

ASTM B516 / ASME SB516

SPECIFICATION FOR WELDED NICKEL-CHROMIUM-IRON ALLOY (UNS N06600, UNS N06603, UNS N06025, AND UNS N06045) TUBES

This specification covers welded UNS N06600, N06603, N06025, and N06045 alloy boiler, heat exchanger, and condenser tubes for general corrosion resisting and low or high-temperature service.

This specification covers tubes 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. Table 2 of Specification B 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.

A. Chemical Composition :-

The material shall conform to the composition limits specified in Table 1.

Table 1

Element	N06600	N06603	N06025	N06045
Nickel(A)	72.0 min	Bal	Bal	45.0 min
Chromium	14.0 -17.0	24.0-26.0	24.0-26.0	26.0-29.0
Iron	6.0-10.0	8.0-11.0	8.0-11.0	21.0-25.0
Manganese	1.0	0.15 max	0.15 max	1.0 max
Carbon	0.15 max	20.0-40.0	0.15-0.25	0.05-0.12
Copper	0.5 max	0.50 max	0.10 max	0.3 max
Silicon	0.5 max	0.50 max	0.5 max	2.5-3.0
Sulfur	0.015 max	0.010 max	0.010 max	0.010 max
Aluminum	...	2.4-3.0	1.8-2.4	...
Titanium	...	0.01-0.25	0.1-0.2	...
Phosphorus	...	0.020 max	0.02 max	0.02 max
Zirconium	...	0.01-0.40	0.01-0.10	...
Yttrium	...	0.01-0.15	0.05-0.12	...
Cerium	0.03-0.09

(A) Nickel shall be determined arithmetically by difference.

B. Mechanical Properties and Other Requirements :-

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 B 751.

Table 2

Alloy	Tensile Strength, min, psi (MPa)	Yield Strength, 0.2% Offset, min, psi (MPa)	Elongation in 2 in. or 50 mm, min, %
N06600	80,000 (550)	35,000 (240)	30
N06603	94,000 (650)	43,000 (300)	25
N06025	98,000 (680)	39,000 (270)	30
N06045	90,000 (620)	35,000 (240)	30

2. Flattening Test.
3. Flange Test.
4. Non-destructive Test Requirements —
 - i. 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.
 - ii. Class 2 — Each piece in each lot shall be subjected to a leak test and an electric test as follows:
 - a. Leak Test—Hydrostatic or pneumatic (air underwater).
 - b. Electric Test—Eddy current or ultrasonic.
 - iii. The manufacturer shall have the option to test to Class 1 or Class 2 and select the non-destructive test methods, if not specified by the purchaser.

C. General Requirements :-

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

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