



SOLVAY
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Halar® 500LC ECTFE

for Thermal Insulation Covering Film

Film made from Halar® 500LC ECTFE has a unique combination of properties that make it particularly well-suited for use in aerospace as a thermal insulation covering film. It is lightweight, durable and meets stringent industry requirements regarding fire and burn-through resistance at a cost that is very competitive with other covering films.

Halar® ECTFE film simplifies manufacturing by using fewer processing steps. Insulation blankets with Halar® 500LC ECTFE covering film are easier to install due to the material's excellent tear resistance. Solvay's Ajedium™ Films is a leading manufacturer of Halar® ECTFE film.

Key Features

- Outstanding tear resistance
- Low moisture permeability
- Improved heat sealability
- Inherently flame retardant

Tear Resistance

Halar® 500LC ECTFE film has exceptional tear resistance at thicknesses as low as 7–8 microns (Table 1), enabling it to withstand secondary fabrication techniques, such as scrim and adhesive application, and prevents damage to the substrate during installation.

Table 1: Properties of Halar® 500LC ECTFE film, 8-micron thickness

Property	Unit	Flow Direction	Transverse Direction	ASTM Test Method
Tensile stress at yield	Mpa (psi)	63 (9,140)	53 (7,690)	D 638
Tensile strain at yield	%	33.8	4.2	D 638
Tensile stress at break	MPa	75 (10,880)	61 (8,850)	D 638
Tensile strain at break	%	57	128	D 638
Tear initiation resistance	N/mm (lb/in)	190 (1,085)	199 (1,140)	D 638
Tear-propagation resistance (Trouser)				D 1938-14
Min. strength/thickness	N/mm (lb/in)	n/a	6.1 (35)	
Max. strength/thickness	N/mm (lb/in)	33.8 (193)	8.1 (46)	
Average tear resistance	N/mm (lb/in)	33.8 (193)	5.2 (30)	

Low Moisture Permeability

The moisture permeability of non-metallized Halar® 500LC ECTFE film is equivalent to that of metallized film substrates and up to four times lower than other non-metallized film substrates. Halar® ECTFE film's low Moisture Vapor Transmission Rate (MVTR) limits the ingress of moisture and accumulation of water in the insulation material, which leads to increased weight.

The excellent moisture barrier properties of Halar® ECTFE film eliminate the additional fabrication process of metal deposition used to retard moisture transmission of aromatic polyketone-based films. The moisture content of Halar® 500LC ECTFE film is <0.1 % by weight, which is less than aromatic polyketone films (tested at 50 °C per ASTM D-57).

Thin-Film Processing

Areal densities of Halar® 500LC ECTFE films at thicknesses as low as 7 microns are among the lowest of all covering films used in manufacturing aerospace thermal insulation blankets, thus meeting the industry's latest standards for low-weight covering films.

Heat Sealing

Halar® ECTFE polymer melts at around 240 °C (464 °F) and has a low viscosity, which allows ECTFE films to be heat sealed at lower temperatures and pressures than competitive films. This feature makes it a good fit for blankets requiring a Nomex®-based, burn-through fabric in the construction.

Flammability

Halar® 500LC ECTFE film has a limiting oxygen index of 52 and it meets fire, smoke, and toxicity requirements for thermal insulation covering films. Results from smoke density and toxic gas emission testing are presented shown in Table 2.

Table 2: Flammability of Halar® 500LC ECTFE film, 8-micron thickness

Test	Results	Unit	Test Method
NBS smoke density			ASTM E-662
D max	1.0	ppm	
Toxic gas emission			BSS 7239 Rev A
CO ₂	2.0	ppm	
HCl	2.0	ppm	
NO _x	0.5	ppm	
HCN	NI*	ppm	
SO ₂	NI*	ppm	
HF	10	ppm	

*No Indication

Contact Solvay

For additional information or assistance with Halar® ECTFE for thermal insulation covering film, please contact your Solvay representative.

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