

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/Motorsport
- 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 aluminum, employing the use of large feed rates and greater depths of cut. Magnesium uses 55% less power than what is required to machine aluminum 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 withstand 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 to e-coat or paint. Non-chromate pretreatments are commercially available and improve the adhesion of the paint system. For further guidance on surface protection, contact Vulcan Metals Specialty Products.

WELDABILITY

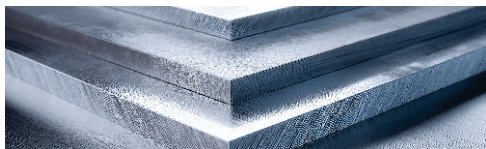
AZ31B has excellent weldability with gas shielded arc using AZ61A (preferred) or AZ92A filler rod. Post weld stress relief is recommended to prevent stress corrosion cracking. AZ31B sheet and plate can also be friction stir welded.



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

MECHANICAL PROPERTIES

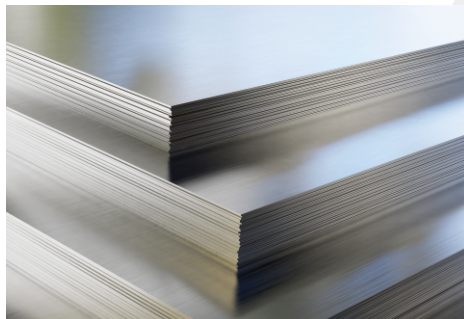
Gauge, inches (mm)	Temper	Tensile Strength, ksi (Mpa)	Yield Strength, ksi (Mpa)	Elongation
0.040-0.060" (1-1.51)	-O	32 (221)	18 (124)	12%
0.060-0.5" (1.52-12.6)	-O	32 (221)	15 (103)	12%
0.5-2" (12.7-50.8)	-O	32 (221)	15 (103)	10%
2-3" (50.8-76.2)	-O	32 (221)	15 (103)	9%
0.040-0.249" (1-6.32)	-H24	39 (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



Sizes:	0.25" (6.35 mm) – 10" (254 mm) thick
Maximum Width:	72" (1828 mm)
Maximum Length:	240" (6100 mm)

THIN GAUGE SHEET/PLATE



Sizes:	0.040" (1 mm) – 0.249" (6.35 mm)
Maximum Width:	60" (1524 mm)
Maximum Length:	240" (6100 mm)

Coil is also available in these gauges.

ULTRA THIN GAUGE SHEET



Sizes:	0.010" (0.25 mm) – 0.038" (0.81 mm)
Maximum Width:	10" (254 mm)

Coil is also available in these gauges.

AZ31B can meet these specifications: AMS 4377, AMS 4375, AMS 4382 and ASTM B90
Domestically Made / DFARS Compliant / RoHS Compliant / Frank Dodd Act Compliant

Vulcan Metals Specialty Products

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