5xxx Plate

5XXX

5XXX series alloys, with magnesium as the major alloying element, combine a wide range of strength, good forming and welding characteristics, and high resistance to general corrosion.

Strength:
Generally increases with increasing magnesium content, and can be further enhanced by cold work.

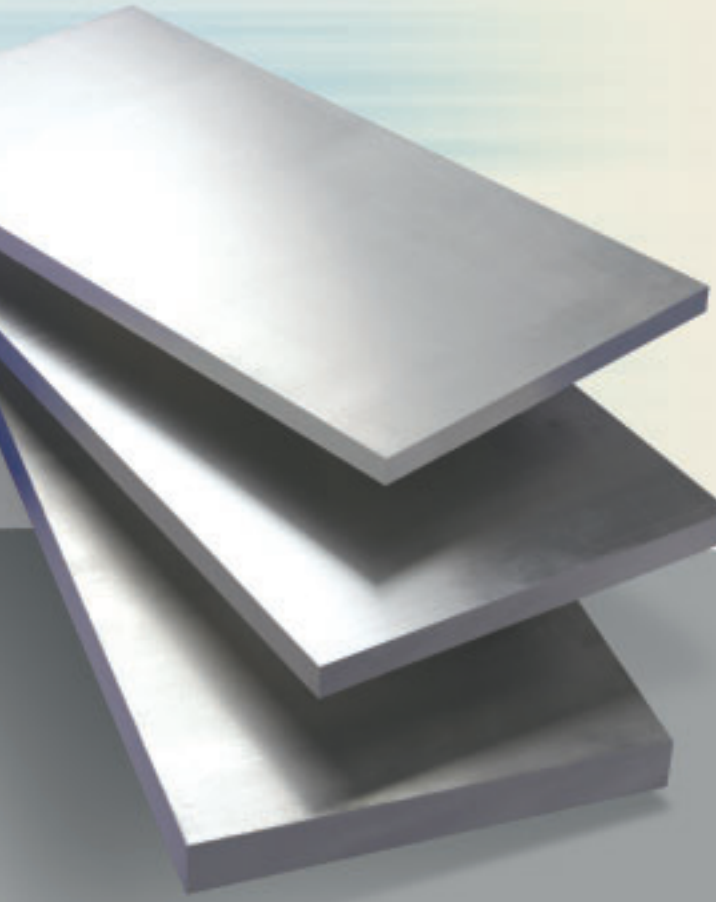
Forming:
5XXX alloys are easily cold formed. Formability being described by minimum cold bend radii. Formability tends to increase as alloy strength decreases.

Welding:
5XXX alloys are easily welded using GMA-W or GTA-W processes. Weld strength equals the minimum annealed strength (O temper) of the welded 5XXX alloy. Welds also show good ductility, facilitating cold forming.

Corrosion Resistance:
5XXX alloys generally have excellent corrosion resistance, often being used in marine applications e.g. 5083-H116.
5XXX series alloys with greater than 3.5% magnesium (e.g. 5086 & 5083) may be susceptible to stress corrosion cracking (SCC). In service, limitations should be placed on the amount of cold work and maximum permissible operating temperature for the higher magnesium alloys to avoid increased susceptibility to stress corrosion cracking and intergrannular corrosion. Such alloys should not be used at operating temperatures >65°C. 5454 and 5754 are manufactured with 2.7% and 3.1% magnesium respectively and are designed for use at elevated temperatures.

Technical Support:
For further information and advice please contact your District Sales Office.

Availability:
5XXX alloys are most commonly available in F (as rolled) or O/H111 (fully soft) condition, although cold worked tempers such as H32, H321 and H116 are also available.



ALCOA

5xxx series alloys technical data

STANDARD DIMENSIONAL AVAILABILITY

Alloy	Temper	Thickness (mm)		Width (mm)	Length (mm)
		Min	Max	Max	Max
	Mill finish				
5251 5052 5454 5754	F O H111 H112	6.35 >20 >113	20 113 103.2	3150 2978 2967*	20000
5456	F	>203.2	590	2080	3150
5083 5086	Brushed Finish (available one or two side film coated - on request)				
	F O H111	8	70	2400*	8000
5754 5456 5083 5086	Mill finish				
	H32 H321 H116	6.35 >13 >73	13 73 203.2	2880 2978 2708*	20000

1. These dimensions show only the range of capabilities and cannot necessarily be provided in every combination of these sizes. Other sizes may be available, subject to enquiry.
2. Where indicated, both Mill Finish and Brushed Finish are available
3. * denotes maximum width decreases with increasing thickness

With a broad combination of desirable properties 5XXX series alloys are used for many applications.

APPLICATION

- Cryogenic applications: production, storage and transportation of liquid petroleum and industrial gases
- Pressure vessels
- Hulls and superstructures of ships such as fast ferries, naval craft and workboats
- Road transport: commercial vehicles and trailers
- General Engineering: mechanical components, jigs, fixtures, flat beds, base plates and general tooling.

Most 5XXX alloys are ordered to the fully annealed O condition. H321 and H116 tempers are often used in transport applications. H321 and H116 tempers are work hardened to increase strength. The most widely used 5XXX alloys are 5083, 5086 and 5754.

5754

Unlike 5083 and other alloys with more than 3.5% magnesium, 5754 is resistant to intergrannular corrosion and stress corrosion cracking after exposure to elevated temperatures (above 65°C). For this reason, it is the preferred alloy choice for applications involving prolonged exposure to such temperatures, e.g. transportation of hot liquids.

5083 & 5086

5083 offers the highest strength of all non heat treatable alloys, containing approximately 4.5% magnesium, 0.7% manganese and 0.13% chromium.
5086 is less highly alloyed than 5083, containing approximately 4.0% magnesium, 0.50% manganese and 0.13% chromium. This results in lower strength but greater ductility compared to 5083.
5086 is favoured when making fabrications which require greater formability than offered by 5083.

FORMABILITY

	Thickness					
	6 mm		*9 mm*		*12 mm*	
Alloy/Temper	**O**	**F**	**O**	**F**	**O**	**F/H32**
5052/5251	1t	2.5t	1.5t	2.5t	2t	3t
5454/5754	1t	3t	1.5t	3.5t	2t	4t
5083/5086	1.5t	3t	1.5t	3.5t	2t	4.5t

Note: Radii expressed as thickness (t) are minimum recommended for bending plates in a standard press brake with air bend dies. Minimum permissible radii will also vary with design and condition of tooling.