



SA-517 Grade A, B, E, F, H, P, Q, S

Overview

This quenched and tempered grade is used primarily in pressure vessel applications. The elevated physicals of this alloy grade is applicable for environments where added strength is required.

Chemical Requirements

*Elements represented in percentage

Elements	Grade A %	Grade B %	Grade E %	Grade F %	Grade H %	Grade P %	Grade Q %	Grade S %
Carbon								
Heat analysis	0.15-0.21	0.15-0.21	0.12-0.20	0.10-0.20	0.12-0.21	0.12-0.21	0.14-0.21	0.10-0.20
Product analysis	0.13-0.23	0.13-0.23	0.10-0.22	0.08-0.22	0.10-0.23	0.10-0.23	0.12-0.23	0.10-0.22
Manganese								
Heat analysis	0.80-1.10	0.70-1.00	0.40-0.70	0.60-1.00	0.95-1.30	0.45-0.70	0.95-1.30	1.10-1.50
Product analysis	0.74-1.20	0.64-1.10	0.35-0.78	0.55-1.10	0.87-1.41	0.40-0.78	0.87-1.41	1.02-1.62
Phosphorus, max	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025
Sulfur, max	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025
Silicon								
Heat analysis	0.40-0.80	0.15-0.35	0.10-0.40	0.15-0.35	0.15-0.35	0.20-0.35	0.15-0.35	0.15-0.40
Product analysis	0.34-0.86	0.13-0.37	0.08-0.45	0.13-0.37	0.13-0.37	0.18-0.37	0.13-0.37	0.13-0.45
Nickel								
Heat analysis	—	—	—	0.70-1.00	0.30-0.70	1.20-1.50	1.20-1.50	—
Product analysis	—	—	—	0.67-1.03	0.27-0.73	1.15-1.55	1.15-1.55	—
Chromium								
Heat analysis	0.50-0.80	0.40-0.65	1.40-2.00	0.40-0.65	0.40-0.65	0.85-1.20	1.00-1.50	—



Elements	Grade A %	Grade B %	Grade E %	Grade F %	Grade H %	Grade P %	Grade Q %	Grade S %
Product analysis	0.46-0.84	0.36-0.69	1.34-2.06	0.36-0.69	0.36-0.69	0.79-1.26	0.94-1.56	—
Molybdenum								
Heat analysis	0.18-0.28	0.15-0.25	0.40-0.60	0.40-0.60	0.20-0.30	0.45-0.60	0.40-0.60	0.10-0.35

Tensile Requirements

	2.50 in. [65 mm] and Under	Over 2.50 to 6 in. [65 to 150 mm]
Tensile strength	115-135 [795-930]	105-135 [725-930]
Yield strength, min, ksi [MPa]	100 [690]	90 [620]
Elongation in 2 in. [50 mm], min, %	16	14
Reduction of area, min, %:		
Rectangular specimens	35	—
Round specimens	45	45