A-514 Grades B, E, F, H, Q, S

Overview

A very popular grade used extensively within the construction industry in earth moving equipment, building / support apparatus, truck frames / bodies, oil rigs, booms, and drilling equipment just to name a few. This quenched and tempered HSLA (High Strength Low Alloy) product have both tensile / yield properties at min 100ksi.

Chemical Requirements

Elements represented in percentage – (max. thickness)

Elements	Grade B (1-1/4)	Grade E (6)	Grade F (2-1/2)	Grade H (2)	Grade Q (6)	Grade S (2 1/2)
Carbon	0.12-0.21	0.12-0.20	0.10-0.20	0.12-0.21	0.14-0.21	0.11-0.21
Manganese	0.70-1.00	0.40-0.70	0.60-1.00	0.95-1.30	0.95-1.30	1.10-1.50
Phosphorus, max	0.030	0.030	0.030	0.030	0.030	0.030
Sulfur, max	0.030	0.030	0.030	0.030	0.030	0.020
Silicon	0.20-0.35	0.20-0.40	0.15-0.35	0.20-0.35	0.15-0.35	0.15-0.45
Nickel	–	–	0.70-1.00	0.30-0.70	1.20-1.50	–
Chromium	0.40-0.65	1.40-2.00	0.40-0.65	0.40-0.65	1.00-1.50	–
Molybdenum	0.15-0.25	0.40-0.60	0.40-0.60	0.20-0.30	0.40-0.60	0.10-0.35
Vanadium	0.03-0.08	A	0.03-0.08	0.03-0.08	0.03-0.08	–
Titanium	0.01-0.10	0.01-0.10	–	–	–	c
Zirconium	–	–	–	–	–	–
Copper	–	–	0.15-0.50	–	–	–
Boron	0.0005-0.005	0.001-0.005	0.0005-0.006	0.0005-0.005	–	0.001-0.005
Columbium, max	–	–	–	–	–	0.06

Tensile & Hardness Requirements

Thickness, in. (mm)	Ultimate Tensile Strength ksi (MPa)	Yield Strength min, ksi (MP)	Elongation in 2 in. (50 mm),Â B,C,D,E	Reduction of Area,B,C	Brinell Hardness Number

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To 3/4 (20), incl	110 to 130 (760 to 895)	100 (690)	18	40G	235 to 293
Over 3/4 to 2-1/2 (20 to 65), incl	110 to 130 (760 to 895)	100 (690)	18	40G, 50H	—
Over 2-1/2 to 6 (65 to 150), incl	100 to 130 (690 to 895)	90 (620)	16	50H	—