

TECHNICAL DATA SHEET (TDS)

PRODUCT: 5083 ALUMINUM ALLOY PLATE

5083 is an aluminum alloy with magnesium and traces of manganese and chromium. It is known for exceptional performance in extreme environments. Aluminum 5083 is highly resistant to attack by both seawater and industrial chemical environments. It has the highest strength of the non-heat treatable alloys with an Ultimate Tensile Strength of 317 MPa and a Tensile Yield Strength of 228 MPa. It is not recommended for use in temperatures in excess of 65 °C. Alloy 5083 is best known as a plate for ship building. The alloy is also produced as extruded seamless tube and other extrusions and as forgings.

PRODUCT BASIC INFORMATION:

Alloy:	5083
Form:	Plate
Temper:	O, H111, H112, H116, H321
Dimension:	Thickness: 6.0mm to 150mm Width: 1,000mm to 2,500mm Length: 3,000mm to 10,000mm
Surface Finish:	Mill Finish
Standard Specification:	GB/T 3880, ASTM B209, EN 485
Application:	General Use

CHEMICAL COMPOSITION:

Element		Percentage (%)
Aluminum	(Al)	Remainder
Silicon	(Si)	0.40 max
Iron	(Fe)	0.40 max
Copper	(Cu)	0.10 max
Manganese	(Mn)	0.4~1.0
Magnesium	(Mg)	4.0~4.9
Chromium	(Cr)	0.05~0.25
Zinc	(Zn)	0.25 max
Titanium	(Ti)	0.15 max
Remainder Each		0.05 max
Remainder Total		0.15 max

MECHANICAL PROPERTIES:

Temper	Thickness	Ultimate Strength Rm/MPa	Yield Strength Rp0.2/MPa	Elongation Min. %	Bend Radius (90°)
O H111	≥ 6.0~12.5mm	270~345	≥ 115	≥ 16%	2.5t
	≥ 12.5~50mm	270~345	≥ 115	≥ 15%	-
	≥ 50~80mm	270~345	≥ 115	≥ 14%	-
	≥ 80~120mm	≥ 260	≥ 110	≥ 12%	-
	≥ 120~150mm	≥ 255	≥ 105	≥ 12%	-
H112	≥ 6.0~12.5mm	≥ 275	≥ 125	≥ 12%	-
	≥ 12.5~40mm	≥ 275	≥ 125	≥ 10%	-
	≥ 40~80mm	≥ 270	≥ 115	≥ 10%	-
	≥ 80~120mm	≥ 260	≥ 110	≥ 10%	-
H116 H321	≥ 6.0~12.5mm	≥ 305	≥ 215	≥ 12%	4.0t
	≥ 12.5~40mm	≥ 305	≥ 215	≥ 10%	-
	≥ 40~80mm	≥ 285	≥ 200	≥ 10%	-

PHYSICAL DATA :

Density (20°C):	2,660	kg/m ³
Melting Point:	574°C	
Thermal Expansion (20°C ~100°C):	24.2 x10 ⁻⁶	/K
Modulus of Elasticity:	70.3	GPa
Thermal conductivity (Temper O):	120	W·m-1·K-1
Electrical Resistivity (Temper O):	0.0595 x10 ⁻⁶	Ω .m
Conductivity (Temper O):	29	%IACS
Magnetic performance:	No	
Color:	Silver	
Odour:	No	

TOLERANCE ON FORMS AND DIMENSIONS :

Thickness Tolerance:	Thickness	Width			
		≤1250mm	>1250~1600mm	>1600~2000mm	>2000~2500mm
	≥ 6~8mm	± 0.35mm	± 0.40mm	± 0.40mm	± 0.50mm
	> 8~10mm	± 0.45mm	± 0.50mm	± 0.50mm	± 0.55mm
	> 10~15mm	± 0.50mm	± 0.60mm	± 0.65mm	± 0.65mm
	> 15~20mm	± 0.60mm	± 0.70mm	± 0.75mm	± 0.80mm
	> 20~30mm	± 0.65mm	± 0.75mm	± 0.85mm	± 0.90mm
	> 30~40mm	± 0.75mm	± 0.85mm	± 1.00mm	± 1.10mm
	> 40~50mm	± 0.90mm	± 1.00mm	± 1.10mm	± 1.20mm
	> 50~60mm	± 1.10mm	± 1.20mm	± 1.40mm	± 1.50mm
	> 60~80mm	± 1.40mm	± 1.50mm	± 1.70mm	± 1.90mm
	> 80~100mm	± 1.70mm	± 1.80mm	± 1.90mm	± 2.10mm
	> 100~150mm	± 2.10mm	± 2.20mm	± 2.50mm	± 2.60mm



