ECTFE Fluoropolymer Extruded Films

Ethylene-ChloroTrifluoroEthylene Film for use in High-Performance Applications

TCI's ECTFE films are produced from HALAR® Ethylene-ChloroTrifluoroEthylene resins by a melt extrusion casting process. These films have the typical fluoropolymer traits of being resistant to harsh thermal, chemical, and ultraviolet environments.

TCI's ECTFE films offer excellent weatherability, chemical abrasion resistance, tear resistance, non-stick properties, and resistance to high-energy radiation. ECTFE films can be heat-sealed, thermoformed, and laminated to various substrates.

TCI's ECTFE films are utilized in a variety of industries:

Chemical Processing
Due to its superior chemical resistance to most acids and solvents over a broad temperature range and low permeability to solvents and gases, ECTFE films applications include: chemical tank linings, pump diaphragms, chlorine cells, water treatment, spray shielding applications for pipe joints, and semi-conductor processing environments.

Outdoor Protection
Excellent weatherability, non-stick properties, U-V stability, abrasion resistance, tear resistance, and high light transmission make ECTFE film very effective for outdoor protective applications.

Photovoltaic Panels
TCI's ECTFE films offer excellent dielectric performance, superior water vapor barrier properties, fire resistance, and high solar transmittance. These films are ideally suited for use in the back sheet and front sheet glazing of PV panels. They are used extensively as an external material for the back sheet for protecting the PV Module from the external environment for an extended period of time.

TCI's ECTFE Films Characteristics:

- Highest abrasion and tear resistance among all fluoropolymer films
- Outstanding weatherability and resistance to UV radiation
- Chemically inert
- Excellent fire resistance, UL V-0 rating
- Superior anti-stick and low friction properties
- Highest dielectric strength of all fluoropolymer films
- Thermoformable and heat-sealable
- Continuous service temperature from -200°C (-328°F) up to 165°C (330°F)

TCI's ECTFE Films General Availability:

- Thickness range from 0.0005" to 0.010" (12 to 250 mμ)
- Standard width: up to 60" (1,524 mm)
- Slit widths available upon request
- Bondable (chemically etched) surfaces available

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ETHYLENE-CHLOROTRIFLUOROETHYLENE FILM FOR USE IN HIGH-PERFORMANCE APPLICATIONS

			ECTFE
General Properties	**Units**	**Test Method**	
Specific Gravity		ASTM D792	1.68
Area Yield	ft^2/lb/mil (m^2/kg/25mμ)		114 (23.4)
Flammability		UL-94	V-0
Water Absoption	%		<0.01
Mechanical Properties			
Tensile Strength (5 mil film)	psi (MPa)	ASTM D882	6,500 (45)
Elongation at Break, min. (5 mil film)	%	ASTM D882	300
Tensile Modulus	psi	ASTM D882	200,000 (1,380)
Initial Tear Strength	g/mil (N/mm)	ASTM D1004	500 (200)
Propagation Tear Strength	g/mil (N/mm)	ASTM D1922	1,200 (480)
Folding Endurance (MIT)	cycles, ave.	ASTM D2176	>250,000
Thermal Properties			
Continuous Use Temp	°F (°C)	UL-746 B	330 (165)
Melt Point	°F (°C)	ASTM D3418	465 (240)
Coeff. of Lin. Thermal Expansion	in/(in °F)	ASTM D696	$9x10^{-5}$
Electrical Properties			
Dielectric Strength (1mil film)	v/mil (kv/mm)	ASTM D149	5,500 (220)
Dielectric Contant 1kHz		ASTM D150	2.6
Optical Properties			
Refractive Index		ASTM D542	1.44
Solar Transmission (2 mil (50 μm) film)	%	ASTM E424	95
Haze (2 mil (50 μm) film)	%		4
Product Offering			
Width	inches (mm)		Up to 60" (1,524)
Thickness	mils (μm)		0.5 - 10 (12.5 - 250)
Standard Colors			Clear
Surface Treatments Available			
Chemical Etching			•
Plasma Treatment			
Applications, Markets			
Composite Molding Process / Release Films			•
Chemical Process			•
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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