

# fumapem® F-930, F-950

## General

The membrane type F-930, F-950 is a per-fluorinated sulfonic acid/PTFE copolymer with excellent chemical stability and superior ionic conductance intended for use in fuel cell applications or electrolysis.

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

## Handling

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.-% HNO<sub>3</sub> 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.

## Physical and chemical data

		F-930	F-950
EW	g/eq	900	900
specific conductivity	in Na <sup>+</sup> form <sup>a)</sup>	mS/cm	>17
	in H <sup>+</sup> form <sup>b)</sup>	mS/cm	>100
specific area resistance	in Na <sup>+</sup> form <sup>a)</sup>	Ωcm <sup>2</sup>	<0,2
	in H <sup>+</sup> form <sup>b)</sup>	Ωcm <sup>2</sup>	<0,05
thickness (dry)	mm	0,025-0,035	0,05-0,06
water uptake	wt %	~30	~30
	n= [H <sub>2</sub> O] / [-SO <sub>3</sub> ]	18-20	18-20
dimensional swelling			
immersed in H <sub>2</sub> O at T= 30°C	%	3-4	3-4
immersed in H <sub>2</sub> O at T= 80°C	%	5-6	5-6
immersed in H <sub>2</sub> O at T= 130°C	%	18	18
elongation at break, 50% r.h., 23°C <sup>c)</sup>	%	>200	>165
tensile modulus, 50% r.h., 23°C <sup>c)</sup>	MPa	>180	>180
tensile strength, maximum, 50% r.h., 23°C <sup>d)</sup>	MPa	>14	>14
density	g/cm <sup>3</sup>	1,98 – 2,0	1,98 – 2,0

### Thermoanalysis

glass transition temperature <sup>d)</sup>	°C	100 – 110	100 – 110
start of thermal decomposition <sup>e)</sup>	°C	270 – 300	270 – 300

- a) determined 0,5 M NaCl at T=30°C  
 b) determined in H<sub>2</sub>O at T=30°C  
 c) determined in H<sub>2</sub>O at T=30°C according to DIN 53834  
 d) determined in dry state using DMA analysis  
 e) determined using TGA

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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