

fumasep® F-10100

General

Membrane type: Perfluorinated cation-exchange membrane – non-reinforced - thickness 100 µm, with low resistance, high mechanical stability, high selectivity and high chemical / oxidative stability.

Application: Electrochemical processes requiring cation exchange membranes with high oxidative stability such as water electrolysis, fuel cells, redox-flow batteries etc.

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 layer of nearly no absorbance, delivered on a backing layer (colourless rigid PET foil, fully transparent). Peel off carefully the membrane from the backing layer.

Handling

Keep membrane package closed / sealed when unused. 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.

Membranes will expand and contract based on water / electrolyte content.

Pretreatment

The membrane is delivered in H-form and dry form (non-activated). In order to receive immediately high performance and lowest resistance it is optional to pre-treat the membrane in aqueous 10 wt% H₂SO₄ solution at T = 70 – 100 °C for at least 6 h. After thorough washing with demineralized water (pH ~ 7) the membrane is ready for use. Membranes will expand and contract based on moisture content.

Especially as for water electrolysis, the activation can be carried out in-situ in the cell without any acid pre-treatment as well.

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

Technical Data Sheet - fumasep® F-10100

Physical and chemical data

fumasep®		F-10100
membrane type		cation exchange membrane
appearance / color		fully transparent or nearly no light absorbance
backing foil		PET foil
reinforcement		none
counter ion		H ⁺ form
delivery form		dry (non-activated)
thickness (dry, as received)	µm	95 – 105
weight per unit area	mg cm ⁻²	18,4 – 22,1
IEC (ion exchange capacity) based on mass of membrane-polymer without woven web	meq g ⁻¹	0,86 – 1,02
area resistance in 0.5 M H ₂ SO ₄ ^{a)}	Ω cm ²	< 0.65
conductivity in 0.5 M H ₂ SO ₄ ^{a)}	mS cm ⁻¹	> 65
selectivity 0.1 / 0.5 mol/kg KCl at T = 25 °C ^{b)}	%	> 90
uptake in 2 M H ₂ SO ₄ at T = 25 °C ^{c)}	wt %	16
dimensional swelling in 2 M H ₂ SO ₄ at T = 25 °C ^{d)}	%	< 18
Young's modulus at 23 °C / 50 % r.h. ^{e)}	MPa	> 350
tensile strength at 23 °C / 50 % r.h. ^{e)}	MPa	23 – 45
elongation at break at 23 °C / 50 % r.h. ^{e)}	%	> 100
bubble point test in water at T = 25 °C	bar	> 3
Resistance in the proton exchange cell at T = 80 °C ^{f)}	Ω cm ²	< 0,16

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

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

c) reference membrane dried over P₂O₅ *in vacuo*.

d) reference membrane as received

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

f) determined from PEM water electrolysis cell and PEM fuel cell via EIS at high frequency region

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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