

# 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.

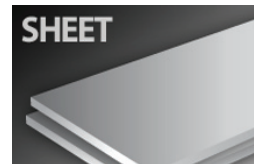
### Benefits

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

### Applications

Packaging  
 Skid  
 Plates  
 Conveyer  
 Systems  
 Tanks  
 Containers  
 Truck liners

### SHAPES AVAILABLE



### 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

### SEE NEXT PAGE FOR ADDITIONAL INFORMATION

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.

### 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.

<b>TYPICAL PROPERTIES of POLYETHYLENE</b>				
ASTM or UL test	Property	LDPE	HDPE	UHMW
<b>PHYSICAL</b>				
D792	Density (lb/in <sup>3</sup> ) (g/cm <sup>3</sup> )	0.033 0.92	0.035 0.96	0.034 0.93
D570	Water Absorption, 24 hrs (%)	<0.01	<0.01	<0.01
<b>MECHANICAL</b>				
D638	Tensile Strength (psi) at 72°F	1,400	4,600	5,800
D638	Tensile Strength (psi) at 150°F	400	400	400
D638	Tensile Modulus (psi)	57,000	200,000	80,000
D638	Tensile Elongation at Break (%)	100	400	300
D790	Flexural Strength at Yield (psi)	1,500	4,600	3,500
D790	Flexural Modulus (psi)	29,000	174,000	88,000
D695	Compressive Strength (psi)	1,400	4,600	3,000
D695	Compressive Modulus (psi)	54,000	100,000	80,000
D732	Shear Strength (psi)	-	-	3,000
D785	Hardness, Shore D	D45	D69	D62-D66
D256	IZOD Notched Impact (ft-lb/in)	No Break	1.3	No Break
<b>THERMAL</b>				
D696	Coefficient of Linear Thermal Expansion (x 10 <sup>-5</sup> in./in./°F)	-	6	11
D648	Heat Deflection Temp (°F / °C) at 66 psi at 264 psi	120 / 48 116 / 46	170 / 76 176 / 80	203 / 95 180 / 82
D3418	Approx. Melting Temperature (°F / °C)	244 / 118	260 / 125	275 / 136
-	Max Operating Temp (°F / °C)	160 / 71	180 / 82	180 / 82
C177	Thermal Conductivity (BTU-in/ft <sup>2</sup> -hr-°F) (x 10 <sup>-4</sup> cal/cm-sec-°C)	- -	- -	2.84 10.0
UL94	Flammability Rating	HB	HB<	HB
<b>ELECTRICAL</b>				
D149	Dielectric Strength (V/mil) short time, 1/8" thick	460-700	450-500	2300
D150	Dielectric Constant at 1 MHz	2.25- 2.30	2.30- 2.35	2.30- 2.35
D150	Dissipation Factor at 1 kHz	0.0002	0.0002	0.0005
D257	Surface Resistivity (ohm/square) at 50% RH	> 10 <sup>15</sup>	> 10 <sup>15</sup>	> 10 <sup>15</sup>
D495	Arc Resistance (sec)	135-160	200-250	250-350

#### 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

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