Aquivion® E87-12S

Perfluorosulfonic Acid

Solvay Specialty Polymers

Message:

Aquivion® E87-12S is a chemically-stabilized (denoted by the S-suffix) perfluorosulfonic acid (PFSA) ionomer membrane that exhibits an Equivalent Weight (EW) of 870 g/eq. Nominal thickness is 120 microns.
Aquivion® PFSA ionomer membranes are melt-extruded products based on the unique Short Side Chain copolymer of Tetrafluoroethylene (TFE) and Sulfonyl Fluoride Vinyl Ether (SFVE) F2C=CF-O-CF2CF2-SO2F produced by Solvay. They are available in the acid form and feature a lower Equivalent Weight (EW) than most commercial proton exchange membranes. The unique Short Side Chain copolymer allows higher crystallinity, improved mechanical properties and better proton conductivity.
Typical applications include PEM fuel cells, water electrolyzers, separators for hydrogen or redox flow batteries, and pervaporation or gas humidification systems.

General Information			
Physical	Nominal Value	Unit	Test Method
Equivalent (EW) [1]	870	g/eq	Internal method
Density-23°C, 50%R.H. [2]	1.930	g/cm³	Internal method
Membrane [3]			
Thickness	120.0	µm	
Weight	232	g/m²	
Total acid content	> 1.12	sec/100cc	Internal method
Tensile Stress [4]			ASTM D882
MD: fracture	40.0	MPa	ASTM D882
TD: fracture	30.0	MPa	ASTM D882
Tensile Elongation [5]			ASTM D882
MD: fracture	140	MPa	ASTM D882
TD: fracture	175	MPa	ASTM D882
Tensile Modulus	250	MPa	
Conductivity [6]	> 228	mS/cm	Internal method
Water absorption characteristics (liquid) [7]			Internal method
By weight		%	Internal method
Elongation at break (MD)		%	Internal method
Elongation at break (TD)		%	Internal method

Additional Information	Nominal Value	Unit	Test Method

HEALTH, SAFETY AND ENVIRONMENT
Aquivion® PFSA membranes are not harmful if used and handled according to standard processing procedures (see for example the "Guide to the Safe Handling of Fluoropolymer Resins" issued by the Society of the Plastics Industry). If handled inappropriately, membranes may release harmful toxic chemicals. Please refer to the Material Safety Data Sheets for more information on handling and safety.
PACKAGING, SHIPMENT AND STORAGE
The membranes are usually available in sheets of customized formats or rolls in various lengths (dimensions are based on dry product conditioned at 23 °C and 50 % Relative Humidity). They are sealed in an inert environment with a multilayer protection film before packaging inside a shock-protected cardboard box. It is recommended to store the product in a clean, controlled humidity environment and protected from direct sun light or other sources of heat.

NOTE	
1.	eq = mol SO3H

2.	Inferred water absorption 0%
3.	23°C, 50% R.H.
4.	-Measure E87-05S mechanical properties-23°C,50% R.H.
5.	-Measure E87-05S mechanical properties-23°C,50% R.H.
6.	When R.H. 100%, it is set to four Probe In-Plane Measurement. Steps: Tcell = 80°C, Tgas = 90°C humidity 100%, flow rate 800sccm.
7.	Immersed in liquid for 4 hours at 100°C

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