Width Tolerance:	Thickness	Width		
		≤ 1000mm	> 1000~2000mm	> 2000~2500mm
	≥ 6~12mm	+ 6mm	+ 7mm	+ 8mm
	> 12~50mm	+ 6mm	+ 7mm	+ 9mm
	> 50~150mm	+ 8mm	+ 8mm	+ 9mm

Length Tolerance:	Thickness	Length			
		≤ 2000mm	> 2000~3000mm	> 3000~4000mm	> 4000
	≥ 6~150mm	+ 7mm	+ 8mm	+ 9mm	+ 10mm

Flatness Tolerance:	Thickness	Total Deviation %		
		On Length	On Width	Partial Deviation
	≥ 6~50mm	≤ 0.2%	≤ 0.4%	≤ 0.3%
	> 50~150mm	≤ 0.2%	≤ 0.2%	By agreement

Lateral Curvature Tolerance:	Width	Lateral Curvature Tolerance for Specified Length			
		≤ 2000mm	> 2000~3000mm	> 3000~5000mm	> 5000mm
	≤1250mm	≤ 4mm	≤ 7mm	≤ 10mm	≤ 0.2% of Specified Length
	>1250~1500mm	≤ 3mm	≤ 6mm	≤ 8mm	
	>1500~2000mm	≤ 3mm	≤ 6mm	≤ 7mm	
	>2000mm	-	≤ 5mm	≤ 6mm	

Squareness Tolerance:	Length	Squareness Tolerance for Specified Width			
		≤ 1000mm	>1000~1500mm	>1500~2000mm	> 2000mm
	≤2000mm	≤ 6mm	≤ 7mm	≤ 8mm	-
	>2000~3000mm	≤ 7mm	≤ 7mm	≤ 9mm	≤ 10mm
	>3000~3500mm	≤ 7mm	≤ 8mm	≤ 10mm	≤ 10mm
	>3500~5000mm	≤ 8mm	≤ 10mm	≤ 10mm	≤ 12mm
	>5000mm	≤ 12mm	≤ 12mm	≤ 15mm	≤ 15mm

OTHER PROPERTIES:

Principal Design Features	This is a non-heat treatable alloy for strengthening. It has very good corrosion resistance, is easily welded and does have good strength.
Machinability	Machinability is poor for this alloy. However the alloy is machinable by conventional means.
Forming	Forming characteristics are good for either hot or cold working.
Weldability	Weldability of this alloy is very good by conventional means. When welding 5083 to itself or another alloy from the same sub-group, the recommended filler metal is 5183. Other suitable fillers are 5356 and 5556.
Heat Treatment	5083 cannot be hardened by means of heat treatment. It does harden due to cold working.



Hot Working	This alloy has excellent cold working characteristics such that hot working should not normally be necessary. However it may be hot worked in the temperature range of 204°C to 371°C.
Cold Working	AL 5083 is readily cold worked by conventional methods. In the annealed (O temper) condition plate of 0.250 " thick can be bent on 1.5 T radiuses.
Annealing	Annealing, if required, may be done at 415°C, followed by air cooling.
Aging	Not applicable to this alloy.
Hardening	Hardening is accomplished by means of cold working only.

APPLICATIONS

Typical Applications	Commonly used in the manufacture of unfired, welded pressure vessels, shipbuilding, marine skips and cages, auto aircraft cryogenics, rail cars, vehicle bodies, tip truck bodies, drilling rigs, TV towers, transportation equipment, various structural applications that make use of the high strength, and in missile components.
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PACKAGING, HANDING & STORAGE:

Package:	Packed in waterproof Kraft, fastened by steel straps on wood pallets, suitable for handling, loading and unloading from the trunks or containers, suitable for export ocean forwarding.
Handling:	Prevent the goods hurting the people who are moving, loading, unloading, especially pay attention to the rolling and dropping for the coils.
Storage:	Stored in indoor area on plain floor, free away from moisture, water, snow, animal oils and dye wastes, avoid storing with acid or basic chemical goods.

The above mentioned aluminum product is produced according to national standard specifications, and has no poison, no pollution, and no cauterization. It is common industry metal material.

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