Designation: B 730 – 08

Standard Specification for Welded Nickel (UNS N02200/UNS N02201) and Nickel Copper Alloy (UNS N04400) Tube[1]

This standard is issued under the fixed designation B 730; 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 specification covers nickel (UNS N02200), low-carbon nickel (UNS N02201), and nickel copper alloy (UNS N04400) in the form of welded and annealed or welded and stress-relieved tube intended for general corrosive service and for mechanical applications.

1.2 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.

1.3 *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:* [2]

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

3. Ordering Information

3.1 Orders for material under this specification shall include the following information:

3.1.1 Alloy name or UNS number.

3.1.2 ASTM designation and year of issue.

3.1.3 *Condition* (Temper) (Table 1).

3.1.4 *Dimensions:*

3.1.4.1 Outside diameter and nominal wall thickness.

NOTE 1—Tube produced to outside diameter and minimum wall thickness may be furnished upon agreement between the manufacturer and the purchaser.

3.1.4.2 Length (specific or random).

3.1.5 Quantity (feet or metres, or number of pieces).

3.1.6 *Certification*—State if certification is required.

3.1.7 *Samples for Product (Check) Analysis*—State whether samples for product (check) analysis should be furnished.

3.1.8 *Purchaser Inspection*—If the purchaser wishes to witness tests or inspection of material at the place of manufacture, the purchase order must so state indicating which tests or inspections are to be witnessed.

3.1.9 *Nondestructive Tests*—Specify either Test Category 1 or 2. If Test Category 1 is required, specify if either a hydrostatic, eddy-current or ultrasonic test is to apply. If Test Category 2 is required, specify which two tests are required.

3.1.10 Supplementary Requirements.

4. Materials and Manufacture

4.1 Tubes shall be made from flat-rolled material by an automatic welding process with no addition of filler metal. Subsequent to welding, and prior to heat treatment, the tubes shall be cold worked to assure that optimum corrosion resistance in the weld area and base metal will be developed during heat treatment.

4.2 Tubes shall be furnished with a scale-free finish. When bright annealing is used, descaling is not necessary.

5. Chemical Requirements

5.1 The material shall conform to the requirements as to chemical composition prescribed in Table 2.

6. Mechanical and Other Requirements

6.1 *Mechanical Properties*—The material shall conform to the requirements for mechanical properties prescribed in Table 1.

6.2 *Flattening Test*—One test per lot.

6.3 *Flange Test*—One test per lot.

6.4 *Nondestructive Tests*:

6.4.1 Tubes shall be subjected to the nondestructive tests outlined in the following test categories:

6.4.1.1 *Category 1*—Hydrostatic, eddy-current, or ultrasonic test as the manufacturer's option unless the purchaser specifies in accordance with 3.1.9.

[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 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.

TABLE 1 Mechanical Properties of Tube

Condition and Size	Tensile Strength, min, psi (MPa)			Yield Strength (0.2 % offset), min, psi (MPa)			Elongation in 2 in. or 50 min (or 4*D*) min, %		
	Nickel	Low-Carbon Nickel	UNS N04400	Nickel	Low-Carbon Nickel	UNS N04400	Nickel	Low-Carbon Nickel	UNS N04400
Annealed:									
5 in. (127 mm) and under outside diameter	55 000 (380)	50 00 (345)	70 000 (480)	15 000 (105)	12 000 (80)	28 000 (195)	35	35	35
Over 5 in. (127 mm) in outside diameter	55 000 (380)	50 000 (345)	70 000 (480)	12 000 (80)	10 000 (70)	25 000 (170)	40	40	35
Stress-relieved									
All sizes	65 000 (450)	60 000 (415)	85 000 (585)	40 000 (275)	30 000 (205)	55 000 (380)	15	15	15

TABLE 2 Chemical Requirements

Element	Composition, %		
	Nicke (UNS N02200)	Low-Carbon Nickel (UNS N02201)	Nickel-Copper (UNS N04400)
Nickel, min	99.0	99.0	63.0
Copper	0.25 max	0.25 max	28.0–34.0
Iron, max	0.40	0.40	2.6
Manganese, max	0.35	0.35	2.0
Carbon, max	0.15	0.02	0.3
Silicon, max	0.35	0.35	0.5
Sulfur, max	0.01	0.01	0.024

6.4.1.2 *Category 2*—Hydrostatic, pneumatic plus eddy-current, or ultrasonic test at the manufacturer's option unless the purchaser specifies in accordance with 3.1.9.

6.4.1.3 The manufacturer shall have the option to use Test Category 1 or 2 if the purchaser does not specify the test category options in accordance with 3.1.9.

7. General Requirements

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

SUPPLEMENTARY REQUIREMENTS

One or more of the following supplementary requirements shall spply only when specified in the purchase order.

S1. The tube may be furnished without cold working.

S2. The tube may be furnished without a final heat treatment.

S3. Tubing over 0.125 in. wall thickness may be welded with the addition of matching filler metal.