

# fumasep® FAP-450

## General

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

*Application:* Redox-Flow Battery, e.g. Vanadium-Redox-Flow Battery (VRB), using aqueous acidic conditions.

*Operation range:* Acidic environment pH < 4, at pH > 6 the material has low ionic conductivity. The material is not stable in caustic environment (pH > 11). General temperature range is room temperature to 50 °C.

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 transparent foil. The membrane is ready to use.

## 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 is delivered in dry form. No pretreatment is required. However, 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® FAP-450**
**Physical and chemical data of fumasep® FAP-450**

fumasep®		FAP-450
membrane type		anion exchange membrane
appearance / colour		transparent
backing foil		between paper
reinforcement		none
counter ion		none
delivery form		dry
thickness (dry)	µm	45 – 55
weight per unit area	mg cm <sup>2</sup>	7.5 – 9.1
area resistance in 0.5 M H <sub>2</sub> SO <sub>4</sub> <sup>a)</sup>	Ω cm <sup>2</sup>	< 0.65
conductivity in 0.5 M H <sub>2</sub> SO <sub>4</sub> <sup>a)</sup>	mS cm <sup>-1</sup>	> 9
selectivity 0.1 / 0.5 mol/kg KCl at T = 25 °C <sup>b)</sup>	%	> 90
dimensional swelling in 2 M H <sub>2</sub> SO <sub>4</sub> at T = 25 °C <sup>c)</sup>	%	10 - 12
Young's modulus at 23 °C / 50 % r.h. <sup>d)</sup>	MPa	800 – 1300
tensile strength at 23 °C / 50 % r.h. <sup>e)</sup>	MPa	40 – 70
elongation at break at 23 °C / 50 % r.h. <sup>e)</sup>	%	> 250
Version <sup>f)</sup>	2.1	Valid from June 4 <sup>th</sup> 2020

a) in specific solutions @ T = 25 °C, measured in two-electrode cell (through-plane).

b) determined from membrane potential measurement in a concentration cell.

c) reference membrane as received

d) determined by stress-strain measurement at T = 25°C and 50 % r.h., according to DIN EN 527-1.

e) determined by stress-strain measurement at T = 25°C and 50 % r.h., according to DIN EN 527-1.

f) Changes without prior notices may apply

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. Fumasep® is a trademark of company FUMATECH BWT GmbH.

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.