TECHNICAL DATA SHEET

PRODUCT: A92219 ALUMINUM ALLOY PLATE

Aluminum Alloy 2219 offers excellent strength-to-weight ratios combined with superior corrosion resistance making it an ideal choice for components requiring these characteristics in engineering and fabrication applications requiring lightweight materials that can resist hostile environmental conditions over extended periods without suffering any degradation of performance or structural integrity over time due to exposure factors like moisture or aggressive chemicals commonly found in certain industrial process plants or marine environments where long term reliability of components is paramount when selecting materials suitable for use under these challenging conditions. Furthermore, thanks to its relatively good machinability, even though not comparable with steel and lower cost than titanium alloys.

PRODUCT BASIC INFORMATION:

Alloy:	**2219**	
Form:		Foils, Coils, Rolls, Strip, Checkered Plate, Flats, Circle, Blank, Ring (Flange) etc.
Temper:	--	H34, H24, T4, F, T5, H14, H22, H36, H18, H19, T851 T451, H26, T3, T351, H32, H112, H16, O, T7, H321, T651, T6, H111, H12, H38,
Dimension:	Thickness: Width: Length:	0.2-300 mm
Surface Finish:		polished, Bright, hair line, sand blast, brush, checkered, etching, embossed, etc.
Standard Specification:	UNS A92219 - AMS 4031 - 2219-0/F Sheet, Plate - AMS 4068 - 2219-T3511 Drawn, Seamless Tubing - AMS 4094 - 2219 T81 Clad Sheet / MS4162 - ASTM B211 - ASTM B221	
Application:	General Use	

CHEMICAL COMPOSITION:

Element		**Percentage (%)**
Aluminum	**(Al)**	93%
Silicon	**(Si)**	--
Iron	**(Fe)**	--
Copper	**(Cu)**	6.3 max
Manganese	**(Mn)**	0.3 max
Magnesium	**(Mg)**	--
Titanium	**(Ti)**	0.06 max
Vanadium	**(V)**	0.10 max
Zirconium	**(Zr)**	0.18 max
Remainder Each		--
Remainder Total		--

MECHANICAL PROPERTIES:

Properties	Metric	Imperial
Tensile strength (annealed)	170 MPa	24656 psi
Yield strength (annealed)	76 MPa	1022 psi
Elongation (annealed)	18%	18%
Elastic modulus	70 - 80 GPa	10153-11603 ksi
Fatigue strength	105 MPa	15229 psi
Poisson's ratio	0.33	0.33

PHYSICAL DATA :

Density (20°C):	2.6 – 2.8	kg/m^3
Melting Point:	510°C	
Thermal Expansion (20°C ~100°C):	22	µm/m-K
Modulus of Elasticity:	70 - 80	GPa
Thermal conductivity (Temper O):	170	W/mK
Electrical Resistivity (Temper O):	5.82e-006 Ω-cm	Typical at 68°F
Conductivity (Temper O):	44	%IACS
Magnetic performance:	No	
Maximum Temperature: Mechanical	230 °C	
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	--
Machinability	Aluminum Alloy 2219 can be machined using conventional methods with some difficulty due to its relatively high hardness values compared to other aluminum alloys, but still much easier than machining steel alloys of similar hardness levels thanks to its better thermal conductivity properties, which helps dissipate heat away from the cutting edge more quickly during machining operations reducing wear on tools significantly compared with steel alloys which tend to retain heat in their cutting edges causing premature tool failure when machined at higher speeds or feeds rates during production runs.
Forming	--
Weldability	When welding this material standard GTAW techniques are recommended since GMAW can lead to porosity issues due to its high melting point, making it difficult for flux-cored wires designed for steel alloys unsuitable for welding aluminum materials like this one without significant modifications that may compromise the weld integrity over time due to lack of shielding gas protection from oxygen contamination during welding operations.

Heat Treatment	--
Hot Working	Aluminum 2219 alloy should not be hot worked if they are not subjected to heat treatment in order to restore the corrosion resistance property of this alloy.
Cold Working	Aluminum 2219 alloy can be cold worked using conventional methods.
Annealing	Aluminum 2219 alloy is annealed at 538°C (1000°F) for sufficient time followed by quenching in cold water.
Aging	Aluminum 2219 alloy can be aged at 190°C (375°F) for varying time after annealing and quenching. Forgings can be aged at 190°C (375°F) for 18 h, and sheet or plate-type product forms can be aged at 190°C (375°F) for 36 h followed by cooling in air.
Hardening	--

APPLICATIONS

Typical Applications	Aluminum 2219 alloy is chiefly used in the following products: **Aerospace structural components** - **Fuel tanks** - **Space structural components** - **High-temperature applications**

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.