

# AZ31B MAGNESIUM SHEET, PLATE & COIL



## AZ31B BENEFITS

### Lightweight:

- 33% lighter than aluminum
- 75% lighter than steel

### Easy machining

- 40% faster than Al 6061
- 96% faster than Al 7075

### Longer tool life

- 5 to 10 times longer tool life when compared to aluminum

### Excellent damping properties

## AZ31B APPLICATIONS

- Aerospace/rotorcraft
- Space/satellites
- Defense
- Automotive/motor sport
- Computer/cell phone/camera housing
- Electrical housing
- Medical equipment
- Orthopedic braces
- Robotics



## MACHINING

Magnesium machines faster than any other known metal. Machining magnesium is limited only to the speed of the cutting tool. Studies have shown that magnesium machines 40% faster than 6000 series aluminum and up to 96% faster than 7000 series aluminium, employing the use of large feed rates and greater depths of cut. Machining magnesium uses 55% less power than what is required to machine aluminium and behaves like wood with well broken chips that do not accumulate on the tooling.

Extremely fine and smooth surfaces can be achieved and 5 to 10 times longer tool life can be expected.

## SURFACE TREATMENT

Surface protection of AZ31B depends on the operating conditions it needs to with stand during service. In dry conditions, with limited exposure to moisture, AZ31B can be left bare or lightly oiled. A protective coating solution should be given to applications in more demanding environments. AZ31B can be protected by a variety of coatings, including chromating, anodizing, plating, e-coat, paint, and plasma electrolytic oxidation (PEO). It is recommended to prepare the magnesium by cleaning and pre-treating (conversion coating) the surface using traditional non-ferrous methods prior e-coat or paint. Non-chromate pretreatments are commercially available and improve the adhesion of the paint system. For further guidance on surface protection. For further guidance on surface protection, contact Vulcan Metals Specialty Products.

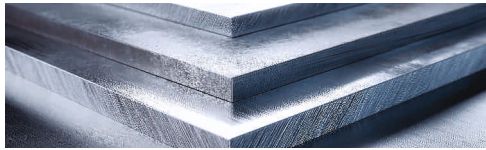
## WELDABILITY

AZ31B has excellent weldability with gas shielded arc using AZ61A (preferred) or AZ92A filler rod. Post weld stress relief is recommended to prevent stress corrosion cracking. AZ31B sheet and plate can also be friction stir welded.



## CHEMICAL COMPOSITION

Aluminum	2.5 - 3.5%
Zinc	0.7 - 1.3%
Manganese	0.20 - 1.0%
Magnesium	Balance



## PHYSICAL PROPERTIES

Specific gravity	0.064 lb/in <sup>3</sup> (1.78g/cm <sup>3</sup> )
Coefficient of thermal expansion	4.9 x 10 <sup>6</sup> °F (26.8 x 10 <sup>-6</sup> °K)
Specific heat capacity	0.25 Btu/lb3/°F (1040 J/kg/K)
Thermal conductivity	44.5 Btu/hr/ft/°F (76.9 W/m/K)
Modulus of elasticity	6500 ksi (44 GPa)
Poissons ratio	0.35
Melting range	1050°F - 1170°F (566°-632°C)

## MECHANICAL PROPERTIES

Gauge, inches (mm)	Temper	Tensile Strength, ksi (MPa)	Yield Strength, ksi (MPa)	Elongation
0.040 - .050" (1 - 1.51)	-0	32 (221)	18 (124)	12%
0.060 - 0.49" (1.52 - 12.6)	-0	32 (221)	15 (103)	12%
0.5 - 1.99" (12.7 - 50.8)	-0	32 (221)	15 (103)	10%
2" - 3" (50.8 - 76.2)	-0	32 (221)	15 (103)	9%
0.040 - 0.249" (1 - 6.32)	-H24	39 (269)	29 (200)	6%
0.25 - 0.374" (6.32 - 9.5)	-H24	38 (262)	26 (179)	8%
0.375 - 0.5" (9.5 - 12.7)	-H24	37 (255)	24 (165)	8%
0.5 - 1" (12.7 - 25.4)	-H24	36 (248)	22 (152)	8%
1 - 2" (25.4 - 50.8)	-H24	34 (234)	20 (138)	8%
2 - 3" (50.8 - 76.2)	-H24	34 (234)	18 (124)	8%

### HEAVY GAUGE ROLLED PLATE



<b>Sizes:</b>	0.25" (6.35 mm) - 10" (254 mm) thick
<b>Maximum Width:</b>	72" (1828 mm)
<b>Maximum Length:</b>	240" (6100 mm)

### THIN GAUGE SHEET/PLATE



<b>Sizes:</b>	0.249" (6.35 mm) - 0.040" (1 mm)
<b>Maximum Width:</b>	60" (1524 mm)
<b>Maximum Length:</b>	240" (6100 mm)

*Coil is also available in these gauges.*

### ULTRA THIN GAUGE SHEET



<b>Sizes:</b>	0.010" (0.25 mm) - 0.038" (0.81 mm)
<b>Maximum Width:</b>	10" (254 mm)

*Coil is also available in these gauges.*

**AZ31B meets these specifications: AMS 4377, AMS 4375, AMS 4382 and ASTM B90**  
Domestically Made / DFARS Compliant / RDHS Compliant / Frank Dodd Act Compliant