

Material Data Sheet

Item: Polyolefins

Description: A class of plastics produced as Low and high Density Polyethylenes, Polypropylene, and Ultra High Molecular Weight Polyethylene (UHMW). Low Density Polyethylene (LDPE) is an excellent material for chemical uses in low heat applications providing good toughness, resistance to chemicals, and flexibility. High Density Polyethylene (HDPE) is more rigid than LDPE, approximately 4 times more tensile strength and 3 times more compressive strength. HDPE satisfies FDA requirements for direct contact with food. HDPE is accepted for USDA and NSF applications, including use for meat cutting boards.

Polypropylene (PP) is lightweight, has high tensile strength, impact resistance, and resistance to most alkalies and acids. It is non-toxic with low moisture absorption. Applications include die cutting surfaces, tank linings, cutting boards, gasketing and Prosthetic devices. LDPE, HDPE, and PP are thermoformable and require welding vs. glueing when fabricating.

Ultra High Molecular Weight Polyethylene (UHMW) has the highest impact strength of the Olefins, providing a very low coefficient of friction requiring no lubrication. It also has extremely low moisture absorption. It is an extraordinary material for industrial uses in wear and sliding applications. UHMW is also used in mining, paper and pulp processing, and in the food and beverage industries.

Overall applications for Olefins also include bearings, conveyor parts, wear surfaces, gears, sprockets, feed screws, cams, liners, guide rails, feed chutes, star wheels, drag chain wear strips, and mixing paddles and scrapers.

Availability: Many thermoplastics are available in a multitude of forms such as sheets, rods, and tubes.

Fabrication: The Gund Company can fabricate a wide range of thermoplastic components per the specifications of our customers. Please do not hesitate to call or fax us your requirements.

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Typical Properties:

Polypropylene: (Average Value)

Physical Properties

Specific Gravity	.900 - .915
Specific Volume (cu. in. per lb.)	29 - 31
Refractive Index	1.49
Tensile Strength (PSI)	3,200 - 5,300
Elongation (%)	200 - 700
Modulus of Elasticity in Tension (10^3 , PSI)	1.3 - 2.0
Compressive Strength (PSI)	8,500 - 10,000
Flexural Strength (PSI)	----
Impact Strength (ft.-lb. per in. of notch)	0.6 - 0.6
Rockwell Hardness	R85 - 110
Thermal Conductivity	2.8
Specific Heat (cal per C° per gm)	0.46
Thermal Expansion (.001 per C°)	6 - 8.5
Resistance to Heat (F°, continuous)	230 - 320
Heat Distortion Temperature (F°)	210 - 220
Volume Resistivity	6.5×10^{16}

Electrical Properties

Dielectric Strength (short time 1/8 thick)	500 - 660
Dielectric Strength (step-by-step 1/8 thick)	650
Dielectric Constant (60 cycles)	2.25
Dielectric Constant (10^3 cycles)	2.25
Dielectric Constant (10^6 cycles)	2.0 - 2.25
Dissipation (Power) Factor (60 cycles)	0.0005
Dissipation (Power) Factor (10^3 cycles)	0.0002 - 0.0008
Dissipation (Power) Factor (10^6 cycles)	0.0001 - 0.0005
Arc Resistance (Seconds)	185

Chemical Properties

Water Absorption (24 hr., 1/8 in thick, %)	<0.01
Burning Rate	Slow
Effect of Sunlight	Requires block
Effect of Weak Acids	Very Resistant
Effect of Strong Acids	Attacked slowly by acids
oxidizing	
Effect of Weak Alkalies	None
Effect of Strong Alkalies	Very Resistant
Effect of Organic Solvents	Resistant below 80 C°
Clarity	Transparent, Translucent, Opaque

All of the information, suggestions, and recommendations pertaining to the properties and uses of the products herein are based upon tests and data believed to be accurate; however, the final determination regarding the suitability of any material described herein for the use contemplated, the manner of such use, and whether the use infringes any patents is the sole responsibility of the user. There is no warranty, expressed or implied, including, without limitation warranty of merchantability or fitness for a particular purpose. Under no circumstances shall we be liable for incidental or consequential loss or damage.

Material Data Sheet

Item: Polyolefins

Typical Properties:

Polyethylene, Hi Molecular Weight:
(Average Value)

Physical Properties

Specific Gravity	0.940 - 0.942
Specific Volume (cu. in. per lb.)	29.8
Refractive Index	----
Tensile Strength (PSI)	2,500
Elongation (%)	5.25
Modulus of Elasticity in Tension (10^3 , PSI)	1.02
Compressive Strength (PSI)	----
Flexural Strength (PSI)	----
Impact Strength (ft.-lb. per in. of notch)	No Break
Rockwell Hardness	R38
Thermal Conductivity	----
Specific Heat (cal per C° per gm)	----
Thermal Expansion (.001 per C°)	7.2
Resistance to Heat (F°, continuous)	----
Heat Distortion Temperature (F°)	163
Volume Resistivity	10

