Alplan

Technical Datasheet

Aluminium Alloy Plate

Service. Quality. Value.

Typical Applications

Light to very heavily machined precision and ultra precision baseplates and construction components

- High precision assembly construction
- High precision components
- Computers
- Automatic assembly machinery
- Recording systems
- Aerospace industry
- Electronic supports / electronics manufacture
- Medical equipment
- Optical industry
- Jigs and fixtures, reference plates
- Robotic systems
- Printing machinery

Product Description

An ultra-high precision wrought aluminium speciality plate designed to meet the most stringent requirements for size and shape stability under the most extreme machining whilst minimising through cost.

Technical Description

Internationally recognised grade 5083/AlMg4.5Mn is the basis for the ALPLAN alloy. The exact composition and processes used in the production process are not disclosed for commercial reasons. The superior wrought production method provides significant technical advantages over cast aluminium plates.

Composition

ALPLAN is a specialised derivative alloy of grade 5083/AlMg4.5Mn pre-milled on both sides to very close thickness and flatness tolerances.

Welding

ALPLAN can be welded using either the MIG or TIG process with excellent results and without suffering any loss of strength. The local deformation will depend on the size, shape and deposition of the weld. Smiths Metal Centres recommended filler metals are S-AlMg4.5Mn (5556) or S-AlMg5.

Machining

To realise ALPLAN's excellent machinability always use sintered carbide cutting tools at high cutting speeds. Very high metal removal rates and an excellent finish are easily achievable with ALPLAN. The exceptional dimensional stability of ALPLAN prevents deformation during and after the machining process.

Anodising

ALPLAN readily accepts anodising for both protective and decorative purposes. The oxide layer will take on a grey tint which produces the best results with darker shades.

Product Attributes	Customer Benefits
Wrought product	Significant benefits in porosity, strength, weldability, structure and anodisability compared with cast product
Porosity free	No rejections because of porosity
Pre-milled on both sides Excellent thickness tolerance Excellent flatness tolerance Excellent machinability	Greatly reduced set-up and machining time
Exceptional shape stability Minimal internal stresses	Products retain shape after the most extreme machining for the life of the component
Anodisable alloy High corrosion resistance	Outstanding visual appearance and wear resistance
Excellent weldability	Very easily welded
Close tolerance cut to size service for both cut blanks circles/rings	Uneconomic cutting to size and stockholding costs are removed - your highly skilled operators and resources are used more efficiently
Immediate or just in time delivery	

Cut to Size Capability

Smiths Metal Centres carry a full range of ALPLAN plates in both imperial and metric sizes. Our close tolerance CNC plate sawing equipment can cut accurately to exact customer requirement for immediate or just in time delivery. We can also supply circles or rings cut to your specifications as part of our first stage engineering capability.

Cutting Tolerances

FLATNESS		mm per m
Thickness	≤15mm	0.35
	>15mm	0.15
Thickness	mm	±0.1
Surface Roughness	Ra max. (Both sides)	0.5 microns

CUT TO SIZE SAWN BLANKS	mm
Edge deviation over cut length/width	+1.5,-0

Alplan

Aluminium Alloy Plate

Service. Quality. Value.

Corrosion Resistance

ALPLAN has very good natural corrosion resistance in both inland and marine atmospheric conditions.

Porosity

ALPAN is porosity free.

Typical Mechanical Properties

Tensile strength	N/mm² (Rm)	275-350
0.2% Yield strength	N/mm² (Rp0.2)	130-190
Elongation	% (A5)	min. 17%
Brinell Hardness	HB	approx. 68
Elastic modulus	kN/mm²	70
Coefficient of thermal expansion	1/K	≤24x10^{-6}
Thermal conductivity	W/m.K	120
Melting Range	°C	580-640
Electrical conductivity	MSM/m (20 °C)	17-18

Typical Machining Parameters

Circular Sawing	Emulsion/alcohol/ tallow/oil
Blade:	SC
Cutting speed:	up to 2500m/min.
Feed per tooth:	0.03mm
Primary clearance angle:	9-7°
Top rake angle:	10°

Rough Milling	No cutting fluid
Tool:	SC
Cutting speed:	up to 2500m/min.
Feed per tooth:	0.1-0.6mm
Primary clearance angle:	8°
Radial rake angle:	20°
Depth of cut:	2-20mm
Helix angle:	30-40°

Finish Milling	Emulsion
Tool:	SC
Cutting speed:	up to 3000m/min.
Feed per tooth:	0.03-0.1mm
Primary clearance angle:	12°
Radial rake angle:	25°
Depth of cut:	≤0.5mm
Helix angle:	30-40°

ALPLAN is unsuitable for deep boring operations greater than 500mm with a radius smaller than 5mm.

Smiths Metal Centres are the exclusive U.K. distributors for ALPLAN high technology speciality plate - for further information on how ALPLAN can reduce your through cost contact one of our local metal centres.

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:

bsi ISO 9001 Quality Management Systems CERTIFIED

UKAS TESTING 1930

www.smithmetal.com info@smithmetal.com

All information in our data sheet is based on approximate testing and is stated to the best of our knowledge and belief. It is presented apart from contractual obligations and does not constitute any guarantee of properties or of processing or application possibilities in individual cases. Our warranties and liabilities are stated exclusively in our terms of trading.

© Smiths Metal Centres 2023