

Property Comparison Sheet for Ultem 1000R and 7075-T6 Aluminum

Ultem 1000R				Aluminum 7075-T6; 7075-T651				Percentage Aluminum > Ultem	Factor Aluminum > Ultem
Physical Properties	English	Units	Comments	Physical Properties	English	Units	Comments		
Density	0.0459	lb/in ³	ASTM D 792	Density	0.102	lb/in ³	AA; Typical	122.2%	2.22
Water Absorption	0.25	%	24 hours @ 73F; ASTM D 570	Mechanical Properties					
Water Absorption at Saturation	1.25	%	Equilibrium, 73F; ASTM D 570						
Linear Mold Shrinkage	0.005 - 0.007	in/in	Flow, 0.125 inch; ASTM D 955		Hardness, Brinell	150	AA; Typical; 500 g load; 10 mm ball		
Melt Flow	9.7 g/10	g/10 min	337C/6.6 kgf; ASTM D 1238		Hardness, Knoop	191	Converted from Brinell Hardness Value		
Mechanical Properties					Hardness, Rockwell A	53.5	Converted from Brinell Hardness Value		
	Hardness, Rockwell M	109	ASTM D 785		Hardness, Rockwell B	87	Converted from Brinell Hardness Value		
					Hardness, Vickers	175	Converted from Brinell Hardness Value		
					Ultimate Tensile Strength	83000	psi	AA; Typical	
					Tensile Yield Strength	73000	psi	AA; Typical	
Tensile Strength @ Yield	16000	psi	Type I, 0.2 in/min; ASTM D 638	Elongation at Break	11	%	AA; Typical; 1/16 in. (1.6 mm) Thickness	356.3%	4.56
Elongation at Break	60	%	Type I, 0.2 in/min; ASTM D 638						
Elongation at Yield	7	%	Type I, 0.2 in/min; ASTM D 638						
Tensile Modulus	520	ksi	0.2 in/min; ASTM D 638						
Flexural Modulus	510	ksi	0.10 in/min, 4" span; ASTM D 790						
Flexural Yield Strength	24000	psi	0.10 in/min, 4" span; ASTM D 790	Modulus of Elasticity	10400000	psi	AA; Typical; Average of tension and compression. Compression modulus is about 2% greater than tensile	43233.3%	433.33
Poisson's Ratio	0.36		ASTM D 638	Poisson's Ratio	0.33				
Izod Impact, Unnotched	25	ft-lb/in	73F; ASTM D 4812	Fatigue Strength	23000	psi	AA; 500,000,000 cycles completely reversed stress; RR Moore machine/specimen		
Gardner Impact	27	ft-lb	73F; ASTM D 3029	Fracture Toughness	18.2	ksi-in ^{1/2}	K(IC) in S-L Direction		
Taber Abrasion, mg/1000 Cycles	10		CS-17, 1 kg; ASTM D 1044	Fracture Toughness	22.8	ksi-in ^{1/2}	K(IC) in T-L Direction		
Izod Impact, Notched	1	ft-lb/in	73F; ASTM D 256	Fracture Toughness	26.4	ksi-in ^{1/2}	K(IC) in L-T Direction		
Izod Impact, Notched	30	ft-lb/in	Reverse Notched, 73F; ASTM D 256	Machinability	70	%	0-100 Scale of Aluminum Alloys		
				Shear Modulus	3900	ksi			
				Shear Strength	48000	psi	AA; Typical		

Information provided by GE Plastics for their North American product line.

Information provided by The Aluminum Association, Inc. from Aluminum Standards and Data 2000 and/or International Alloy Designations and Chemical Composition Limits for Wrought Aluminum and Wrought Aluminum Alloys (Revised 2001). Metals Handbook, Vol.2 - Properties and Selection: Nonferrous Alloys and Special-Purpose Materials, ASM International 10th Ed. 1990.