

Halar[®]



SOLVAY

asking more from chemistry[®]

Halar[®] High Clarity ECTFE

Transparent Films for
Architectural Applications

**SPECIALTY
POLYMERS**

Halar® High Clarity ECTFE Films. Superior Transparency for Innovative Architectural Designs

Heavy, breakable and quite conventional, glass is gradually being replaced by specialty films that are able to combine UV resistance, weatherability and light transmission with distinctive properties such as flexibility, weight reduction, chemical resistance and self-cleanability.

Halar® High Clarity ECTFE films from Solvay are the ideal substitute for glass and outperform ETFE, currently considered the best polymeric alternative and the industry standard.

Halar® High Clarity ECTFE Main Features

- Film thickness up to 300µ
- Highly transparent
- Excellent outdoor stability, hydrolysis and UV aging
- Fire resistance approval
- NFPA 701, UNI EN13501 certified
- Chemical resistance
- Very high water vapor barrier properties
- Excellent printability
- Abrasion resistance
- Self-cleanability

As architects and engineers continue to seek higher quality lightweight materials for multilayer (cushions) or reinforced single-layer constructions, Halar® High Clarity ECTFE films are being introduced to meet those needs.

Targeted applications include canopies, facades, domes, and umbrellas for residential and public facilities such as stadiums, airports, train stations, commercial centers, and swimming pools.



*ETFE (left) and Halar® High Clarity ECTFE (right) films,
250 microns (10 mils)*

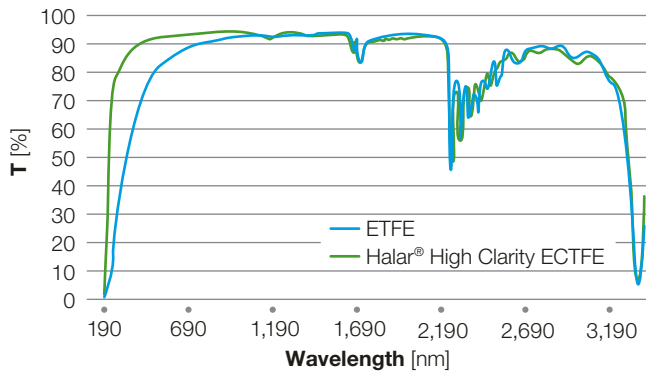


Going beyond ETFE by Offering a More Transparent Film

Compared to the more commonly used ETFE, Halar® High Clarity ECTFE films offer similar mechanical, chemical and fire resistance properties.

However, Halar® High Clarity ECTFE films outperform ETFE with improved light transmission (95% – EN 313), decreased haze (diffusing light 0,9% – EN 313), and better printability, due to their higher receptivity to corona treatment.

Optical Properties

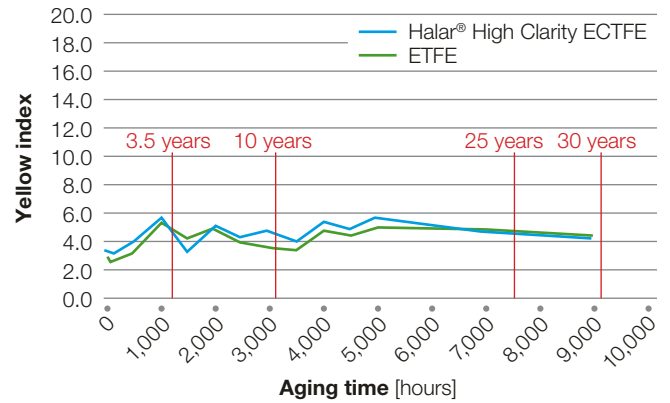


		ECTFE	ETFE
Measured in air			
Total Transmittance	Mean	95.0	93.8
	Dev. std	0.1	0.1
Haze	Mean	0.9	9.2
	Dev. std	0.2	0.8
Measured in water			
Total Transmittance	Mean	99.2	94.0
	Dev. std	0.0	0.1
Haze	Mean	0.4	4.7
	Dev. std	0.0	0.3

Weatherability

At regular intervals, optical properties (such as total light transmission) were tested. Results confirm that Halar® High Clarity ECTFE films undergo very limited changes in properties, with variations well in line with other partially fluorinated polymers used in outdoor applications.

Total transmittance, measured in Q-UVb¹, showed very limited changes after 9,000 hours, which is the equivalent to 30 years outdoor exposure.



The limited variation in optical properties measured after exposure of the film to UVb are of particular interest, since the samples were submitted to very high doses of this high energy radiation².

Furthermore, after 9 years of Florida outdoor weathering, real exposure testing confirms results of accelerated aging, with very limited changes in properties recorded.

Aging method

Methods used for accelerated aging are Q-UVb. Given the irradiance of the Q-UVb instrumentation used, a rough correlation between accelerated and natural aging has been calculated: 100 hrs in Q-UVb are estimated to correspond to 120 days of outdoor exposure in Florida (valid as indicative estimation only).

Mechanical Properties

Sample	Direction	Average Tear Strength [N/mm]
Halar® High Clarity ECTFE	1	384.6 (16.4)
	2	456.6 (10.5)
ETFE	1	424.8 (0.3)
	2	432.7 (17.4)

Fire Resistance Properties

Halar® High Clarity ECTFE meets the requirements for UNI EN 13501 B-s1, d0 classification and is rated Class A per ASTM E84. It is important to note that the LOI (Limited Oxygen Index – ASTM D2863) of Halar® High Clarity ECTFE is > than 55% (ETFE is around 32%).

¹ Halar® ECTFE films are listed on UL QIHE2 (generic RTI, VTM-0, UL746C outdoor use and ASTM E162 radiant panel)

² Q-UV Panel UVb 313nm lamps; 8h light at 70 °C; 4h condensation 50 °C; irradiance 18.3W/m² between 270 and 320nm



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