TECHNICAL DATA SHEET
Polyethylene
(PE)

Polyethylenes are semi-crystalline materials with excellent chemical resistance, good fatigue and wear resistance and a wide range of properties. Polyethylenes are easy to distinguish from other plastics because they float in water. Polyethylenes provide good resistance to organic solvents, degreasing agents and electrolytic attack. Polyethylene is used more than any other thermoplastic polymer. There are a wide variety of grades and formulations available that have an equally wide range of properties.

Benefits
- Durability
- Easily fabricated
- Chemical resistance
- Abrasion resistance
- Good electrical properties
- Impact resistance
- Low coefficient of friction
- Moisture resistance

Applications
- Packaging
- Skid
- Plates
- Converyer
- Systems
- Tanks
- Containers
- Truck liners

POLYETHYLENE GRADES
Low Density Polyethylene (LDPE)

This extruded material offers good corrosion resistance and low moisture permeability. It can be used in applications where corrosion resistance is important, but stiffness, high temperature, and structural strength are not. A highly flexible product, LDPE is used widely in orthopaedic products, or where mobility without stress fatigue is desired. LDPE is also frequently used in consumer packaging, bags, bottles, and liners.

Benefits
- Lightweight
- Formable
- Impact Resistant
- Good electrical properties
- Easily cleaned
- Easily Fabricated

Applications
- Chemical resistant tank and containers
- Food storage containers
- Laboratory equipment
- Corrosion resistant work surfaces
- Vacuum formed end caps and tops
- Moisture barrier

POLYETHYLENE GRADES
High Density Polyethylene (HDPE)

Representing the largest portion of the polyethylene applications, HDPE offers excellent impact resistance, light weight, low moisture absorption, and high tensile strength. HDPE is also non-toxic and non-staining and meets FDA and USDA certification for food processing.

Benefits
- Abrasion Resistant
- High impact resistance
- Low coefficient of friction
- Abrasion resistant
- Scratch and marking resistant
- Chemical resistant
- Water and moisture resistant

Applications
- Food cutting boards
- Corrosion resistant covers
- Pipe flanges
- Radiation shielding
- Self-supporting containers
- Prosthetic devices

SHAPES AVAILABLE

SEE NEXT PAGE FOR ADDITIONAL INFORMATION

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Ultra High Molecular Weight Polyethylene (UHMW PE)

UHMWPE is light weight (1/8 the weight of steel), high tensile strength, and is easily machined. It is the ideal material for many wear parts in machinery and equipment as well as a superb lining in material handling systems and storage containers. UHMW PE is self-lubricating, shatter resistant, long-wearing, abrasion and corrosion resistant. It meets FDA and USDA acceptance for food and pharmaceutical equipment and is a good performer in applications up to 180 °F (82 °C) or when periodically cleaned with live steam or boiling water to sterilize.

### Benefits
- Durability
- Easily fabricated
- Chemical resistance
- Abrasion resistance
- Electrical properties
- Impact resistance
- Low coefficient of friction
- Moisture resistance

### Applications
- Tanks and containers
- Food storage containers
- Laboratory equipment
- Disposable formed products
- Surface structures
- Vacuum formed end caps and tops
- Moisture barrier

### TYPICAL PROPERTIES of POLYETHYLENE

<table>
<thead>
<tr>
<th>ASTM or UL test</th>
<th>Property</th>
<th>LDPE</th>
<th>HDPE</th>
<th>UHMW</th>
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<tbody>
<tr>
<td></td>
<td>Physical</td>
<td></td>
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<tr>
<td>D792</td>
<td>Density (lb/in³) (g/cm³)</td>
<td>0.033</td>
<td>0.035</td>
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<td>Water Absorption, 24 hrs (%)</td>
<td>&lt;0.01</td>
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<td>Mechanical</td>
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<tr>
<td>D638</td>
<td>Tensile Strength (psi) at 72°F</td>
<td>1,400</td>
<td>4,600</td>
<td>5,800</td>
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<tr>
<td>D638</td>
<td>Tensile Strength (psi) at 150°F</td>
<td>400</td>
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<tr>
<td>D638</td>
<td>Tensile Modulus (psi)</td>
<td>57,000</td>
<td>200,000</td>
<td>80,000</td>
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<tr>
<td>D638</td>
<td>Tensile Elongation at Break (%)</td>
<td>100</td>
<td>400</td>
<td>300</td>
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<tr>
<td>D790</td>
<td>Flexural Strength at Yield (psi)</td>
<td>1,500</td>
<td>4,600</td>
<td>3,500</td>
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<tr>
<td>D790</td>
<td>Flexural Modulus (psi)</td>
<td>29,000</td>
<td>174,000</td>
<td>88,000</td>
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<tr>
<td>D695</td>
<td>Compressive Strength (psi)</td>
<td>1,400</td>
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<tr>
<td>D695</td>
<td>Compressive Modulus (psi)</td>
<td>54,000</td>
<td>100,000</td>
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<tr>
<td>D732</td>
<td>Shear Strength (psi)</td>
<td>300</td>
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<td>D785</td>
<td>Hardness, Shore D</td>
<td>D45</td>
<td>D69</td>
<td>D62-D66</td>
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<tr>
<td>D256</td>
<td>IZOD Notched Impact (ft-lb/in)</td>
<td>No Break</td>
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<td>No Break</td>
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<td>Thermal</td>
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<tr>
<td>D696</td>
<td>Coefficient of Linear Thermal Expansion (x 10⁻³ in./in./°F)</td>
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<td>D648</td>
<td>Heat Deflection Temp (°F / °C) at 66 psi</td>
<td>120 / 48</td>
<td>170 / 76</td>
<td>203 / 95</td>
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<tr>
<td></td>
<td>at 264 psi</td>
<td>116 / 46</td>
<td>176 / 80</td>
<td>180 / 82</td>
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<td>D3418</td>
<td>Approx. Melting Temperature (°F / °C)</td>
<td>244 / 118</td>
<td>260 / 125</td>
<td>275 / 136</td>
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<td>Max Operating Temp (°F / °C)</td>
<td>160 / 71</td>
<td>180 / 82</td>
<td>180 / 82</td>
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<td>C177</td>
<td>Thermal Conductivity (BTU-in/ft²-hr-°F) (x 10⁴ cal/cm-sec-°C)</td>
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<td>2.84</td>
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<td>UL94</td>
<td>Flammability Rating</td>
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<td>Electrical</td>
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<tr>
<td>D149</td>
<td>Dielectric Strength (V/mil) short time, 1/8&quot; thick</td>
<td>460-700</td>
<td>450-500</td>
<td>2300</td>
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<td>D150</td>
<td>Dielectric Constant at 1 MHz</td>
<td>2.25-2.30</td>
<td>2.30-2.35</td>
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<tr>
<td>D150</td>
<td>Dissipation Factor at 1 kHz</td>
<td>0.0002</td>
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<td>0.0005</td>
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<td>D257</td>
<td>Surface Resistivity (ohm/square) at 50% RH</td>
<td>&gt; 10¹⁵</td>
<td>&gt; 10¹⁵</td>
<td>&gt; 10¹⁵</td>
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<tr>
<td>D495</td>
<td>Arc Resistance (sec)</td>
<td>135-160</td>
<td>200-250</td>
<td>250-350</td>
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</table>

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