



membranium®



ITC-Imperial Trading Company DOO
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Membrane elements

Product catalog

MEMBRANIUM

Membranium is a brand new supplier of membrane flatsheet and spiral wound elements. Being the first Russian company among the worldwide leaders, we are manufacturing nanostructured membrane flatsheet and membrane elements for reverse osmosis (RO), nanofiltration (NF) and ultrafiltration (UF).

Our mission is to increase efficiency of water production using state-of-the-art membrane technologies.

The factory operates state-of the-art equipment and machinery based on the latest technology developments for production of membrane flatsheets, automatic rolling equipment to produce elements in a range of sizes starting from domestic 1812 up to regular 8040 for different kind of industrial applications.



CAREFULLY DEVELOPING MEMBRANE SCIENCE TRADITIONS

1998

POLIMERSINTEZ initiating a production site to make spiral wound filter elements for Russian market on a commercial basis. The compilation of long term scientific background for flatsheet development along with hi end technology practice had helped to set up this venture.

1986

Creation of POLIMERSINTEZ as a leading institution for «Membrana» center (more than 25 different industry's participants).

1977

The USSR's first pilot industrial plant "Membrana-1" for production of cellulose esters based membrane is commissioned in Vladimir.

1974

Polymeric membranes department is established at VNIIS. The first industrial membrane plant in the USSR is commissioned.

1968

Works of shaping acetate fibers from acetates are completed. Ph.D. thesis on photo- and photo-oxidative degradation of cellulose acetates is completed.

2010

POLIMERSINTEZ together with State owned high-tech investment fund RUSNANO (www.rusnano.com) decided to create Joint Venture RM Nanotech (MEMBRANIUM trade mark) to set up 10 000 sq. m production site for RO, NF and UF range of products.

1982

Start of serial industrial production of spiral wound filter elements.

1975

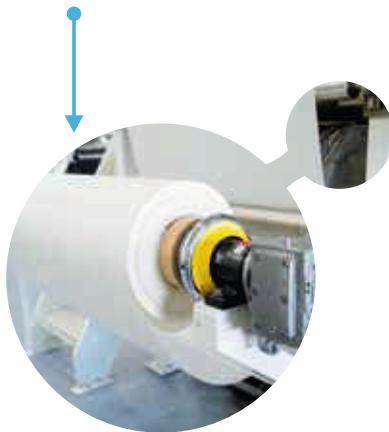
Gas separation membranes lab establishment.

1970

A pilot continuous operation unit for production of membranes is set up at VNIIS (Scientific Research Institute of Synthetic Resins).

MEMBRANE FLATSHEET PRODUCTION

UF membrane flatsheet



NF and RO composite membrane flatsheet



Automatic and manual rolling of spiral wound elements



DISTINCTIVE ADVANTAGES

MEMBRANIUM products has a certain number of peculiarities, especially developed for OEM's benefits, such as:

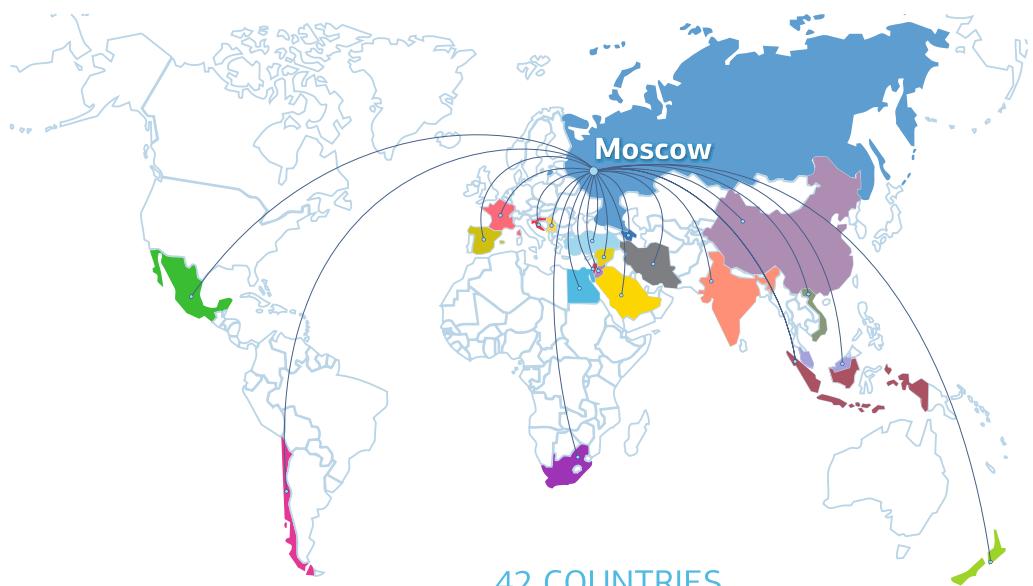
- ✓ SW membrane elements provide higher flow while maintaining high rejection level
- ✓ NF membrane elements do not require active chlorine removal from feed water before introduction into the system
- ✓ Membrane elements can be supplied both in wet or dry conditions
- ✓ Quality Control according to ISO 9001
- ✓ Our sea water (KM series) membranes were tested and certified by NSF International

