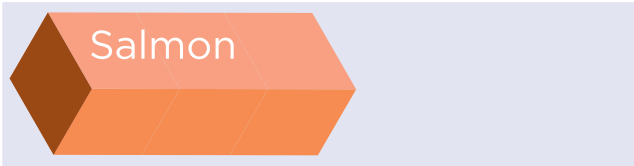


Colour Code



Characteristics

Alumold 500 is a heat treated and stress relieved Aluminium alloy specifically developed for tooling applications. It has high strength, very high thermal conductivity and is very easy to machine. These characteristics are especially relevant where time compression in tool production and product output are important. Depending on the polymer involved, extended production runs are possible

Manufacturing

There are two manufacturing routes depending on thickness, rolled plate and forged block. The two routes result in slightly different properties and these are set out in the table on the back page.

Typical Applications

Plastic injection moulding tools, blow moulding, jigs, prototype tools, vacuum forming and low-inertia base and top plates for cold work die sets.

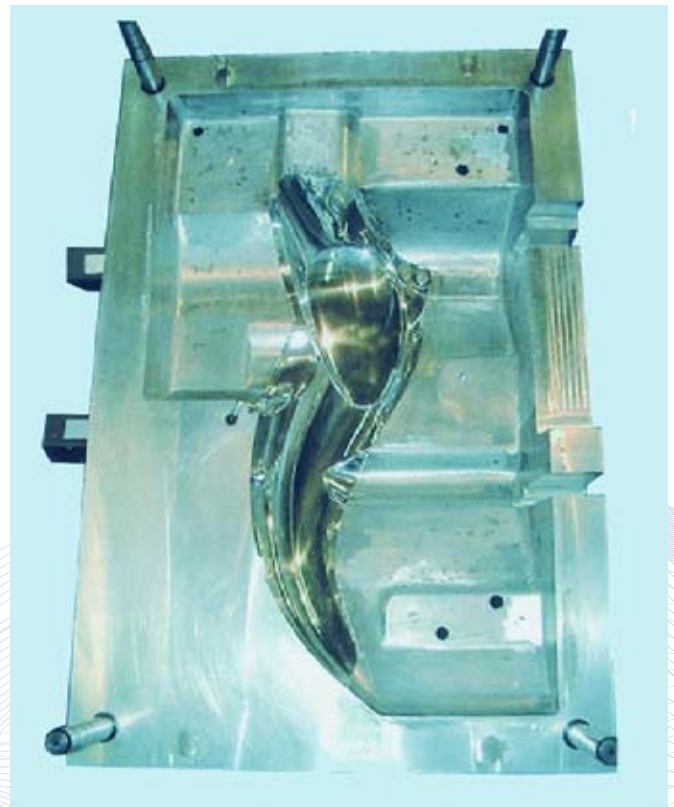
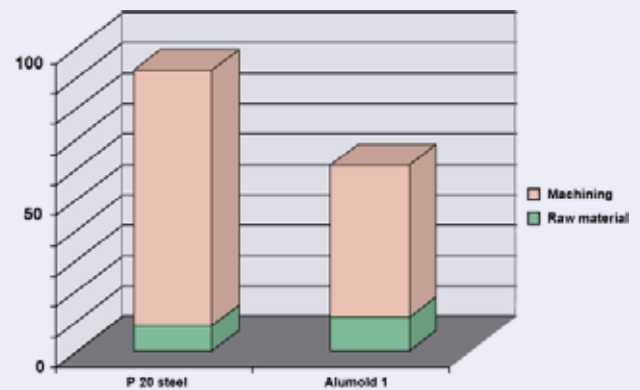
STOCK

Alumold 500 is stocked as plate or block and cut to customer's requirements.

Productivity

The very high thermal conductivity of Alumold 500 results in much higher cooling rates and therefore increased output. Its high diffusivity allows rapid temperature equalisation in the mould and hence reduction in internal stresses and warping in the product.

Indicative Mould Production Cost Compared With Conventional Tool Steel



MECHANICAL PROPERTIES

Rolled Material							Forged Material						
Thickness (mm)	Minimum values MPa			Typical values MPa			Thickness (mm)	Minimum values MPa			Typical values MPa		
	Rm	Rp 0.2	% A	Rm	Rp 0.2	% A		Rm	Rp 0.2	% A	Rm	Rp 0.2	% A
25.0 to 76.2	560	504	5	590	540	10	175.0 to 200.0	475	420	4	530	470	10
76.2 to 127.0	550	497	4	580	530	6	200.0 to 300.0	465	400	3.5	520	460	9
127.0 to 152.4	540	476	2.5	570	520	4	300.0 to 400.0	450	370	3	520	460	8
152.4 to 203.2	525	473	1	555	510	2	400.0 to 450.0	430	350	3	520	460	7
203.2 to 254.0	505	455	1	535	490	1.5	450.0 to 700.0	410	340	3	480	420	7
254.0 to 305.0	470	435	0.5	510	470	1.5							

USAGE PROPERTIES

Operation	Performance criteria	Rolled Material	Forged Material
Milling	Swarf breaking Surface brightness	Excellent	Excellent Excellent
Polishing	Aesthetic Optical	Excellent Good	Excellent Good (add surface treatment)
Engraving/etching	Chemical etching Laser Etching	Excellent Excellent	Good Excellent
Surface treatments	Hard anodising	Excellent	Excellent
	Nickel plating	Excellent for cavity: abrasion resistance	Excellent for cavity: abrasion resistance
	PVD / PA CVD	Dedicated for Aluminium: high hardness	Dedicated for Aluminium: high hardness
	Thermal / laser spraying	Thick and hard layer: parting line resistance	Thick and hard layer: parting line resistance
Welding	Refilling (TIG)	Good: DC/Helium rod 5180,5356, 4047,4145	Good: DC/Helium rod 5180,5356, 4047,4145

PHYSICAL PROPERTIES (both forged and rolled material)

Specific Gravity	2.82 kg/dm ³
Coefficient of thermal expansion	23.7 x 10 ⁻⁶ /°C
Thermal conductivity	153 W/m.°C
Specific heat	857 J /kg.°C
Thermal diffusivity	63 x 10 ⁻⁶ m ² / sec
Tensile modulus	72,000 MPa
Compression modulus	73,000 Mpa
Poisson's coefficient	0.33
Melting range	475 - 630 °C

MOULD DESIGN

Parting line stress should be limited to 50 MPa maximum and, ideally 35 MPa.

HEAT TREATMENT AND INTERNAL STRESS RELIEVING

Plates are delivered after complete thermal treatment and internal stress relieving. No further treatment is recommended.

