



ACRYLIC (PMMA POLYMETHYLMETHACRYLATE)

1. Common trade names: Plexiglas, Acrylite

	UNITS		
2. Density	g/cm ³	1.19	Mass per unit volume
3. Mold Shrinkage	in./in.	.003-.007	Size of part versus mold cavity
4. Continuous Service Temp	°F	150-190	Highest temp material can perform reliably for the long term
5. Melting Point	°F	270-350	Temperature material begins to melt
6. Processing Temp	°F	390-490	Recommended temperature for molding
7. Tensile Strength	$\frac{lb}{in.^2}$	8800-11300	Maximum stress without yielding to a stretching mold
8. Izod Impact Strength	$\frac{ft-lb}{in.}$	0.3	Energy required to break at a v-notch
9. Compressive Strength	$\frac{10^3 lb.}{in.^2}$	13-17	Resist a crushing force
10. Flexural Strength, yeild	$\frac{10^3 lb.}{in.^2}$	14-19	Resistance to fracture during bending
11. Elongation, tensile break	%	2-6	Stretching ability before breaking
12. Dielectric Strength	$\frac{V}{10^{-3} in.}$	279	Voltage material can withstand before dielectric breakdown * = aluminum oxide
13. Water Absorption, 24 hours	%	0.3	% Water absorbed when immersed in water for 24 hours
14. Coefficient of Lin. Thermal Expansion	$10^{-5} \frac{in.}{in. \text{ } ^\circ F}$	4	Change in length per change in temperature
15. Crystalline or Amorphous	C = Crystalline A = Amorphous	A	Crystalline: arranged polymer, sharp melting point Amorphous: random polymer, broad melt)
16. Clarity	O = Opaque TP = Transparent TL = Translucent	TP	Opaque = no light passes through it Transparent = some light passes through it Translucent = light passes directly through it
17. Flammability	Flame Resistance High ← Low 5VA 5VB V-0 V-1 V-2 HB	HB	Reference standard UL 94
18. Process: Drying Required		Yes	Is it recommended to dry the material prior to molding?
19. Hot Stamp		Yes	Does the material hot stamp?
20. Machining Qualities	Qualitative Scale: Excellent, Good, Fair, Poor	Good	How does the material machine?
21. Creep Resistance		Fair	Can this material keep it's shape under load? * = with additive or co-polymer
22. Ultrasonic Welding		Good	Does the material weld via ultrasonics?
23. Low Friction		Poor	Surface lubricity
24. Abrasion Resistance		Fair	How well does the material withstand wear? * = with additive or co-polymer
25. Solvent Resistance		Good	How well does the material withstand chemicals?
26. UV Resistance		Excellent	How well does the material withstand UV rays? * = with UV additive
27. Environmental Stress Crack Resistance		Fair*	Can this material resist environmental stress cracking? * = with additive or co-polymer
28. FDA		Yes	Are there FDA grades available?
29. Living Hinge		No	Can this material be used in a living hinge application?
30. Year Developed		1936	
31. Cost: year 2006	$\frac{\$}{lb.}$ @ 5,000 lbs.	\$1.96	Natural/Black Year 2006

32. Applications:

Lenses, Lighting Fixtures, Signs, Glazing, Medical, Display Fixtures, Household, Specialty Products, Windows