SOFTWARE

Our own software is designed to carry out preliminary calculation of elements' performance in specific conditions on the basis of feed water parameters, type of the system's configuration and during evaluation of results and system cost. Software can be downloaded at www.membranium.com



WORLDWIDE PRESENCE



MEMBRANIUM ELEMENTS COMPETITIVE REPLACEMENT MATCH GUIDE

DOW Filmtec		Hydranautics		TORAY	
Sea water		High rejection elements		Standard elements	
KM 8040-CM	SW30HRLE-440i		TM820E-440	AD-440	RE8040-SHA440
KM 8040-CM2	SW30HRLE-400	SWC4 MAX			RE8040-SHA400
KM 8040-CM3	SW30HRLE-370/34i	SWC4-LD	TM820E-400	AD-400,34	
KM 4040-CM	SW30HR LE-4040	SWC5-LD-4040	TM810V	AD-90	RE4040-SHA
Brackish water					
High rejection elements					
KC 8040-C	BW30HR-440	CPA5 MAX	TM720D-440 TM720-430	AG-440	RE8040- BE440
KC 8040-C2	BW30-400	CPA3	TM720DA400 TM720-400	AG8040F 400	RE8040- BE
KC 8040-C3	BW30FR-400/34	CPA2	TM720D-400	AG-400, 34	RE8040-BE34
	BW30-365		TM720-370	AG8040F	RE8040- BN
KC 4040-C	LCHR-4040	CPA2-4040	TM710D	AG-90	RE4040- BE
	BW30-4040		TM710	AG4040FM	
Low pressure elements					
KH 8040-C	LE-400	ESPA1	TM720L-440		RE8040- BLN
KH 4040-C	LE-4040	ESPA1-4040	TMG10		RE4040- BLN
Extra low pressure elements					
KCH 8040-C	XLE-440*	ESPA4	TMH20A-440	AK8040F 400	RE8040- BLF
KCH 8040-F					
KCH 8040-C3		ESPA4-LD	TMH20A-370		
KCH 8040-F3					
KCH 4040-C	XLE-4040	ESPA4-4040	TMH10A	AK4040FM	RE4040- BLF
KCH 4040-F	XLE-4040				

* adapter is required for core tube



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INDUSTRIAL GRADE MEMBRANE ELEMENTS DATASHEET

Salt Rejection			Permeate Flow				Test conditions				Recom mended NDP (MPa)	Weight (kg)*	
S(%) nom	S(%) min	Q (GPD) nom	Q (GPD) min	Q (m³/h)	Q (l/h)	Test solution	P (MPa)	Re- cov- ery	T°C				
Sea water													
Standart elements													
KM 8040-C	99,75	99,55	10500	8925	1,66		3,2% NaCl	5,5	10	25	2-3	14,8	
KM 8040-C2	99,75	99,55	9800	8075	1,50		3,2% NaCl	5,5	10	25	2-3	15,8	
KM 8040-C3	99,75	99,55	9000	7600	1,42		3,2% NaCl	5,5	10	25	2-3	15,3	
KM 4040-C	99,75	99,4	2100	1680		330	3,2% NaCl	5,5	8	25	2-3	4,1	
High rejection membrane elements													
KM 8040-CM	99,8	99,6	8000	6800	1,26		3,2% NaCl	5,5	10	25	2-3	14,8	
KM 8040-CM-2	99,8	99,6	7600	6460	1,20		3,2% NaCl	5,5	10	25	2-3	15,8	
KM 8040-CM-3	99,8	99,6	7100	6035	1,12		3,2% NaCl	5,5	10	25	2-3	15,3	
KM 4040-CM	99,75	99,4	1700	1360		270	3,2% NaCl	5,5	8	25	2-3	4,1	
Brackish water													
High rejection membrane elements													
KC 8040-C	99,7	99,4	11500	9775	1,81		0,15 % NaCl	1,5	15	25	1,4-2,0	14,8	
KC 8040-C-2	99,7	99,4	11000	9350	1,73		0,15 % NaCl	1,5	15	25	1,4-2,0	15,8	
KC 8040-C-3	99,7	99,4	10300	8755	1,62		0,15 % NaCl	1,5	15	25	1,4-2,0	15,3	
KC 4040-C	99,7	99,4	2500	2125		390	0,15 % NaCl	1,5	15	25	1,4-2,0	4,1	
KC 4040-C2	99,7	99,4	2300	1955		360	0,15 % NaCl	1,5	15	25	1,4-2,0	4,1	
KC 4040-C3	99,7	99,4	2200	1870		350	0,15 % NaCl	1,5	15	25	1,4-2,0	4,1	
Low pressure membrane elements													
KH 8040-C	99,2	98,5	11500	9200	1,81		0,15 % NaCl	1,0	15	25	0,9-1,4	14,8	
KH 4040-C(F)	99,2	98,5	2400	1900		380	0,15 % NaCl	1,0	15	25	0,9-1,4	4,1	
Extra low pressure membrane elements													
KCH 8040-C (F)	99,1	98,3	12400	10540	1,96		0,05 % NaCl	0,7	15	25	0,6-0,9	13,8	
KCH 8040-C(F)3	99,1	98,3	10500	8925	1,66		0,05 % NaCl	0,7	15	25	0,6-0,9	12,3	
KCH 4040-C (F)	99,1	98,3	2500	2210		410	0,05 % NaCl	0,7	15	25	0,6-0,9	3,1	



