TECHNICAL DATA SHEET (TDS)

PRODUCT: 6082 ALUMINUM ALLOY EXTRUDED PROFILE

Aluminum alloy 6082 is a medium strength alloy with excellent corrosion resistance. It has the highest strength of the 6000 series alloys. It is known as a structural alloy. As a relatively new alloy, the higher strength of Aluminum alloy 6082 has seen it replace 6061 in many applications. The addition of a large amount of manganese controls the grain structure which in turn results in a stronger alloy. It is difficult to produce thin walled, complicated extrusion shapes in alloy 6082. The extruded surface finish is not as smooth as other similar strength alloys in the 6000 series.

PRODUCT BASIC INFORMATION:

Alloy:	**6082**		
Form:	Tube, Round Bar, Flat Bar, Square Bar, Angle Bar, Other Profile		
Temper:	O, T4, T6		
Dimension:	**Tube:**	Round:	D: 8.0mm to 350mm, T: 1.0~40mm
		Square:	15mm x 15mm ~ 250mm x 250mm
		Rectangle:	10mm x 20mm ~ 200mm x 250mm
	Bar:	Round:	6.0mm to 350mm
		Square:	10mm x 10mm ~ 152.4mm x 152.4mm
		Flat:	18mm x 2mm ~ 152.4mm x 150.0mm
	Angle		W: 10~200mm, T: 1.0~15mm
	Profile		Circumscribing Circle ≤ 350mm
	Length:		1,000mm to 10,000mm
Surface Finish:	Mill Finish, Coating, Anodized		
Standard Specification:	ASTM B221, EN 755		

CHEMICAL COMPOSITION:

Element		Percentage (%)
Aluminum	**(Al)**	Remainder
Silicon	**(Si)**	0.7~1.3
Iron	**(Fe)**	0.50 Max
Copper	**(Cu)**	0.1 Max
Manganese	**(Mn)**	0.6~1.2
Magnesium	**(Mg)**	0.8~1.2
Chromium	**(Cr)**	0.25 Max
Zinc	**(Zn)**	0.20 Max
Titanium	**(Ti)**	0.10 Max

Remainder Each	0.05 max
Remainder Total	0.15 max

MECHANICAL PROPERTIES:

	Temper	Wall Thickness	Ultimate Strength Rm/MPa	Yield Strength Rp0.2/MPa	Elongation Min.%
Tube	**O**	≤ 25mm	≤ 160	≤ 110	≥ 14%
	T4	≤ 25mm	≥ 205	≥ 110	≥ 14%
	T6	≤ 5mm	≥ 290	≥ 250	≥ 8%
		5 < t ≤ 25mm	≥ 310	≥ 260	≥ 10%
Profile	**T4**	≤ 25mm	≥ 205	≥ 110	≥ 14%
	T6	≤ 5mm	≥ 290	≥ 250	≥ 8%
		5 < t ≤ 25mm	≥ 310	≥ 260	≥ 10%
Bar	**O**	≤ 200mm*	≤ 160	≤ 110	≥ 14%
	T4	≤ 200mm*	≥ 205	≥ 110	≥ 14%
	T6	≤ 20mm*	≥ 295	≥ 250	≥ 8%
		> 20~150mm*	≥ 310	≥ 260	≥ 8%
		>150~200mm*	≥ 280	≥ 240	≥ 6%
		>200~250mm*	≥ 270	≥ 200	≥ 6%

***Note**:* Diameter for round bar, Width across flats for square, Thickness for rectangle bar*

PHYSICAL DATA :

Density (20°C):	2,700	kg/m^3
Melting Point:	575°C	
Thermal Expansion (20°C ~100°C):	23.1 $x10^{-6}$	/K
Modulus of Elasticity:	71	GPa
Thermal conductivity (Temper O):	180	W·m-1·K-1
Electrical Resistivity (Temper O):	0.038 $x10^{-6}$	Ω .m
Conductivity (Temper O):	42	%IACS
Magnetic performance:	No	
Color:	Silver	
Odour:	No	

TOLERANCE ON FORMS AND DIMENSIONS :

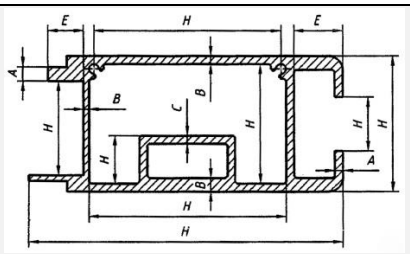
	Outside Diameter	Tolerance on Diameter		
		Maximum allowable deviation of **mean diameter** from specified diameter	Maximum deviation of diameter at **any point** from specified diameter	
			T4, T6	O
Round Tube	≥ 8~18mm	± 0.25mm	± 0.60mm	± 1.50mm
	> 18~30mm	± 0.30mm	± 0.70mm	± 1.80mm
	> 30~50mm	± 0.35mm	± 0.90mm	± 2.20mm

