

Products for Engineering Applications

**WESTLAKE
PLASTICS COMPANY**

Material Descriptions

ABSYLUX®



ABS (Acrylonitrile-Butadiene-Styrene)

Absylux ABS is a low cost engineering plastic that is easy to machine and fabricate. It is an ideal material for structural applications when impact resistance, strength, and stiffness are required. Absylux is widely used for machining preproduction prototypes since it has excellent dimensional stability and is easy to paint and glue. This is also available in flame retardant grade.

HIPS



(High Impact Polystyrene)

HIPS is a low cost plastic material that is easy to machine and fabricate. It is often specified for low strength structural applications when impact resistance, machinability, and low cost are required. It is frequently used machining preproduction prototypes since it has excellent dimensional stability and is easy to fabricate. HIPS is FDA compliant for use in food processing applications.

LENNITE®



UHMW-PE (Ultra High Molecular Weight Polyethylene)

Lennite UHMW-PE is a low friction engineering plastic with excellent chemical resistant and abrasive wear resistance. It is widely used in conveyors, packaging machinery, and food processing machinery since it is inherently low friction, wears well, and is not abrasive to mating parts. Westlake manufactures Lennite with extremely low levels of residual stress so it can be machined into complex parts with minimal deformation.

NORYLUX™



(Modified Polyphenylene Oxide)

Norylux modified PPO is a strong, engineering plastic with outstanding mechanical, thermal, and electrical properties. Low moisture absorption and low thermal expansion make Norylux one of the most dimensionally stable thermoplastics available. It is used for a variety of structural applications including electrical housings, scientific instrumentation parts, and fluid handling components.

POMALUX®



(Acetal Copolymer)

Pomalux is a high performance acetal copolymer that has excellent mechanical, electrical, and wear properties. It is engineered to provide outstanding dimensional stability, even when machining parts with complex geometries. It is a good choice for many bearing and wear applications since it has a low coefficient of friction and wears well in both wet and dry environments.

DIELUX®



(PTFE filled Acetal Copolymer)

Dielux PTFE filled acetal copolymer is an outstanding bearing and wear material for use in both wet and dry environments. It is frequently used in place of traditional metal and plastic bearing materials when low friction, excellent wear properties, and good dimensional stability are required. The PTFE filler allows Dielux to be used without additional lubricants in applications where grease and oil are undesirable.

TPX®



(Polymethylpentene)

TPX is a lightweight, high temperature polyolefin with exceptional acoustical and electrical properties. TPX has low moisture absorption and excellent chemical resistance. It is often used for applications requiring low distortion of sound waves including sonar covers, speaker cones, and ultrasonic transducer heads. TPX is also used for electrical insulating applications requiring high dielectric strength and a low dielectric constant.

ZELUX®



(Polycarbonate)

Zelux polycarbonate is a transparent engineering plastic with excellent dimensional stability and good mechanical and electrical properties. It is used for structural applications when clarity and impact strength are essential including lenses, manifolds, site glasses and machine guards. Zelux is used for a wide range of electrical applications since it has low moisture absorption and good insulating properties.

