DUPONT Tedlar®

Solutions for PEM Electrolyzer Gasket and Subgasket

Benefits of Tedlar®:

Adhesive Free Sealing

Tedlar® subgaskets have the right surface chemistry for adhesion to PFSA membrane without needing an adhesive to seal the system.

Compact Stack Design

Thin gasket and subgasket allows high packing density (reduced device pitch).

Sustainable

Non-PFAS: No regulatory restrictions or reporting requirements for a sustainable product and supply-chain.

Long Term Efficiency

Tedlar® subgaskets enable sustained cell efficiency over many operational hours due to excellent proton and oxidation resistance.

Enhanced Durability and Safety

Mechanical strength and stability ensure lasting seal integrity, extending service life and reducing operational costs.

Pressure Stability

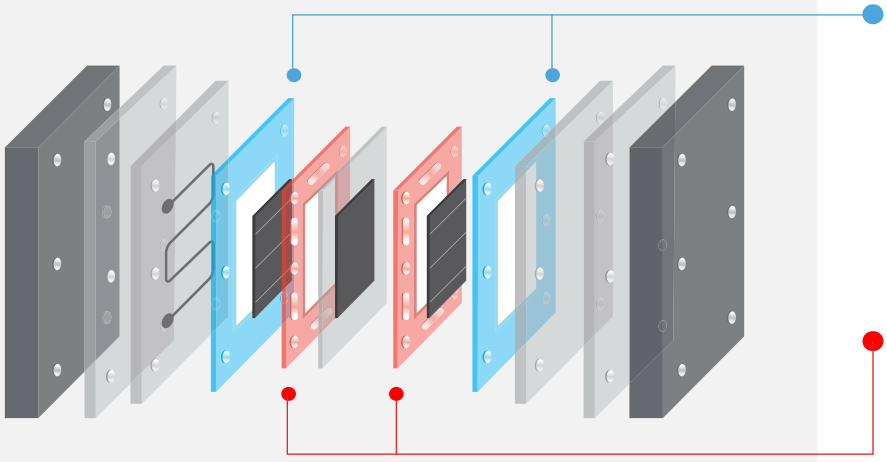
Low creep under compression enables stable system pressure and device efficiency by lowering the risk of gasket deformation and intrusion into flow channels.

Enabling the Green Future

As the world accelerates toward cleaner energy and mobility, hydrogen has emerged as a key enabler—especially green hydrogen. A well-established process to produce green hydrogen is through the splitting of water using Proton Exchange Membrane (PEM) electrolyzers. This method offers a path to decarbonization without generating greenhouse gases.

Material Innovation for PEM Electrolyzers: PEM electrolyzers play a growing role in green hydrogen production, but their performance and scalability depend on materials that can endure harsh conditions, maintain long-term efficiency, and meet sustainability goals. ***That's where Tedlar® comes in—offering the durability, chemical resistance, and environmental compliance needed to support safe, efficient, and scalable hydrogen systems***.

Role of Gaskets and Subgaskets



Typical PEM electrolyzer cross-section showing the gasket and the subgasket

Gaskets (edge-gaskets) positioned between cells in a PEM electrolyzer, prevent leaks, maintain system pressure, preserve the purity of the hydrogen produced, maintain electrical insulation, and ensure overall efficiency.

Subgaskets residing within a PEM cell, seal the system against leakage and provide mechanical support to the membrane electrode assembly (MEA).

Tedlar® Solution for Gaskets and Subgaskets

Proven Protection. Lasting Performance.

Engineered for durability and precision, Tedlar® gaskets and subgaskets deliver superior chemical resistance, thermal stability, and long-lasting performance—ideal for the demanding conditions of PEM electrolyzers.

Zero Adhesives to Avoid Membrane Contamination

Adhesives in PEM electrolyzers can leach chemicals that degrade membrane performance and shorten lifespan.

Tedlar® PVF subgaskets bond securely to PFSA membranes under compression and moderate heat—NO ADHESIVE needed.

Their unique surface chemistry ensures strong sealing and long-term stability without creep or leakage.

