

## Polyolefin

### Polypropylene

A “member” of the polyolefin family, polypropylene thermoplastics are derived from propylene gas, a by-product of the petroleum refining process. Polypropylene is a low density polymer that combines moderate temperature resistance, excellent chemical resistance, good electrical properties and good mechanical strength. There are many specialty formulations of homopolymers and copolymers with enhanced stiffness, impact resistance, U.L flammability resistance and higher service temperatures. A significant percentage of mechanical, commercial and industrial usages are derived from the combination of excellent resistance to most organic chemicals, low permeability, ease of processing, machine-ability and the availability of impact resistant grades.

<b>Tensile Strength at Yield - lbs. / sq. in.:</b>	4.8 x 10 <sup>3</sup>
<b>Dielectric Strength - Volts/ Mil:</b>	500
<b>Heat Deflection Temperature - 66 lb / sq. in.:</b>	195 F / 90 C
<b>Elongation % at Yield - ASTM D 638:</b>	16
<b>Comparative Cost:</b>	Low

### Polyethylene - Polyolefin

Polyethylene - including low density, high density, and ultra high molecular weight formulations are among the highest volume thermoplastics in use today. Polyethylene is available in many formulations with a wide range of performance characteristics. Polyethylene grades have a wide range of flexibility, rigidity, impact resistance, clarity and temperature resistance. Most polyethylene grades have a maximum service temperature of @ 160 F, but several can be used over 200F. Generally, polyethylene has an extremely low rate of moisture absorption (low permeability), excellent chemical resistance and electrical properties, relatively low coefficient of friction, and “toughness”

### Low Density polyethylene

Generally speaking low density polyethylene formulations are flexible, have relatively low heat resistance, and have high impact resistance at low temperatures. Most low density polyethylene applications are for packaging, materials, bags, blow molded bottles and containers.

<b>Tensile Strength at Yield- ASTM D 638:</b>	3600 psi
<b>Dielectric Strength - Volts / Mil:</b>	500
<b>Heat Deflection Temperature - 66 psi:</b>	150F / 66 C
<b>Elongation % at Yield - ASTM D 638:</b>	600
<b>Comparative Cost:</b>	Low

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## High density polyethylene

“HDPE” is more rigid and has higher tensile strength than low density formulations. Variations in molecular weight provide improved impact resistance, resistance to stress cracking and generally higher mechanical properties. High density polyethylene applications include blow molded containers, trash cans, carts, bins, tanks and highway barriers.

<b>Tensile Strength at Yield - ASTM D 638:</b>	3000 psi
<b>Dielectric Strength - Volts / Mil:</b>	500
<b>Heat Deflection Temperature - 66 psi:</b>	150F / 66 C
<b>Elongation % at Yield - ASTM D 638:</b>	15
<b>Comparative Cost:</b>	Low

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## Ultra High Molecular Weight Polyethylene (“UHMW PE”) (Type)

The generally accepted definition of “UHMW PE” is a polyethylene with a molecular weight over 3,100,000 - measured by the solution viscosity method. UHMW PE materials are characterized by exceptionally low coefficient of friction, excellent abrasion resistance, enhanced “wear life”, greatly increased impact strength (as compared to other polyethylenes) and excellent chemical resistance. Typical applications include chute linings, conveyor wear strips, guide rails, snow board bottoms, snow mobile track sprockets and rollers and bearings.

<b>Tensile Strength at Yield - ASTM D 638:</b>	3150 psi
<b>Dielectric Strength - ASTM D 150:</b>	142
<b>Heat Deflection Temperature - 66 psi:</b>	150F / 66 C
<b>Elongation % at Break - ASTM D 638:</b>	460
<b>Comparative Cost:</b>	Moderate