	> 50~80mm	± 0.40mm	± 1.10mm	± 2.60mm
	> 80~120mm	± 0.60mm	± 1.40mm	± 3.60mm
	> 120~200mm	± 0.90mm	± 2.00mm	± 5.00mm
	> 200~350mm	± 1.40mm	± 3.00mm	± 7.60mm

Round Tube	**Outside Diameter**	**Tolerance on Wall Thickness (%)**		
		≤ 3.0mm	> 3.0~5.0mm	> 5.0mm
	≤ 150mm	± 7%	± 9%	± 11%
	>150~300mm	± 6%	± 8%	± 10%
	>300~350mm	± 5%	± 7%	± 9%

	Width, depth or width across flats	**Tolerance on Width, Depth or Width across flats (mm)**			
		Circumscribing Circle			
		≤ 100mm	**> 100~200mm**	**> 200~300mm**	**> 300~350mm**
Square Tube	≤ 10 mm	± 0.40	± 0.50	± 0.55	± 0.60
	>10~25mm	± 0.50	± 0.70	± 0.80	± 0.90
	>25~50mm	± 0.80	± 0.90	± 1.00	± 1.20
Rectangle Tube	>50~100mm	± 1.00	± 1.20	± 1.30	± 1.60
	>100~150mm	-	± 1.50	± 1.70	± 1.80
	>150~200mm	-	± 1.90	± 2.20	± 2.40
	>200~300mm	-	-	± 2.50	± 2.80
	>300~350mm	-	-	-	± 3.50

	Wall Thickness	**Tolerance on Wall Thickness (mm)**		
		Circumscribing Circle		
		≤ 100mm	**> 100~300mm**	**> 300~350mm**
Square Tube	≥ 0.5~1.5mm	± 0.30	± 0.40	-
	>1.5~3mm	± 0.35	± 0.50	± 0.70
	>3~6mm	± 0.55	± 0.70	± 0.90
Rectangle Tube	>6~10mm	± 0.75	± 1.00	± 1.20
	>10~15mm	± 1.00	± 1.30	± 1.50
	>15~20mm	± 1.50	± 1.80	± 2.00
	>20~30mm	± 1.80	± 2.20	± 2.50
	>30~40mm	-	± 2.50	± 3.00

Profile						***Note:*** *For the profile with open ends, additional tolerance shall be added on dimension H*	
	Dimension H	**Tolerance on Dimension H**				**Additional Tolerance with open ends**	
		≤ 100mm	**> 100~200**	**> 200~300**	**> 300~350**	**Dimension E**	**Tolerance**
	≤ 10mm	± 0.40	± 0.50	± 0.55	± 0.60	≤ 20mm	-

	>10~25mm	± 0.50	± 0.70	± 0.80	± 0.90	>20~30mm	± 0.15
	>25~50mm	± 0.80	± 0.90	± 1.00	± 1.20	>30~40mm	± 0.25
	>50~100mm	± 1.00	± 1.20	± 1.30	± 1.60	>40~60mm	± 0.40
	>100~150mm	-	± 1.50	± 1.70	± 1.80	>60~80mm	± 0.50
Profile	>150~200mm	-	± 1.90	± 2.20	± 2.40	>80~100mm	± 0.60
	>200~300mm	-	-	± 2.50	± 2.80	>100~125mm	± 0.80
	>300~350mm	-	-	-	± 3.50	>125~150mm	± 1.00

	Wall Thickness A, B, C	**Tolerance on Wall Thickness A, B, C (mm)**					
		Circumscribing Circle					
		≤ 100mm	**>100~300**	**>300~350**	**≤ 100mm**	**>100~300**	**>300~350**
		Wall Thickness A			**Wall Thickness B**		
	≤ 1.5mm	± 0.20	± 0.25	± 0.35	± 0.30	± 0.40	-
	>1.5~3.0mm	± 0.25	± 0.30	± 0.45	± 0.35	± 0.50	± 0.70
	>3.0~6.0mm	± 0.30	± 0.35	± 0.60	± 0.55	± 0.70	± 0.90
	>6.0~10mm	± 0.35	± 0.45	± 0.65	± 0.75	± 1.00	± 1.20
	>10~15mm	± 0.40	± 0.50	± 0.70	± 1.00	± 1.30	± 1.50
	>15~20mm	± 0.45	± 0.55	± 0.75	± 1.50	± 1.80	± 2.00
Profile	>20~30mm	± 0.50	± 0.60	± 0.80	± 1.80	± 2.20	± 2.50
	>30~40mm	± 0.60	± 0.70	± 0.90	-	± 2.50	± 3.00
		Wall Thickness C					
	≤ 1.5mm	± 0.35	± 0.50	-			
	>1.5~3.0mm	± 0.45	± 0.65	± 0.90			
	>3.0~6.0mm	± 0.60	± 0.90	± 1.20			
	>6.0~10mm	± 1.00	± 1.30	± 1.50			
	>10~15mm	± 1.30	± 1.70	± 1.90			
	>15~20mm	± 1.90	± 2.20	± 2.30			
	>20~30mm	± 2.20	± 2.70	± 3.10			
	>30~40mm	-	-	-			