Tedlar® Enables Recyclability of Catalyst

Absence of adhesives in the Tedlar® subgasket-PFSA membrane bond allows the recovery of expensive metal catalysts from the membrane at the end of life, offsetting costs and enabling a more sustainable footprint.

Built for Harsh Chemistry

PEM electrolyzers operate in acidic, high-stress environments—demanding materials with exceptional chemical and proton resistance.

Tedlar® PVF films meet this challenge with unmatched stability: Tedlar® PVF films meet this challenge. They are hydrolytically stable and resist strong acids and alkalis without degrading.

In **5,000+ hours** of testing, Tedlar® subgaskets maintained integrity with:

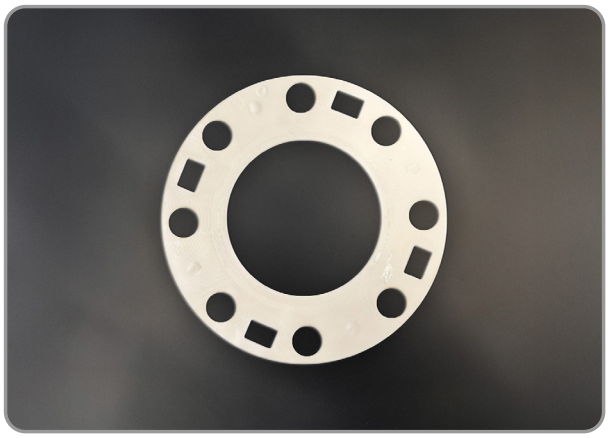
- ☑ **No material breakdown**
- ☑ **No ion leaching**
- ☑ **No total organic content under 100 ppb**

Tedlar® 's outstanding chemical resistance is due to it's highly inert chemistry and does not dissolve in any known solvent at room temperature.

Tedlar® has high chemical resistance and compatibility with acids, bases, oxidizers, a variety of solvents including polar, nonpolar, aromatic, aliphatic, hydrocarbon and chlorinated solvents.

Tedlar® subgaskets in 5000+ hrs of accelerated electrolyzer testing showed:

- **No changes to material composition**
- **No leaching of ions of concern (Al, B, Ca, Ce, Co, Cr, Cu, Fe, Ir, Mg, Mn, Mo, Na, Ni, P, Pt, Sn, Ti, or Zn)**
- **<100 parts per billion total organic content (TOC)**
- **No trace of organic acids**



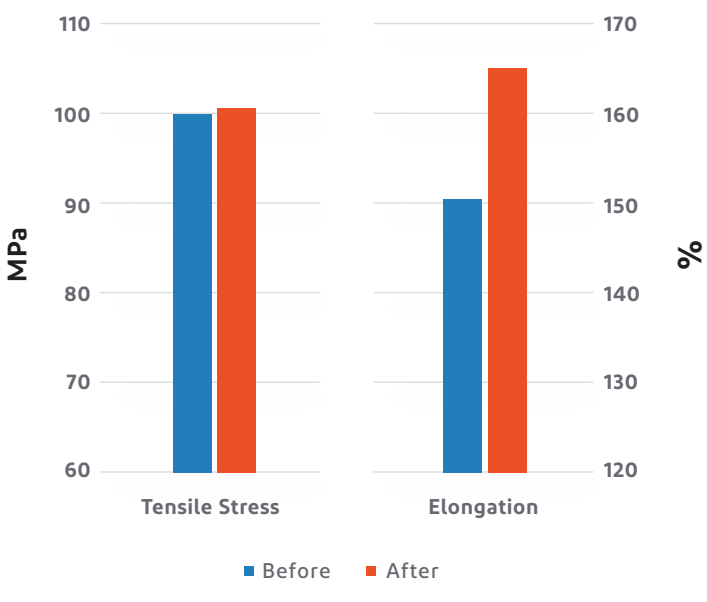
Tedlar® gasket extracted from electrolyzer after 5000+ hrs accelerated testing maintaining physical integrity and showing no deformation.