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1 - Feed spacer 28 mil

F - shrink film wrapped

2 - Feed spacer 31 mil

C - Fiberglass shell

3 - Feed spacer 34 mil

DRY - dry membrane elements

*Element weight may vary ** For light industrial membrane elements please contact us



membranum®

SEA WATER Reverse osmosis Membrane elements

KM Series

Product Description	Membrane material Membrane type Design	Composite polyamide ORM45K Spiral wound
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*

Test conditions:
test solution of NaCl
32 g/l, P=5,5 MPa,
T=25 °C, pH=7,5.
Recovery -10%

**

Flow of each single element in a batch may vary for +/-15%

Nominal rejection is reached after 48 hours of continuous operation on test solution

Minimal rejection of a new element after 20 minutes' test on test solution.

For details see operation manual

1)

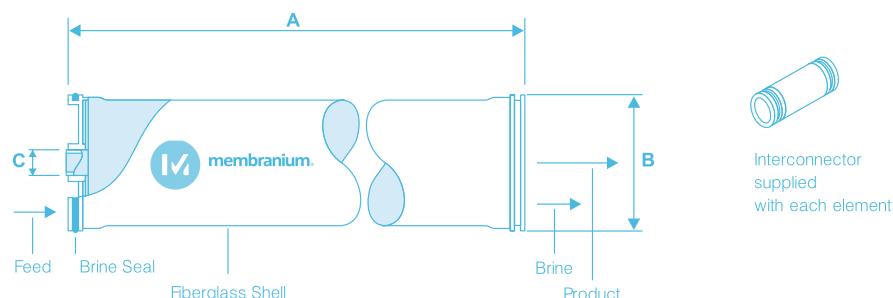
For operation at a temperature higher than 30°C pH should be less than 10

Specification

Model	Flow*		normal**/ minimal***	Area		Spacer	
	m3/hr	GPD		m2	ft2	mm	mil
KM 8040-C	1,66	10500	99,75/99,55	39	420	0,71	28
KM 8040-C2	1,50	9500	99,75/99,55	37	400	0,79	31
KM 8040-C3	1,42	9000	99,75/99,55	35	375	0,86	34

Operating conditions

Recommended operation pressure, MPa	4,5-6,5
Maximum operation pressure, MPa	7
Maximum pressure drop, MPa	0,1
Operation temperature, °C ¹⁾	4-45
pH at continuous operation at T<35°C	2-11
pH at continuous operation at T<45°C	3-10,5
Chemical cleaning, temperature, °C****	T<45 T<35 T<25
CIP pH (short time operation)	2-11 1-11,5 1-12
Free chlorine content, mg/l max	0,1
Maximum feed flow, m3/hr	17
Concentrate/permeate ratio on each element, min	10:1
SDI (15 minutes test), max	5
Turbidity, NTU max	1



Model	A mm	B mm	C mm
KM 8040-C (2,3)	1016	200,1	28,6



membranum®

SEA WATER Reverse osmosis Membrane elements

KM Series

Product Description	Membrane material Membrane type Design	Composite polyamide ORM45K Spiral wound
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*

Test conditions:
test solution of NaCl
32 g/l, P=5,5 MPa,
T=25 °C, pH=7,5.
Recovery -8%

**

Flow of each single element in a batch may vary for +/-20%

Nominal rejection is reached after 48 hours of continuous operation on test solution

Minimal rejection of a new element after 20 minutes' test on test solution.

For details see operation manual

Specification



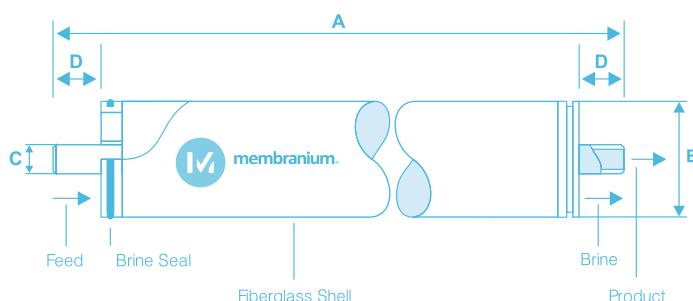
Model	Flow*		Rejection*	Area		Spacer	
	l/hr	GPD		m ²	ft ²	mm	mil
KM 4040-C	330	2100	normal**/ minimal***	8,0	86	0,71	28

