

Polypropylene (PP or Polypro)

Reference Information supplied by our sources:

Polypropylene

GENERAL DESCRIPTION

Polypropylene is an economical material that offers a combination of outstanding physical, chemical, mechanical, thermal and electrical properties not found in any other thermoplastic. Compared to low or high density polyethylene, it has a lower impact strength, but superior working temperature and tensile strength.

GENERAL PROPERTIES

Polypropylene provides excellent resistance to organic solvents, degreasing agents and electrolytic attack. It has a lower impact strength, but its working temperatures and tensile strength are superior to low or high density polyethylene. It is light in weight, resistant to staining, and has a low moisture absorption rate. This is a tough, heat-resistant, semi-rigid material, ideal for the transfer of hot liquids or gases. It is recommended for vacuum systems and where higher heats and pressures are encountered. It has excellent resistance to acids and alkalines, but poor resistance to aromatic, aliphatic and chlorinated solvents.

FEATURES

- Lightweight • High tensile strength • Impact resistant • High compressive strength • Excellent dielectric properties • Resists most alkalis and acids • Resists stress cracking • Retains stiffness and flex • Low moisture absorption • Non-toxic • Non-staining • Easily fabricated • High heat resistance

FABRICATION TECHNIQUES

- Hot gas welding • Spin welding • Fusion & butt welding • Machining with wood or metal working tools • Vacuum forming • Ultra-sonic sealing

THERMO-FORMED APPLICATIONS

- Chemical resistant tanks & linings • Laboratory consoles, sinks & ducts • Plating barrels & tanks • Lavatory partitions • Filter press plates • Railroad crossing components • Pump components & housings • Prosthetic devices • Die cutting pads • Clean room walls, floors & ceilings

TYPICAL PROPERTIES of POLYPROPYLENE

ASTM or UL test	Property	Homopolymer	Co-Polymer	Flame Retardant
PHYSICAL				
D792	Density (lb/in ³) (g/cm ³)	0.033 0.905	0.033 0.897	0.035 0.988
D570	Water Absorption, 24 hrs (%)	<0.01	0.01	0.02

MECHANICAL				
D638	Tensile Strength (psi)	4,800	4,800	4,300
D638	Tensile Modulus (psi)	195,000	-	-
D638	Tensile Elongation at Yield (%)	12	23	28
D790	Flexural Strength (psi)	7,000	5,400	-
D790	Flexural Modulus (psi)	180,000	160,000	145,000
D695	Compressive Strength (psi)	7,000	6,000	-
D695	Compressive Modulus (psi)	-	-	-
D785	Hardness, Rockwell R	92	80	-
D256	IZOD Notched Impact (ft-lb/in)	1.9	7.5	0.65
THERMAL				
D696	Coefficient of Linear Thermal Expansion (x 10 ⁻⁵ in./in./°F)	6.2	6.6	-
D648	Heat Deflection Temp (°F / °C) at 66 psi at 264 psi	210 / 99 125 / 52	173 / 78 110 / 43	106 / 41 57 / 14
D3418	Melting Temperature (°F / °C)	327 / 164	327 / 164	327 / 164
-	Max Operating Temp (°F / °C)	180 / 82	170 / 77	180 / 82
C177	Thermal Conductivity (BTU-in/ft ² -hr-°F) (x 10 ⁻⁴ cal/cm-sec-°C)	0.76-0.81 2.6-2.8	- -	- -
UL94	Flammability Rating	HB	n.r.	V-O
ELECTRICAL				
D149	Dielectric Strength (V/mil) short time, 1/8" thick	500-660	475	500-650
D150	Dielectric Constant at 1 kHz	2.25	2.2-2.36	2.3
D150	Dissipation Factor at 1 kHz	0.0005-0.0018	0.0017	-
D257	Volume Resistivity (ohm-cm) at 50% RH	8.5 x 10 ¹⁴	2 x 10 ¹⁶	10 ¹⁵
D495	Arc Resistance (sec)	160	100	-

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.