



TECHNICAL DATA SHEET

PRODUCT: A96351 ALUMINUM ALLOY PLATE

PRODUCT BASIC INFORMATION:

Alloy:	6351
Form:	Foils, Coils, Rolls, Strip, Checkered Plate, Flats, Circle, Blank, Ring (Flange) etc.
Temper:	-- T4, T54, T1, T11,
Dimension:	Thickness: -- Width: -- Length: --
Surface Finish:	polished, Bright, hair line, sand blast, brush, checkered, etching, embossed, etc.
Standard Specification:	UNS A92048 - ASTM 221 6351-T6 - ASME SB 221 - AA6351-T651
Application:	General Use

CHEMICAL COMPOSITION:

Element		Percentage (%)
Aluminum	(Al)	95.9 - 98.5 %
Silicon	(Si)	0.70 - 1.3
Iron	(Fe)	<= 0.50 %
Copper	(Cu)	<= 0.10 %
Manganese	(Mn)	0.40 - 0.80
Magnesium	(Mg)	0.40 - 0.80
Chromium	(Cr)	--
Zinc	(Zn)	<= 0.20 %
Titanium	(Ti)	<= 0.20 %
Remainder Each		0.05 max
Remainder Total		0.15 max

MECHANICAL PROPERTIES:

Properties	Metric	Imperial
Tensile strength	250 MPa	35260 psi
Yield strength	150 MPa	21756 psi
Elongation	20%	20%
Elastic modulus	70 – 80 GPa	10200 ksi
Shear strength	200 MPa	29200 psi
Hardness	95	95
Poisson's ratio	0.033	0.033
Fatigue strength	90 MPa	13054 psi

PHYSICAL DATA :

Density (20°C):	2.5 – 2.8	kg/m ³
Melting Point:	554 – 649 °C	
Thermal Expansion (20°C ~100°C):	23	µm/m°C
Modulus of Elasticity:	68.9	GPa
Thermal conductivity (Temper O):	176	W/mK
Electrical Resistivity (Temper O):	0.00000382	ohm-cm
Conductivity (Temper O):	46	%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	
Length Tolerance:	Thickness	Length			
		≤ 2000mm	> 2000~3000mm	> 3000~4000mm	> 4000
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

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Machinability

Machining aluminum 6351 requires special tools due to its high hardness levels compared to other alloys like steel or brass. High-speed steel (HSS) tools are often recommended when machining this alloy as they provide better cutting performance than carbide tools do due to their higher wear resistance capabilities when machining harder materials like aluminum alloys at high speeds and feeds rates while still producing good surface finishes on the workpiece material processed with them. Additionally, coolants should always be used during machining operations in order to reduce friction between the tool and workpiece material as well as prevent chips from sticking onto the cutting edges, which could affect tool life performance significantly if not addressed properly.

Forming

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Weldability

6351 has excellent weldability by all standard methods including GMAW (MIG) and GTAW (TIG). Filler alloy 4043 is the primary filler though 5356 wire is the suggested alternative. Additionally, preheat treatments should be done prior to welding operations in order to reduce any risk of cracking that may occur during post-weld cooling cycles.

Heat Treatment

The properties of aluminum 6351 can be further enhanced through a variety of heat treatment techniques, such as tempering, ageing, and solution zing treatments, which help increase the strength and hardness of the alloy while maintaining its ductility and formability. These treatments are usually carried out at specific temperatures depending on the desired results achieved by the user. For example, solution zing treatments are done at temperatures ranging from 500 °C to 900 °C while ageing treatments need higher temperatures ranging from 350 °C to 600 °C for optimal results.

Hot Working

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Cold Working

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Annealing

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Aging

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Hardening

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APPLICATIONS

Typical Applications

6351, and similarly 6082, has moderate extrudability suitable for high stress applications including recreational trailers, marine, boats, truck bodies, automotive componentry, food production equipment, bridges, cranes, trusses, defense, rail and civil structural supports.

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.

