SigmaChip A2 DATA SHEET

TYPICAL APPLICATIONS

Repetition and engineering components including:

Gears	**Valve blocks**	**Spindles**
Shafts	**Nozzles**	**Cable glands**
Pipe unions	**Threaded items**	**Studding**
Turned parts	**Plumbing**	**Pneumatics**
Hydraulics	**Pins**	**Decorative**
Bearings	**Bolts**	**Washers**
Nuts	**Bushings**	

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

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.

TYPICAL MECHANICAL PROPERTIES

Tensile Strength	N/mm^2 (Rm)	320-360
0.2% Proof Strength	N/mm^2 (Rp0.2)	270-300
Elongation	A5%	10-12
Brinell Hardness	HB	90-115

TYPICAL PHYSICAL PROPERTIES

Elastic Modulus	kN/mm^2	70
Coefficient of Linear Thermal Expansion	1/K	$22.9x10^{-6}$
Thermal Conductivity	W/m.K (20°C)	151-172
Annealing Temperature	Specialised thermomechanical heat treatment required	
Electrical Conductivity	$m/\Omega mm^2$ (20°C)	23-26

TOLERANCES (mm)

Diameter		Tolerance +	Tolerance −
>2	≤ 10	0.05	0.05
>10	≤ 18	0.05	0.10
>18	≤ 30	0.08	0.13
>30	≤ 40	0.14	0.14
>40	≤ 60	0.20	0.20
>60	≤ 80	0.30	0.30
>80	≤ 100	0.40	0.40
>100	≤ 160	±½% of diameter	

NOMINAL COMPOSITION %

	Si	Fe	Cu	Mn	Mg
Min			5.0		
Max	0.4	0.7	6.0		

	Cr	Zn	Ti	Bi	Pb
Min				0.2	0.2
Max		0.3		0.6	0.6

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

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.

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.

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.

TURNING

Tool:	HSS
Cutting speed sm/m:	125-500
Feed mm/rev:	0.18-0.40
Cut mm:	0.8-5

Tool:	CARBIDE
Cutting speed sm/m:	200-750
Feed mm/rev:	0.18-0.40
Cut mm:	0.8-5

DRILLING

Tool:	HSS
Cutting speed sm/m:	150-300
Feed mm/rev:	0.09-0.5

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SMITHS METAL CENTRES are the exclusive UK distributors for SigmaChip A2 high technology free machining aluminium – for further information on how SigmaChip A2 can reduce your through-cost contact your local metal centre. We have 15 strategically placed Metal Centres to guarantee the most competitive TOTAL service package in the UK.

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