

# Aquivion® E87-12S

## perfluorosulfonic acid

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)  $F_2C=CF-O-CF_2CF_2-SO_2F$  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.

Please visit [Aquivion.com](http://Aquivion.com) for more information.

### General

|                 |                                               |
|-----------------|-----------------------------------------------|
| Material Status | • Commercial: Active                          |
| Availability    | • Asia Pacific<br>• Europe<br>• North America |

| Physical                            | Typical Value | Unit              | Test method     |
|-------------------------------------|---------------|-------------------|-----------------|
| Density - 23°C, 50%R.H.             | 1.93          | g/cm <sup>3</sup> | Internal Method |
| Equivalent Weight (EW) <sup>1</sup> | 870           | g/eq              | Internal Method |
| Membrane <sup>2</sup>               |               |                   |                 |
| Thickness                           | 120.0         | µm                |                 |
| Weight                              | 232           | g/m <sup>2</sup>  |                 |
| Total Acid Capacity                 | > 1.12        | sec/100cc         | Internal Method |

| Mechanical                  | Typical Value | Unit | Test method |
|-----------------------------|---------------|------|-------------|
| Tensile Modulus             | 240           | MPa  |             |
| Tensile Stress <sup>3</sup> |               |      | ASTM D882   |
| MD : Break                  | 40.0          | MPa  |             |
| TD : Break                  | 30.0          | MPa  |             |
| Elongation <sup>3</sup>     |               |      | ASTM D882   |
| MD : Break                  | 160           | %    |             |
| TD : Break                  | 200           | %    |             |

| Electrical                | Typical Value | Unit  | Test method     |
|---------------------------|---------------|-------|-----------------|
| Conductivity <sup>4</sup> | > 228         | mS/cm | Internal Method |

| Additional Information                           | Typical Value | Unit | Test method     |
|--------------------------------------------------|---------------|------|-----------------|
| Water Uptake Properties (in liquid) <sup>5</sup> |               |      | Internal Method |
| By weight                                        | < 40          | %    |                 |
| Elongation (MD)                                  | < 20          | %    |                 |
| Elongation (TD)                                  | < 25          | %    |                 |

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### 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.
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### Notes

Typical properties: these are not to be construed as specifications.

<sup>1</sup> eq=(mol SO<sub>3</sub>H)

<sup>2</sup> at 23°C, 50% R.H.

<sup>3</sup> - mechanical properties measured on E87-05S

- at 23°C, 50% R.H.

<sup>4</sup> Setup: 4-probe, in-plane measurement; Procedure: set T<sub>cell</sub> = 80°C, T<sub>gas</sub> = 90°C, Humidity 100%, Flow 800 sccm.

<sup>5</sup> 4 hours soak in liquid @100°C



Safety Data Sheets (SDS) are available by emailing us or contacting your sales representative. Always consult the appropriate SDS before using any of our products.

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