



FEP Fluoropolymer Extruded Films

FLUORINATED ETHYLENE PROPYLENE FILM FOR USE IN HIGH-PERFORMANCE APPLICATIONS

TCI's FEP films are produced from Fluorinated Ethylene Propylene (FEP) resin by a melt extrusion casting process. TCI's 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's 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's FEP Films Characteristics

- 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) wide
- FEP HG is available in thicknesses 0.005", 0.010", 0.020" and 0.030"
- 0.020" and 0.030" are available up to 49" (1250 mm) wide
- Any slit widths available upon request
- 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
- Bondable (plasma treated or chemically etched) surfaces available

This information is supplied in good faith and is based on information currently available. TCI makes NO WARRANTIES, EITHER EXPRESSED OR IMPLIED, INCLUDING ANY WARRANTIES FOR FITNESS, OR USE FOR A PARTICULAR PURPOSE, OR OF ANY MERCHANTABILITY OR AGAINST INFRINGEMENT OR THE LIKE, unless expressly set forth herein.

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

200 Bouchard Street, Manchester, NH 03103 USA PHONE: (603) 296-2221 FAX: (603) 296-2248 www.textilecoated.com



FEP Fluoropolymer Extruded Films

FLUORINATED ETHYLENE PROPYLENE FILM FOR USE IN HIGH-PERFORMANCE APPLICATIONS

| | | | FEP PG | FEP WG | FEP MR | FEP HG |
|--|-------------------------|-------------|---|--------------|----------------------|--------------------|
| General Properties | Units | Test Method | | | | |
| Specific Gravity | | ASTM D792 | 2.15 | | | |
| Area Yield | ft ² /lb/mil | | 90 | | | |
| Flammability | | UL-94 | V-0 | | | |
| Water Absorption | % | | <0.01 | | | |
| Mechanical Properties | | | | | | |
| 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 | |
| Thermal Properties | | | | | | |
| 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 ⁻⁵ | | 5.5x10 ⁻⁵ | |
| Electrical Properties | | | | | | |
| 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 ¹⁵ | n/a | | 1x10 ¹⁵ |
| Optical Properties | | | | | | |
| Refractive Index | | ASTM D542 | 1.34 | n/a | | 1.34 |
| Solar Transmission | % | ASTM E424 | 96 | n/a | | 96 |
| Product Offering | | | | | | |
| 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 |
| Surface Treatments Available | | | | | | |
| Chemical Etching | | | • | • | | • |
| Plasma Treatment | | | • | • | | • |
| Applications, Markets | | | | | | |
| 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.

This information is supplied in good faith and is based on information currently available. TCI makes NO WARRANTIES, EITHER EXPRESSED OR IMPLIED, INCLUDING ANY WARRANTIES FOR FITNESS, OR USE FOR A PARTICULAR PURPOSE, OR OF ANY MERCHANTABILITY OR AGAINST INFRINGEMENT OR THE LIKE, unless expressly set forth herein.