Operating conditions

Recommended operation pressure, MPa	4,5-6,5
Maximum operation pressure, MPa	7
Maximum pressure drop, MPa	0,1
Operation temperature, °C ¹⁾	4-45
pH at continuous operation at T<35°C	2-11
pH at continuous operation at T<45°C	3-10,5
Chemical cleaning, temperature, °C ****	T<45 T<35 T<25
CIP pH (short time operation)	2-11 1-11,5 1-12
Free chlorine content, mg/l max	0,1
Maximum feed flow, m ³ /hr	3,6
Concentrate/permeate ratio on each element, min	10:1
SDI (15 minutes test), max	5
Turbidity, NTU max	1

1)

For operation at a temperature higher than 30°C pH should be less than 10



Model	A mm	B mm	C mm	D mm
KM 4040-C	1016	100	19,1	26,7



SEA WATER High Rejection Reverse osmosis Membrane elements KM Series

Product Description	Membrane material Membrane type Design	Composite polyamide ORM45KM Spiral wound
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*

Test conditions:
test solution of NaCl
32 g/l, P=5,5 MPa,
T=25 °C, pH=7,5.
Recovery -8%

**

Flow of each single element in a batch may vary for +/-15%

Nominal rejection is reached after 48 hours of continuous operation on test solution

Minimal rejection of a new element after 20 minutes' test on test solution.

Typical boron rejection: 91% at following test conditions: test solution of 32 000 ppm, 5 ppm boron, P=5,5 MPa, 25°C, pH 8, recovery-8%.

For details see operation manual

Specification

Model	Flow*		normal**/ minimal***	Area		Spacer	
	m3/hr	GPD		m2	ft2	mm	mil
KM 8040-CM	1,26	8000	99,8/99,6	39	420	0,71	28
KM 8040-CM2	1,20	7600	99,8/99,6	37	400	0,79	31
KM 8040-CM3	1,12	7100	99,8/99,6	35	375	0,86	34

Operating conditions

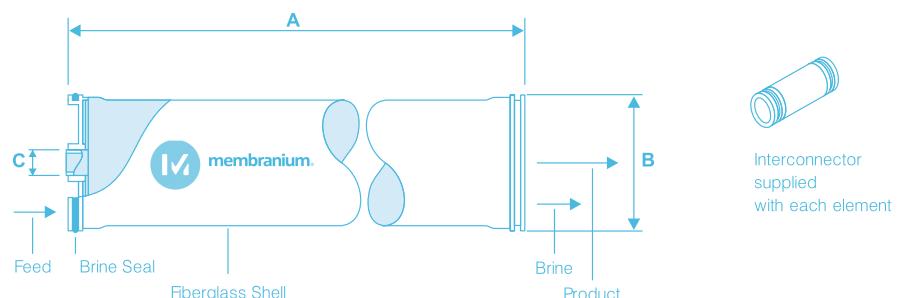
Recommended operation pressure, MPa	4,5-6,5
Maximum operation pressure, MPa	7
Maximum pressure drop, MPa	0,1
Operation temperature, °C ¹⁾	4-45
pH at continuous operation at T<35°C	2-11
pH at continuous operation at T<45°C	3-10,5
Chemical cleaning, temperature, °C****	T<45 T<35 T<25
CIP pH (short time operation)	2-11 1-11,5 1-13 ²⁾
Free chlorine content, mg/l max	0,1
Maximum feed flow, m3/hr	17
Concentrate/permeate ratio on each element, min	10:1
SDI (15 minutes test), max	5
Turbidity, NTU max	1

1)

For operation at a temperature higher than 30°C pH should be less than 10

2)

Max 20 minutes



Model	A mm	B mm	C mm
KM 8040-CM (2,3)	1016	200,1	28,6



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SEA WATER High Rejection Reverse osmosis Membrane elements KM Series

Product Description	Membrane material Membrane type Design	Composite polyamide ORM45KM Spiral wound
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*

Test conditions:
test solution of NaCl
32 g/l, P=5,5 MPa,
T=25 °C, pH=7,5.
Recovery -8%

**

Flow of each single element in a batch may vary for +/-20%

Nominal rejection is reached after 48 hours of continuous operation on test solution

Minimal rejection of a new element after 20 minutes' test on test solution.

Typical boron rejection: 91% at following test conditions: test solution of 32 000 ppm, 5 ppm boron, P=5,5 MPa, 25°C, pH 8, recovery-8%.

For details see operation manual

Specification

Model	Flow*		normal**/ minimal***	Area		Spacer	
	l/hr	GPD		m ²	ft ²	mm	mil
KM 4040-CM	270	1700	99,8/99,6	8,0	86	0,71	28

