

Halar[®]



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Halar[®] ECTFE

Powder Coatings for Corrosion Protection

**SPECIALTY
POLYMERS**

Halar® ECTFE

Powder Coatings for Corrosion Protection

The Best Choice for Over 35 Years

Halar® ECTFE powder coatings have been used since 1975 as the ideal corrosion protection material in a wide variety of industries. Halar® ECTFE has a unique combination of properties that delivers long-lasting performance and includes excellent chemical resistance, outstanding permeation resistance, exceptional surface properties, good adhesion and high purity.

Properties	Value
Melting point	220–245 °C
Maximum continuous service temperature (according to UL)	150 °C
Density	1.68 g/L
Broad chemical resistance	pH 1–14

Halar® ECTFE is well-suited for the following:

- When the part will be used for handling strong acids and strong bases at elevated temperatures
- Where other plastics (Epoxy, Polyamide, PP, PVC, etc.) cannot resist
- Where corrosion-resistant metals would be attacked or be too expensive
- Where a glass lining cannot be used due to chemical resistance failure or poor reliability (unexpected cracks)

Serving the Most Demanding Industries

Industries such as chemical processing, pulp and paper, pharmaceutical, food processing and semiconductor, get the best corrosion protection when coating fundamental parts such as:

- Reactors and vessels
- Pumps and valves
- Agitators and impellers
- Centrifuges and filters



Photo courtesy of Fisher Company

Coating Systems

Halar® ECTFE offers two types of powder coating systems: primer and topcoat or primeless. A Halar® ECTFE grade with potable water and food contact compliance is also available. All grades are applied by electrostatic powder coating technique.

Halar® ECTFE electrostatic powder coating offers:

- Easy and fast application
- A seamless coating reducing risk of failures due to permeation or delamination
- Excellent wrap-around and edge coverage
- Uniform coating thickness
- Flexibility of the final thickness depending on service conditions
- High build coatings
- Possibility of coating for both interior and exterior surfaces
- Absence of solvents

Chemical Resistance

Halar® ECTFE demonstrates excellent overall chemical resistance because:

- It is virtually unaffected by most harsh chemicals commonly encountered in the industry
- It is a hydrophobic material with exceptional resistance to strong acids and bases (pH 1–14)
- It is not dissolved by any known solvent up to 150 °C
- It shows outstanding resistance to ozone and high energy radiation

Halar® ECTFE properties variation after 30 days continuous exposure

Chemical	Conc. [% by weight]	Test Temp. [°C]	Weight	Mechanical properties
H ₂ SO ₄	98	121	< 1 %	Insignificant
HCl	37	121	< 1 %	Insignificant
HF	50	121	< 1 %	Insignificant
HNO ₃	50	50	< 1 %	Insignificant
H ₂ O ₂	30	88	< 1 %	Insignificant
Chlorine water	Saturated solution	40	< 1 %	Insignificant
NaClO	15	100	< 1 %	Insignificant
NaOH	30	121	< 1 %	Insignificant
TMAH	25	100	< 1 %	Insignificant
Methanol	100	65	< 1 %	Insignificant

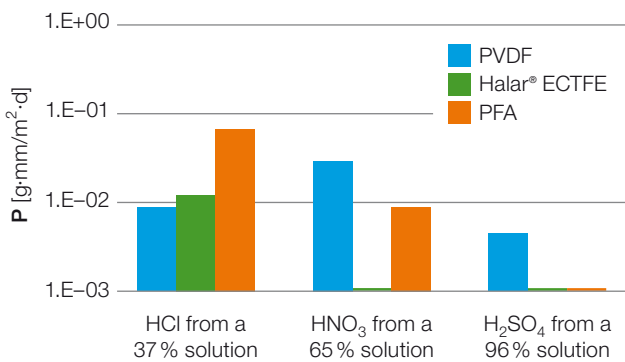
Data obtained at atmospheric pressure by immersion of compression molded specimens according to ASTM D543

Permeation Resistance

Permeation resistance is extremely important for the coating's long-term performance. Even if the coating material is not affected by direct contact with chemical substances, permeation through the coating can lead to metal substrate corrosion, with subsequent service failure.

