LIQUIDMETAL TECHNOLOGIES

Properties Comparison

LQMT

Liquidmetal and Common Crystalline Metals

Mechanical and Physical Properties

	Liquidmetal® Alloy	Mg AZ-91	Al 380 Series	Ti 6Al-4V	Stainless 17-4
Yield Strength, σ_y					
ksi	**270**	22	23	115	126
(MPa)	**(1900)**	(150)	(159)	(790)	(870)
Hardness					
Vickers	**550**	71	100	340	325
Density, ρ					
lb/in³	**0.222**	0.065	0.099	0.160	0.283
(g/cm³)	**(6.1)**	(1.8)	(2.8)	(4.4)	(7.8)
Impact Strength					
ft-lb	**5.9**	1.9	3.0	17.7	55.3
(J)	**(8)**	(2.7)	(4)	(24)	(75)
Elasticity, e					
(% of Original Shape)	**2.00%**	0.35%	0.10%	0.69%	0.44%
Young's Modulus, E					
Msi	**13.5**	6.5	10	16.5	28.6
(GPa)	**(93)**	(45)	(71)	(114)	(198)
Specific Strength, σ/ρ					
ksi	**45**	13	8	26	16
(MPa)	**(311)**	(83)	(58)	(178)	(111)
Poisson's Ratio, ν	**0.39**	0.35	0.33	0.34	0.27

Electrical and Thermal Properties

	Liquidmetal® Alloy	Mg AZ-91	Al 380 Series	Ti 6Al-4V	Stainless 17-4
Heat Capacity, cp					
BTU/lb°F	**0.10**	0.25	0.23	0.13	0.10
(J/Kg°K)	**(420)**	(1050)	(963)	(526)	(419)
Thermal Expansion, α					
μin/in°F	**5.5**	14.0	12.0	4.8	6.7
(μm/m°K)	**(10.1)**	(26.0)	(21.2)	(8.6)	(12.0)
Thermal Conductivity, k					
BTU/ft hr°F	**3.5**	42.1	62.9	3.8	10.3
(W/m°K)	**(6)**	(73)	(109)	(7)	(18)
Electrical Resistivity, R					
μ Ω in	**75**	6.7	2.5	70	30.3
(μ Ω cm)	**(190)**	(17)	(6.4)	(178)	(77)

Properties listed in this chart are for the following materials:

Magnesium AZ-91D

Aluminum 380.0-F

Titanium Ti-6Al-4V ELI, Annealed

Stainless Steel 17-4 PH Condition H 1150

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