SigmaChip A2

Technical Datasheet

Free Machining Aluminium Alloy

Service. Quality. Value.

Typical Applications

Repetition and engineering components including:

- Gears
- Shafts
- Pipe unions
- Turned parts
- Hydraulics
- Valve blocks
- Nozzles
- Threaded items
- Plumbing
- Pins
- Spindles
- Cable glands
- Studding
- Pneumatics
- Decorative

Product Description

A high performance free machining aluminium alloy engineered for economic production of repetition components, whilst giving superior tool life and component quality, together with high mechanical properties.

Technical Description

A sophisticated 2011 T3/T6 derivative alloy made to the most exacting quality standards required for consistency of machinability and surface finish. ISO designation AlCu5.5 PbBi.

Fabrication

We do not recommend SigmaChip A2 for applications where welding is required. SigmaChip A2 has poor bending qualities.

Machining

SigmaChip A2 has exceptional machinability for an aluminium alloy, with far superior machinability to all-purpose grades such as 6082 (H30). Easy to machine on any equipment, SigmaChip A2 produces excellent tolerances and surface finish with very low tool wear. Characteristic 'needle' chips are produced, which are very easily cleared from the work area. Coolant is rarely required for roughing operations, but emulsion or cutting oil may be beneficial when finishing to provide cooling and inhibit edge build-up.

Anodising

SigmaChip A2 will technically anodise adequately for improved corrosion resistance or wear resistance. Colour anodising can also be successfully undertaken with dark colours. However, the high alloying element levels needed to produce such good machinability also reduce the anodising qualities of the alloy and decorative anodising is likely to be inadequate for aesthetically demanding applications. We strongly recommend the use of SigmaChip A6 aluminium alloy when a combination of free machining qualities and good anodisability are required.

Product Attributes	Customer Benefits
Excellent free machining properties, especially on automatics	
Very high uniformity of diameter, concentricity, surface finish and straightness	Greatly reduced machining times, minimal machining problems and superior component performance and reduced tool wear
Superior production techniques to produce maximum consistency and uniformity	
Product sourced from mills with ISO 9000 quality systems	Guarantee of highest quality giving increased component confidence
Very low density	Lighter components giving low cost with improved product performance
Good mechanical properties	Suitable for high strength applications
Excellent surface finish	Very good component aesthetics

Corrosion Resistance

SigmaChip A2 has fair natural corrosion resistance. Technical anodising can be applied to improve corrosion resistance where appropriate. If SigmaChip A2 has inadequate corrosion resistance for your application we recommend the use of SigmaChip A6 aluminium alloy.

Cut to Size Capability

Every Smiths Metal Centre has at least one automatic power bandsaw for immediate requirements and has access within the Smiths group to thirty power saws including a fully automated magazine feed CNC rod blanking line. We can economically cut from one off blanks to the largest production run – for immediate or JIT deliveries.

Cut to Size Billets	mm
Tolerance	±0.3

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Chemical Composition (weight %)

	Si	Fe	Cu	Mn	Mg	Cr	Zn	Ti	Bi	Pb
Min			5.0						0.2	0.2
Max	0.4	0.7	6.0				0.3		0.6	0.6

Typical Mechanical Properties

Tensile strength	N/mm² (Rm)	320-360
0.2% Yield strength	N/mm² (Rp0.2)	270-300
Elongation	% (A5)	10-12
Brinell Hardness	HB	90-115
Elastic modulus	kN/mm²	70
Coefficient of thermal expansion	1/K /mm²	≤22.9x10^{-6}
Thermal conductivity	W/m.K	151-172
Electrical conductivity	m/Ωmm²(20°C)	23-26
Annealing Temperature	Specialised thermomechanical heat treatment required	

Technical Assistance

Our knowledgeable staff backed up by our resident team of qualified metallurgists and engineers, will be pleased to assist further on any technical topic.

UK Service Centres:

Smiths Belfast 02895 908 897
Smiths Biggleswade 01767 604 704
Smiths Birmingham 0121 728 4940
Smiths Bristol 0117 971 2800
Smiths Chelmsford 01245 466 664
Smiths Gateshead 0191 469 5428
Smiths Horsham 01403 261 981
Smiths Leeds 0113 307 5167
Smiths Manchester 0161 794 8650
Smiths Norwich 01603 789 878
Smiths Nottingham 0115 925 4801
Smiths Redruth 01209 315 512
Smiths Verwood 01202 824 347
Main Office 0845 527 3331

Quality & Testing:

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UKAS TESTING 1930

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