



ALUMINIUM ALLOY 6005A

A versatile alloy for structural applications

6005A alloy is one of the most recent formulations among the Al-Mg-Si alloys of medium mechanical strength, which enables it to be used for structural and semi-structural purposes. The ease of working with this alloy is a good foundation for the development of a wide range of applications and section design. The alloy 6005A offers a range of potential improvement features compared with 6061 alloy sections and some 6082 alloy sections. This provides positive outcomes and benefits for customer end-use applications.

Classification Society Approval

6005A alloy is approved and certified for shipbuilding applications by all international marine classification societies, including Det Norske Veritas (DNV) and Lloyds Register.

Wall Thickness

The minimum available wall thickness for sections extruded in 6005A alloy is a function of section design. 6005A sections with thin wall thickness can be successfully extruded.

Capral's capability to extrude 6005A alloy

Location	Hollows Max. CCD (mm)*	Solids Max. CCD (mm)*
Angaston, Sth Australia	210	230
Bremer, Queensland	180	250
Campbellfield, VIC	380	425
Smithfield, NSW	300	330

* Sizes outside these ranges are subject to special enquiry

Typical applications

- Marine shapes
- Ladder sections
- Transport shapes
- Light structural sections
- Pylons and antennae
- Wide thin walled deck profiles for shipbuilding
- Yacht masts
- Tubes & hollow sections
- Building & Construction

The features and benefits of 6005A Alloy for Structural Sections

Features	Outcome	Customer Benefit
Improved extrudability	<ul style="list-style-type: none"> • Capability to run sections with superior surface quality 	<ul style="list-style-type: none"> • Consistent product in terms of appearance • Extrusion meets the increasing requirement for improved structural surface finish
Improved section design flexibility	<ul style="list-style-type: none"> • Potential for reduced wall thickness and more complex designs (particularly in hollow sections) 	<ul style="list-style-type: none"> • Reduction in wall thickness on specific sections • Design flexibility for structural applications
Improved section shape due to lower quench sensitivity	<ul style="list-style-type: none"> • Less distortion on specific sections • Capability to run specific sections on presses with air cooling and achieve mechanical properties 	<ul style="list-style-type: none"> • Improvement in consistency of shape • Achievement of agreed requirements
Improved process allowing tighter control of mechanical properties	<ul style="list-style-type: none"> • Increased consistency and tighter mechanical property range against AS/NZS and Class Society standards 	<ul style="list-style-type: none"> • Opportunity to develop sections within a "tighter" mechanical property range • Conformance to agreed mechanical property requirements

Characteristics of 6005A - T5 Extruded Sections

Item	Rating
Weldability	A
Corrosion Resistance A (inclusive of marine environment)	A
Machinability	B
Surface Finish	A
Anodising Response	B
Formability	B
Heat Treatable	A

Comparative features and mechanical properties of 6005A, 6061 & 6082 alloys and tempers

Alloy	Features	Temper	Minimum Tensile Strength (MPa)						
			50	100	150	200	250	300	350
6005A	Medium strength alloy, good extrudability. Can produce relatively complex shapes due to low quench sensitivity. Superior Mill surface finish.	T4	[Bar chart showing strength values for 6005A T4]						
		T5	[Bar chart showing strength values for 6005A T5]						
6061	Medium strength alloy, not as easy to extrude and quench as 6005A. Average mill surface finish. Less complex shapes achievable.	T4	[Bar chart showing strength values for 6061 T4]						
		T5	[Bar chart showing strength values for 6061 T5]						
		T6	[Bar chart showing strength values for 6061 T6]						
6082	The highest strength in the medium strength alloy group. Acceptable extrudability with average mill surface finish. Reasonable design flexibility.	T4	[Bar chart showing strength values for 6082 T4]						
		T5	[Bar chart showing strength values for 6082 T5]						
		T6	[Bar chart showing strength values for 6082 T6]						

6005A Chemical Composition: (AS/NZS 1866:1997)

%	Si	Fe	Cu	Mn	Mg	Cr	Zn	Others Each	Others Total
Min	0.50				0.40				
Max	0.90	≤0.35	≤0.30	≤0.50	0.70	≤0.30	≤0.20	≤0.05	≤0.15

Mn + Cr: 0.12 - 0.50%

6005A Mechanical Property Requirements: (AS/NZS 1866:1997)

Temper	0.2% Proof Stress (Min)	U.T.S. (MPa) (Min)	Elongation %
T4	110	180	14
T5	240	260	8

Typical Mechanical Properties of 6005A-T5, 6061-T6 and 6082-T6

Alloy	Temper	Yield Strength (MPa)	UTS (MPa)	Elongation %
6005A	T5	265	290	12
6061	T6	270	310	12
6082	T6	290	330	11

Additional Information

For further information regarding the use and/or suitability of 6005A alloy for specific sections and final product application, contact your Capral Aluminium Sales Representative.

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