



Designation: B 626 – 03

Standard Specification for Welded Nickel and Nickel-Cobalt Alloy Tube¹

This standard is issued under the fixed designation B 626; 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 approval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

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 N06058, UNS N06059, UNS N06200, UNS N06210, UNS N08031, UNS R30556, UNS N06230, UNS N06686, and UNS R20033)* 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 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 safety and health practices, and determine the applicability of regulatory limitations prior to use.*

2. Referenced Documents

2.1 ASTM Standards:

B 751 Specification for General Requirements for Nickel and Nickel Alloy Welded Tube²

3. General Requirements—

3.1 Material furnished in accordance with this specification shall conform to the applicable requirements of the current edition of Specification B 751 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 non-destructively 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:

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 $1\frac{1}{2}$ 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,

5.1.8 *Ends*—Plain ends cut and deburred will be furnished, unless otherwise specified, and

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

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 June 10, 2003. Published July 2003. Originally approved in 1977. Last previous edition approved in 2001 as B 626 - 01.

* New designations established in accordance with ASTM E 527 and SAE J1086, Practice for Numbering Metals and Alloys (UNS).

² *Annual Book of ASTM Standards*, Vol 02.04.

TABLE 1 Chemical Requirements

	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	
Ni-Mo Alloys N10001	remainder	1.0 max	26.0- 30.0	4.0-6.0	...	0.05 max	1.0	2.5 max	1.0 max	0.2- 0.4	0.04	0.03	...	...	...	...	...	...	...	...	...	...	...	...	...
N10665	remainder	1.0 max	26.0- 30.0	2.0 max	...	0.02 max	0.10	1.0 max	1.0 max	...	0.04	0.03	...	...	...	...	...	...	...	...	...	...	...	...	...
N10675	65.0 min	1.0- 3.0	27.0- 32.0	1.0-3.0	3.0 max	0.01 max	0.10	3.0 max	3.0 max	0.20 max	0.030	0.010	0.20 max	0.20 max	0.20 max	0.50 max	0.10 max	...	...	...	0.20 max	0.20 max	94.0- 98.0	...	...
N10629	remainder	0.5- 3.0	26.0- 30.0	1.0-6.0	...	0.01 max	0.05	2.5 max	1.5 max	...	0.04	0.01	...	0.5 max	...	0.1- 0.5	...	...	...	...	...	...	...	...	...
N10624	remainder	6.0- 10.0	21.0- 25.0	5.0-8.0	...	0.01 max	0.10	1.0 max	1.0 max	...	0.025	0.01	...	0.5 max	...	...	...	...	...	...	...	...	...	...	...
Ni-Mo-Cr-Fe Alloy N10242	remainder	7.0- 9.0	24.0- 26.0	2.0 max	...	0.03 max	0.80	1.00 max	0.80 max	0.030	0.015	...	0.50 max	0.50 max	...	0.50 max	...	...	...	0.006 max	...	...	...	...	...
Low C Ni- Mo-Cr Alloys N10276	remainder	14.5- 16.5	15.0- 17.0	4.0-7.0	3.0- 4.5	0.010 max	0.08	2.5 max	1.0 max	0.35 max	0.04	0.03	...	...	...	...	...	...	...	...	...	...	...	...	...
N06022	remainder	20.0- 22.5	12.5- 14.5	2.0-6.0	2.5- 3.5	0.015 max	0.08	2.5 max	0.5 max	0.35 max	0.02	0.02	...	...	...	...	...	...	...	...	...	...	...	...	...
N06455	remainder	14.0- 18.0	14.0- 17.0	3.0 max	...	0.015 max	0.08	2.0 max	1.0 max	...	0.04	0.03	0.70 max	...	...	...	...	...	...	...	...	...	...	...	...
Ni-Cr-Fe- Mo-Cu Alloys N06007	remainder	21.0- 23.5	5.5- 7.5	18.0-21.0	1.0 max	0.05 max	1.0	2.5 max	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 max	1.0	...	1.0 max	...	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 max	0.015 max	1.0	5.0 max	1.0 max	...	0.04	0.03	...	1.5- 2.5	0.50 max	...	...	...	...	...	...	...	...	...	...
N06030	remainder	28.0- 31.5	4.0- 6.0	13.0-17.0	1.5- 4.0	0.03 max	0.8	5.0 max	1.5 max	...	0.04	0.02	...	1.0- 2.4	0.30- 1.50	...	...	...	...	...	...	...	...	...	...
Ni-Fe-Cr-Mo Alloys N08320	25.0-27.0	21.0- 23.0	4.0- 6.0	remainder	...	0.05 max	1.0	...	2.5 max	...	0.04	0.03	4xC min	...	...	...	...	...	...	...	...	...	...	...	...
Ni-Cr-Mo-Fe Alloy 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 max	...	0.04	0.03	...	...	...	...	...	...	...	...	...	...	...	...	...
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 max	0.30 max	0.3- 1.25	...	...
Ni-Cr-W-Mo Alloy N06230	remainder	20.0- 24.0	1.0- 3.0	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	...	...	...	0.20- 0.50	0.005- 0.050	0.005- 0.050	...	0.015 max	...	...	...	...
Low C-Ni- Cr-Mo Alloy	remainder	20.0- 24.0	1.0- 3.0	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	...	...	...	0.20- 0.50	0.005- 0.050	0.005- 0.050	...	0.015 max	...	...	...	...