THIXOMOLDED MAGNESIUM

MATERIAL PROPERTIES & COMPARISON

		MAGNESIUM	MAGNESIUM	PC	PC	NYLON 6/6	PEI	STEEL	ALUMINUM	ZINC
Type		**AZ91D**	AZ31B	GE Lexan	LNP 30% CF	DuPount Zytel	GE Ultem	316	A380	ZAMAK 3
Process		**Thixomolded**	Machined Prototype	Injection Molded	Injection Molded	Injection Molded	Injection Molded	Cast	Cast	Cast
MECHANICAL	UNITS									
Yield Strength	KSI(MPA)	**23.5(160)**	29(200)	9(62)	24(165)	11.5(79)	16(110)	34.8(240)	23.1(159)	32.0(221)
Modulus of Elasticity	MSI(GPA)	**6.5(45)**	6.5(45)	0.33(2.3)	1.9(13.1)	0.41(2.8)	0.48(3.3)	28(193)	10.3(71)	12.4(86)
Elongation	%	**7.5 @ break**	15 @ break	7 @ yield	2.5 @ break	5 @ yield	7 @ yield	60 @ break	3.5 @ break	10 @ break
Poisson's Ratio	-	**0.35**	0.35	0.3	0.3	0.3	0.3	0.29	0.33	0.27
Specific Modulus	in x106	**99.4**	101.6	7.5	21.6	9.5	10.5	96.9	105.0	51.7
PHYSICAL										
Specific Gravity	g/cc	**1.81**	1.77	1.21	1.33	1.18	1.27	8.0	2.73	6.6
Density	lb/in3	**0.065**	0.064	0.044	0.048	0.043	0.0459	0.289	0.098	0.24
Specific Volume	in3 per lb	**15.29**	15.63	22.73	20.83	23.26	21.79	3.46	10.2	4.167
Hardness	Rockwell	**75 E**	55 E	110 R	120 R	119 R	125 R	80 B	47 B	49 B
THERMAL										
Thermal Conductivity	Btu/ft-hr-F(W/m-K)	**41.8(72)**	55.5(96)	0.11(0.19)	0.41(0.71)	0.15(0.26)	0.13(0.22)	9.42(16.3)	63(109)	65.3(113)
Specific Heat	Btu/lb-F(kJ/kg-K)	**0.25(1.05)**	0.24(1.0)	0.28(1.17)	-	0.52(2.2)	-	0.12(0.5)	0.23(0.96)	0.10(0.42)
Coeff. Of Thermal Expansion @ 70F	µin/in-F(µm/m-K)	**13.8(25)**	14.4(26)	38(68)	9(16)	43.3(78)	31(55.8)	8.89(16)	11.7(21.1)	15.2(27.4)
Deflection Temperature @ 264 PSI	F(C)	**>700(370)**	-	270(132)	300(149)	176(80)	394(201)	1670(910)	670(354)	480(249)
Melting Temperature	F(C)	**790(421)**	1120(605)	550(288)	580(305)	486(252)	660(349)	2500(1400)	1000(538)	718(381)
ELECTRICAL										
Electrical Conductivity	% IACS	**12**	18.5	-	-	-	-	23	27	27
Electrical Resistivity	µOhm-in	**43**	23.4	-	-	-	-	29	16.3	16.3
Shielding Effectiveness 0.020" thk @ 100MHz	dB	**>85**	-	<20	<20	<20	<20	-	-	-
Shielding Effectiveness 0.050" thk @ 100MHz	dB	**>88**	-	<20	<25	<20	<20	-	-	-
CORROSION										
Mil 117B Salt Spray Corrosion	Mils per Year	**2.8**	-	-	-	-	-	30	15	-
FLAME CHARACTERISTICS										
Ignition Temperature at One Atmosphere	F(C)	**900(490)+**	-	-	-	-	-	-	-	-
UL94 Flame Exposure Results	-	**DNB**	-	V-0	V-1	V-0	V-0	-	-	-

TYPICAL TOLERANCES FOR THIXOMOLDED PARTS

Thickness	in (mm)	MIN	**0.015(0.38)**	MAX	**2.0(50.8)**	** *Dependent on part geometry*	
Porosity	%	MIN	**0.0%**	MAX	**1.1%**		
		RANGE				TOLERANCE	
Linear Dimension: *Formed by die features contained in the same die half*	in (mm)	0.000	to	1.000		**+/-**	**0.0005(0.013)**
	in (mm)	Each additional inch beyond 1 in.				**+/-**	**0.0010(0.025)**
Across Parting Line Dimensions: *Dimensions formed across the parting line of the two die halves. Based on component projected area.*	in (mm)	0.000	to	10.0(64.5)		**+**	**0.0015(0.038)**
	in (mm)	11.0(71.0)	to	20.0(129.0)		**+**	**0.0025(0.064)**
	in (mm)	21.0(135.5)	to	50.0(322.6)		**+**	**0.004(0.102)**
	in (mm)	51.0(329.0)	to	100.0(645.2)		**+**	**0.006(0.152)**
Flatness: *Across largest dimension of part.*	in (mm)	0.000	to	3.00		**+/-**	**0.002(0.051)**
	in (mm)	Each additional inch beyond 3 in.				**+/-**	**0.001(0.025)**
Moving Die Component Tolerances: *Consist of a) Linear Dimension and b) Moving Component Tolerance*	in (mm)	0.000	to	10.0(64.5)		**+**	**0.004(0.102)**
	in (mm)	11.0(71.0)	to	20.0(129.0)		**+**	**0.006(0.152)**
	in (mm)	21.0(135.5)	to	50.0(322.6)		**+**	**0.008(0.203)**
	in (mm)	51.0(329.0)	to	100.0(645.2)		**+**	**0.010(0.254)**
Surface Finish	**Replicates tool finish. Typical plastic tool polish levels employed. Expect 32 RMS or better.**						

Values shown are typical values for comparison purposes and should not be used for design. Actual values should be taken from test results.

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