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DATASHEET • 490+

Elektron® 43 Extruded Products

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 is available as rolled plate, forging feedstock and extruded bar, section and profile. Elektron 43 is an optimised wrought evolution of the original casting alloy, Elektron WE43.

The properties of Elektron 43 mean 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 has undergone extensive flammability testing by the Federal Aviation Administration (FAA). The FAA have shown that the use of Elektron 43 in aircraft seat frames does not reduce the level of safety of the aircraft when compared to heavier aluminium seat components.

Designations

UNS M18434
ASTM WE43C

Specifications

AMS 4485 – Extrusion
ASTM B107 and B107M – Extrusion
MMPDS-08 (and later versions) – Including full A and B basis statistical analysis of properties for bothextrusions and plate.

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	1.83
Coefficient of thermal expansion	25.6 x $10^{-6}K^{-1}$
Thermal conductivity	57.6 $Wm^{-1}K^{-1}$
Specific heat	993 $Jkg^{-1}K^{-1}$
Electrical resistivity	148 nΩm
Modulus of elasticity	44.1 GPa
Poisson's ratio	0.3
Melting range	540 – 640˚C
Damping index	0.09
Brinell hardness	70 – 90

Design data

Longitudinal – Specification minima
(A-basis statistical)

Extruded – T5

0.2% proof	195 MPa (28.2 ksi)
Ultimate tensile strength	303 MPa (43.9 ksi)
Elongation	6%

Ambient temperature mechanical properties

T5 properties for extruded Elektron 43 are dependent upon extruded profile. Tensile strength values up to 300 MPa 0.2% PS (43.5 ksi); 375 MPa UTS (54.4 ksi); and elongation of 11% have been demonstrated.

Typical tensile properties

Extruded bar – Longitudinal

0.2% proof stress MPa (ksi)	Tensile strength MPa (ksi)	Elongation %
243 (34.8)	352 (51.0)	11.5

Extruded bar – Transverse

0.2% proof stress MPa (ksi)	Tensile strength MPa (ksi)	Elongation %
183 (26.5)	305 (44.2)	11.3

Asymmetry of properties

Asymmetry is when the tensile yield strength is greater than the compressive yield strength due to the twinning behaviour. Elektron 43 has reduced asymmetry compared to other magnesium alloys.

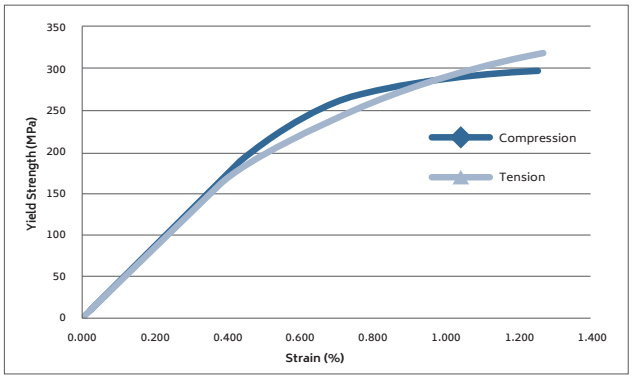

Figure 1.

Elevated temperature properties

	0.2% proof stress MPa (ksi)	Tensile strength MPa (ksi)	Elongation %
20˚C	240 (34.8)	350 (50.8)	11
250˚C	200 (29.0)	268 (38.9)	22

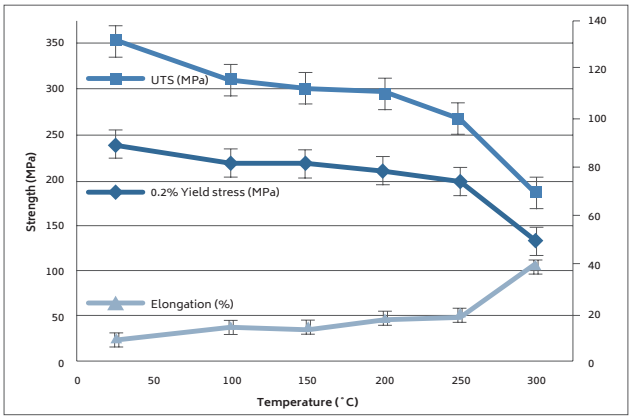

Figure 2.

Extruded bar – Fatigue properties

ASTM E466 axial fatigue

R=0.1 at 50 million cycles = 195 MPa
Other R ratios are shown in the graph below.

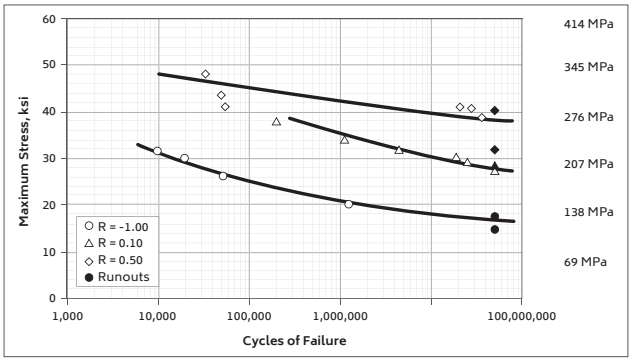

Figure 3.

Other properties

Plate
Elektron 43 rolled plate is available and has specification AMS 4371. Please see Magnesium Elektron Datasheet 492.

Forging
Elektron 43 is a high strength alloy that responds well to forging – please see Magnesium Elektron information sheet, available on the website, for the forging of Elektron 43.

Machining
Elektron 43, like all magnesium alloys, machines faster than any other metal.

Corrosion resistance
Corrosion rate < 30 mpy

Surface treatment
Elektron 43 can be anodised with treatments including: Keronite®, Tagnite® and MagOxid®, amongst others.

Conversion coatings that are Hexavalent chromium free are also available. These include: Alodine® 160/161, Surtec® 650, Metalast® TCP-HF, Oxsilan® MG 0611, Gardobond® X4729, and MagPass®, amongst others.

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

Discover more at
www.luxfermeltechnologies.com

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† The information contained within is meant as a guideline only

Certificate No. FM12677

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