TECHNICAL DATA SHEET (TDS)

PRODUCT: 3004 ALUMINUM ALLOY COIL / SHEET

3004 aluminum alloy is an alloy in the wrought aluminum-manganese family (3000 or 3xxx series). It is similar to the 3003 alloy, except for the addition of approximately 1% magnesium. It can be cold worked (but not, unlike some other types of aluminum alloys, heat treated) to produce tempers with a higher strength but a lower ductility. Like most other aluminum-manganese alloys, 3003 is a general-purpose alloy with moderate strength, good workability, and good corrosion resistance. It is commonly rolled and extruded, but typically not forged. As a wrought alloy, it is not used in casting.

PRODUCT BASIC INFORMATION:

Alloy:	**3004**	
Form:	Sheet, Coil	
Temper:	O, H14, H24, H34	
Dimension:	Thickness:	0.20mm to 6.0mm
	Width:	20.0mm to 2,600mm
	Length:	1,000mm to 4,000mm, or Coil
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)**	0.3 max
Iron	**(Fe)**	0.7 max
Copper	**(Cu)**	0.25 max
Manganese	**(Mn)**	1.0~1.5
Magnesium	**(Mg)**	0.8~1.3
Chromium	**(Cr)**	-
Zinc	**(Zn)**	0.25 max
Titanium	**(Ti)**	-
Remainder Each		0.05 max
Remainder Total		0.15 max

MECHANICAL PROPERTIES:

		O	H14	H24	H34
Ultimate Strength Rm/MPa		155~200	155~200	220~265	220~265
Yield Strength Rp0.2/MPa		≥ 60	≥ 60	≥ 170	≥ 170
Elongation Min. %	≥ 0.2~0.5mm	≥ 13%	≥ 1%	≥ 3%	≥ 3%
	≥ 0.5~1.5mm	≥ 14%	≥ 2%	≥ 4%	≥ 4%
	≥ 1.5~3.0mm	≥ 15%	≥ 2%	≥ 4%	≥ 4%
	≥ 3.0~6.0mm	≥ 16%	≥ 3%	-	-
Bend Radius (90º)	≥ 0.2~0.5mm	0t	0.5t	0.5t	0.5t
	≥ 0.5~1.5mm	0t	1.0t	1.0t	1.0t
	≥ 1.5~3.0mm	0t	1.5t	1.5t	1.5t
	≥ 3.0~6.0mm	1.0t	2.0t	-	-

PHYSICAL DATA :

Density (20°C):	2,720	kg/m^3
Melting Point:	629°C	
Thermal Expansion (20°C ~100°C):	23.2×10^{-6}	/K
Modulus of Elasticity:	70	GPa
Thermal conductivity (Temper O):	162	W·m-1·K-1
Electrical Resistivity (Temper O):	0.041×10^{-6}	Ω .m
Conductivity (Temper O):	42	%IACS
Magnetic performance:	No	
Color:	Silver	
Odour:	No	

TOLERANCE ON FORMS AND DIMENSIONS :

Thickness Tolerance:	**Thickness**	**Width**			
		≤1000mm	>1000~1250mm	>1250~1600mm	>1600~2000mm
	≥ 0.2~0.4mm	± 0.02mm	± 0.04mm	± 0.05mm	-
	> 0.4~0.5mm	± 0.03mm	± 0.04mm	± 0.05mm	± 0.06mm
	> 0.5~0.6mm	± 0.03mm	± 0.05mm	± 0.06mm	± 0.07mm
	> 0.6~0.8mm	± 0.03mm	± 0.06mm	± 0.07mm	± 0.08mm
	> 0.8~1.0mm	± 0.04mm	± 0.06mm	± 0.08mm	± 0.09mm
	> 1.0~1.2mm	± 0.04mm	± 0.07mm	± 0.09mm	± 0.10mm
	> 1.2~1.5mm	± 0.05mm	± 0.09mm	± 0.10mm	± 0.11mm
	> 1.5~1.8mm	± 0.06mm	± 0.10mm	± 0.11mm	± 0.12mm
	> 1.8~2.0mm	± 0.06mm	± 0.11mm	± 0.12mm	± 0.14mm
	> 2.0~3.0mm	± 0.07mm	± 0.12mm	± 0.13mm	± 0.15mm
	> 3.0~4.0mm	± 0.10mm	± 0.15mm	± 0.17mm	± 0.18mm
	> 4.0~6.0mm	± 0.18mm	± 0.22mm	± 0.24mm	± 0.25mm

