.50	0.70- 1.20	..	..	..	..	..	..	..	..	..	..	..
N06985	18.0-21.0	1.5 max	0.015 max	1.0	5.0	1.0 max	..	0.04	0.03	..	1.5- 2.5	0.50 max	..	..	..	..	..	..	..	..	..	..
N06030	13.0-17.0	1.5- 4.0	0.03 max	0.8	5.0	1.5 max	..	0.04	0.02	..	1.0- 2.4	0.30- 1.50	..	..	..	..	..	..	..	..	..	..
Ni-Fe-Cr-Mo Alloys																							
N08320	remainder	..	0.05 max	1.0	..	2.5 max	..	0.04	0.03	4xC min	..	..	..	..	..	..	..	..	..	..	..	..
Ni-Cr-Mo-Fe Alloy																							
N06002	17.0-20.0	0.20- 1.0	0.05- 0.15	1.0	0.5- 2.5	1.0 max	..	0.04	0.03	..	..	..	..	..	..	..	..	..	..	..	..	..
Ni-Fe-Cr-Co Alloy																							
R30556	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 max	0.30 max	0.3- 1.25	..	..	..
Ni-Cr-W-Mo Alloy																							
N06230	3.0 max	13.0- 15.0	0.05- 0.15	0.25- 0.75	5.0 max	0.30- 1.00	..	0.03	0.015	..	..	..	0.50 max	..	0.005- 0.050	..	0.015 max	..	..	..	..	..

TABLE 1 Continued

	Composition Limits, %																								
	Ni	Cr	Mo	Fe	W	C	Si max	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- Cr-Mo Alloy N06058	balance	20.0- 23.0	19.0- 21.0	1.5 max	0.3 max	0.010 max	0.10 max	0.3 max	0.50 max	...	0.015	0.010	...	0.50 max	...	0.40 max	...	...	0.02- 0.15	...	...	...	...	...	...
N06059	balance	22.0- 24.0	15.0- 16.5	1.5 max	...	0.010 max	0.10† max	0.3 max	0.5 max	...	0.015	0.010	...	0.50 max	...	0.1- 0.4	...	...	...	...	...	...	...	...	...
Low C-Ni- Cr-Mo-Cu Alloy N06200	remainder	22.0- 24.0	15.0- 17.0	3.0 max	...	0.010 max	0.08	2.0 max	0.50 max	...	0.025	0.010	...	1.3- 1.9	...	0.50 max	...	...	...	...	...	...	...	...	...
Low C-Ni- Mo-Cr Alloy N10362	remainder	13.8- 15.6	21.5- 23.0	1.25 max	...	0.010 max	0.08	...	0.60 max	...	0.025	0.010	...	...	...	0.50 max	...	...	...	...	...	...	...	...	...
Low C-Ni- Fe-Cr- Mo-Cu Alloy N08031	30.0-32.0	26.0- 28.0	6.0- 7.0	balance	...	0.015 max	0.3	...	2.0 max	...	0.020	0.010	...	1.0- 1.4	...	...	...	...	0.15- 0.25	...	...	...	...	...	...
Low C-Ni- Cr-Mo-W Alloy N06686	remainder	19.0- 23.0	15.0- 17.0	5.0 max	3.0- 4.4	0.010 max	0.08	...	0.75 max	...	0.04	0.02	0.02- 0.25	...	...	...	...	...	...	...	...	...	...	...	...
Ni-Co-Cr-Si Alloy N12160	remainder	26.0- 30.0	1.0 max	3.5 max	1.0 max	0.15 max	2.4- 3.0	27.0- 33.0	1.5 max	...	0.030	0.015	0.20- 0.80	...	...	...	...	...	...	...	1.0 max	...	...	...	...
Cr-Ni-Fe-N Alloy R20033	30.0-33.0	31.0- 35.0	0.50- 2.0	balance	...	0.015 max	0.050	...	2.0 max	...	0.02	0.01	...	0.3- 1.20	...	...	...	...	0.35- 0.60	...	...	...	...	...	...
Low C-Ni- Mo-Cr-Ta Alloy N06210	remainder	18.0- 20.0	18.0- 20.0	1.0 max	...	0.015 max	0.08	1.0 max	0.5 max	...	0.02	0.02	...	...	...	...	...	...	...	...	...	1.5- 2.2	...	...	...

†Editorially corrected.

4.2.1 *Class IA and Class IIA Tubes*—Each finished tube shall be subjected to the hydrostatic test, the pneumatic test, or the eddy current test at the manufacturer’s option.

4.2.2 *Class III Tubes*—Each finished tube shall be subjected to the pneumatic test and the eddy current test. Tubes larger than 1½ in. (38.1 mm) in outside diameter may be subjected to the hydrostatic test in lieu of the pneumatic test at the manufacturer’s option.

5. Ordering Information

5.1 It is the responsibility of the purchaser to specify all requirements that are necessary for 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 *Class* (see 4),

5.1.3 *Quantity* (feet or number of lengths),

5.1.4 *Size* (outside diameter and average wall thickness),

5.1.5 *Length* (cut or random),

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

5.1.7 *Purchaser Inspection*—~~State which tests or inspections are to be witnessed,~~

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