

ASME SA 178 TUBE SPECIFICATIONS

GENERAL CHARACTERISTICS:

This specification applies to carbon steel and carbon-manganese steel tubes with minimum wall thickness that are electric resistance welded and are used as boiler tubes, boiler flues, super heater flues, and safe ends. The [ASTM SA 178 tube](#) sizes and thicknesses typically supplied to this specification are 0.035 to 0.320 in. [0.9 to 9.1 mm], inclusive, in minimum wall thickness, and 1/2 to 5 in. [12.7 to 127 mm] in outer diameter. Other sized tubes are acceptable as long as they meet all other specifications of this specification. Tubing with an internal diameter or thickness less than 1/8 in. [3.2 mm] or 0.015 in. [0.4 mm] is exempt from the standards for mechanical properties.

HEAT TREATMENT:

All tubes must be heat treated at a temperature of at least 1650°F (900°C) after welding, and they must then be cooled in the open air or in a controlled environment furnace. After the final cold-draw pass, cold-drawn tubes must be heat treated at a temperature of 1200° [650°C] or higher.

ASTM SA 178 CHEMICAL COMPOSITION FOR TUBE:

Designation		%C	%Mn	%S	%P	%Si
Grade A, Low-Carbon Steel	Min	0.06	0.27	--	--	--
	Max	0.18	--	0.035	0.035	--
Grade C, Medium-Carbon Steel	Min	--	0.80	--	--	--
	Max	0.035	7.50	0.035	0.035	--
Grade D, Carbon-Manganese Steel	Min	--	1.00	--	--	0.10
	Max	0.027	1.15	0.015	0.030	--

MECHANICAL PROPERTIES OF ASME SA 178 TUBE:

Mechanical properties	Grade	UTS ksi (MPa)	YS ksi (MPa)	%EL
ASME SA 178	A	325	180	35
ASME SA 178	C	415	255	30
ASME SA 178	D	485	275	30

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