Magnesium Elektron

SERVICE & INNOVATION IN MAGNESIUM

Elektron Diecasting Alloys

Datasheet : 475

Magnesium Elektron UK,
P.O. Box 23, Rake Lane, Swinton, Manchester, M27 8DD, England.
Tel: 0161 911 1000 Fax: 0161 911 1010
Web: www.magnesium-elektron.com VAT No: GB 668 2142 26

Elektron Diecasting Alloys AZ91D, AM50A, AM60B

ELEKTRON diecasting alloys AZ91D, AM50A and AM60B are supplied to diecasting foundries worldwide for the production of high volume components used in the automotive, electronics and telecommunication industries. Other commercial alloys are available where there is a requirement for elevated temperature properties.

CUSTOM MANUFACTURE

The chemical composition of each ELEKTRON diecasting alloy is based upon the standard ASTM specification. However, Magnesium Elektron is one of the few companies that manufactures primary alloy ingot to order. As such, Magnesium Elektron is able to manufacture alloy ingot with compositions which are tailored to meet the specific processing requirements of the diecasting foundry.

For example, diecasting foundries operating the hot chamber process may desire alloy ingot with manganese levels at the lower end of the ASTM specification. This minimises the formation of aluminium-manganese precipitates which form the 'sludge' often observed in the holding furnace. In this example, Magnesium Elektron is able to offer alloy ingot with a manganese content at the lower end of the ASTM specification.

RECYCLING SERVICES

Magnesium Elektron provides a comprehensive recycling service to the diecasting industry. This includes toll recycling high grade arisings and processing lower grade arisings such as dross and swarf. With over 10 years experience of managing materials from the diecasting process, Magnesium Elektron has built up an excellent logistical infrastructure to support its services in this area.

CHEMICAL COMPOSITION

ALLOY	AZ91D	AM50A	AM60B
Aluminium (%)	8.5 - 9.5	4.5 - 5.3	5.6 - 6.4
Manganese (%)	0.17 - 0.3	0.28 - 0.50	0.26 - 0.50
Zinc (%)	0.45 - 0.9	0.20 max	0.20 max
Silicon (%)	0.05 max	0.05 max	0.05 max
Copper (%)	0.025 max	0.008 max	0.008 max
Nickel (%)	0.001 max	0.001 max	0.001 max
Iron (%)	0.004 max	0.004 max	0.004 max
Beryllium (%)	0.0005 - 0.0015	0.0005 - 0.0015	0.0005 - 0.0015
Other Each (%)	0.01 max	0.01 max	0.01 max

PHYSICAL PROPERTIES

Density ($kg / m^3 \times 10^3$)	1.81	1.79	1.78
Coefficient of thermal expansion µm/m°K	25	26	25.6
Thermal conductivity ($Wm^{-1}K^{-1}$)	72	62	62
Specific heat ($Jkg^{-1}K^{-1}$)	1050	1050	1050
Modulus of rigidity (Shear & Torsion 10^6 psi)	2.4	-	-
Youngs modulus (GPa)	45	45	45
Melting range (°C)	470 – 595	543 – 620	540 – 615
Brinell hardness (500 kg load, 10 mm ball)	75	57	62

INGOT SIZES

Ingots available in 4 kg, 7.5 kg or 12 kg trapezoidal form.
Shrunk wrapped and banded on wooden pallets, in weights of: 800 - 950 kilos

AMBIENT TEMPERATURE MECHANICAL PROPERTIES

	AZ91D	AM50A	AM60B
TYPICAL TENSILE PROPERTIES			
0.2% Tensile yield strength MPa (ksi)	150 (23)	120 (18)	130 (19)
Ultimate tensile strength MPa (ksi)	230 (34)	220 (32)	220 (32)
Elongation (%)	3	6 - 10	6 - 8
TYPICAL COMPRESSIVE PROPERTIES			
0.1% Yield strength MPa (ksi)	165 (24)	-	130 (19)
Ultimate strength MPa (ksi)	400 (58)	-	-
TYPICAL SHEAR PROPERTIES			
Ultimate shear strength MPa (ksi)	140 (20)	-	-
IMPACT VALUES			
1/4 in Unnotched Charpy j (ft.lb)	2.2 (1.6)	9.5 (7.0)	6.1 (4.5)
FATIGUE PROPERTIES			
Rotating bend test 5×10^7 cycles MPa (ksi)	70 (10)	70 (10)	70 (10)

MECHANICAL PROPERTIES AT 177°C (350°F)

	AZ91D	AM50A	AM60B
TYPICAL TENSILE PROPERTIES			
0.2% Tensile yield strength MPa (ksi)	115 (17)	-	90 (13)
Ultimate tensile strength MPa (ksi)	150 (22)	-	110 (16)
TYPICAL COMPRESSIVE PROPERTIES			
0.1% Yield strength MPa (ksi)	130 (19)	-	-
Ultimate strength MPa (ksi)	210 (30)	-	-

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