

Comparitive chart showing the properties of the commonly used Magnesium Alloy & Aluminium alloy castings.

Mechanical / Physical Properties	Normal properties for Magnesium Alloy Sand castings conforming to ASTM Desgn :B 80 Alloy No. AZ91C			(Normal properties for Aluminium alloy Sand castings conforming to IS:617 Gr. 4450 (LM - 25)		
	Temper F	Temper T4	Temper T6	Temper M	Temper TE	Temper TF
Tensile Strength (Min.)	23.0 Ksi / 158 MPa	34.0 Ksi / 234 MPa	34.0 Ksi / 234 MPa	130 N/mm ²	150	230
Yield Strength (0.2% offset) Min.	11.0 Ksi / 76 MPa	11.0 Ksi / 76 MPa	11.0 Ksi / 76 MPa	80-100 N/mm ²	120-150 N/mm ²	200-250 N/mm ²
Elongation in 2" (50-8 mm) Min.	2%	7%	3%	2%	1%	Not required
Typical Brinell Hardness						
Number HB	60 (50-65)	55 (55-70)	70 (60-90)	55 - 65	70 - 75	90 -110
Electrical Conductivity	11.5% IACS	9.9% IACS	11.2% IACS	—	43%IACS	39%IACS
Electrical Resistivity	150 nohm.m.	175 nohm.m.	151.5 nohm.m.	—	40% nohm.m.	44.2% nohm.m.
Thermal Properties						
Non-Equilibrium Solidus	785°F / 421°C	—	—	—	—	—
Solidus	875°F / 468°C	—	—	555°C	—	—
Liquidus	1105°F / 596°C	—	—	615°C	—	—
Elastic Modules						
Tension	45 GPa / 6.5 x 10 ⁶ psi	—	—	72.4 GPa	—	—
Shear	17 GPa / 2.4 x 10 ⁶ psi	—	—	27.2 GPa	—	—
Poisson's Ratio	0.35	—	—	—	—	—
Fatigue strength (RR. Moore type tests at (1 x 10 ⁸ cycles)	12-14 Ksi / 80-95 MPa	—	—	—	55 MPa	60 MPa
Density (at 20°C / 68°F) room Temp.	1.81 g/cm ³ (0.66 lb/in ³)	—	—	2.685 g/cm ³ (0.097 lb/in ³)	—	—
Damping	2.08%	—	—	1.62%	—	—
Co-efficient of Linear Thermal Expansion (at 20-100°C / 68-212°F)	26 um/ m.k (14 uin / in.F)	—	—	21.5 um/m.K°C (14 uin / in.F)	—	—
Specific heat (at 20°C / 68°F)	1.05 kJ / Kg. K (0.25 Btu / lb°F)	—	—	0.963 KJ / Kg.K (0.25 Btu / lb°F)	—	—
Latent heat of fusion	373 kJ / Kg. K (160 Btu / lb)	—	—	389 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)	—	—	167W / m.K (41.8 Btu / ft.h°F)	(Temper T51) T4	151 W / m.K T6
Electrolyte Solution	1.58V versus saturated calomel electrode			(-) 0.82 V versus 0.1 N saturated calomel electrode		
Hydrogen over voltage	0.40 V (as cast)	—	—	—	—	—

NOTES:

1. The information mentioned above is indicative and for guidance only. M/s.Exclusive Magnesium Pvt. Ltd. doe not take any responsibility for the accuracy and relevance of this information supplied and expresly exclude liability for any damage , loss or

2. Values given are for separetely cast test pieces.

3. As per British Standard EN 1753 : 1997 (1 N / mm² is equivalent to 1 MPa).

4. 1 Pa = 1 N/m² 1 Mpa (mega pascal) = 1 x 10⁶ Pa and 1 m = 1000 mm