



ETFE Fluoropolymer Extruded Films

ETHYLENE TETRAFLUOROETHYLENE FILM FOR USE IN PHARMACEUTICAL APPLICATIONS

ETFE films are the material of choice for use in pharmaceutical containers such as cap liners, stoppers, and plunger laminates. Like all TCI's fluoropolymer films, they are inherently inert and will not contaminate the contents of the pharmaceutical container. These films are free of plasticizers, processing aids, or additives that may cause contamination.

ETFE films possess excellent thermal stability, flexibility, and release over a broad continuous-use temperature range of -200°C to 165°C (-328°F to 330°F).

TCI's proprietary Plasma Surface Treatment creates ETFE films that are bondable to various elastomers, including silicone and butyl rubbers.

TCI offers several ETFE film options to match diverse processing techniques and applications.



ETFE PG (Premium Grade)

- General purpose grade for use in most flat cap liner and plunger applications.
- Offers superior anti-stick and low friction properties, combined with high elongation and tear resistance.
- Continuous use temperature range from -200°C to 165 °C (328°F to 330°F)

TCI's ETFE Films - General Availability

- Thickness range from 0.0005" to 0.005" (12.5 to 125 µm).
- Plasma treated surfaces available – 1 side or both sides.
- Standard width: 60" (1,524 mm).
- Width up to 62" (1,575 mm) available.
- Any slit widths available upon request.

ETFE LM

- Specialty grade of ETFE that possess highest elongation and formability characteristics at molding temperatures amongst all ETFE films, due to its lower melt point (225°C versus 260°C) for other grades.
- Engineered for extreme draw depths and intricate molding profiles, such as those found in CapMat applications.
- Provides wrinkle and tear-free surface after molding.
- ETFE LM grade service temperature is from -200°C to 125°C (-328°F to 257°F).



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			ETFE PG	ETFE LM
General Properties	Units	Test Method		
Specific Gravity		ASTM D792	1.74	1.78
Area Yield	ft ² /lb/mil		110	108
Area Yield	m ² /kg/25μm		22.6	22.2
Flammability		UL-94	V-0	V-0
Water Absorption	%		<0.03	n/a
Mechanical Properties				
Tensile Strength	psi (MPa)	ASTM D882	7,000 (48)	6,000 (42)
Elongation at Break, min.	%	ASTM D882	300	400
Tensile Modulus	psi (MPa)	ASTM D882	140,000 (965)	n/a
Folding Endurance (MIT)	cycles	ASTM D2176	50,000	200,000
Thermal Properties				
Continuous Use Temp	°F (°C)	UL-746 B	330 (165)	257 (125)
Melt Point	°F (°C)	ASTM D3418	500 (260)	437 (225)
Coeff. of Lin. Thermal Expansion	in/(in °F)	ASTM D696	7x10 ⁻⁵	7x10 ⁻⁵
Product Offering				
Width	inches (mm)		Up to 62" (1,575)	
Thickness	mils (μm)		0.5 - 5 (12.5 - 125)	
Standard Colors			Clear	
Surface Treatments Available				
Chemical Etching			•	
Plasma Treatment			•	

The above table contains typical representative values and is not to be used for product specification. Contact TCI for a formal specification.

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