PVDF Film

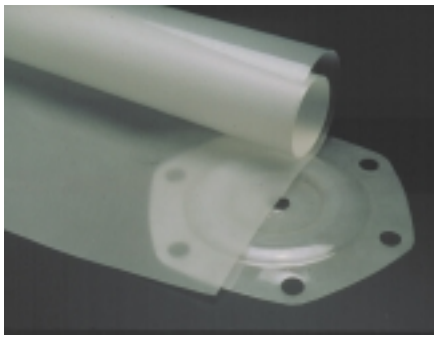
(polyvinylidene fluoride)

Westlake Product Bulletin

PVDF is strong and tough as reflected by its tensile properties and impact strength. Compared to many thermoplastics, PVDF has excellent resistance to creep and fatigue, yet in thin sections such as films, PVDF components are flexible and transparent.

The following physical property information is based on typical values of the base Kynar® 740 resin as well as test results obtained from actual film testing.

	Units	ASTM Test	Result
Mechanical			
Tensile Strength @yield	psi	D882	7,550
Elongation @break	%	D882	160
Tensile Modulus	psi	D882	250,000
Flexural Modulus	psi	D790	260,000
Tear Strength - prop.	g/mil	D1004	735
Thermal			
Continuous Use Temp.–UL	°F	—	265
Heat Deflection Temperature @264 psi	°F	D648	244
Melt Temp.–DSC	°F	—	329-338
Glass Transition Temp.	°F	D3418	—
Flammability			
UL Rating–UL94	—	—	VTM-0
L.O.I.	%	D2863	43
NBS Smoke	Dmax	E662	—
Electrical			
Surface Resistivity	Ohms	D257	$>10^{16}$
Dielectric Strength @.003"	V/mil	D149	1,930
Dielectric Constant	1 KHz	D150	8.15-10.46
Dissipation Factor	1 KHz	D150	0.005-0.019
Other			
Specific Gravity	—	D792	1.78
Water Absorption	%/24 hr.	D570	0.01
Refractive Index	—	—	1.42
Haze	%	D1003	—
Area Factor	$in^2/lb/mil$	—	15,480



Applications Include:

- Filters
- Diaphragms
- Release films
- Piezoelectric films
- Chemical resistant tank linings
- Fuel cell seals
- Medical bags

Advantages of PVDF Film:

- Excellent chemical resistance
- Stable to UV and the effects of weather
- Low NBS smoke generation and superior LOI
- Excellent transmittance of solar energy
- Excellent dielectric strength
- High heat resistance
- Excellent physical and mechanical properties for a fluoropolymer
- Resin FDA compliant
- FM 4910 approved

Manufacturing Capabilities:

Thicknesses and Widths:

.002" 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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F-006 8/01

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Adhesive Bonding:

PVDF film can be bonded to a variety of substrates including itself and metals with bond strengths ranging from 50-800 psi. These systems are designed to perform under harsh chemical environments. There are three recommended two-part epoxy based adhesive systems for use with WESTLAKE PVDF film.

1. **ARALDITE®**
2. **HYSOL®**
3. **BONDiT® B45TH**

Note: The adhesive improves if the surface of PVDF film is corona treated or modified with a treatment of primary amine or fuming sulfuric acid.

Welding:

PVDF can be fusion welded by several methods. Ultrasonic, hot lamination, resistance heating, spin welding, and radio frequency are all methods usable to bond PVDF to itself with limited success. The most common and successful approaches to welding PVDF film are heat contact welding and hot gas or air using welding rod.

Outgassing:

PVDF film exhibits extremely low weight loss when exposed to high vacuum.

Sample	TML	CVCM	WVR
PVDF	0.39%	0.07%	0.00%

Light Transmittance:

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

	% Light Transmittance
PVDF	93

Permeability To Gases:

PVDF has low permeability to water vapor and various other gases.

Gases	cc-mils/100 in²/24 hrs-atm
CO_2 Nitrogen Oxygen	5.5 9.0 14.0
Water Vapor	2.6 (g-mil)

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