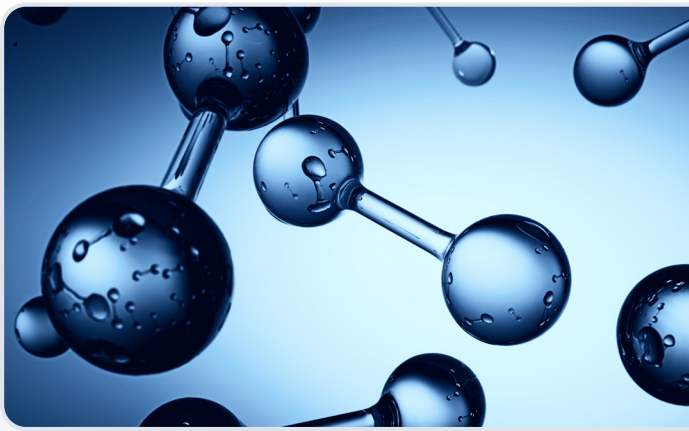
Stability that Lasts

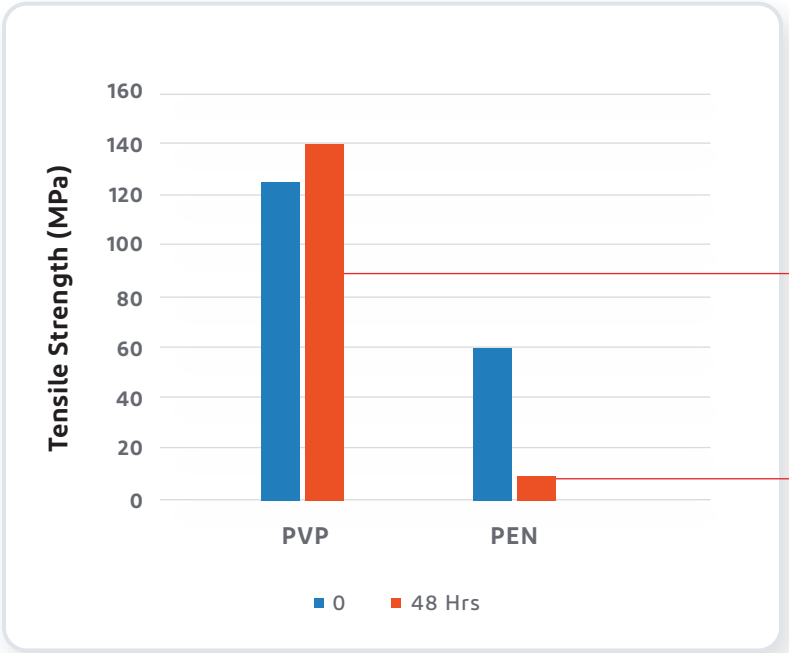
PEM electrolyzers run hot and humid—up to 90°C and 100% RH—for tens of thousands of hours. Tedlar® PVF gasket or subgasket can retain it's shape and strength under these conditions, with no delamination or thickness change.

Unlike other materials, Tedlar® films resist thermal and hydrolytic stress over time, helping prevent membrane failure and reduce total cost of ownership.

Mechanical properties of PVF unchanged after six months of damp heat testing at 85°C/ 85% RH





