

Thermalux® Film

(polysulfone)

Thermalux is a tough, rigid, high-strength, amorphous thermoplastic that maintains its properties over a wide temperature range. It has good electrical properties, clarity and toughness, plus exceptional steam resistance and thermoformability. It is used widely in food service, electronics, medical devices, chemical process equipment and automotive industries.

The following physical property information is based on typical values of the base UDEL® P-1700 resin as well as test results obtained from actual film testing.



	Units	ASTM Test	Result
Mechanical			
Tensile Strength @yield	psi	D882	10,600
Elongation @break	%	D882	110
Tensile Modulus	psi	D882	360,000
Flexural Modulus	psi	D790	390,000
Tear Strength - prop.	g/mil	D1004	16
Thermal			
Continuous Use Temp.-UL	°F	—	302
Heat Deflection Temperature @264 psi	°F	D648	345
Melt Temp.-DSC	°F	—	—
Glass Transition Temp.	°F	D3418	374
Flammability			
UL Rating-UL94	—	—	HB
L.O.I.	%	D2863	30
NBS Smoke	Dmax	E662	—
Electrical			
Surface Resistivity	Ohms	D257	3.0 x 10 ¹⁶
Dielectric Strength @.004"	V/mil	D149	2,400
Dielectric Constant	1 KHz	D150	3.14
Dissipation Factor	1 KHz	D150	0.0013
Other			
Specific Gravity	—	D792	1.24
Water Absorption	%/24 hr.	D570	0.3
Refractive Index	—	—	1.633
Haze	%	D1003	0.6
Area Factor	in ² /lb/mil	—	22,360

Applications Include:

- Flex circuits
- Hot melt adhesives
- Thermoformed food trays
- High temperature labels
- Medical device windows
- Hydraulic piston components

Advantages of Thermalux Film:

- Exceptional electrical properties over varying conditions
- Excellent mechanical properties
- Good chemical resistance
- Hydrolytically stable
- Transparency
- Resin FDA compliant

Manufacturing Capabilities:

- Thicknesses and Widths:**
 .001" to .010" up to 27" wide
 .011" to .029" up to 26" wide

Finishes:

all thicknesses available polished one side, matte the other (P/M)

*In addition to our standard capabilities, Westlake also has the ability to process custom resins in various sizes and colors with some exceptions.



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 BONDIT® is a Registered Trademark of RELTEK LLC.

Adhesive Bonding:

A number of adhesives are suitable for joining Thermalux to itself or other materials. Some are recommended only for relatively low temperature applications. Others give bonds that retain their integrity at temperatures approaching the continuous

service temperature of Thermalux film itself. Three adhesives are recommended for applications:

1. 3M EC-880 up to 180°F
2. 3M EC-2216 up to 180°F
3. RELTEK BONDIT® B45 TH up to 280°F

Thermoforming:

Thermalux film must be dry before it can be thermoformed. If not dry, it will foam when subjected to thermoforming heat. Film direct from the extrusion line is dry and therefore satisfactory for forming. A tightly wound roll of film remains suitable for thermoforming for 8 to 16 hours, depending on humidity conditions and how hot the film remained at the wind-up station. Film 9 mil or less will not bubble, and does not require drying prior to thermoforming.

Rolls of 20 mil Thermalux film can be dried in roll form. For example, this requires about 20 hours at 275°F to dry with about a 6" thickness over a core. The time required for drying any roll depends on the actual thickness of the winding, as the film throughout must reach at least 250°F.

Outgassing:

Thermalux meets stringent outgassing requirements and is clean room compatible.

Sample	TML	CVCM
Thermalux	0.06%	0.00%

Note: Three hundred mg portions of the sample were cut into 16-18 pieces, dried in a desiccator at 25°C for 15 hours and reweighed before outgassing at <0.04 torr vacuum. Approximately 0.25% moisture weight loss occurred during desiccation. Test conducted in accordance with ASTM method F1227 – analysis of Total Mass Loss (TML) and Collected Volatile Condensable Materials (CVCM).

Light Transmittance:

Where opacity and transparency of films are important, light transmission can be a determining factor for the proper film choice.

	% Light Transmittance
Thermalux	70-85

Heat Sealing:

This method requires a hot plate or other suitable heat source that is covered with a thin film of "Teflon" and is capable of attaining 700°F. The surfaces to be bonded are pressed against the 700°F hot plate for approximately ten seconds and joined immediately. Because Thermalux film contains a small amount of moisture, it is desirable to dry it for 2 – 3 hours at 250°F.

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