Width Tolerance:	Thickness	Width				
		≤300mm	>300~500mm	>500~1250mm	>1250~1650mm	>1650mm
	≥ 0.2~0.6mm	+ 0.4mm	+ 0.6mm	+ 1.5mm	+ 2.5mm	+ 3.0mm
	> 0.6~1.0mm	+ 0.5mm	+ 1.0mm	+ 1.5mm	+ 2.5mm	+ 3.0mm
	> 1.0~2.0mm	+ 0.7mm	+ 1.2mm	+ 2.0mm	+ 2.5mm	+ 3.0mm
	> 2.0~3.0mm	+ 1.0mm	+ 1.5mm	+ 2.0mm	+ 2.5mm	+ 4.0mm
	> 3.0~6.0mm	+ 1.5mm	+ 2.0mm	+ 3.0mm	+ 3.0mm	+ 5.0mm

Length Tolerance:	Thickness	Length			
		≤1000mm	>1000~2000mm	>2000~3000mm	>3000mm
	≥ 0.2~3.0mm	+ 3mm	+ 4mm	+ 6mm	+ 8mm
	> 3.0~6.0mm	+ 4mm	+ 6mm	+ 8mm	+ 10mm

Flatness Tolerance:	Thickness	Total Deviation		
		On Length	On Width	Partial Deviation
	≥ 0.2~0.5mm	By agreement	By agreement	By agreement
	> 0.5~3.0mm	≤ 0.4%	≤ 0.5%	≤ 0.5%
	> 3.0~6.0mm	≤ 0.3%	≤ 0.4%	≤ 0.4%

Lateral Curvature Tolerance:	Width	Lateral Curvature for Specified Length			
		≤1000mm	>1000~2000mm	>2000~3500mm	>3500mm
	≤300mm	≤ 2.0mm	≤ 4.0mm	≤ 8.0mm	-
	>300~600mm	≤ 1.5mm	≤ 3.0mm	≤ 5.0mm	-
	>600~1000mm	≤ 1.0mm	≤ 2.0mm	≤ 4.0mm	≤ 5.0mm
	>1000~2000mm	-	≤ 2.0mm	≤ 4.0mm	≤ 5.0mm
	>2000mm	-	-	≤ 4.0mm	≤ 5.0mm

Squareness Tolerance:	Length	Squareness Tolerance for Specified Width			
		≤1000mm	>1000~1500mm	>1500~2000mm	>2000mm
	≤1000mm	≤ 4.0mm	-	-	-
	>1000~2000mm	≤ 4.0mm	≤ 5.0mm	≤ 6.0mm	-
	>2000~3000mm	≤ 5.0mm	≤ 5.0mm	≤ 7.0mm	≤ 8.0mm
	>3000~5000mm	≤ 6.0mm	≤ 8.0mm	≤ 8.0mm	≤ 10.0mm

OTHER PROPERTIES:

Principal Design Features	This is an alloy of aluminum with magnesium and manganese. It is strengthened (hardened) by cold work only as it does not respond to heat treatment, other than annealing.
Machinability	The machinability of this alloy is considered to be excellent, especially in the hard temper. As is typical of the aluminum alloys an oil lubricant should be used for machining, although light cuts may be done dry.
Forming	AL 3004 is easily formed by either cold or hot working with conventional tooling.

Welding	The alloy is weldable by the standard methods. Best results are obtained by use of TIG or MIG welding with the same alloy as filler rod.
Heat Treatment	Heat treatment has no effect upon this alloy. It may be annealed after cold working however.
Hot Working	The hot working range (as for forging) is 260°C to 483°C. In that range the alloy is easily hot worked.
Cold Working	Cold working capability of this alloy is good. it can readily be cold worked up to a 75% reduction of area by conventional methods. Working beyond the 75% reduction requires an intermediate anneal.
Annealing	Annealing, during or following cold working, is done at 344°C, allowing adequate time for thorough heating, followed by air cooling.
Aging	Not applicable to this alloy.
Hardening	Cold working is the only means of producing the harder (H) tempers of this alloy.

APPLICATIONS

Typical Applications	Aluminum 3004 is commonly used in the making of beverage cans, drawn and ironed rigid containers (cans), chemical handling and storage equipment, builders' hardware, incandescent and fluorescent, lamp bases and similar applications requiring good formability and higher strength than provided by 3003. It is also used in siding, culvert pipe, industrial roofing. It is developed to satisfy the need for thinner gauges in can-stock, and thereby to some extent replaced its predecessor 3003 alloy in the making of beverage cans. Can-stock can be made thinner due to the addition of 1% magnesium, which contributes in solid solution strengthening. It is also commonly used in sheet metal work.

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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