Westlake Products for Engineering Applications—Properties

	Units	ASTM Test	Absylux	Absylux FR	HIPS	Lennite	Norylux	Norylux 30% GF	Pomalux	Pomalux 25% GF	Dielux	TPX	Zelux M	Zelux W	Zelux 10% GF	Zelux 20% GF	Zelux 30% GF	Zelux 40% GF	
			Acrylonitrile-Butadiene-Styrene	Acrylonitrile-Butadiene-Styrene Flame Retardant	High Impact Polystyrene	Ultra High Molecular Weight Polyethylene	Modified Polyphenylene Oxide	Modified Polyphenylene Oxide 30% Glass Filled	Acetal Copolymer	Acetal Copolymer 25% Glass Filled	PTFE Filled Acetal Copolymer	Polymethyl-pentene	Polycarbonate Machine Grade	Polycarbonate Window Grade	Polycarbonate 10% Glass Filled	Polycarbonate 20% Glass Filled	Polycarbonate 30% Glass Filled	Polycarbonate 40% Glass Filled	
MECHANICAL																			
Tensile Strength @yield	psi	D638	6,100	5,500	2,800	2,800	9,200	17,500	8,800	16,000	6,500	—	9,000	9,000	9,600	16,000	19,000	23,000	
Tensile Strength @break	psi	D638	—	—	3,500	6,000	—	—	—	—	2,300	10,000	10,000	8,000	—	—	—	—	
Tensile Modulus	psi	D638	310,000	320,000	239,000	—	—	—	410,000	1,200,000	—	—	—	—	450,000	860,000	1,250,000	1,680,000	
Tensile Elongation @yield	%	D638	—	—	—	—	—	—	—	—	—	—	7.0	7.0	8.0	5.0	3.0	3.0	
Tensile Elongation @break	%	D638	—	—	52.0	>350.0	25.0	5.0	75.0	—	10.0-14.0	120.0	135.0	135.0	15.0	—	—	—	
Flexural Strength @yield	psi	D790	10,500	9,500	6,200	—	14,400	25,000	—	—	10,000	—	14,200	14,200	15,000	19,000	23,000	27,000	
Flexural Modulus	psi	D790	340,000	330,000	277,000	—	370,000	1,130,000	375,000	1,050,000	300,000	—	340,000	340,000	500,000	800,000	1,100,000	1,400,000	
Compressive Strength	psi	D695	—	7,650	—	—	—	—	16,000 ⁽¹⁾	—	—	—	12,500	12,500	14,000	16,000	18,000	21,000	
Compressive Modulus	psi	D695	—	200,000	—	—	—	—	—	—	—	—	345,000	345,000	520,000	760,000	1,130,000	1,500,000	
Izod Impact Strength																			
Un-Notched	ft•lbs/in	D256	—	—	—	—	—	—	—	—	—	—	No break	No break	40.0	19.0	21.0	24.0	
Notched @73°F	ft•lbs/in	D256	7.7	4.0	2.1	18.0 ⁽²⁾	3.5	2.2	1.5	1.1	0.8	—	17.0	17.0	2.0	2.0	2.0	2.5	
Hardness (R, M, L or D)	—	D7852 D2240	R105	R97	R95	D61	R119	L108	M80	M80	—	R85	M70 R118	M70 R118	M85 R124	M91 R122	M92 R121	M93 R121	
THERMAL																			
Heat Deflection Temperature																			
@66 psi	°F	D648	203	195	189	203	—	285	315	—	—	180	280	280	295	300	305	310	
@264 psi	°F	D648	214	173	165	—	254	275	219	322	210	—	270	270	288	295	295	295	
Coefficient of Thermal Expansion	in/in/°F	D696	4.1x10 ⁻⁵⁽³⁾	4.1x10 ⁻⁵⁽³⁾	5.0x10 ⁻⁵	11.0x10 ⁻⁵	3.3x10 ⁻⁵	1.4x10 ⁻⁵	4.7x10 ⁻⁵	2.2x10 ⁻⁵	5.4x10 ⁻⁵	—	3.8x10 ⁻⁵	3.8x10 ⁻⁵	1.8x10 ⁻⁵	1.5x10 ⁻⁵	1.21x10 ⁻⁵	0.90x10 ⁻⁵	
Flammability Rating-UL94	—	—	@.125" HB	@.058" V-0	@.058" HB	—	@.058" V-1	@.058" V-1	@.060" HB	@.060" —	—	—	@.375" V-0	@.375" V-0	@.058" V-0	@.058" V-1	@.058" V-1	@.044" V-1	
Thermal Conductivity	(BTU•in)/(hr•ft ² •°F)	C177	—	—	—	—	—	—	1.60	—	—	—	1.32	1.32	1.39	1.46	1.53	1.53	
ELECTRICAL																			
Dielectric Strength	Kv/cm	D149	—	400	—	900	500	530	—	—	—	—	380	380	450	490	475	450	
Dielectric Constant	—	D150	—	—	—	@60Hz 2.30	@60Hz 2.69	@60Hz 3.15	@1MHz 3.80	—	—	@1kHz 2.12	@60Hz 3.17	@60Hz 3.17	@60Hz 3.10	@60Hz 3.17	@60Hz 3.35	@60Hz 3.53	
Dissipation Factor	—	D150	—	—	—	@50Hz 0.00019	@60Hz 0.0007	@60Hz 0.0020	—	—	—	—	@60Hz 0.0009	@60Hz 0.0009	@60Hz 0.0008	@60Hz 0.0009	@60Hz 0.0011	@60Hz 0.0013	
Volume Resistivity	ohm•cm	D257	—	—	—	>10 ¹⁶	—	—	—	—	—	—	1.0x10 ¹⁷	1.0x10 ¹⁷	1.0x10 ¹⁷	1.0x10 ¹⁷	1.0x10 ¹⁷	1.0x10 ¹⁷	
TRIBOLOGICAL																			
Coefficient of Friction (Dry vs. Steel)																			
Static	—	—	—	—	—	—	—	—	—	—	0.15	—	—	—	—	—	—	—	
Dynamic	—	—	—	—	—	—	—	—	—	—	0.07	—	—	—	—	—	—	—	
Limiting PV Against Steel @100fpm	—	—	—	—	—	—	—	—	—	—	12,500	—	—	—	—	—	—	—	
OPTICAL																			
Haze	%	D1746	—	—	—	—	—	—	—	—	—	2.0	1.0	3.2	—	—	—	—	
Transparency	%	D1746	—	—	—	—	—	—	—	—	—	91	—	—	—	—	—	—	
OTHER																			
Specific Gravity	—	D792	1.04	1.22	1.04	0.93	1.08	1.31	1.41	1.58	1.51	0.84	1.20	1.20	1.25	1.35	1.43	1.52	
Water Absorption																			
@24 hours	%	D570	—	—	—	Nil	0.07	0.06	0.22	0.29	0.20	0.01	0.15	0.15	0.12	0.16	0.14	0.12	
@Equilibrium	%	D570	—	—	—	—	—	—	—	—	—	—	0.35	0.35	0.31	0.29	0.26	0.23	

⁽¹⁾ @10% deflection
⁽²⁾ Double 15° Notch @73°F
⁽³⁾ ASTM E831

The Company

Westlake Plastics Company is the world leader in extrusion and compression molding technologies of high performance thermoplastics. Our advanced technologies allow us to convert the full range of thermoplastic resins into stock shapes and film.

