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ASTM A268/A268M - 10 (R2016) Standard specification for seamless and welded ferritic and martensitic stainless steel tubing for general service

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American Society of Testing and Materials

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Description

This guide covers standard specification for a number of grades of nominal-wall-thickness, welded ferritic and martensitic stainless steel tubing for general corrosion-resisting and high-temperature service.

The steel shall conform to the required chemical composition for carbon, manganese, phosphorus, sulfur, silicon, nickel, chromium, molybdenum, aluminum, copper, nitrogen, titanium, and columbium.

The number of tubes in a lot heat treated by the continuous process shall be determined from the size of the tubes.

The steel shall conform to the following tensile properties: tensile strength, yield strength, and elongation.

The tubes shall have a hardness number that will not exceed the prescribed Brinell and Rockwell hardness values. Several mechanical tests shall be conducted, namely:

- tension test;
- flaring test (for seamless tubes);
- flange test (for welded tubes);
- hardness test;
- reverse flattening test;
- intergranular corrosion test; and
- hydrostatic or nondestructive electric test.

Scope

Most of the grades are commonly known as the "straight-chromium" types and are characterized by being ferromagnetic. Two of these grades, TP410 and UNS S 41500 are amenable to hardening by heat treatment, and the high-chromium, ferritic alloys are sensitive to notch-brittleness on slow cooling to ordinary temperatures. These features should be recognized in the use of these materials. Grade TP439 is used primarily for hot-water tank service and does not require post-weld heat treatment to prevent attack of the heat affected zone.

Chemical Requirements (refer standard for table contents...)

- (A) For small diameter or thin walls, or both, tubing, where many drawing passes are required, a carbon maximum of 0.015 % is necessary. Small outside diameter tubes are defined as those less than 0.500 in. [12.7 mm] in outside diameter and light wall tubes as those less than 0.049 in. [1.2 mm] in average wall thickness (0.040 in. [1 mm] in minimum wall thickness).
- (B) Plate version of CA6NM.
- (C) Carbon plus nitrogen = 0.30 max.
- (D) Nickel plus copper.
- (E) Carbon plus nitrogen = 0.025 % max.
- (F) $Cb/(C + N) = 12$ min.

An optional supplementary requirement is provided, and when desired, shall be so stated in the order.

The values stated in either inch-pound units or SI units are to be regarded separately as standard. Within the text, the SI units are shown in brackets. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with the standard. The inch-pound units shall apply unless the "M" designation of this specification is specified in the order.

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