

ST100XF/ASTM A656 Grade 100

Structural Steel Plate

General Product Description

ST100XF steel plate is a low-carbon, thermo-mechanical controlled-rolled material that has been developed for applications where increased strength-to-weight ratios are required. ST100XF is available as temper-leveled, cut-to-length plate and meets or exceeds the requirements of ASTM A656 Grade 100.

Applications: ST100XF plate is designed to be used for transport trailers, construction equipment, crane booms, mobile manlifts, agriculture equipment, rail cars, heavy vehicle frames and chassis.

Dimensions: The following ST100XF plate sizes are available:

Product Type	Thickness, in [mm]	Width, in [mm]	Length, in [mm]
Cut-to-Length Plate	0.188 – 0.375 [4.8 – 9.5]	60 – 96 [1,525 - 2,438]	96 – 720 [2,438 – 18,288]
	>0.375 – 0.500 [>9.5 – 12.7]	60 – 72 [1,525 – 1,830]	96 – 720 [2,438 – 18,288]

Mechanical Properties

Tensile Testing: Performed using plate-type specimens, transverse direction according to ASTM A6 requirements. The minimum values are tabulated below.

0.2% YS ksi [MPa]	UTS ksi [MPa]	Elongation in 2" [50 mm] %
100 [690]	110 [760]	16

Charpy V-notch (CVN) Impact Testing: three options are available:

- Impact tested with a minimum longitudinal CVN impact energy of 20 ft-lbs @ -40°F (27 J @ -40°C).
- Charpy V-notch impact test requirements subject to agreement between producer and purchaser.
- No Charpy V-notch impact testing performed.

Chemical Composition (% max. ladle analysis, unless noted)

C	Mn	P	S	Si	V	Cb	N	Cb+V+Ti	CEV (Typical)	Pcm (Typical)
0.10	1.90	0.025	0.006	0.40	0.15	0.10	0.020	0.20	0.51	0.21

$$\text{Carbon Equivalent } CEV = C + \frac{Mn}{6} + \frac{Cr+Mo+V}{5} + \frac{Ni+Cu}{15}; \quad Pcm = C + \frac{Si}{30} + \frac{(Mn+Cu+Cr)}{20} + \frac{Ni}{60} + \frac{Mo}{15} + \frac{V}{10} + 5B$$

Tolerances

Thickness, width, and length tolerances for ST100XF steel plate are in accordance with the requirements of ASTM A6. The flatness tolerance for as-supplied plate is ASTM A6 half-standard flatness.

Fabrication and Other Recommendations

Weldability

ST100XF steel plate is weldable by conventional electric arc welding processes, using low-hydrogen consumables. Although ST100XF is made to a chemistry which is readily weldable without preheat or post weld heat treatment, a precautionary preheat of 120°C (250°F) is recommended to remove any moisture. When matching consumables are not required, lower strength electrodes are recommended.

Welding Process	Recommended Consumables
Shielded Metal Arc (SMAW)	AWS-E11018
Submerged Arc Weld (SAW)	AWS F11X-EXXX
Gas Metal Arc (GMAW)	AWS ER110S-X
Flux Cored Arc Welding (FCAW)	AWS E11XT-X

Formability

ST100XF exhibits cold forming characteristics similar to those of ASTM A656 Grade 80. The minimum recommended punch radius, R, and die width opening, W, as a function of bending orientation for cold bending are provided in the following table.

Thickness in [mm]	Bend Axis Perpendicular to Rolling Direction		Bend Axis Parallel to Rolling Direction	
	Min. Punch Radius, R	Die width W	Min. Punch Radius, R	Die width W
0.1875 – 0.500 [4.8 – 12.7]	1.75t	8t	2.625t	10t

Sales Contacts

For sales information, please call 877-294-3858 (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.