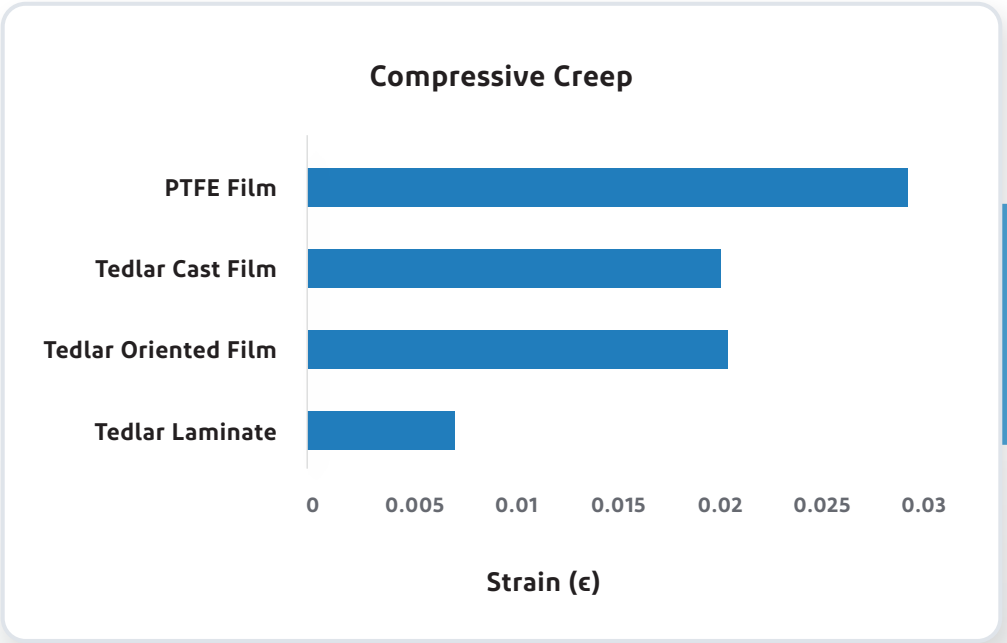


Consistent Tensile Strength
No change in tensile strength of PVF film after 48h HAST testing.

83% loss of tensile strength in PEN film after 48h HAST testing.

Excellent Creep Resistance

Gaskets in PEM electrolyzers must resist 15–30 MPa of compression without deforming into flow channels. Tedlar® films show significantly less deformation than PTFE and no channel obstruction— ensuring stable pressure and efficient operation.



Tedlar® PVF films have less deformation than PTFE under same compressive load.

Testing Parameters - Time: 24h. Pressure: 8MPa

Low Hydrogen Permeability

Hydrogen leaks largely originate from deformed seals or gaskets. Hydrogen permeability is a key material property of a gasket material to ensure electrolyzer operation over a long period of time. The lower the permeability, the better the material's ability to contain hydrogen. ***When compared to PTFE in similar conditions, Tedlar PVF® films show lower hydrogen permeability***.

	PVF	PTFE
hydrogen permeability ($cm^3 \cdot cm/m^2 \cdot day \cdot bar$) at 25 °C	0.17	6.4

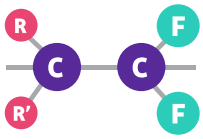
Permeability Data for Aerospace Applications, IIT Research Institute, NASA Contract NAS7-388, March 1968

Non-PFAS Product

PFAS, also known as "Forever Chemicals", are reviewed and regulated globally. Tedlar® films are non-PFAS and not made with any PFAS materials, thus exempt from regulatory reporting requirements—offering a sustainable, future-ready solution with a secure, compliant supply chain.

Per- and Polyfluoroalkyl Substances
PVDF, FEVE, ETFE, PTFE, ECTFE, and thousands more

PFAS Polymers



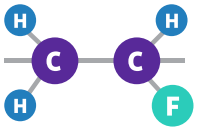
R, R' = H, F, or C

"Forever Chemicals"

OR

Polyvinyl Fluoride

PVF



"PFASs are defined as fluorinated substances that contain at least one fully fluorinated methyl or methylene carbon atom (without any H/Cl/Br/I atom attached to it), i.e. with a few noted exceptions, any chemical with at least a perfluorinated methyl group (–CF3) or a perfluorinated methylene group (–CF2–) is a PFAS."

Quote from OECD PFAS Review

OECD

"Polyvinyl fluoride (PVF) is a partial fluorinated fluoropolymer and not a PFAS... could be a viable alternative fluoropolymer to polymeric PFAS for certain applications..."

Quote from Published ECHA Restriction - Proposal, Annex C

ECHA EUROPEAN CHEMICALS AGENCY

"[options include] Tedlar, a weatherresistant polymer that is not a PFAS compound itself and makes no use of PFAS during its manufacturing process."

NREL.gov - Removing Barriers to 100% Renewables

NREL Transforming ENERGY

Based upon DuPont evaluation of published regulatory policies as of August 2025. Customers shall perform their own diligence of the suitability and regulatory classification of their products that utilize Tedlar® PVF materials.

DUPONT Tedlar®

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