

fumapem® FAA-3-PE-30

General

Membrane type: Anion-exchange membrane – PE-reinforced – thickness 30 μm , with very low resistance, high selectivity and high stability in pH acidic and basic environment.

Application: Alkaline fuel cells without KOH or at low KOH concentration and relative application.

Stability range: pH = 1 – 12 at T = 25 – 50 $^{\circ}\text{C}$.

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 thin brown, slightly opaque foil, delivered on a backing foil (colorless rigid PET foil). Carefully separate the membrane from the backing layers.

Handling and Storage

Keep membrane package closed / sealed when unused. Unpack membrane only for direct use and process it 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 which may get into contact with the membrane during inspection, storage, pretreatment and mounting must be free of sharp edges or angles.

Dry form: Storage for long time scale (> 12 month) may be done in dry state (sealed container). Wet form: Storage for short and medium time scale (hours up to several weeks) may be done in unsealed containers in 0.5 – 1.5 wt% NaCl solution or comparable neutral pH electrolytes. For storage over a longer time period a sealed container is recommended using afore said electrolyte with additional sodium sulfite (Na_2SO_3) in concentration 1 – 3 wt% to avoid biological fouling.

Pretreatment

The membrane is delivered in bromide form and dry form. Depending on application and cell design, assembling is possible in dry form (without pretreatment) or wet form. Before assembling in wet form put the membrane sample between stabilizing meshes / spacers (in order to avoid curling) in NaCl solution - e.g. 0.5 M NaCl solution at T = 25 $^{\circ}\text{C}$ for 72 hrs exchanging the solution several times. Do not let the membrane dry out since micro-cracks may likely occur during shrinkage.

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

Physical and chemical data of fumapem® FAA-3-PE-30

fumapem®	unit	FAA-3-PE-30
membrane type		anion exchange membrane
appearance		brown, slightly opaque
backing foil		PET
reinforcement		PE
counter ion		bromide (Br)
delivery form		dry
thickness (dry)	µm	20 – 30
weight per unit area	mg cm ⁻²	2.0 – 2.8
area resistance in Cl ⁻ form ^{a)}	Ω cm ²	< 1.3
specific conductivity in Cl ⁻ form ^{a)}	mS cm ⁻²	> 1.5
selectivity 0.1 / 0.5 mol/kg KCl at T = 25 °C ^{b)}	%	> 94
uptake in H ₂ O at T = 25 °C ^{c)}	wt %	< 20
dimensional swelling in H ₂ O at T = 25 °C ^{d)}	%	< 1
Young's modulus at 23 °C / 50 % r.h. ^{e)}	MPa	> 1500
tensile strength at 23 °C / 50 % r.h. ^{e)}	MPa	> 40
elongation at break at 23 °C / 50 % r.h. ^{e)}	%	> 50
proton transfer rate ^{f)}	nmol min ⁻¹ cm ⁻²	< 2000
bubble point test in water at T = 25 °C	bar	> 3
Version ^{g)}	2.1	Valid from August 20 th 2020

- a) in Cl⁻ form in 0.5 M NaCl @ T = 25 °C, measured in standard measuring cell through-plane)
 b) determined from membrane potential measurement in a concentration cell
 c) in Br⁻ form, membrane as received stored in water for 24 hrs, reference membrane dried over P₂O₅ *in vacuo*
 d) in Br⁻ form, membrane as received stored in water for 24 hrs, reference membrane as received
 e) determined from pH potential measurement in a concentration cell 0.5 M HCl / 0.5 M NaCl @ T = 25 °C
 f) determined by stress-strain measurement at T = 25 °C and 50 % r.h., according to DIN EN 527-1
 g) 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. Fumapem® 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.



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