Ionics* Ion Exchange Membranes

General Description and Use

Ionics ion exchange membranes are homogeneous ion exchange films cast in sheet form on reinforcing synthetic fabrics such as polypropylene, polyester and acrylic cloth. The membranes are typically used in Ionics ED and EDR stacks but are also available for sale individually.

Membrane Types and Naming

Ionics* membranes are made with monomer formulations developed by our membrane chemists cast continuously on various support structures. They are each selective for allowing either anions or cations to pass through them. SUEZ - Water Technologies & Solutions has been making homogeneous ion exchange membranes for 70 years since the invention of the technology by Ionics Corp. in 1948. There are currently six membrane chemistries used in membranes sold by SUEZ and the full names of these formulations have been simplified as follows:

- AR204SZRA → AR204
- AR103QDP → AR103
- AR908SE → AR908
- CR64LMR → CR64
- CR67HMR(P) → CR67
- CR61CMP → CR61

There are two newer membrane chemistries, as well:

- CR62
- AR118

We cast membranes on a variety of cloths. Each cloth type is designated by a single letter:

R → woven acrylic cloth (now discontinued)

H → heavy woven acrylic cloth

E → nonwoven polyester cloth

T → thin nonwoven polyester cloth

U → ultra-thin nonwoven polyester cloth

P → Polypropylene woven cloth

N → Thin polypropylene nonwoven cloth

The name of each membrane type is the combination of its membrane chemistry and its support structure (e.g. AR103P, CR67T)

General Membrane Characteristics

- Low electrical resistance
- High permselectivity
- Rugged construction and high burst strength
- Excellent long-term stability up to 65°C (149°F)
- Long-term resistance to aqueous acid solutions
- High dimensional stability
- High resistance to fouling by organic materials

Certifications

Ionics ion exchange membranes have certifications below. See individual membrane fact sheets for specific certifications.

- NSF 61 - Drinking Water
- 21CFR175,176,177,178,182 – Food Contact Materials
- EU 1935/2004 – Food Contact Materials
- EU 10/2001 - Food Contact Materials
- BSE/TSE EMEA/410/1 – No Materials of Animal Origin
- EU 606/2009 – Wine Treatment

Find a contact near you by visiting www.suezwatertechnologies.com and clicking on "Contact Us."

Configurations

The membranes are available in configurations to fit Ionics ED and EDR stacks as well as uncut boards for custom designs.

In the material description and in the facing Membrane Selection Guide, the following primary configurations are available:

- BOARD → uncut board from production line (typ. 20"x42")
- BLK → cut board with no holes
- MK1 → laboratory scale membrane with 8 holes (9"x10")
- V20 → Ionics V20 Stack
- M3C → MkIII, w/ 4 central 1" circular holes
- MK4 → MkIV w/ 4 end 2" circular holes
- BP3 → 3-comp. bipolar w/ 6 0.75" circular holes

Packaging Information

Membranes are double sealed and packaged 15 per bag in a plastic bag with an anti-microbial aqueous solution of propylene glycol, water, benzoic acid, and polyvinylpyrrolidone-iodine. A maximum of 60 membranes are packaged per box for shipment.

Storage and Handling

Membranes should be stored flat in a cool, dark room. Membranes must be kept wet. There is typically unlimited storage shelf life if membranes are kept flat, wet, and clean.

Safety

PPE ..... Gloves optional

Disposal ..... Industrial waste

Use proper PPE. Scrap according to local guidelines

Ionics Ion Exchange Membrane Properties and Selection Guide

Membrane Characteristics		AR103				AR204			AR908		AR118	CR61		CR62	CR64	CR67				
		P	N	H	U	R	E	T	E	T	U	P	N	T	H	R	P	E	T	U
Membrane Thickness	µm	570	300	1100	130	640	550	280	650	290	130	580	300	320	1020	680	600	570	300	150
Ion Exchange Capacity	meq/dry g resin	2.37	2.37	2.10	2.37	2.29	2.34	2.43	1.97	1.97	2.35	2.20	2.20	2.60	2.20	2.29	2.10	2.33	2.55	1.92
Resistance in 0.1N NaCl	ohm-cm2	9.4	2.8	20.0	1.4	5.8	3.2	1.7	7.0	3.5	11.0	10.0	3.6	6.5	20.0	9.2	10.0	5.5	2.5	2.0
Water Content	% wet resin	39	39	37	41	46	42	42	43	47	18	44	44	32	42	48	46	49	46	46
Burst Strength	psi	280	95	330	90	150	120	85	120	85	90	280	95	85	330	150	280	120	85	80
Permselectivity	%	92	92	N/A	90	94	92	90	94	92	80	94	95	97	N/A	90	90	94	90	90
Water Transfer	ml/F in 0.6N NaCl@ 16 mA/cm2	110	115	N/A	230	120	130	150	100	100	N/A	165	180	105	N/A	165	150	185	205	205
Sucrose Transport	g/F of 30% suc. in 0.2N KCl @ 16 mA/cm2	2	3	N/A	N/A	12	12	13	N/A	N/A	N/A	7	8	N/A	N/A	8	8	8	9	9
pH Stability		1-14	1-14	1-14	1-14	1-10.5	1-10.5	1-10.5	1-14	1-14	14-Jan	1-14	1-14	1-14	1-14	1-14	1-14	1-14	1-14	1-14
Material numbers for ordering by configuration	BOARD (20x42)	3099320	3180466	3043242	3160427	3043243	3156778	3151405	3156777	3151403	3180518	3043553	3180486	3180551	3043486	3043303	3043184	3156779	3151404	3160380
	BLK	3043622	3180469	3009354	--	3009749	3156791	3156810	3156766	3156767	3180519	3043269	3180489	3180555	3009750	3009753	3156824	3156814	3156820	
	MK1	3015585	3180480	--	3160451	3015614	3156796	3156813	3137152	3180522	3180520	3015583	3180490	3180556	3015584	3015613	3156825	3156819	3156823	3160382
	M3C	3009746	3180481	3015616	--	3009748	3156792	3156811	3101822	3156768	--	3015620	3180491	3180557	3009778/ 3009780/ 3043441	--	3009752	3156815	3156821	--
	MK4	--	--	--	3160429	3009776	3156794	3151406	3149705	3151402	--	--	3180492	3180558	3009781/ 3009782	3009784	--	3156817	3151407	3160381
	BP3	3137462	3180483	--	--	--	--	--	--	--	3180521	3137464	3180493	--	--	--	3136600	--	--	--
	V20	--	3180484	--	--	--	--	3171087	--	3171088	--	--	3180494	3180559	3180252	--	--	--	3171089	--
Typical Applications		Whey Demin BPED	Whey Demin, huBrine Concentration	Electrode Compartment Membrane only	DD, RED	BW Desal Sugar, Glycol, Glycerine	BW Desal Sugar, Glycol, Glycerine	BW Desal Sugar, Glycol, Glycerine	BW Desal. WW TDS Removal, Dairy, Protein Demin	BW Desal. WW TDS Removal, Dairy, Protein Demin	Acid Blocking Anion for BPED	Whey Demin, Cation Layer for BP Membrane	Whey Demin, Cation Layer for BP Membrane	Brine Concentration	Electrode Compartment Membrane only	BW Desal. WW TDS Removal, Dairy, Protein Demin	BW Desal. WW TDS Removal, Dairy, Protein Demin	BW Desal. WW TDS Removal, Dairy, Protein Demin	BW Desal. WW TDS Removal, Dairy, Protein Demin	BW Desal. WW TDS Removal, Dairy, Protein Demin, RED