

TYPICAL APPLICATIONS

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

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

PRODUCT ATTRIBUTES

Wrought product

Porosity free

Pre-milled on both sides

Excellent thickness tolerance

Excellent flatness tolerance

Excellent machinability

Exceptional shape stability

Minimal internal stresses

Anodisable alloy

High corrosion resistance

Excellent weldability

Close tolerance cut to size service for both cut blanks and circles/rings

Immediate or just in time delivery

CUSTOMER BENEFITS

Significant benefits in porosity, strength, weldability, structure and anodisability compared with cast product

No rejections because of porosity

Greatly reduced set-up and machining time

Products retain shape after the most extreme machining for the life of the component

Outstanding visual appearance and wear resistance

Very easily welded

Uneconomic cutting to size and stockholding costs are removed - your highly skilled operators and resources are used more efficiently

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.

TYPICAL MECHANICAL PROPERTIES

Tensile strength	N/mm ² (Rm)	275-350
0.2% Yield strength	N/mm ² (Rp0.2)	130-190
Elongation	% (A5)	min. 17%
Brinell Hardness	HB	approx. 68
Elastic Modulus	kN/mm ²	70
Coefficient of Linear Thermal Expansion	1/K	≤ 24x10 ⁻⁶
Thermal Conductivity	W/m.K	120
Melting Range	°C	580-640
Electrical Conductivity	MS/m (20°C)	17-18

CORROSION RESISTANCE

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

CUT TO SIZE CAPABILITY

Smiths Metal Centres carry a full range of ALPLAN plates in both imperial and metric sizes.

Our close tolerance CNC platesawing 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.

TOLERANCES/CUTTING

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

Turned circles/rings and sawn circles/rings are manufactured by our in-house engineering centre from a minimum 75mm O.D. to a maximum 1200mm O.D.

POROSITY

ALPLAN is porosity free.

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.

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.

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.

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www.smithmetal.com

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 your local metal centre. We have 14 strategically placed Metal Centres to guarantee the most competitive TOTAL service package in the U.K.

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SPECIALITY PLATE 06/96 AMBER