



ASTM A514 Grade B

Quenched and Tempered Steel Plate

ASTM A514 Grade B is a quenched and tempered steel product offered for structural applications where high yield strength (100 ksi min.) combined with good formability and toughness are required. This grade is ideal for applications where increased strength-to-weight ratios and uniformity of properties are required.

Typical Applications

Some potential applications for A514 Grade B include transport trailers, construction equipment, crane booms, mobile man-lifts, agricultural equipment, heavy vehicle frames and chassis, and welded bridge structural members.

Available Sizes

Thicknesses range from 3/16 to 1-1/4" (4.8 to 31.8 mm) in widths 72 to 102" (1,830 to 2,591 mm). Maximum length is 600" (15.2 m).

Standard plate thicknesses available (96" wide x 240" pattern size) include 3/16", 1/4", 3/8", 1/2", 3/4", 1", and 1-1/4" (4.8, 6.4, 9.5, 12.7, 19.0, 25.4, and 31.8 mm).

Please inquire for other sizes.

Flatness

Guaranteed to meet 1/2 ASTM A6 flatness tolerances.

Composition, wt. %

	C	Mn	P	S	Si	Cr	Mo	V	Ti	B
Min.	0.12	0.70			0.20	0.40	0.15	0.03	0.01	0.0005
Max.	0.21	1.00	0.035	0.008*	0.35	0.65	0.25	0.08	0.04	0.005

*Note that SSAB's S level is more restrictive than A514 Grade B.

Typical CE_{IIW} and corrosion index for A514 Grade B are 0.51 and 6.1, respectively.

Weldability

A514 Grade B can be welded using a low-hydrogen electrode Shielded Metal Arc Welding (SMAW), Gas Metal Arc Welding (GMAW) or Submerged Arc Welding (SAW) process. Care must be taken when welding A514 Grade B due to its susceptibility to hydrogen cracking in the weld heat affected zone. Because of the relatively high carbon equivalent value and the heat treat cycle to which the plate has been exposed, care must be taken to ensure that appropriate welding procedures and proper welding consumables are used. When using an SMAW or GMAW process, it is also recommended that the area to be welded be preheated to approximately 200°F prior to welding.



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A514 Grade B may be susceptible to reheat cracking in the heat-affected zone of welds during stress relieving or postweld heat treatment. As a result, SSAB recommends that a qualified welding engineer consider this potential phenomenon before stress relieving weldments of this product.

Formability

A514 Grade B exhibits good cold forming characteristics. Following ASTM A6, for plate thickness up to 0.75", the recommended minimum inside bend radius for cold bending is $1.75t^{**}$ (where t is plate thickness). For thickness over 0.750" to 1.000", the recommended inside bend radius for cold bending is $2.25t^{**}$. For plate thicknesses over 1.00", the minimum inside bend radius should be $4.5t^{**}$. When bending parallel to the rolling direction (i.e., hard-way bend), the radii shown above should be increased by a factor of 1.5. Tighter radii can be achieved with suitable preparation of cut or burnt edges and by avoidance of excessive restraint. For applications requiring more severe bends, please inquire.

** For bends made perpendicular to the rolling direction.

Specified Mechanical Properties (ASTM A6)

Transverse Tensile (Plate-type specimen)				Hardness
Yield Strength, ksi	Ultimate Tensile Strength, ksi	%Elong. in 2"	%Reduction of Area	HBW*
100 min.	110 to 130	16 min.	35 min.	235 to 293

* For plates up to 3/8", a Brinell test may be used instead of a tensile test for those plates not tensile tested in a 15-ton lot.

Typical Charpy V-notch Properties

Typical full-size Charpy V-notch energies at -50°F (-45°C) in the longitudinal and transverse orientations for A514 Grade B plates are in excess of 20 ft-lbs (27 J).

Sales Contacts

For sales information, please call 877-722-2589 (Southern USA & Mexico), 800-340-5566 (Western and Central USA), 800-383-9031 (North Central USA), and 888-576-8530 (Northeast USA & Canada) or consult www.ssab.com.