

## Seamless Ferritic and Austenitic Alloy Steel Tubes for Boiler, Superheater and Heat Exchanger

### Standard & Material

ASTM A213/A213M ASME SA213 T92

It covers seamless ferritic and austenitic steel tubes for boiler, superheater and heat exchanger. The tubing sizes and thicknesses are 1/8 inch [3.2mm] in inside diameter to 5 inch [127mm] in outside diameter and 0.015 to 0.500 inch [0.40 to 12.7mm], inclusive, in minimum wall thickness or, if specified in the order, average wall thickness. Tubing having other diameters may be furnished, provided such tubes comply with all other requirements of ASTM A213/A213M ASME SA213.

### Chemistry Composition

C, % 0.07-0.13	Mn, % 0.30-0.60
P, % 0.020 max	S, % 0.010 max
Si, % 0.50 max	Ni, % 0.40 max
Cr, % 8.50-9.50	Mo, % 0.30-0.60
V, % 0.15-0.25	B, % 0.001-0.006
Nb, % 0.04-0.09	N, % 0.03-0.07
Al, % 0.02 max	W, % 1.50-2.00
Ti, % 0.01 max	Zr, % 0.01 max

### Mechanical Properties

Tensile Strength, MPa 620 min

Yield Strength, MPa 440 min

Elongation, % 20 min

Hardness, HBW 250 or HV 265 or HRC 25 max

Wall Thickness: min wall thickness or average wall thickness

Developed Length: max 30 meters each length, +10mm/-0mm

Manufacture: the tubes made by cold finished or hot finished process.

Heat Treatment: the tubes are heat treated by normalizing and tempering, austenitizing/solutioning temperature 1040°C-1080°C, subcritical annealing or tempering temperature 730°C-800°C.

Inspection & Test: chemistry composition analysis, tensile test, flattening test, flaring test, hardness test, NDT, surface inspection and dimension check.

Further Process: U bending tubes, fin tubes, studded tubes

