

# fumasep<sup>®</sup> F-1850

## General

*Membrane type:* Fluorinated cation-exchange membrane - non-reinforced - thickness 50 µm, with low resistance, high blocking capability of vanadium ions, and high stability in acidic environment.

*Application:* Electrochemical processes, such as Redox-Flow Battery, Vanadium-Redox-Flow Battery (VRB) for instance, using aqueous acidic conditions or other electrochemical applications.

Membranes are identified by membrane type and identification number (Lot Number). Please refer to this type and identification number in case of queries.

## Delivery

The membrane is the colourless, transparent foil, delivered on a backing layer (*white* rigid PET foil). Pull off carefully the membrane from the backing foil.

## Handling

Keep membrane package closed / sealed when unused. Unpack membrane only for direct use and process immediately after opening. Store, handle and process the membrane in a clean and dust-free area. Use only new and sharp knives or blades, when cutting the membrane. Always wear protective gloves when handling the membrane. Handle with care, be sure not to puncture, crease or scratch the membrane, otherwise leaks will occur. All surfaces in contact with the membrane during handling, inspection, storage and mounting must be smooth and free of sharp projections.

## Pretreatment

The membrane does not need any pretreatment and is ready for use. Please assemble the membrane in dry form. Membranes will expand and contract based on electrolyte content.

If you have any concerns about storage, chemical stability, and pretreatment please feel free to contact us for further information.

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## Technical Data Sheet - fumasep<sup>®</sup> F-1850

### Physical and chemical data of fumasep<sup>®</sup> F-1850

fumasep <sup>®</sup>		F-1850
membrane type		cation exchange membrane
appearance / colour		transparent, colourless
backing foil		PET (white)
reinforcement		none
thickness (dry)	µm	45 – 50
weight per unit area	mg cm <sup>-2</sup>	9,9 – 10.9
area resistance in 0.5 M H <sub>2</sub> SO <sub>4</sub> <sup>a)</sup>	Ω cm <sup>2</sup>	< 0.3
conductivity in 0.5 M H <sub>2</sub> SO <sub>4</sub> <sup>a)</sup>	mS cm <sup>-1</sup>	17.8
selectivity 0.1 / 0.5 mol/kg KCl at T = 25 °C <sup>b)</sup>	%	>99
uptake in 2 M H <sub>2</sub> SO <sub>4</sub> at T = 25 °C <sup>c)</sup>	wt %	6
dimensional swelling in 2 M H <sub>2</sub> SO <sub>4</sub> at T = 25 °C <sup>d)</sup>	%	4
uptake in vanadyl sulfate at T =25°C <sup>c)</sup>	wt %	3
dimensional swelling in vanadyl sulfate at T =25°C <sup>d)</sup>	%	4
Young's modulus at 23 °C / 50 % r.h. <sup>e)</sup>	MPa	> 230
yield strength at 23 °C / 50 % r.h. <sup>e)</sup>	MPa	8 – 12
tensile strength at 23 °C / 50 % r.h. <sup>e)</sup>	MPa	24 – 30
elongation at break at 23 °C / 50 % r.h. <sup>e)</sup>	%	360 – 390

a) in 0.5 M H<sub>2</sub>SO<sub>4</sub> solution @ T = 25 °C, measured in two-electrode cell (through-plane), sample activated in 10 % H<sub>2</sub>SO<sub>4</sub>, T = 100 °C, 30 min. before measurement.

b) determined from membrane potential measurement in a concentration cell, sample activated in 10 % H<sub>2</sub>SO<sub>4</sub>, T = 100 °C, 30 min. before measurement.

c) reference membrane dried over P<sub>2</sub>O<sub>5</sub> *in vacuo*.

d) reference membrane activated in 10 % H<sub>2</sub>SO<sub>4</sub>, T = 100 °C, 30 min. before measurement.

e) determined by stress-strain measurement at T = 25°C and 50 % r.h., according to DIN EN 527-1, sample activated in 10 % H<sub>2</sub>SO<sub>4</sub>, T = 100 °C, 30 min. before measurement.

Note: The product is not certified for drinking water applications. The data are not measured directly on the item supplied. The data sheet does not release the customer of the necessity of a goods inwards control procedure. All information included in this data sheet is based on tests and data believed to be reliable. The data do not imply any warranty or performance guarantee. It is the user's responsibility to examine performance, suitability and durability of the product for the intended purpose. FUMATECH BWT GmbH does not assume any liability for patent infringement resulting from the use of this product.

Hereby, it is certified that all results of the measured item comply with the margins of the internal specification defined in the technical datasheet. All measurements and data recording are conducted in accordance with standardized procedures following the ISO 9001 certification.

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