Operating conditions

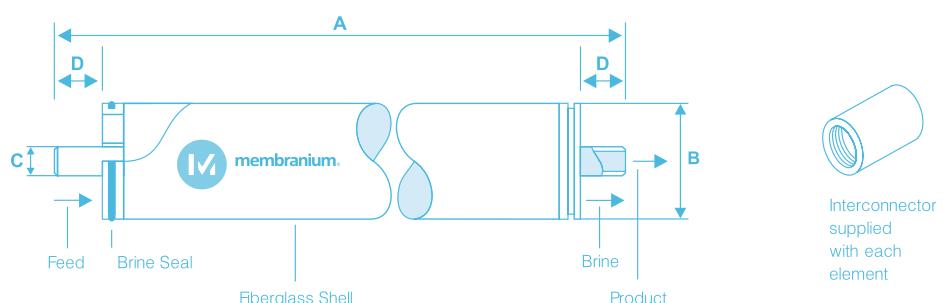
Recommended operation pressure, MPa	4,5-6,5
Maximum operation pressure, MPa	7
Maximum pressure drop, MPa	0,1
Operation temperature, °C ¹⁾	4-45
pH at continuous operation at T<35°C	2-11
pH at continuous operation at T<45°C	3-10,5
Chemical cleaning, temperature, °C****	T<45 T<35 T<25
CIP pH (short time operation)	2-11 1-11,5 1-13 ²⁾
Free chlorine content, mg/l max	0,1
Maximum feed flow, m ³ /hr	3,6
Concentrate/permeate ratio on each element, min	10:1
SDI (15 minutes test), max	5
Turbidity, NTU max	1

1)

For operation at a temperature higher than 30°C pH should be less than 10

2)

Max 20 minutes



Model	A mm	B mm	C mm	D mm
KM 4040-CM	1016	100	19,1	26,7



membranium®

BRACKISH WATER High Rejection Reverse osmosis Membrane elements

Product Description	Membrane material	Composite polyamide	KC Series
	Membrane type	ORM31K	
	Design	Spiral wound	

*

Test conditions:
test solution of NaCl
1500 mg/l, P=1,55
MPa, T=25 °C, pH=7,5.
Recovery -15%

**

Flow of each single element
in a batch
may vary for +25% / -15%

Nominal rejection
is reached after 100
hours of continuous
operation on test
solution

Minimal rejection
of a new element after
20 minutes' test
on test solution

For details see
operation manual

1)

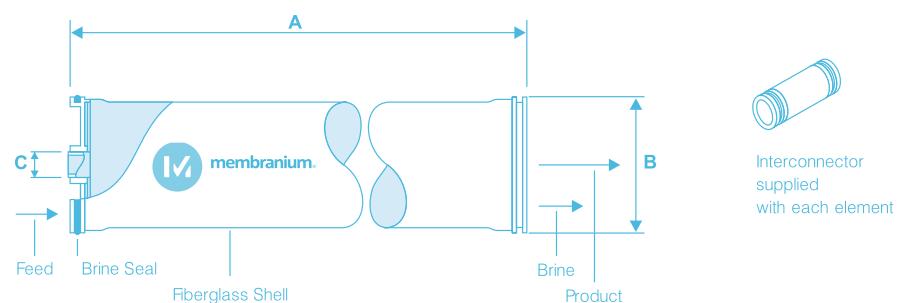
For operation at
a temperature higher than 30°C
pH should be less than 10

Specification

Model	Flow*		Rejection* normal**/ minimal***	Area		Spacer	
	m3/hr	GPD		m2	ft2	mm	mil
KC 8040-C	1,81	11 500	99,7/99,4	39	420	0,71	28
KC 8040-C2	1,73	11 000	99,7/99,4	37	400	0,79	31
KC 8040-C3	1,65	10 300	99,7/99,4	35	375	0,86	34

Operating conditions

Recommended operation pressure, MPa	1,2-2,0
Maximum operation pressure, MPa	4,1
Maximum pressure drop, MPa	0,1
Operation temperature, °C ¹⁾	4-45
pH at continuous operation at T<35°C	2-11
pH at continuous operation at T<45°C	3-10,5
Chemical cleaning, temperature, °C****	T<45 T<35 T<25
CIP pH (short time operation)	2-11 1-11,5 1-12
Free chlorine content, mg/l max	0,1
Maximum feed flow, m3/hr	17
Concentrate/permeate ratio on each element, min	5:1
SDI (15 minutes test), max	5
Turbidity, NTU max	1



Model	A mm	B mm	C mm
KC 8040-C (2,3)	1016	200,1	28,6



membranum®

BRACKISH WATER High Rejection Reverse osmosis Membrane elements

Product Description	Membrane material Membrane type Design	Composite polyamide ORM31K Spiral wound	KC Series
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*

Test conditions:
test solution of NaCl
1500 mg/l, P=1,55
MPa, T=25 °C, pH=7,5.
Recovery -15%

*

Flow of each single element in a batch may vary for + / -15%

**

Nominal rejection is reached after 48 hours of continuous operation on test solution.

Minimal rejection of a new element after 20 minutes' test on test solution.

