

fumapem® F-14100

General

The membrane type F-14100 is a per-fluorinated sulfonic acid polymer cation-exchange membrane with excellent chemical stability and high conductivity. In comparison to the F-900 series this membrane type has a higher equivalent weight which results in a lower transport of water and aqueous media.

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

Handling

Please note that this membrane type should not be heated over a temperature of 120°C. Modifications of the polymer dispersion on the micro level can not be excluded at higher temperatures.

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.

Membranes will expand and contract subject to the moisture content. This is affected by relative humidity of the environment as well as exposure to organic solvents or vapour thereof. To control and minimise wrinkling it is necessary to expand membranes before mounting by pretreatment (see below).

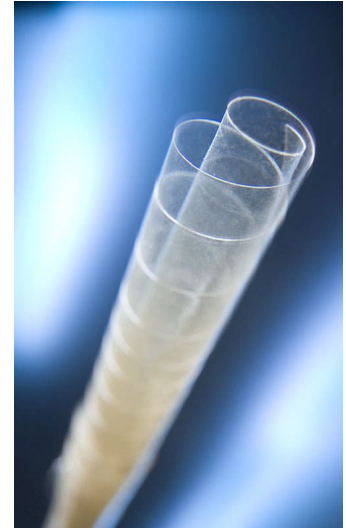
Pretreatment and Conditioning

For optimum performance, minimum wrinkling and lowest electrical resistance it is necessary to pretreat membranes according to the following prescription:

Put the membrane samples in an aqueous 10 wt.-% HNO₃ solution for at least 3 h at 90°C.

After treatment for 1 h in demineralised water at 90°C.

After rinsing with demineralised water (~pH 7) the membrane is ready for use.



Technical Data Sheet - fumapem F-14100

Physical and chemical data

EW	g/eq	1400	
specific conductivity	in Na ⁺ form ^{a)}	mS/cm	>8
	in H ⁺ form ^{b)}	mS/cm	>40
specific area resistance	in Na ⁺ form ^{a)}	Ωcm ²	<1,6
	in H ⁺ form ^{b)}	Ωcm ²	<0,27
thickness (dry)	mm	0,10 – 0, 12	
water uptake	wt %	~15	
	n= [H ₂ O] / [-SO ₃]	10 – 12	
dimensional swelling			
immersed in H ₂ O at T= 30°C	%	1 – 2	
immersed in H ₂ O at T= 80°C	%	4 – 5	
immersed in H ₂ O at T= 130°C	%	-	
elongation at break, 50% r.h., 23°C ^{c)}	%	>250	
tensile modulus, 50% r.h., 23°C ^{c)}	MPa	>260	
tensile strength, maximum, 50% r.h., 23°C ^{d)}	MPa	>16	
density	g/cm ³	1,98 – 2,0	
methanol permeability	mol/h m ²	<20	

Thermoanalysis

glass transition temperature	°C	110 – 120
start of thermal decomposition	°C	270 – 300

a) determined 0,5 M NaCl at T=30°C

b) determined in H₂O at T=30°C

c) determined in H₂O at T=30°C according to DIN 53834

d) determined in dry state using DMA analysis

e) determined using TGA

f) determined in a passive concentration cell applying 1,0 M Methanol versus deionised water at T= 50 °C

Please note: The measuring data are not measured directly on the item supplied. The data correspond with the measurement of our quality control.

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