

# LUXFER® MAGNESIUM ROLLED PRODUCTS

## 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

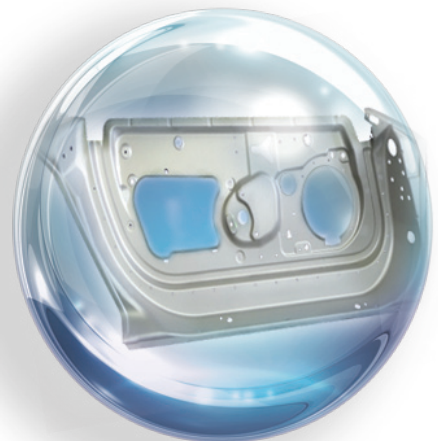
#### **Longer tool life**

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

#### **Good damping properties**

### **AZ31B Applications**

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



# AZ31B MAGNESIUM SHEET, PLATE AND COIL

## 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 × 10 <sup>-6</sup> /°F (26.8 × 10 <sup>-6</sup> /K)
Specific heat capacity	0.25 Btu/lb/°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)

## WELDABILITY

Excellent weldability with gas shielded arc using AZ61A (preferred) or AZ92A filler rod; post weld stress relief is required to prevent stress corrosion cracking. AZ31B sheet and plate can also be FSW.

## MECHANICAL PROPERTIES

Gauge inches (mm)	Temper	Tensile Strength ksi (MPa)	Yield Strength ksi (MPa)	Elongation
.040-.050" (1-1.51)	-O	32 (221)	18 (124)	12%
.060-0.49" (1.52-12.6)	-O	32 (221)	15 (103)	12%
0.5-1.99" (12.7-50.8)	-O	32 (221)	15 (103)	10%
2"-3" (50.8-76.2)	-O	32 (221)	15 (103)	9%
.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%



**LUXFER®**  
**MAGNESIUM**  
**ROLLED PRODUCTS**

Visit [www.luxfermrp.com](http://www.luxfermrp.com) for more information.

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## MACHINING

*Magnesium machines faster than any other known metal.*

Machining magnesium is only limited to the speed of the tool which is doing the cutting. 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. Machining magnesium uses 55% less power than what is required to machine aluminum. Magnesium machines like wood with well broken chips and does not accumulate on the tooling as compared to aluminum alloys. Extremely fine and smooth surfaces can be achieved and 5 to 10 times longer tool life can be expected.

## SURFACE TREATMENT

The surface protection of AZ31B is dependent on the service conditions where the material will be operating. In dry conditions, with limited exposure to moisture, AZ31B can be left bare or lightly oiled. A protective coating solution should be given to application in more demanding environments. AZ31B can be protected by a variety of coatings that include chromating, anodizing, plating, e-coat, paint, and plasma electrolytic oxidation (PEO). It is recommended to prepare the magnesium surface by cleaning and pre-treatment (conversion coating) using traditional non-ferrous methods prior to e-coat or paint. There are commercially available pre-treatments that are a non-chromate based chemistry which result in good adhesion of the paint system. For further guidance on surface protection, contact Luxfer MRP.



AZ31B meets these specifications: AMS 4377, AMS 4375, AMS 4382 and ASTM B90

Domestically Made / DFARS Compliant / RDHS Compliant / Frank Dodd Act Compliant

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