



# FEP Fluoropolymer Extruded Films

## FLUORINATED ETHYLENE PROPYLENE FILM FOR USE IN HIGH PERFORMANCE APPLICATIONS

TCI FEP films are produced from Fluorinated Ethylene Propylene (FEP) resin by a melt extrusion casting process. TCI FEP films offer all the benefits of fluorinated films, such as high temperature and chemical resistance, non-stick properties, and superior dielectric performance. FEP films can be heat-sealed, thermoformed, laminated to various substrates, and serve as a melt adhesive.

### TCI FEP Films Are Available In Four Grades

#### FEP PG (Premium Grade)

- Manufactured out of 100% virgin premium grade FEP resin with MFI range of 5-10
- Best suited for applications where high dielectric performance is required, such as PCB laminates and wire & cable applications
- Grade of choice for protective, decorative, see-through and other applications where visual appearance and clarity are important
- Meets ASTM D3368 specification for Type I FEP film

#### FEP WG (Welding Grade)

- Offers 15-20% cost savings vs. PG grade
- Perfect economical solution for heat sealing, welding, and other melt adhesive applications that don't have high aesthetics requirements
- Meets ASTM D3368 standards for Type I - general purpose FEP film

#### FEP MR (Mold Release Grade)

- Due to its superior non-stick performance and up to 400°F (205°C) service temperature, FEP is the material of choice in high temperature composite molding
- Features high elongation and excellent conformability to complex contoured molds
- Standard colors include red, violet and white. Custom colors available upon request
- Available in a variety of perforated patterns
- Meets ASTM D3368 standards for Type IV – mold release FEP film

#### FEP HG (High Molecular Weight Grade)

- Offers superior stress-crack resistance and flex endurance performance (250,000 cycles MIT test)
- Material of choice for chemical tank linings, pump diaphragms and rupture discs
- Meets ASTM D3368 standards for Type III FEP film



### TCI FEP Films Characteristics

- Outstanding high and low temperature resistance:
  - ◇ Continuous service temperature range from -400° to 400°F (-240 to 205°C )
  - ◇ Intermittent service temperature up to 500°F (260°C )
- Superior anti-stick and low friction properties
- Chemically inert and solvent resistant to most chemicals
- Outstanding dielectric properties over a wide range of frequencies and temperatures.
- Excellent light transmission and clarity
- Free of plasticizers, processing aids, or additives
- Acceptable for food contact
- Meets the requirements of US Pharmacopeia protocol for USP class VI plastic

### TCI FEP Films-General Availability

- Thickness range from 0.0005" to 0.010" (12 to 250 μm)
- Standard width: up to 60" (1,524 mm)
  - ◇ Thicknesses >0.002": up to 62" (1,575 mm)
- Any slit widths available upon request
- Bondable (plasma treated or chemically etched) surfaces available

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TEXTILES COATED INTERNATIONAL | Manufacturer of High Performance Fluoropolymer Films, Composites, and Laminates

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## FLUORINATED ETHYLENE PROPYLENE FILM FOR USE IN HIGH PERFORMANCE APPLICATIONS

			FEP PG	FEP WG	FEP MR	FEP HG
<b>General Properties</b>	<b>Units</b>	<b>Test Method</b>				
Specific Gravity		ASTM D792	2.15			
Area Yield	ft <sup>2</sup> /lb/mil		90			
Flammability		UL-94	V-0			
Water Absorption	%		<0.01			
<b>Mechanical Properties</b>						
Tensile Strength	psi	ASTM D882	3,500		5,000	
Elongation at Break	%	ASTM D882	300		350	
Tensile Modulus	psi	ASTM D882	70,000		70,000	
Initial Tear Strength (2 mil film)	g	ASTM D1004	550		550	
Propagation Tear Strength (2 mil film)	g	ASTM D1922	250		250	
Folding Endurance (MIT)	cycles, ave.	ASTM D2176	10,000		250,000	
<b>Thermal Properties</b>						
Continuous Use Temp	°F (°C)	UL-746 B	400 (205)		400 (205)	
Melt Point	°F (°C)	ASTM D3418	500 (260)		520 (270)	
Coeff. of Lin. Thermal Expansion	in/(in °F)	ASTM D696	5.5x10 <sup>-5</sup>		5.5x10 <sup>-5</sup>	
<b>Electrical Properties</b>						
Dielectric Strength (1mil film)	volts / mil	ASTM D149	6,500	n/a		6,500
Dielectric Contant 1kHz		ASTM D150	2.0	n/a		2.0
Dissipation Factor, 1kHz		ASTM D150	0.0003	n/a		0.0003
Surface Resistivity	ohm/sq	ASTM D257	1x10 <sup>15</sup>	n/a		1x10 <sup>15</sup>
<b>Optical Properties</b>						
Refractive Index		ASTM D542	1.34	n/a		1.34
Solar Transmission	%	ASTM E424	96	n/a		96
<b>Product Offering</b>						
Width	inches (mm)		0.5-2 mil: up to 60" (1,524); 3-10 mil: up to 62" (1,575)			up to 62" (1,575)
Thickness	mils (µm)		0.5 - 10 (12.5 - 250)			2 -10 mil
Standard Colors			Clear	Clear Tinted	White, Red, Violet	Clear
<b>Surface Treatments Available</b>						
Chemical Etching			•	•		•
Plasma Treatment			•	•		•
<b>Applications, Markets</b>						
Composite Molding Process: Release Films					•	
Chemical Process / Equipment			•	•		•
Heat Sealing / Welding / Melt Adhesive			•	•		
Electrical / Electronics			•			
Medical			•			•
Optical /Photovoltaics			•			
Protective/Decorative			•			

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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