



Magnesium Elektron

SERVICE & INNOVATION IN MAGNESIUM

Elektron[®] 43

PRELIMINARY DATASHEET

Preliminary Datasheet 043[†]

The information contained within is meant as a guideline only [†]

[†]Disclaimer: The information provided within this document is aimed to assist manufacturers and other interested parties in the use of magnesium alloys. Magnesium Elektron accepts no liability in whole or in part from use and interpretation of the data herein.

Elektron® 43

APPLICATIONS

Elektron 43 is a light, high strength wrought magnesium alloy for use at temperatures up to 250°C. Designs in Elektron 43 can be 20% to 30% lighter than a corresponding aluminium design. Elektron 43 will be available as rolled plate, forging feedstock and extruded bar, section & profile. Elektron 43 is a wrought evolution of the original casting alloy, Elektron WE43.

The isotropic properties of Elektron 43 means it is well suited for use as feedstock material from which to machine high performance components, especially those associated with elevated temperature performance.

Elektron 43 uses Elektron zirconium grain refining technology to ensure high performance. Elektron zirconium grain refined alloys have undergone extensive flammability testing by the Federal Aviation Administration (FAA). The FAA have shown that the use of Elektron zirconium grain refined alloys in aircraft seat frames does not reduce the level of safety of the aircraft when compared to heavier aluminium seat frames.

DESIGNATIONS

ASTM & UNS designations are applied for.

CHEMICAL COMPOSITION

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

HEAT TREATMENT

Extruded Elektron 43 develops its maximum strength in the artificially aged (T5) heat treated condition.

PHYSICAL PROPERTIES

Specific Gravity:	1.84 g/cm ³
Co-efficient of	
Thermal Expansion:	26.7 x 10 ⁻⁶ K ⁻¹
Thermal Conductivity:	51.3 Wm ⁻¹ K ⁻¹
Specific Heat:	966 Jkg ⁻¹ K ⁻¹
Electrical Resistivity:	148 nΩm
Modulus of Elasticity:	44 GPa
Poisson's Ratio:	0.27
Melting Range :	540 – 640°C
Damping Index:	0.09
Brinell Hardness:	70-90

Elektron[®] 43

AMBIENT TEMPERATURE MECHANICAL PROPERTIES

AVERAGE TENSILE PROPERTIES

EXTRUDED BAR - Longitudinal

0.2% Proof Stress MPa (ksi)	Tensile Strength MPa (ksi)	Elongation %
215 (31)	330 (48)	14

EXTRUDED BAR - Transverse

0.2% Proof Stress MPa (ksi)	Tensile Strength MPa (ksi)	Elongation %
182 (26)	294 (43)	11

EXTRUDED BAR - Fatigue Properties

ASTM E466 Axial fatigue, R=0.1,
5 x 10⁷ cycles
185 MPa (27 ksi)

ROLLED PLATE

Nominal Thickness Range:
1mm to 38mm (0.040 inch to 1.5 inch)

0.2% Proof Stress MPa (ksi)	Tensile Strength MPa (ksi)	Elongation %
276 (40)	345 (50)	12

Nominal Thickness Range:
39mm to 76mm (1.501 inch to 3 inch)

0.2% Proof Stress MPa (ksi)	Tensile Strength MPa (ksi)	Elongation %
255 (37)	345 (50)	14

OTHER PROPERTIES

FORGING

Elektron 43 is a high strength alloy that responds well to forging.

MACHINING

Elektron 43, like all magnesium alloys, machines faster than any other metal. The power per cubic centimetre of metal removed varies from 9 to 14 watts per minute, depending on the operation.

CORROSION RESISTANCE

Corrosion rate < 30mpy

SURFACE TREATMENT

Elektron 43 can be anodised with treatments such as Keronite[®], Tagnite[®], and MagOxid[®], amongst others.

Dip treatments are also available, such as; Alodine[®] 160/161, Surtec[®] 650, Metalast[®] TCP-HF, Oxsilan[®] MG 0611 and Gardobond[®] X4707, amongst others.

Like all magnesium alloys, following pre-treatment, Elektron 43 can be painted or coated using conventional techniques.

All information is given in good faith but without warranty. Freedom from patent rights must not be assumed. Health and Safety information is available for all Magnesium Elektron products.

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