

Seamless Ferritic Alloy Steel Pipe for High Temperature Service

Standard & Material

ASTM A335/A335M ASME SA335 P91

It covers nominal wall and minimum wall seamless ferritic alloy steel pipe intended for high temperature service. Pipe ordered to ASTM A335/A335M shall be suitable for bending, flanging (vanstoning), and similar forming operations, and for fusion welding. Selection will depend upon design, service conditions, mechanical properties, and high temperature characteristics.

Chemistry Composition

C, % 0.08-0.12	Mn, % 0.30-0.60
P, % 0.020 max	S, % 0.010 max
Si, % 0.20-0.50	Ni, % 0.40 max
Cr, % 8.00-9.50	Mo, % 0.85-1.05
V, % 0.18-0.25	Nb, % 0.06-0.10
N, % 0.03-0.07	Al, % 0.02 max
Ti, % 0.01 max	Zr, % 0.01 max

Mechanical Properties

Tensile Strength, MPa 585 min

Yield Strength, MPa 415 min

Elongation, % 20 min

Hardness, HBW 190-250 or HV 196-265 or HRB 90-HRC 25

Wall Thickness: min wall thickness or average wall thickness

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

Manufacture: pipes shall be made by the seamless process and shall be either hot finished or cold drawn with the finishing treatment.

Heat Treatment: the tubes are heat treated by normalize and temper, or quench and temper at temperatures of 1040-1080°C or 730-800°C.

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

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

