

Quality **F11**

According to Standard **ASTM A 182/A 182M - 10a**

Number **-**



Comparable Standards

EN W.N. BS

1.7335 13CrMo4-4 -

Chemical Analysis - Class 1	C %	Mn %	Si %	P%	Cr %	Ni %	Mo %	S%	Other Elements
	0.05 to 0.15	0.30 to 0.60	0.50 to 1.00	0.030	1.00 to 1.50	—	0.44 to 0.65	0.030	—
Class 2, 3	C %	Mn %	Si %	P%	Cr %	Ni %	Mo %	S%	Other Elements
	0.10 to 0.20	0.30 to 0.80	0.50 to 1.00	0.040	1.00 to 1.50	—	0.44 to 0.65	0.040	—

Hot Work and Heat Treatment

Grade	Heat Treat Type	Austenitizing/Solutioning Temperature, Minimum or Range, °F [°C] ^A	Cooling Media	Quenching Cool Below °F [°C]	Tempering Temperature, Minimum or Range, °F [°C]
Low Alloy Steels					
F 11, Class 1, 2, 3	anneal	1650 [900]	furnace cool	-	-
	normalize and temper	1650 [900]	air cool	-	1150 [620]

Mechanical Properties at Room Temperature

Grade Symbol	Tensile Strength, min, ksi [Mpa]	Yield Strength, min, ksi [Mpa]	Elongation in 2 in, [50 mm] of 4D, min, %	Reduction of Area, min, %	Brinell Hardness Number, HBW
F11 Class 1	60 [415]	30 [205]	20	45	121-174
F11 Class 2	70 [485]	40 [275]	20	30	143-207
F11 Class 3	75 [515]	45 [310]	20	30	156-207