For details see operation manual

Specification

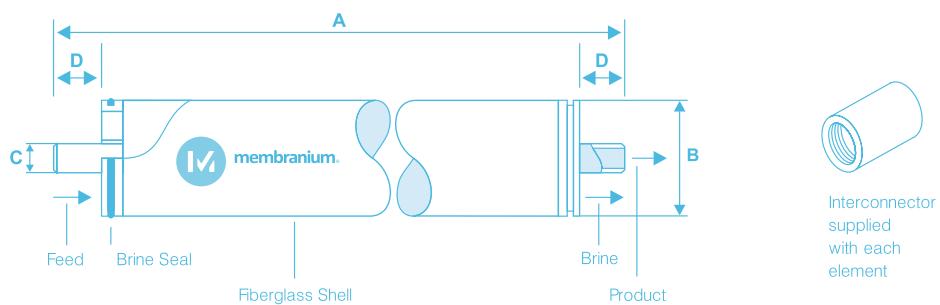
Model	Flow*		Rejection*	Area		Spacer	
	l/hr	GPD		normal**/ minimal***	m ²	ft ²	mm
KC 4040-C	390	2500	99,7/99,4	8,3	90	0,71	28
KC 4040-C2	360	2300	99,7/99,4	7,9	85	0,79	31
KC 4040-C3	350	2200	99,7/99,4	7,5	80	0,86	34

Operating conditions

Recommended operation pressure, MPa	1,2-2,0
Maximum operation pressure, MPa	4,1
Maximum pressure drop, MPa	0,1
Operation temperature, °C ¹⁾	4-45
pH at continuous operation at T<35°C	2-11
pH at continuous operation at T<45°C	3-10,5
Chemical cleaning, temperature, °C****	T<45 T<35 T<25
CIP pH (short time operation)	2-11 1-11,5 1-12
Free chlorine content, mg/l max	0,1
Maximum feed flow, m ³ /hr	3,6
Concentrate/permeate ratio on each element, min	5:1
SDI (15 minutes test), max	5
Turbidity, NTU max	1

1)

For operation at a temperature higher than 30°C pH should be less than 10

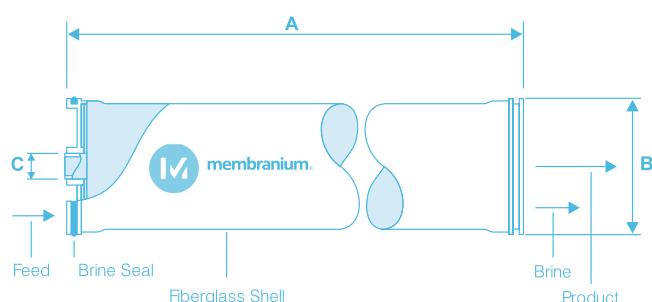


Model	A mm	B mm	C mm	D mm
KC 4040-C(2,3)	1016	100	19,1	26,7

KH Series

1)

For operation at
a temperature higher than 30°C
pH should be less than 10



A blue line drawing of a cylindrical object with a flared end, representing an interconnector element.

Model	A mm	B mm	C mm
KH 8040-C	1016	200,1	28,6

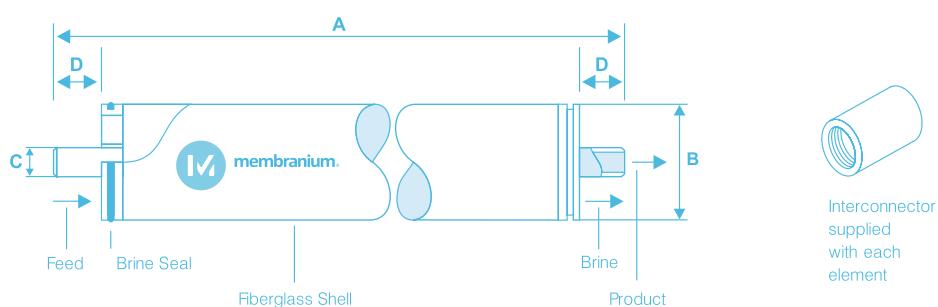


membranum®

BRACKISH WATER Low pressure Reverse osmosis Membrane elements

		KH Series						
Product Description	Membrane material	Composite polyamide						
	Membrane type	ORM32K						
Design	Spiral wound							
<i>Test conditions:</i> test solution of NaCl 1500 mg/l, P=1,0 MPa, T=25 °C, pH=7,5. Recovery -15%								
* Flow of each single element in a batch may vary for +15% / -20%								
** Nominal rejection is reached after 48 hours of continuous operation on test solution								
*** Minimal rejection of a new element after 20 minutes' test on test solution								
**** For details see operation manual								
Operating conditions	Recommended operation pressure, MPa							0,9-1,2
	Maximum operation pressure, MPa							4,1
	Maximum pressure drop, MPa							0,1
	Operation temperature, °C ¹⁾							4-45
	pH at continuous operation at T<35°C							2-11
	pH at continuous operation at T<45°C							3-10,5
	Chemical cleaning, temperature, °C****							T<45 T<35 T<25
	CIP pH (short time operation)							2-11 1-11,5 1-12
	Free chlorine content, mg/l max							0,1

1)
For operation at a temperature higher than 30°C pH should be less than 10



Model	A mm	B mm	C mm	D mm
KH 4040-C	1016	100	19,1	26,7



membranium®

TAP & LOW-MINERALIZED WATER

Extra low pressure

Reverse osmosis Membrane elements

KCH Series

Product Description	Membrane material Membrane type Design Features	Composite polyamide ORM33K Spiral wound Fiberglass shell (-C) or shrink film-wrapped (-F)
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Test conditions:
test solution of NaCl
500 mg/l, P=0,7 MPa,
T=25 °C, pH=7,5.
Recovery -15%