Halar® ECTFE coatings show very low permeability to oxygen, water vapor, carbon dioxide, chlorine gas, hydrochloric acid and various other gases, which makes it a good choice for corrosion protection in the harshest environments.

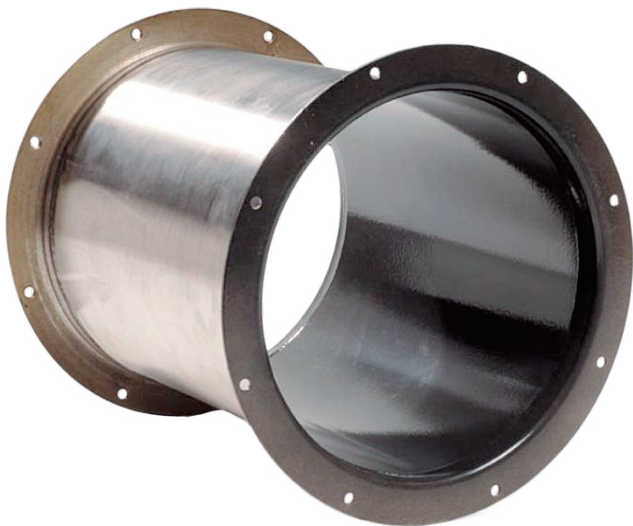
Halar® ECTFE permeation resistance



Adhesion to Substrate

Halar® ECTFE powder coatings are designed to consistently develop excellent adhesion to various types of substrates such as carbon steel, stainless steel, aluminum, copper, and titanium.

Years of experience show that Halar® ECTFE coated parts are successfully used under pressure/vacuum conditions.

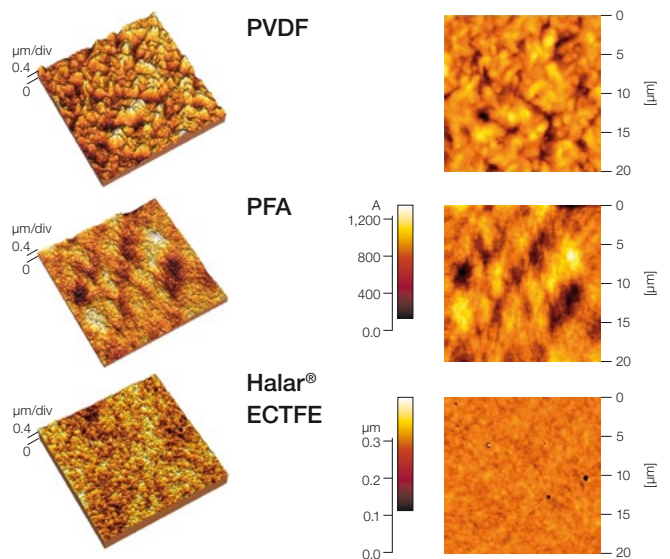


Surface Properties

Halar® ECTFE coatings demonstrate toughness, hardness, good flexibility, excellent impact properties and good scratch and abrasion resistance, thanks to a hardness of Shore D 75.

Halar® ECTFE coatings are distinguished from other fluoropolymer-based coatings by their exceptional surface smoothness, which inhibits buildup and accumulation of particles and metallic salts and reduces the formation of biorganic films and bacterial colonies.

Atomic force microscopy topographies of Halar® ECTFE coatings on internal pipe surface



Purity

Halar® ECTFE powder coatings offer high-purity coatings that are suitable for applications in the semiconductor, biotech, and pharmaceutical industries.

- Static soak tests in ultra-pure water and high-purity chemicals show extremely low levels of metallic and organic extractables
- Dynamic rinse data validates Halar® ECTFE as suitable for high purity systems
- Halar® ECTFE has very low fluoride ion leach-out





Specialty Polymers

Worldwide Headquarters

SpecialtyPolymers.EMEA@solvay.com

Viale Lombardia, 20
20021 Bollate (MI), Italy

Americas Headquarters

SpecialtyPolymers.Americas@solvay.com

4500 McGinnis Ferry Road
Alpharetta, GA 30005, USA

Asia Headquarters

SpecialtyPolymers.Asia@solvay.com

No.3966 Jindu Road
Shanghai, China 201108

www.solvay.com

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