

# ALPASE M-1™

ALUMINUM MOLD PLATE - A PROVEN PRODUCT  
DEVELOPED FOR THE PLASTIC AND MOLDING INDUSTRIES



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Alpase introduced M-1 in 1988 as a high density, dimensionally stable, high strength (non-heat treated) aluminum plate. Its design was inspired by the growing high-temp plastic and mold industries.

M-1 has among the best elevated temperature properties available in aluminum. It is a cast product with uniform equiaxed grain structure making the properties uniform in all directions. More cost-effective than wrought aluminum and tool steel, M-1 lowers real-time production costs through machining advantages.



## M-1 Product Features and Benefits

- **Density** - M-1 offers a very tight equiaxed grain structure that is metallurgically sound throughout. This is achieved using modern technologies in casting, cooling and homogenization processes.
- **Brinell Hardness** - Highly consistent throughout the entire plate regardless of thickness.
- **Machinability** - Aluminum machining rates are over 3 times that of steel and M-1 is rated very high among aluminum alloys. M-1 has the capability of achieving an excellent surface finish.
- **Weldability** - Maintains its high mechanical properties in and adjacent to weld area without additional heat treatment unlike wrought alloys.
- **Dimensional Stability** - Unlike wrought alloys, M-1 maintains dimensional stability during machining without stress relieving. The result is a very low residual stress and uniform grain structure in all directions.
- **Hardcoat Anodize** - M-1 conforms well to hardcoat anodizing as well as Nickel Coating.
- **Cost Efficiency** - Decreases production costs and increases productivity better than tool steel or wrought aluminum molds. High thermal conductivity allows for shorter cycle times.

Produced in the USA

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## M-1 APPLICATIONS

**Injection Molding** - M-1 aluminum is used for mold applications where 1 to 12 cavities are required. The faster cool-down rate of M-1 will increase productivity, tool steel molds have a much slower cool-down rate.

M-1 aluminum molds are approximately one-third of the cost of tool steel molds. It is more cost-effective to make engineering changes with M-1 aluminum molds than re-working tool steel or wrought aluminum alloys.

Wrought alloys must be rough-machined because of the material softness, heat treated to the required hardness and reset for the final machine process. *With M-1 this costly process is eliminated.*

**Structural Foam Molding** - Dimensional stability and uniform hardness of M-1 is ideal for structural foam molding.

**R.I.M. Molding** - Proven high thermal fatigue properties of M-1 aluminum mold plate make it the number one choice for R.I.M. molding.

**R.T.M. Molding** - Unique combination of hardness, thermal fatigue resistance, polishability and weldability has made M-1 the specified choice for R.T.M. molds.

**Rubber Molds** - From simple mat molds to sophisticated aero-space parts, the dense grain structure in combination with dimensional stability, make M-1 your number one choice.

**Blow Molding** - M-1 is best used for blow molding due to its high Brinell hardness and high thermal conductivity.

## M-1 TYPICAL PROPERTIES

<b>Typical Tensile Strength</b>	43 ksi	<b>Coefficient of Expansion</b>	$12.9 \times 10^{-6}$ (68 to 392°F)
<b>Typical Yield</b>	30 ksi	<b>Electrical Conductivity</b>	39% (I.A.C.S.) Uniform equiaxed grains
<b>Typical Elongation</b>	7% to 9%	<b>Microstructure</b>	Vacuum Tight
<b>Brinell Hardness</b>	85 HB	<b>Thermal Conductivity</b>	95 Btu/ft x h x °F
<b>Density</b>	0.101 lb./in <sup>3</sup>	<b>Modulus of Elasticity</b>	10.8 KSI x 10 <sup>3</sup>

### Tolerances

<b>Thickness</b>	+1/8" - 0"
<b>Width/Length</b>	+1/4" - 0"

### Standard Sizes

<b>Thickness</b>	From 1" to 30"
<b>Widths</b>	Up to 88"
<b>Lengths</b>	Up to 195"

### Non-Standard Thicknesses

**Special Inquiry**

### Close Tolerances

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New Technologies  
In Aluminum



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