	Diameter or Width across flats	**Tolerance**	
		Round Bar	**Square Bar**
	≥ 8mm~10mm	± 0.22mm	-
	≥ 10mm~18mm	± 0.22mm	± 0.22mm
Round	>18~25mm	± 0.25mm	± 0.25mm
Bar	>25~40mm	± 0.30mm	± 0.30mm
	>40~50mm	± 0.35mm	± 0.35mm
&	>50~65mm	± 0.40mm	± 0.40mm
	>65~80mm	± 0.45mm	± 0.45mm
Square	>80~100mm	± 0.55mm	± 0.55mm
Bar	>100~120mm	± 0.65mm	± 0.65mm
	>120~150mm	± 0.80mm	± 0.80mm
	>150~180mm	± 1.00mm	± 1.00mm
	>180~220mm	± 1.15mm	± 1.15mm
	>220~270mm	± 1.35mm	-

	>270~320mm	± 1.60mm	-

	Width	Tolerance on width and Thickness							
		Width (mm)	Thickness (mm)						
			≤ 6	≤ 10	≤ 18	≤ 30	≤ 50	≤ 80	≤ 120	≤ 150
Flat Bar	≥10~18mm	± 0.25	±0.20	±0.25	±0.25	-	-	-	-	-
	>18~30mm	± 0.30	±0.20	±0.25	±0.30	±0.30	-	-	-	-
	>30~50mm	± 0.40	±0.25	±0.25	±0.30	±0.35	±0.40	-	-	-
	>50~80mm	± 0.60	±0.25	±0.30	±0.35	±0.40	±0.50	±0.60	-	-
	>80~120mm	± 0.80	±0.30	±0.35	±0.40	±0.45	±0.60	±0.70	±0.80	-
	>120~150mm	± 1.00	±0.40	±0.45	±0.50	±0.55	±0.60	±0.70	±0.90	±1.00

	Circumscribing circle Diameter	Tolerance on fixed Length		
		≤ 2000mm	> 2000~5000mm	> 5000~10000mm
Tube Profile Bar	≤ 100mm	+ 5mm	+ 7mm	+ 10mm
	>100~200mm	+ 7mm	+ 9mm	+ 12mm
	>200~350mm	+ 8mm	+ 11mm	+ 14mm

OTHER PROPERTIES:

Principal Design Features	This alloy has the highest strength of the 6000 series alloys. It is known as a high strength structural alloy with good weldability, workability and machinability. Due to the fine grained structure this alloy exhibits a good resistance to dynamic loading conditions.
Machinability	Machinability in the harder T4 and T6 tempers is good. It is notably less easy to machine in the annealed temper.
Forming	Easily cold worked and formed in the annealed condition. Stamping, bending, spinning, deep drawing are all readily accomplished using standard methods.
Weldability	Aluminum alloy 6082 has very good weldability but strength is lowered in the weld zone. When welded to itself, alloy 4043 wire is recommended. If welding Aluminum alloy 6082 to 7005, then the wire used should be alloy 5356.
Heat Treatment	Solution heat treat at 530°C for adequate time to allow for thorough heating and then water quench. Precipitation hardening is done at 175°C for 10 to 18 hours and air cool.
Hot Working	Hot working may be done in the temperature range of 260°C to 370°C.
Cold Working	Cold working in the O temper condition is readily performed. The alloy is notably less easy to cold form in the T4 and T6 tempers.
Annealing	Annealing should be done at 415°C for few hours followed by controlled cooling, then air cool.

Aging	The aging precipitation heat treatment is done at 175°C for 8 hours followed by air cooling. This produces the T6 temper.
Hardening	See "Aging".

APPLICATIONS

Typical Applications	Aluminum alloy 6082 is typically is used for, trusses, cranes, ore skips, beer barrels, bridges, scaffolding elements, rail coach parts, offshore constructions, machine building and mobile cranes, highly stressed applications and transport applications. EN AW-6082 is certified for use in marine 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.

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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