

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 Temperatures									
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		