Electrical Properties

Dielectric Strength (short time 1/8 thick)	710
Dielectric Strength (step-by-step 1/8 thick)	680
Dielectric Constant (60 cycles)	----
Dielectric Constant (10^3 cycles)	----
Dielectric Constant (10^6 cycles)	230
Dissipation (Power) Factor (60 cycles)	----
Dissipation (Power) Factor (10^3 cycles)	----
Dissipation (Power) Factor (10^6 cycles)	0.0002
Arc Resistance (Seconds)	----

Chemical Properties

Water Absorption (24 hr., 1/8 in thick, %)	0.01
Burning Rate	Very Slow
Effect of Sunlight	----
Effect of Weak Acids	Very Resistant
Effect of Strong Acids	----
Effect of Weak Alkalies	----
Effect of Strong Alkalies	----
Effect of Organic Solvents	----
Clarity	Translucent to Opaque

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Typical Properties:

Polyethylene, Low Density: (Average Value)

Physical Properties

Specific Gravity	0.910 - 0.925
Specific Volume (cu. in. per lb.)	----
Refractive Index	1.51
Tensile Strength (PSI)	1,000 - 2,300
Elongation (%)	90 - 650
Modulus of Elasticity in Tension (10^3 , PSI)	0.17 - 0.35
Compressive Strength (PSI)	----
Flexural Strength (PSI)	----
Impact Strength (ft.-lb. per in. of notch)	>16
Rockwell Hardness	D41 - D46 (Shore)
Thermal Conductivity	8.0
Specific Heat (cal per C° per gm)	0.55
Thermal Expansion (.001 per C°)	16 - 18
Resistance to Heat (F°, continuous)	212
Heat Distortion Temperature (F°)	105 - 121 (66 psi)
Volume Resistivity	> 10^{16}

Electrical Properties

Dielectric Strength (short time 1/8 thick)	460 - 700
Dielectric Strength (step-by-step 1/8 thick)	420 - 700
Dielectric Constant (60 cycles)	2.25 - 2.35
Dielectric Constant (10^3 cycles)	2.25 - 2.35
Dielectric Constant (10^6 cycles)	2.25 - 2.35
Dissipation (Power) Factor (60 cycles)	<0.0005
Dissipation (Power) Factor (10^3 cycles)	<0.0005
Dissipation (Power) Factor (10^6 cycles)	<0.0005
Arc Resistance (Seconds)	135 - 160

Chemical Properties

Water Absorption (24 hr., 1/8 in thick, %)	<0.015
Burning Rate	Very Slow
Effect of Sunlight	Surface Crazing
Effect of Weak Acids	Resistant
Effect of Strong Acids	Attacked by oxidizing acids
Effect of Weak Alkalies	Resistant
Effect of Strong Alkalies	Resistant
Effect of Organic Solvents	Soluble in aromatic solvents >60 C°
Clarity	Translucent to Opaque

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Typical Properties:

Polyethylene, High Density: (Average Value)

Physical Properties

Specific Gravity	0.941 - 0.965
Specific Volume (cu. in. per lb.)	29.4 - 28.7
Refractive Index	1.54
Tensile Strength (PSI)	3,100 - 5,500
Elongation (%)	15 - 1,000
Modulus of Elasticity in Tension (10^3 , PSI)	0.8 - 1.5
Compressive Strength (PSI)	2,400
Flexural Strength (PSI)	1,000
Impact Strength (ft.-lb. per in. of notch)	1.5 - 12
Rockwell Hardness	D60 - D7C (Shore)
Thermal Conductivity	11 - 12.4
Specific Heat (cal per C° per gm)	0.55
Thermal Expansion (.001 per C°)	11 - 13
Resistance to Heat (F°, continuous)	250
Heat Distortion Temperature (F°)	140 - 180 (66 psi)
Volume Resistivity	10^{15} - 10^{16}

Electrical Properties

Dielectric Strength (short time 1/8 thick)	450 - 500
Dielectric Strength (step-by-step 1/8 thick)	440 - 600
Dielectric Constant (60 cycles)	2.25 - 2.35
Dielectric Constant (10^3 cycles)	2.25 - 2.35
Dielectric Constant (10^6 cycles)	2.25 - 2.35
Dissipation (Power) Factor (60 cycles)	<0.0005
Dissipation (Power) Factor (10^3 cycles)	<0.00021
Dissipation (Power) Factor (10^6 cycles)	<0.0003
Arc Resistance (Seconds)	----

Chemical Properties

Water Absorption (24 hr., 1/8 in thick, %)	<0.01
Burning Rate	Very Slow
Effect of Sunlight	Requires Block
Effect of Weak Acids	Very Resistant
Effect of Strong Acids	Attacked slowly by oxidizing acids
Effect of Weak Alkalies	Very Resistant
Effect of Strong Alkalies	Very Resistant
Effect of Organic Solvents	Resistant Below 80 C°
Clarity	Translucent to Opaque

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