**

Flow of each single element in a batch may vary for +/-15%

Nominal rejection is reached after 48 hours of continuous operation on test solution

Minimal rejection of a new element after 20 minutes' test on test solution

For details see operation manual

1)

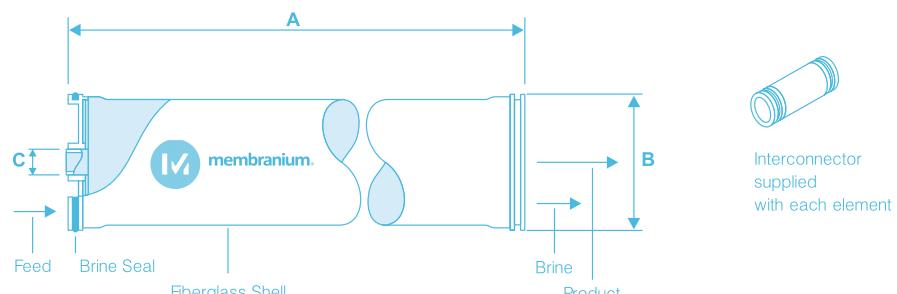
For operation at a temperature higher than 30°C pH should be less than 10

Specification

Model	Flow*		Rejection*		Area		Spacer	
	m3/hr	GPD	normal**/ minimal***	m2	ft2	mm	mil	
KCH 8040-C	1,96	12 400	99,1/98,7	41	440	0,66	26	
KCH 8040-C3	1,66	10 500	99,1/98,7	35	375	0,86	34	
KCH 8040-C-DRY	1,96	12 400	99,1/98,5	41	440	0,66	26	
KCH 8040-C3-DRY	1,66	10 500	99,1/98,5	35	375	0,86	34	
KCH 8040-F	1,96	12 400	99,1/98,7	41	440	0,66	26	
KCH 8040-F3	1,66	10 500	99,1/98,7	35	375	0,86	34	
KCH 8040-F-DRY	1,96	12 400	99,1/98,5	41	440	0,66	26	
KCH 8040-F3-DRY	1,66	10 500	99,1/98,5	35	375	0,86	34	

Operating conditions

Recommended operation pressure, MPa	0,6-0,9
Maximum operation pressure, MPa	4,1/2,1
Maximum pressure drop, MPa	0,07
Operation temperature, °C ¹⁾	4-45
pH at continuous operation at T<35°C	2-11
pH at continuous operation at T<45°C	3-10,5
Chemical cleaning, temperature, °C****	T<45 T<35 T<25
CIP pH (short time operation)	2-11 1-11,5 1-12
Free chlorine content, mg/l max	0,1
Maximum feed flow, m3/hr	17
Concentrate/permeate ratio on each element, min	5:1
SDI (15 minutes test), max	5
Turbidity, NTU max	1



Model	A mm	B mm	C mm
KCH 8040-C (3)	1016	200,1	28,6
KCH 8040-C3-DRY	1016	200,1	28,6
KCH 8040-F (3)	1016	200,1	28,6
KCH 8040-F3-DRY	1016	200,1	28,6



membranum®

TAP & LOW-MINERALIZED WATER

Extra low pressure

Reverse osmosis Membrane elements

KCH Series

Product Description

Membrane material	Composite polyamide
Membrane type	ORM33K
Design	Spiral wound
Features	Fiberglass shell (-C) or shrink film-wrapped (-F)

*

Test conditions:
test solution of NaCl
500 mg/l, P=0.7 MPa,
T=25°C, pH=7,5.
Recovery -15%

*

Flow of each single element in a batch may vary for +/-15%

**

Nominal rejection is reached after 48 hours of continuous operation on test solution

Minimal rejection of a new element after 20 minutes' test on test solution

For details see operation manual

Specification

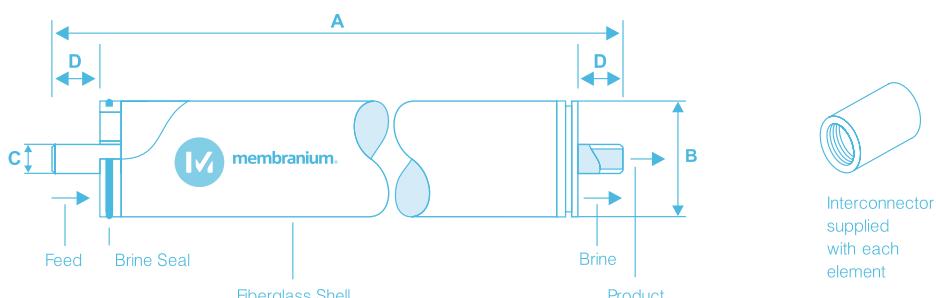
Model	Flow*		normal** / minimal***	Area		Spacer	
	l/hr	GPD		m ²	ft ²	mm	mil
KCH 4040-C	410	2500	99,1/98,3	8,6	93	0,66	26
KCH 4040-C-DRY	410	2500	99,1/98,0	8,6	93	0,66	26
KCH 4040-F	410	2500	99,1/98,3	8,6	93	0,66	26
KCH 4040-F-DRY	410	2500	99,1/98,0	8,6	93	0,66	26

