

Properties of the commonly used Magnesium Alloy AZ91C

Normal properties for Magnesium Alloy Sand castings conforming to ASTM Design :B 80 Alloy No. AZ91C in F Temper		
Tensile Strength (Min.)		23.0 Ksi / 158 MPa
Yield Strength (0.2% offset) Min.		11.0 Ksi / 76 MPa
Elongation in 2" (50-8 mm) Min.		2%
Typical Brinell Hardness Number HB		60 (50-65)
Electrical Conductivity		11.5% IACS
Electrical Resistivity		150 nohm.m.
<u>Thermal Properties</u>		
Non-Equilibrium Solidus		785°F / 421°C
Solidus		875°F / 468°C
Liquidus		1105°F / 596°C
<u>Elastic Modules</u>		
Modulus of Elasticity	E	4.4816 x 10 ¹⁰ N/m ²
Tension		45 GPa / 6.5 x 10 ⁶ psi
Shear		17 GPa / 2.4 x 10 ⁶ psi
Poisson's Ratio	μ	0.35
Fatigue strength (RR. Moore type tests at (1 x 10 ⁸ cycles)		12-14 Ksi / 80-95 MPa
Density (at 20oC / 68oF) room Temp.		1.81 g/cm ³ (0.66 lb/in ³)
Co-efficient of Linear Thermal Expansion	α	26 um/ m.k (14 uin / in.F) 2.538 x 10 ⁻⁵ per °C
Specific heat (at 20°C / 68°F)		1.05 kJ / Kg. K (0.25 Btu / lb °F)
Latent heat of fusion		373 kJ / Kg. K (160 Btu / lb)
Thermal conductivity (at 100 - 300°C / 212-572°F)		72 W/m.K (41.8 Btu / ft.h°F)
Electrolyte Solution Hydrogen over voltage		1.58V versus saturated calomel electrode 0.40 V (as cast)
<u>Chemical Composition</u>		
Copper	Cu.	0.10% max
Silicon	Si.	0.30% max
Magnesium	Mg.	Remainder
Iron	Fe	0.05% max
Manganese	Mn.	0.13-0.35% max
Nickel	Ni.	0.01% max
Zinc	Zn.	0.40-1.0% max
Aluminium	Al.	8.1-9.3% max
Total Impurities		0.3% max

NOTES:

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- Values given are for separately cast test pieces.
- As per British Standard EN 1753 (1 N / mm² is equivalent to 1 MPa).