New product development is the hallmark of Westlake Plastics. Our six business groups (Chemical Resistance, Engineering, Film, High Performance, Medical and Static Control) work in close conjunction with resin suppliers and end users to develop new products that meet the critical needs of customer applications as well as industry specific standards.

Our field and in-house technical experts provide you with excellent resources for product application and recommendations. Our industry focused expertise includes:

- **Analytical Instrumentation**
- **Automotive**
- **Aviation and Aerospace**
- **Chemical Processing**
- **Computer**
- **Electrical/Electronics**
- **Food Handling**
- **Medical**
- **Nuclear Energy**
- **Pharmaceutical**
- **Semiconductor**
- **Telecommunications**

In addition to our knowledge on specific industries, Westlake also offers over 40 years of manufacturing experience. With both compression molding and extrusion technologies, we are able to offer small runs of customized products with short turn around times as well as generous samples.

If it's product or application knowledge you seek, Westlake is ready to respond to your challenges.

Other Westlake Products

Many of our standard products are also available in different grades including: FDA compliant, fire retardant and glass fiber reinforced.

Made from:

- **Engineering and Mechanical Resins**
 - Acetal Copolymer (ULTRAFORM[®], CELCON[®])
 - Acrylonitrile-Butadiene-Styrene (CYCOLAC[®])
 - Modified Polyphenylene Oxide (NORYL[®])
 - Polycarbonate (LEXAN[®], MAKROLON[®])
 - Low-Density Polyethylene
 - High-Density Polyethylene
 - Ultra-High Molecular Weight Polyethylene
 - Polymethylpentene
 - Polypropylene
 - Crystal Polystyrene (STYRON[®])
 - High Impact Polystyrene (STYRON[®])
- **Fluoropolymer Resins**
 - Ethylene-Chlorotrifluoroethylene (HALAR[®])
 - Ethylene-Tetrafluoroethylene (TEFZEL[®])
 - Polyvinylidene Fluoride (KYNAR[®])
 - TFE/PVDF/HFP Terpolymer
- **High Performance Resins**
 - Polyetheretherketone (VICTREX[®])
 - Polyethersulfone (RADEL[®]A, ULTRASON[®] E)
 - Polyetherimide (Utem[®])
 - Polysulfone (UDEL[®])
 - Polyphenylsulfone (RADEL[®] R)

Westlake Product

Pomalux[®]
Absylux[®]
Norylux[™]
Zelux[®]
Ethylux[®]
Ultra Ethylux[®]
Lennite[®]
TPX[®]
Propylux[®]
Styraclear[®]
HIPS

ECTFE
ETFE
PVDF
Clariflex[™]

PEEK
PES
Tempalux[®]
Thermalux[®]
PPSU

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Trade Names:

ABSYLUX[®] – Westlake Plastics Co.
CELCON[®] – Ticona
CYCOLAC[®] – GE Plastics
CLARIFLEX[™] – Westlake Plastics Co.
ETHYLUX[®] – Westlake Plastics Co.
HALAR[®] – Ausimont USA, Inc.
KYNAR[®] – Elf Atochem North America, Inc.
LENNITE[®] – Westlake Plastics Co.
LEXAN[®] – GE Plastics
MAKROLON[®] – Mobay

NORYL[®] – GE Plastics
NORYLUX[™] – Westlake Plastics Co.
POMALUX[®] – Westlake Plastics Co.
PROPYLUX[®] – Westlake Plastics Co.
RADEL[®] – Amoco Performance Products, Inc.
STANYL[®] – DSM Engineering Plastics
STYRACLEAR[®] – Westlake Plastics Co.
STYRON[®] – Dow U.S.A.
TEFZEL[®] – Du Pont Co.
TEMPALUX[®] – Westlake Plastics Co.

THERMALUX[®] – Westlake Plastics Co.
TPX[®] – Mitsui Plastics, Inc.
UDEL[®] – Amoco Performance Products, Inc.
ULTRAFORM[®] – BASF Corp.
ULTRA ETHYLUX[®] – Westlake Plastics Co.
ULTRASON[®] – BASF Corp.
VICTREX[®] – Victrex, Inc.
WESTLAKE[®] – Westlake Plastics Co.
ZELUX[®] – Westlake Plastics Co.

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