

Basic Properties of Thixomolding® Alloys

Designation	AZ91D G-Mag	AM50A Thixo	AM60B G-Mag	AE42 Thixo	AZ91 D Die Cast	AM60B Die Cast	AM50A Die Cast	ZAMAK3 Die Cast	A 380 Die Cast
Properties and Constants*									
Tensile Strength, ksi (MPa) @ 68°F (20°C)	42 (288)	32 (220)	40 (280)	33 (225)	34 (230)	32 (220)	29 (200)	41 (283)	47 (320)
Tensile Yield, ksi (MPa) .2% offset @ 68°F (20°C)	27 (188)	18 (120)	22 (150)	20 (140)	23 (160)	19 (130)	16 (110)	32 (221)	23 (160)
Comp. Strength, ksi (MPa)	n/a	n/a	n/a	n/a	58 (400)				
Comp. Yield, ksi (MPa) .1% offset	n/a	n/a	n/a	n/a	23 (165) ^e	19(130) ^e	16 (113)	60 (414)	
Elongation, % in 2 inches @ 68°F (20°C)	8.3	10-15	13.9	8-10	3	6-8	6-10	10	3
Young's Modulus, Msi (GPa) @ 68°F (20°C)	6.5 (45)	6.5 (45)	6.5 (45)	6.5 (45)	6.5 (45)	6.5 (45)	6.5 (45)	12.4 (85.5)	10.3 (71.0)
Poisson's Ratio	0.35	0.35	0.35	0.35	0.35	0.35	0.35	0.37	0.37
Shear Strength, ksi (MPa) @ 68°F (20°C)	n/a	n/a	n/a	n/a	20 (140)			31 (214)	27 (186)
Fatigue Strength, ksi (MPa):									
R.R. Moore 5x10 ⁸ Cycles un-notched					14 (97)	10 (70)	10 (70)	6.9 (47.6)	21 (145)
Rotating Beam DIN 50113, 5x10 ⁷ Cycles notched		10 (70)	10 (70)						
Impact Strength,ft-lb (J) ^b Un-notched .25 in. bar	1.6 (2.2)	7.0 (9.5)	4.5 (6.1)	4.3 (5.8)	1.6 (2.2)	4.5 (6.1)	7.0 (9.5)	43 (58)	3 (4)
Hardness, Brinell ^d Average	75	58	62	57	70	62	58	82	80
Density, ob/in ³ (g/cm ³)	.066 (1.81)	.064 (1.78)	.065 (1.79)	.064 (1.79)	.066 (1.81)	.065 (1.79)	.064 (1.78)	0.24 (6.6)	.097 (2.74)
Therm. Cond.,Btu/ft•hr•°F(W/m•K):									
@ 20°C	29.6 (51)	36 (65)	35 (61)	40 (68)	29.6 (51)	35 (61)	36 (65)	65.3 (113.0)	55.6 (96.2)
@ 50°C	31.6 (54.7)								
@ 100°C	34.6 (59.9)								
@ 150°C	65.4 (37.8)								
Coef of Therm. Exp.,µin/in°F (µm/m•K) 20-200°C	15.2 (27.9)	14.4 (26.0)	14.4 (26.0)	14.5 (26.1)	15.2 (27.9)	14.4 (26.0)	14.4 (26.0)	15.2 (27.4)	12.2 (21.8)
Elec.Resistivity, µW•in (mW•cm)	35.8 (14.1)	31.8 (12.5)	31.8 (12.5)	n/a	35.8 (14.1)	31.8 (12.5)	31.8 (12.5)	27 (69)	27 (69)
Solidus Temp., °F (°C)	875 (470)	1010 (543)	1005 (540)	n/a	875 (470)	1005 (540)	1010 (543)	718 (381)	1000 (540)
Liquidus Temp., °F (°C)	1105 (595)	1150 (620)	1140 (615)	n/a	1105 (595)	1140 (615)	1150 (620)	728 (387)	1100 (595)

n/a - Not Available or Not Applicable