

ASTME B514 / ASME SB514

SPECIFICATION FOR WELDED NICKEL-IRONCHROMIUM ALLOY PIPE

This specification covers nickel-iron-chromium alloys in the form of welded, cold-worked, and annealed pipe for general corrosive service and heat-resisting applications.

These products are furnished in three alloys: UNS N08120, UNS N08800, and UNS N08810. Alloy UNS N08800 is employed normally in service temperatures up to and including 1100°F (593°C). Alloys UNS N08120 and UNS N08810 are employed normally in service temperatures above 1100°F where resistance to creep and rupture is required, and are annealed to develop controlled grain size for optimum properties in this temperature range.

A. General Requirement :-

1. Material furnished in accordance with this specification shall conform to the applicable requirements of the current edition of Specification B 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 | Alloy N08120 | Alloys N08800 and N08810 |
|----------------|--------------|--------------------------|
| Nickel | 35.0 min | 30.0 min |
| | 39.0 max | 35.0 max |
| Chromium | 23.0 min | 19.0 min |
| | 27.0 max | 23.0 max |
| Iron | remainder | 39.5 min (A) |
| Manganese, max | 1.5 | 1.5 |
| Carbon | 0.02 min | (B) |
| | 0.10 max | |
| Copper, max | 0.50 max | 0.75 |
| Silicon, max | 1.0 | 1.0 |
| Sulfur, max | 0.03 | 0.015 |
| Aluminum | 0.40 max | 0.15 min |
| | ... | 0.60 max |
| Titanium | 0.20 max | 0.15 min |
| | ... | 0.60 max |
| Columbium | 0.4 min | ... |
| | 0.9 max | ... |
| Molybdenum | 2.50 max | ... |
| Phosphorus | 0.040 max | ... |
| Tungsten | 2.50 max | ... |
| Cobalt, max | 3.0 | ... |
| Nitrogen | 0.15 min | ... |
| | 0.30 max | ... |
| Boron | 0.010 max | ... |

(A) Iron shall be determined arithmetically by difference.

(B) Alloy UNS N08800: 0.10 max. Alloy UNS N08810: 0.05 to 0.10.

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 | Condition (Temper) | Tensile Strength, min, psi (MPa) | Yield Strength, 0.2% Offset, min, psi (MPa) | Elongation in 2 in. or 50 mm, min, % |
|--------------|---------------------------|---|--|---|
| UND N08120 | annealed | 90000 (621) | 40000 (276) | 30 |
| UND N08800 | annealed | 75000 (520) | 30000 (207) | 30 |
| UND N08810 | annealed | 65000 (450) | 25000 (170) | 30 |

2. Grain Size—A transverse sample representing the full-wall thickness of annealed alloys UNS N08120 and N08810 shall conform to an average grain size of ASTM No. 5 or coarser.
3. 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.
4. Annealing Temperature—Alloy UNS N08120 shall be annealed at 2150°F (1177°C) minimum; alloy UNS N08810 shall be annealed at 2050°F (1120°C) minimum.
5. 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).
 - b. Electric Test—Eddy current or ultrasonic.
6. Transverse Guided Bend Test—At the option of the pipe manufacturer, the transverse guided bend test may be substituted in lieu of the flattening test. One test is required for each lot as defined in Specification B 775.

Related Keywords

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