Reference Information supplied by our sources:

## POLYCARBONATE

### DESCRIPTION

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® M product is machine-grade polycarbonate, while their Zelux® W is window-clear material for applications where transparency is an important consideration. SABIC (formerly GE) brand Lexan® 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)<br>(g/cm³) | 0.043<br>1.2 | 0.052<br>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<br>(x $10^{-5}$ in./in./°F) | 3.9 | 1.2 |
| D648 | Heat Deflection Temp (°F / °C)<br>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<br>(BTU-in/ft²-hr-°F)<br>(x $10^{-4}$ cal/cm-sec-°C) | 1.3<br>6.9 | 1.3<br>6.9 |
| UL94 | Flammability Rating<br>@ less than .45" (11.5mm) thickness<br>@ .45" (11.5mm) thickness and above | H-B<br>V-0 | H-B<br>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 | $10^{16}$ | $10^{16}$ |

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.