



VULCAN
SPECIALTY PRODUCTS

ELEKTRON 43 PLATES



Satellite & Space



Defense



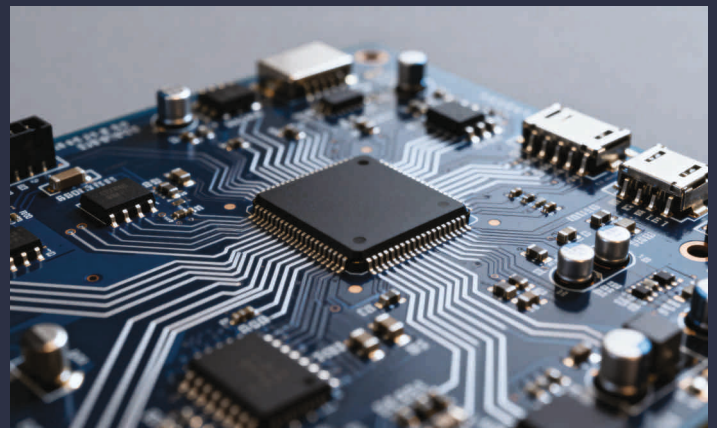
Aerospace



Formula 1



Electric Vehicles



Electronic Components



ELEKTRON 43 PLATES

ELEKTRON 43 BENEFITS

Flame Resistant

Non-burning
Lightweight

33% lighter than aluminum

75% lighter than steel

High Strength

Creep Resistant

Free machining

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

ELEKTRON 43 APPLICATIONS

- Aerospace / aircraft
- Defense
- Motorsport / automotive
- Space / satellites
- Electrical housing
- High-performance equipment
- Lightweighting



MINIMUM TENSILE PROPERTIES

INCH/POUND UNITS

Nominal Thickness inches	Tensile Strength ksi	Yield Strength at 0.2% Offset ksi	Elongation in 4D %
1.00 to 1.50 incl.	44	33	12
Over 1.50 to 6.0 incl.	47	30	6

MINIMUM TENSILE PROPERTIES

SI UNITS

Nominal Thickness, inches	Tensile Strength, ksi	Yield Strength at 0.2% Offset ksi	Elongation in 4D, %
25.4 to 38.1 incl.	303	228	12
Over 38.1 to 152.4 incl.	324	207	6

CHEMICAL COMPOSITION

Yttrium	3.7 – 4.3%
Rare Earths	2.3 – 3.5%
Zirconium	0.2% min
Magnesium	Balance

PHYSICAL PROPERTIES

Specific gravity	1.83
Coefficient of thermal expansion	$2.56 \times 10^{-6} \text{ k}^{-1}$
Specific heat capacity	$993 \text{ j kg}^{-1} \text{ k}^{-1}$
Thermal conductivity	$57.6 \text{ W m}^{-1} \text{ k}^{-1}$
Modulus of elasticity	44 GPa
Poissons ratio	0.295
Melting range	540°C – 640°C

MACHINING

Magnesium machines faster than most metals, only limited to the speed of the cutting tool. Studies have shown that magnesium machines 40% faster than 6000 series aluminium 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.

Magnesium machines like wood with well broken chips that do not accumulate on tooling. 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 Elektron 43 is dependent on the service conditions where the material will be operating. In dry conditions, with limited exposure to moisture, Elektron 43 can be left bare or lightly oiled. A protective coating solution should be given to application in more demanding environments. Elektron 43 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 paint. There are commercially available non-chromate pre-treatments that result in good adhesion of the paint system. For further guidance on surface protection, contact Vulcan Metals Specialty Products.



FLAME RESISTANT

Elektron 43 is a flame-resistant alloy. It meets the flammability requirements set out in the FAA's Aircraft Materials Fire Test Handbook DOT/FAA/AR-00/12 for commercial aircraft. The unique alloy content of Elektron 43 provides it with an aluminum-like flammability resistance when in bulk form.

This flame resistance is the result of a robust, protective surface oxide that forms, making E43 the alloy of choice for applications requiring both lightweight and high strength in demanding environments.

Elektron 43 meets these specifications: **AMS 4378; ASTM B107**
Domestically Made | DFARS Compliant | RDHS Compliant