

TABLE 1 TENSILE REQUIREMENTS FOR CLASS 1 PLATES

	Grades 2 and 12	Grade 11	Grades 22, 21, 5, 7, 9
Tensile strength, ksi [MPa]	55 to 80 [380 to 550]	60 to 85 [415 to 585]	60 to 85 [415 to 585]
Yield strength min. ksi [MPa]	33	35	30
Elongation in 8 in. [200 mm], min. % ^A	18	19	18
Elongation in 2 in. [50 mm], min. % ^A	22	22	18
Reduction of area, min. %			45 ^B 40 ^C

^A See Specification A 20/A 20M, elongation adjustments ^B Measured on round test specimens. ^C Measured on flat specimen.

TABLE 2 TENSILE REQUIREMENTS FOR CLASS 2 PLATES

	Grade 2	Grade 11	Grade 12	Grades 22, 21, 5, 7, 9	Grade 91
Tensile strength, ksi [MPa]	70 to 90 [485 to 620]	75 to 100 [515 to 690]	65 to 85 [450 to 585]	75 to 100 [515 to 690]	85 to 110 [585 to 760]
Yield strength, min. ksi [MPa]/(0.2% offset)	45 [310]	45 [310]	40 [275]	45 [310]	60 [415]
Elongation in 8 in. [200 mm], min. % ^B	18	18	19	...	...
Elongation in 2 in. [50 mm], min. % ^B	22	22	22	18	18
Reduction of area, min. %	...	...	...	45 ^C 40 ^D	...

^A Not applicable to annealed material. ^B See Specifications A 20/A 20M, elongation adjustments.
^C Measured on round test specimens. ^D Measured on flat specimen.

TABLE 3 CHEMICAL REQUIREMENTS

Element	Composition, %									
	Grade 2	Grade 12	Grade 11	Grade 22	Grade 21	Grade 5	Grade 7	Grade 9	Grade 91	
Carbon, max:										
Heat anal.	0.05-0.21	0.05-0.17	0.05-0.17	0.05-0.15 ^A	0.05-0.15 ^A	0.15 max	0.15 max	0.15 max	0.08-0.12	
Product anal.	0.04-0.21	0.04-0.17	0.04-0.17	0.04-0.15 ^A	0.04-0.15 ^A	0.15 max	0.15 max	0.15 max	0.06-0.15	
Manganese:										
Heat anal.	0.55-0.80	0.40-0.65	0.40-0.65	0.30-0.60	0.30-0.60	0.30-0.60	0.30-0.60	0.30-0.60	0.30-0.60	
Product anal.	0.50-0.88	0.35-0.73	0.35-0.73	0.25-0.66	0.25-0.66	0.25-0.66	0.25-0.66	0.25-0.66	0.25-0.66	
Phosphorus, max:										
Heat anal.	0.035	0.035	0.035	0.035	0.035	0.040	0.030	0.030	0.020	
Product anal.	0.035	0.035	0.035	0.035	0.035	0.040	0.030	0.030	0.025	
Sulfur, max:										
Heat anal.	0.040	0.040	0.040	0.035	0.035	0.030	0.030	0.030	0.010	
Product anal.	0.040	0.040	0.040	0.035	0.035	0.030	0.030	0.030	0.012	
Silicon:										
Heat anal.	0.15-0.40	0.15-0.40	0.50-0.80	0.50 max	0.50 max	0.50 max	1.00 max	1.00 max	0.20-0.50	
Product anal.	0.13-0.45	0.13-0.45	0.44-0.86	0.50 max	0.50 max	0.55 max	1.05 max	1.05 max	0.18-0.56	
Chromium:										
Heat anal.	0.50-0.80	0.80-1.15	1.00-1.50	2.00-2.50	2.75-3.25	4.00-6.00	6.00-8.00	8.00-10.00	8.00-9.50	
Product anal.	0.46-0.85	0.74-1.21	0.94-1.56	1.88-2.62	2.63-3.37	3.90-6.10	5.90-8.10	7.90-10.10	7.90-9.60	
Molybdenum:										
Heat anal.	0.45-0.60	0.45-0.60	0.45-0.65	0.90-1.10	0.90-1.10	0.45-0.65	0.45-0.65	0.90-1.10	0.85-1.05	
Product anal.	0.40-0.65	0.40-0.65	0.40-0.70	0.85-1.15	0.85-1.15	0.40-0.70	0.40-0.70	0.85-1.15	0.80-1.10	
Nickel, max:										
Heat anal.	...	...	...	...	...	...	...	...	0.40	
Product anal.	...	...	...	...	...	...	...	...	0.43	
Vanadium:										
Heat anal.	...	...	...	...	...	...	...	...	0.18-0.25	
Product analysis	...	...	...	...	...	...	...	...	0.16-0.27	
Columbium:										
Heat anal.	...	...	...	...	...	...	...	...	0.06-0.10	
Product anal.	...	...	...	...	...	...	...	...	0.05-0.11	
Nitrogen:										
Heat anal.	...	...	...	...	...	...	...	...	0.030-0.070	
Product anal.	...	...	...	...	...	...	...	...	0.025-0.080	
Aluminum, max:										
Heat anal.	...	...	...	...	...	...	...	...	0.04	
Product anal.	...	...	...	...	...	...	...	...	0.05	

^A The carbon content for plates over 5 in. (125 mm) in thickness is 0.17 max on product analysis.