

ASTM B517 / ASME SB517 SPECIFICATION FOR WELDED NICKEL-CHROMIUM-IRON ALLOY (UNS N06600, UNS N06603, UNS N06025, AND UNS N06045) PIPE

This specification covers welded, cold-worked, and annealed nickel-chromium-iron alloy (UNS N06600, N06603, N06025, and N06045) pipe for general corrosive service and heat-resisting applications.

A. General Requirement :-

1. Material furnished in accordance with this specification shall conform to the applicable requirements of the current edition of Specification SB-775 unless otherwise provided herein.

B. Chemical Composition :-

The material shall conform to the requirements as to chemical composition prescribed in Table 1.

Table 1

Element	N06600	N06603	N06025	N06045	Product (Check) Analysis Variations, Under Min. or Over Max., of the Specified Limit of Element
Nickel ^A	72.0 min.	Bal	Bal	45.0 min.	0.45
Chromium	14.0 min.	24.0–26.0	24.0–26.0	26.0–29.0	0.15
	17.0 max...	...	...	...	0.25
Iron	6.0 min.	8.0–11.0	8.0–11.0	21.0–25.0	0.1
	10.0 max...	...	...	...	0.1
Manganese	1.0	0.15 max.	0.15 max.	1.0 max.	0.03
Carbon	0.15 max.	20.0–40.0	0.15–0.25	0.05–0.12	0.01
Copper	0.5 max.	0.50 max.	0.10 max.	0.3 max.	0.03
Silicon	0.5 max.	0.50 max.	0.5 max.	2.5–3.0	0.03
Sulfur	0.015 max.	0.010 max.	0.010 max.	0.010 max.	0.003
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	...
Nitrogen	...	...	...	0.05–0.12	...

^A Nickel shall be determined arithmetically by difference.

C. Mechanical and Other Requirements :-

1. Mechanical Properties — The material shall conform to the requirements for mechanical properties prescribed in Table 2.

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 — Pipe shall be capable of withstanding, without cracking, flattening under a load applied gradually at room temperature until the distance between the platens is five times the wall thickness.
3. Non-destructive Test Requirements:
 - i. Category 1 — Each piece of each lot shall be subject to one of the following four tests: hydrostatic, pneumatic (air underwater), eddy current, or ultrasonic.
 - ii. Category 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), and
 - b. Electric Test — eddy current or ultrasonic.
 - iii. The manufacturer shall have the option to test Category 1 or Category 2 and select the non-destructive test methods, if not specified by the purchaser.

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