



Elektron AZ80A Forging Billet

AZ80A

AZ80A is a wrought magnesium base alloy containing aluminium, zinc and manganese. Increased strength is obtained by artificial aging from the as-fabricated form.

Elektron AZ80A has a fine controlled microstructure for improved forging performance and consistent mechanical properties of the forged part.

Applications

AZ80A forgings can be used where pressure tightness or machinability are required. That parts are dimensionally stable during and after machining is also an important design consideration.

Forgings in AZ80A find application in high strength parts for satellites, helicopter gearboxes and rotor hubs, bicycle frames, roadwheels, missile frames and interstage fairings, brake housings and landing gear struts.

Specifications

- Uns No. M11800
- AMS4360
- ASTM B91-12
- FEDERAL QQ-M-40B

Chemical composition

Aluminium	7.8-9.2%
Zinc	0.20-0.8%
Manganese	0.12-0.5%
Magnesium	Balance

Heat treatment

Billets are normally provided fully homogenised to promote ease of forging.

Physical properties

Specific gravity	1.8
Coefficient of thermal expansion	$26 \times 10^{-6} \text{K}^{-1}$
Thermal conductivity	$76 \text{Wm}^{-1}\text{K}^{-1}$
Specific heat	$1100 \text{Jkg}^{-1}\text{K}^{-1}$
Electrical resistivity	145 nΩm
Modulus of elasticity	45GPa
Poissons ratio	0.35
Melting range	470-595 °C

Grain structure

The grain refinement of forging billets is a key factor affecting the ease of which the metal can be forged. Elektron AZ80A forging billet undergoes a special grain refining process to ensure a fine uniform structure.

Grain size is controlled to below 200 μm for 300 mm diameter billet.

Design data for AZ80A forgings

Specification minimum tensile properties.

AZ80A-T5 die forgings

0.2% proof stress	193 MPa
Tensile strength	290 MPa
Elongation	2%

AZ80-F die forgings

0.2% proof stress	179 MPa
Tensile strength	290 MPa
Elongation	5%

Machining

AZ80A, like all magnesium alloy forgings, machines faster than any other metal. Providing the geometry of the part allows, the limiting factor is the power and speed of the machine rather than the quality of the tool material. The power required per cubic centimetre of metal removed varies from 9 to 14 watts per minute depending on the operation.

Surface treatment

All the normal chromating, anodizing, plating and finishing treatments are readily applicable.

Heat treatment

As-fabricated (F) forgings can be converted to the precipitation treated temper T5 by heating to 177°C for 16-24 hours, followed by air cooling.

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Certificate No. FM12677

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