

AlgoTuf 500

Maximum wear-resistance
Abrasion resistant heat-treated steel plate



AlgoTuf 500 is designed specifically for applications which require extremely high abrasion resistance. This 500 HBW material has become the popular abrasion-resistant product for mining and other highly abrasive industrial applications.

Dimensions

Thickness range: 0.236" (6mm) - 1.25" (31.75mm)
Maximum width: 152" (3860mm)
Maximum length: 960" (24400mm)

The stock plate size most commonly available through Algoma's distributor network is 96" x 288" (2440mm x 7315mm).

Notch Toughness

AlgoTuf 500 will typically have CVNL average values of 20 ft-lbs at -40°F (27 Joules at -40°C).

AlgoTuf 500 is not normally produced with certified notch toughness values. However, impact values may be reported, for information only, if requested at the time the order is placed.

Hardness

AlgoTuf 500 is heat-treated to produce a through-thickness hard product with a range of 477-545 HBW for thicknesses up to 1.25" (31.75mm).

Forming (Up to 90°)

Because of its extreme strength and hardness, forming of AlgoTuf 500 is not recommended. If forming is absolutely essential, use an inside bend radius of at least 10t (where t is the plate thickness), with the bend axis transverse to the rolling direction (i.e. across the grain), for thicknesses up to 0.787" (20mm).

Maximum Temperatures for Hot Forming and Stress-Relief

AlgoTuf 500 can be heated to approximately 350°F (175°C) for about 20 minutes, for hot forming or stress relief operations. Additional time at this temperature may result in some loss of mechanical properties.

Chemical Composition - Heat Analysis (% maximum)

Thickness	C	Mn	P	S	Si	Cr	Mo	Ni	B
0.236" (6mm) to 1.25" (31.75mm)	0.33	1.50	0.025	0.015	0.50	0.70	0.35	0.70	0.003

Notes:

1. The molybdenum content will vary according to thickness.
2. To meet the required mechanical properties, Algoma may use additional alloy elements, which it will report to purchasers.

Mechanical Properties (transverse) for information only*

Tensile Strength Typical	Yield Strength Typical	Elongation (per cent) Typical 2" (50mm)
225 ksi (1551 MPa)	NA	14

*These values are provided for reference only and no express or implied warranty is made that a specific plate will provide these properties, unless negotiated with Algoma prior to order acceptance

Welding

AlgoTuf 500 exhibits excellent weldability. Because of its low alloy content, this grade can be welded using simple procedures and common, readily available consumables.

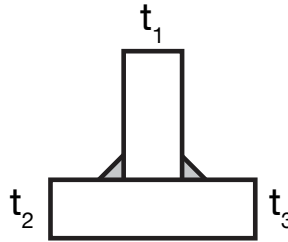
Algoma recommends H8 designation electrodes.

High heat input welding processes such as electroslag and electrogas are not suitable for AlgoTuf 500, and will cause a reduction of mechanical properties and hardness along the heat-affected zone.



Preheat and Interpass Temperatures

Algoma recommends the following preheat and interpass temperatures, which should be monitored with temperature crayons, thermocouples, etc. Higher preheat temperatures may be required when the weld metal hydrogen level is greater than 8ml/100g deposited weld metal, or when higher joint restraint is present.



Combined plate thickness ($t_1+t_2+t_3$)	H8 Designation	
	Low restraint	High restraint
≤ 0.75 " (20mm)	120°F (50°C)	255°F (125°C)
≤ 1.50 " (38mm)	210°F (100°C)	400°F (200°C)
≤ 2.25 " (57mm)	255°F (125°C)	400°F (200°C)
≤ 3.00 " (75mm)	300°F (150°C)	400°F (200°C)
> 3.00 " (75mm)	300°F (150°C)	400°F (200°C)

*Ambient temperature is assumed as 68°F (20°C).

These temperatures are based on the SMAW process, using E7018 electrodes. Once the electrodes are removed from their sealed containers, they should be stored in an oven at 250°F (120°C).

Preheat temperatures can be reduced by 50°F (28°C) for the GMAW process.

The Dearden-O'Neill Carbon Equivalent (C.E.) of AlgoTuf 500 is:

Thickness	Nominal Aim Carbon Equivalent	Maximum Carbon Equivalent
0.236" (6mm) to 1.25" (31.75mm)	0.61	0.66

The carbon equivalent calculated from the mill test report should be used for critical applications.