SPECIFICATION FOR WELDED UNS N06625, UNS N06219, AND UNS N08825 ALLOY TUBES

SB-704

(Identical with ASTM Specification B704-00 except that certification has been made mandatory in para. 3.1.8 and editorial corrections have been made.)

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1. Scope

1.1 This specification covers welded UNS N06625, UNS N06219, and UNS N08825 alloy boiler, heat exchanger, and condenser tubes for general corrosion resisting and low- or high-temperature service.

1.2 This specification covers tubes $\frac{1}{8}$ to 5 in. (3.18 to 127 mm), inclusive, in outside diameter and 0.015 to 0.500 in. (0.38 to 12.70 mm), inclusive, in wall thickness. Specification SB-751 lists the dimensional requirements of these sizes. Tubes having other dimensions may be furnished provided such tubing complies with all other requirements of this specification.

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.

2. Referenced Documents

2.1 *ASTM/ASME Standards:*

SB-751 Specification for General Requirements for Nickel and Nickel Alloy Welded Tube

E 8 Test Methods for Tension Testing of Metallic Materials

3. Ordering Information

3.1 Orders for material to this specification should include the following information:

3.1.1 Quantity (feet or number of lengths);

3.1.2 UNS number;

3.1.3 Size (outside diameter, minimum or average wall thickness);

3.1.4 Length (random or specific);

3.1.5 Class; and

3.1.6 ASME designation.

TABLE 1
CHEMICAL REQUIREMENTS

	Composition Limits, %		
	UNS N06625	UNS N06219	UNS N08825
Ni	58.0 min.[A]	Bal	38.0–46.0
Cr	20.0–23.0	18.0–22.0	19.5–23.5
Fe	5.0 max.	2.0–4.0	22.0 min.[A]
Mo	8.0–10.0	7.0–9.0	2.5–3.5
Cb + Ta	3.15–4.15	...	...
C	0.10 max.	0.05 max.	0.05 max.
Mn	0.50 max.	0.50 max.	1.0 max.
Si	0.5 max.	0.70–1.10	0.5 max.
P	0.015 max.	0.020 max.	...
S	0.015 max.	0.010 max.	0.03 max.
Al	0.4 max.	0.50 max.	0.2 max.
Ti	0.40 max.	0.50 max.	0.6–1.2
Co (if determined)	1.0 max.	1.0 max.	...
Cu	...	0.50 max.	1.5–3.0

[A] Element may be determined arithmetically by difference.

3.1.7 *Product Analysis* — State if required;

3.1.8 *Certification* — Certification and a report of test results are required; and

3.1.9 *Purchaser Inspection* — State which tests or inspections are to be witnessed, if any.

4. Materials and Manufacture

4.1 Tube shall be made from flat-rolled alloy by an automatic welding process with no addition of filler metal. Subsequent to welding and prior to final annealing, the material shall be cold-worked in either the weld metal only or both weld and base metal.

4.2 Tube shall be furnished with oxide removed. When bright annealing is used, descaling is not necessary.

TABLE 2
MECHANICAL PROPERTY REQUIREMENTS

Alloy	Tensile Strength, min, psi (MPa)	Yield Strength,[A] 0.2% Offset, min, psi (MPa)	Elongation in 2 in. or 50 mm, min, %
UNS N06625	120,000 (827)	60,000 (414)	30
UNS N06219	96,000 (660)	39,000 (270)	30
UNS N08825	85,000 (586)	35,000 (240)	30

[A] Yield strength shall be determined by the offset method at 0.2% limiting permanent set in accordance with Test Methods E 8.

5. Chemical Composition

5.1 The material shall conform to the composition limits specified in Table 1. One test is required for each lot as defined in Specification SB-751.

5.2 If a product analysis is performed, it shall meet the chemistry limits prescribed in Table 1, subject to the analysis tolerances of Specification SB-751.

6. Mechanical and Other Properties

6.1 *Mechanical Properties* — The material shall conform to the mechanical property requirements specified in Table 2. One test is required for each lot as defined in Specification SB-751.

6.2 *Flattening Test* — A flattening test shall be made on each end of one tube per lot. Superficial ruptures resulting from surface imperfections shall not be cause for rejection.

6.3 *Flange Test* — A flange test shall be made on each end of one tube per lot.

6.4 *Nondestructive Test Requirements:*

6.4.1 *Class 1* — Each piece in each lot shall be subject to one of the following four tests: hydrostatic, pneumatic (air underwater), eddy current, or ultrasonic.

6.4.2 *Class 2* — Each piece in each lot shall be subjected to a leak test and an electric test as follows:

6.4.2.1 *Leak Test* — hydrostatic or pneumatic (air underwater), and

6.4.2.2 *Electric Test* — eddy current or ultrasonic.

6.5 The manufacturer shall have the option to test to Class 1 or 2 and select the nondestructive test methods, if not specified by the purchaser.

7. General Requirements

7.1 Material furnished under this specification shall conform to the applicable requirements of the current edition of Specification SB-751 unless otherwise provided herein.

8. Keywords

8.1 UNS N06625; UNS N06219; UNS N08825; welded tube

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