TECHNICAL DATA SHEET

PRODUCT: A94045 ALUMINUM ALLOY

4043 Aluminum is one of the oldest and most widely used aluminum welding and brazing alloys. This material can be classed as a general-purpose type filler alloy. Its principal alloying element is silicon. The silicon additions result in improved fluidity (wetting action) to make the alloy a preferred choice by welders. The alloy is less sensitive to weld cracking and produces brighter, almost smut-free welds. The alloy is non-heat treatable. This alloy has a lower melting range than the base metals for which it is commonly used and relieves contraction during weldment cooling. Some more benefits are low hot cracking sensitivity in most applications, excellent corrosion resistance, and low shrinkage rate/reduced distortion.

PRODUCT BASIC INFORMATION:

Alloy:	**4045**
Form:	Foils, Coils, Rolls, Strip, Checkered Plate, Flats, Circle, Blank, Ring (Flange) etc.
Temper:	--
Dimension:	Thickness: Width: Length:
Surface Finish:	polished, Bright, hair line, sand blast, brush, checkered, etching, embossed, etc.
Standard Specification:	UNS A94045 - AMS4123, AMS4124, AMS QQA225/9 - AMS4154, AMS4169, AMS QQA200/11 - ASTM B211 - ASTM B221 - BS L100 - BS L160 - DTD 5124 - BS EN 573, BS EN 755, BS EN 754
Application:	General Use

CHEMICAL COMPOSITION:

Element		**Percentage (%)**
Aluminum	**(Al)**	87.4 - 91
Silicon	**(Si)**	9.0 – 11.0
Iron	**(Fe)**	0.80 max
Copper	**(Cu)**	0.30 max
Manganese	**(Mn)**	0.05 max
Magnesium	**(Mg)**	0.05 max
Chromium	**(Cr)**	--
Zinc	**(Zn)**	0.10 max
Titanium	**(Ti)**	0.20 max
Remainder Each		0.05 max
Remainder Total		0.15 max

MECHANICAL PROPERTIES:

Properties	Metric	Imperial
Tensile strength	120 MPa	17404 psi
Yield strength	64 MPa	9282 psi
Elongation	11%	11%
Elastic modulus	71 GPa	10297 ksi
Shear strength	69 MPa	10007 psi

PHYSICAL DATA :

Density (20°C):	2.69	kg/m^3
Melting Point:	573 – 599 °C	
Thermal Expansion (20°C ~100°C):	21 - 24	µm/m-K
Modulus of Elasticity:	--	MPa
Thermal conductivity (Temper O):	170	W/mK
Electrical Resistivity (Temper O):	3.85e-08	Ω·m
Electrical conductivity	24 - 32	m/Ω mm 2
Conductivity (Temper O):	45	%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	--
Machinability	--
Forming	--
Weldability	Aluminum 4045 Alloy exhibits excellent welding performance, casting performance, good wear resistance, high corrosion resistance, and low expansion coefficient.

Heat Treatment	The heat treatment processes applied to AMS 4045 are ageing, annealing, and solution heat treating. Ageing, or precipitation hardening, is done at 120°C to 175°C for eight to 24 hours. This process improves the material's strength and hardness. Annealing is done at 399°C to 427°C, improving the material's formability and ductility. Solution heat-treating is done at a temperature range of 510°C to 540°C, followed by water quenching. This process dissolves the material's soluble particles, making it more ductile and formable.
Hot Working	--
Cold Working	--
Annealing	--
Aging	--
Hardening	AMS 4045 pipes is exceptionally hard, making bending and shaping without cracking challenging. It undergoes annealing and other heat treatment processes to improve the material's formability and ductility. Heat treatment processes also enhance strength, toughness, and stress-corrosion cracking resistance.

APPLICATIONS

Typical Applications	Due to its remarkable properties, AMS 4045 finds use in various aircraft applications, from structural to non-structural parts. It is used to manufacture aircraft skins, fuselage frames, wing spars, and landing gears. It is also used to construct airframes, missiles, and rockets.

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.