

Reference Information supplied by our sources:

#### DESCRIPTION

## POLYCARBONATE

Unfilled Polycarbonate is a tough, transparent engineering thermoplastic which offers very high impact strength and high modulus of elasticity. It also has a high heat deflection temperature and absorbs very little moisture. These properties, plus good low frequency and high voltage insulating characteristics, make polycarbonate a prime material for electrical and electronic components. Its strength, impact resistance and transparency (unfilled grades only) also make it an ideal material for certain transparent structural applications.

NOTE: Use caution when specifying polycarbonate for applications in which transparency is critical. For example, Westlake Plastics' Zelux<sup>®</sup> M product is machine-grade polycarbonate, while their Zelux<sup>®</sup> W is window-clear material for applications where transparency is an important consideration. SABIC (formerly GE) brand Lexan<sup>®</sup> polycarbonate sheet is available in many different grades, with varying properties and transparency.

### **GLASS FILLED GRADES**

Glass fibers may be added in various amounts (10%, 20%, 30% and 40%) to increase tensile strength, stiffness, compressive strength, and lower the thermal expansion coefficient. NOTE: Glass-filled polycarbonate is typically natural (greenish white) in color, and is sometimes also available in black color. Properties for 30% glass-filled polycarbonate are shown below for reference. Contact us for properties of other grades.

#### **KEY PROPERTIES**

high impact strength
excellent strength retention at elevated temperatures
high tensile, shear, and flexural strength
high modulus of elasticity
low deformation under
load
excellent creep and cold flow resistance
low coefficient of thermal expansion
good electrical insulation properties
easy to fabricate & machine

#### **TYPICAL APPLICATIONS**

Polycarbonate exhibits a broad range of outstanding properties for applications in: • electrical connectors • brush holders • coil bobbins & forms • insulators • relay components • dialysis equipment parts • medical tubing • gamma sterilizable reusables • instrument covers • covers • handles • rollers • machine guards • fittings

# **TYPICAL PROPERTIES of POLYCARBONATE**

ASTM or UL test	Property	Unfilled	30% Glass			
PHYSICAL						
D792	Density (lb/in³) (g/cm³)	0.043 1.2	0.052 1.43			
D570	Water Absorption, 24 hrs (%)	0.12	0.12			



MECHANICAL					
D638	Tensile Strength (psi)	9,500	19,000		
D638	Tensile Modulus (psi)	320,000	-		
D638	Tensile Elongation at Break (%)	60	10		
D790	Flexural Strength (psi)	15,000	23,000		
D790	Flexural Modulus (psi)	375,000	1,100,000		
D695	Compressive Strength (psi)	12,000	18,000		
D695	Compressive Modulus (psi)	240,000	500,000		
D785	Hardness, Rockwell	M70 / R118	M92		
D256	IZOD Notched Impact (ft-lb/in)	13	2		
THERMAL					
D696	Coefficient of Linear Thermal Expansion (x 10 <sup>-5</sup> in./in./°F)	3.9	1.2		
D648	Heat Deflection Temp (°F / °C) at 264 psi	270 / 132	295 / 146		
D3418	Glass Transition Temp (°F / °C)	293 / 145	300 / 149		
-	Max Operating Temp (°F / °C)	250 / 121	270 / 132		
C177	Thermal Conductivity (BTU-in/ft²-hr-°F) (x 10 <sup>-4</sup> cal/cm-sec-°C)	1.3 6.9	1.3 6.9		
UL94	Flammability Rating @ less than .45" (11.5mm) thickness @ .45" (11.5mm) thickness and above	H-B V-0	H-B V-0		
ELECTRICAL					
D149	Dielectric Strength (V/mil) short time, 1/8" thick	390	470		
D150	Dielectric Constant at 60 Hz	3.17	3.35		
D150	Dissipation Factor at 60 Hz	0.0009	0.0011		
D257	Volume Resistivity (ohm-cm)at 50% RH	10 <sup>16</sup>	10 <sup>16</sup>		

NOTE: The information contained herein are typical values intended for reference and comparison purposes only. They should NOT be used as a basis for design specifications or quality control. Contact us for manufacturers' complete material property datasheets.

All values at 73°F (23°C) unless otherwise noted.

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