



## POLYSTYRENE (PS)

1. Common trade names: Styron, Crystal, Huntsman					
	<b>UNITS</b>	<b>GP</b>	<b>IMPACT</b>		
2. Density	g/cm <sup>3</sup>	1.04	1.09	Mass per unit volume	
3. Mold Shrinkage	in./in.	0.005		Size of part versus mold cavity	
4. Continuous Service Temp	°F	150	Highest temp material can perform reliably for the long term		
5. Melting Point	°F	212		Temperature material begins to melt	
6. Processing Temp	°F	400-450		Recommended temperature for molding	
7. Tensile Strength	$\frac{lb}{in.^2}$	2600	7500	Maximum stress without yielding to a stretching mold	
8. Izod Impact Strength	$\frac{ft-lb}{in.}$	0.2	4	Energy required to break at a v-notch	
9. Compressive Strength	$\frac{10^3 lb.}{in.^2}$	11 - 16		Resist a crushing force	
10. Flexural Strength, yeild	$\frac{10^3 lb.}{in.^2}$	8-14		Resistance to fracture during bending	
11. Elongation, tensile break	%	1		Stretching ability before breaking	
12. Dielectric Strength	$\frac{V}{10^{-3} in.}$	508		Voltage material can withstand before dielectric breakdown * = aluminum oxide	
13. Water Absorption, 24 hours	%	0.02	0.06	% Water absorbed when immersed in water for 24 hours	
14. Coefficient of Lin. Thermal Expansion	$10^{-5} \frac{in.}{in. \text{ } ^\circ F}$	6		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	TL	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			No	Is it recommended to dry the material prior to molding?	
19. Hot Stamp			Yes	Does the material hot stamp?	
20. Machining Qualities			Fair	How does the material machine?	
21. Creep Resistance			Good	Can this material keep it's shape under load? * = with additive or co-polymer	
22. Ultrasonic Welding			Excellent	Does the material weld via ultrasonics?	
23. Low Friction			Poor	Surface lubricity	
24. Abrasion Resistance			Fair	Good	How well does the material withstand wear? * = with additive or co-polymer
25. Solvent Resistance			Poor	How well does the material withstand chemicals?	
26. UV Resistance			Poor	How well does the material withstand UV rays? * = with UV additive	
27. Environmental Stress Crack Resistance			Poor	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 (K-resin -Yes)	Can this material be used in a living hinge application?	
30. Year Developed			1937	1965	
31. Cost: year 2006	\$/lb. @ 5,000 lbs.	\$1.00	\$1.02	Natural/Black Year 2006	

**Qualitative Scale:  
Excellent,  
Good,  
Fair,  
Poor**

32. Applications:

Household Goods, Containers, Packaging, Disposable Glassware,  
 Video Cassettes, Fan Grilles, Medical Vials, Medical Test Tubes, Toys