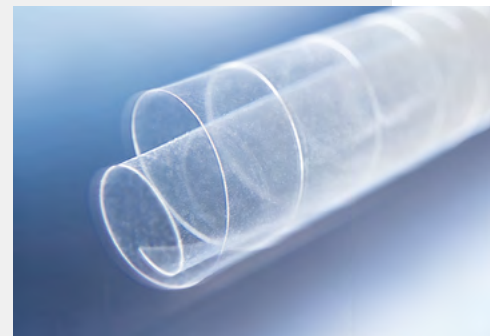


Membranes and ionomers for PEMFC applications

The fumapem® ion-exchange membranes for automotive and stationary PEMFC are reinforced separators made from PFSA in thickness 10–60 μm .

The non-reinforced separators for DMFC and related applications are based on PFSA and they produced in thickness 80–120 μm .

The polymer dispersions of PFSA of EW 700–1000 are available in concentration up to 25 %.



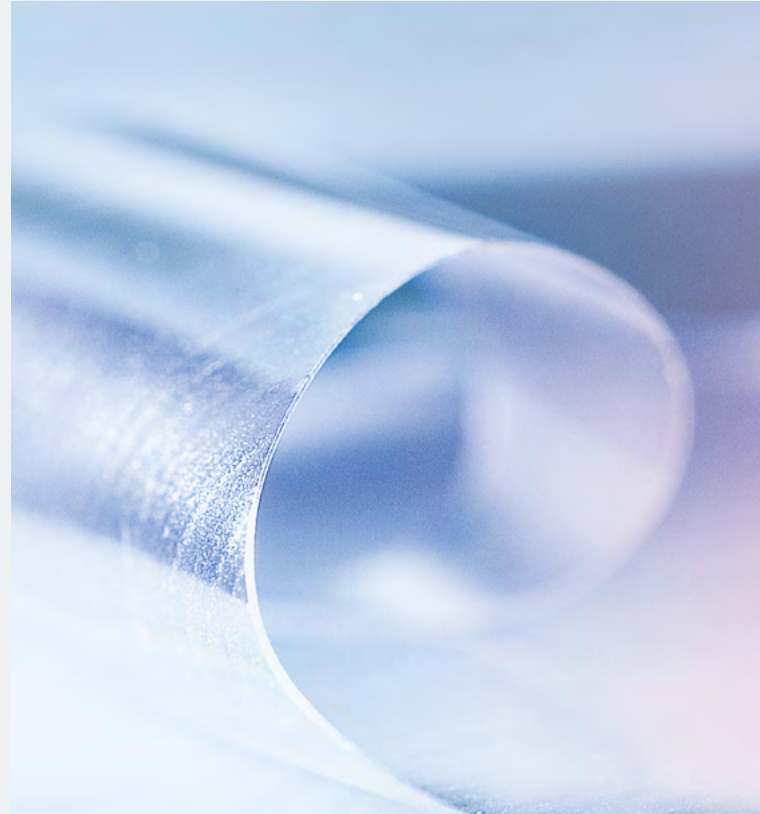
MEMBRANES AND IONOMERS FOR PEMFC APPLICATIONS

The membranes for PEMFC application are based on short-side-chain PFSA polymer. The membranes feature fast break-in time, high mechanical strength, and superior chemical durability. The membranes are available in customized width up to 100 cm and customized length up to 300 m.

The membranes for DMFC and related applications are based on long-side-chain PFSA polymer. The membranes feature ultra-high mechanical strength in order to eliminate the force caused by swelling. The membranes are available in customized width up to 150 cm and customized length up to 300 m.

The membrane's properties such as thickness and equivalent weight can be adjusted upon request.

The polymeric dispersions are water based, which facilitates the transport. The water dispersions have very narrow particle size distribution below 100 nm. The dispersions are transported in PE containers.



fumapem® membrane	Application	Thickness / μm	R / $\text{Ohm}\cdot\text{cm}^2$ at applications conditions	Hydrogen cross-over / $\text{mA}\cdot\text{cm}^{-2}$	E-Modulus // tensile strength / MPa	Reinforcement material
FS-715-RFS	automotive	15	0,02	< 1,5	> 400 // > 30	ePTFE
FS-930-RFS	Stationary / marine	30	0,035	< 1,0	> 400 // > 40	ePTFE
FS-960-RFS	Hydrogen-Oxygen	60	0,08	< 0,8	> 400 // > 40	ePTFE
F-1850	DMFC	50	0,18	n.a.	> 700 // > 30	none
F-14100	DMFC	100	0,14	n.a.	> 700 // > 40	none

fumion® dispersion	Polymer EW	Polymer particle size / nm	Solid concentration / %	Viscosity @ RT / $\text{mPa}\cdot\text{s}$
FSLA-710	710-740	< 100	10	10-30
FSLA-820	780-810	< 100	20	20-80
FSLA-920	850-880	< 100	20	20-80
FSLA-1020	960-1000	< 100	20	20-80