Operating conditions

Recommended operation pressure, MPa	0,6-0,9
Maximum operation pressure, MPa	4,1/2,1
Maximum pressure drop, MPa	0,07
Operation temperature, °C ¹⁾	4-45
pH at continuous operation at T<35°C	2-11
pH at continuous operation at T<45°C	3-10,5
Chemical cleaning, temperature, °C****	T<45 T<35 T<25
CIP pH (short time operation)	2-11 1-11,5 1-12
Free chlorine content, mg/l max	0,1
Maximum feed flow, m ³ /hr	3,6
Concentrate/permeate ratio on each element, min	5:1
SDI (15 minutes test), max	5
Turbidity, NTU max	1

1)

For operation at a temperature higher than 30°C pH should be less than 10



Model	A mm	B mm	C mm	D mm
KCH 4040-C	1016	100	19,1	26,7
KCH 4040-C-DRY	1016	100	19,1	26,7
KCH 4040-F	1016	100	19,1	26,7
KCH 4040-F-DRY	1016	100	19,1	26,7

Additional information on reverse osmosis membrane elements

Notes	<p>Flow of each single element in a lot may vary:</p> <ul style="list-style-type: none"> • $\pm 15\%$ for elements KM8040-C and KCH 8040-C(F), KCH 4040-C(F), • $\pm 20\%$ for elements KM4040-C, • $+25\% / -15\%$ for elements series KC and K, • $+15\% / -20\%$ for elements series KH <p>Nominal rejection of 4040 and 8040 membrane elements is achieved after 48 hours of continuous operation on test solution.</p> <p>Each element is preserved with a solution containing 1% of sodium metabisulphite and tightly packed under nitrogen in a barrier film bag.</p> <p>Each element of KH, KCH series is preserved with a solution containing 1% of sodium metabisulfite, 10% of propylene glycol and is vacuum packed under nitrogen in a barrier film bag.</p> <p>Elements DRY are vacuum packed under nitrogen in a barrier film bag.</p>
Important information	<p>At the first launch an element should be washed for at least 1 hour.</p> <p>In order to prevent destruction of elements the following should be observed:</p> <ul style="list-style-type: none"> • Do not allow excessive feed pressure and feed flow above the levels indicated in the specification. • Take measures for protection of membrane elements from back pressure on the permeate side. The pressure on permeate side under no circumstances must exceed pressure at the feed of membrane element. • Avoid hydraulic hammer during start up, operation and shut down of reverse osmosis systems. • During start up of reverse osmosis system the feed pressure must be increased up to the operating level gradually within 30-60 second (at the max. rate of 0,1 MPa/sec) • Take measures for prevention of membrane elements' operation in dead-end mode without concentrate discharge.
Operating conditions	<ul style="list-style-type: none"> • Operating pressure may vary: For sea water from 4,5 up to 7 MPa, for brackish water from 1 up to 4 MPa, for slightly salted and tap water from 0,5 up to 2,0 MPa depending on the salt content of feed water, temperature, recovery, operating life of membrane elements. • Pressure drop must not exceed 0,07 MPa on each element and 0,4 MPa on each pressure vessel. • Feed water temperature must not exceed 45 OC. At pH 10 the maximum temperature of the feed water must not exceed 35 OC • Time of chemical cleaning of membrane elements within the range of pH 1-12 must not exceed 4 hours, occurrence of chemical cleaning not exceeding 1 time per month. • The maximum turbidity of feed water must not exceed 1 NTU, and SDI<5. For long and stable operation of reverse osmosis plants it is recommended to pre-treat feed water to turbidity below 0,2 NTU and SDI down to the level of 1-3. • Recovery on each membrane element 1 m (40 inch) long must not exceed 15% for all types of membrane elements, except sea water elements. Recovery for sea water membrane elements must not exceed 10%. For long and stable operation of sea water membrane plats it is recommended to maintain recovery on each membrane element 1 m long within 6 – 8%.
Chemical compatibility	<ul style="list-style-type: none"> • Chlorine: it is not recommended to expose composite polyamide membrane to free chlorine and other oxidizers (permanganate, ozone, bromine, iodine). In case such oxidizers are present in the feed water measures should be taken for their removal. • Cationic polymers and cationic surfactants can cause irreversible changes of composite polyamide membranes' properties. For this reason they should not be used during operation and chemical cleaning of reverse osmosis membrane elements. • For lubrication of rubber seals glycerin should be used. Using petroleum based lubricants can be the cause of membrane elements' failure.
General	<ul style="list-style-type: none"> • Membrane elements should be stored wet after use. • To prevent biological contamination of membrane elements during prolonged shut-down of reverse osmosis systems it is recommended to run preservation of elements (or system) following the manufacturer's instructions. • The customer shall bear responsibility for use of chemical agents not recommended for use with membrane elements. • The customer's failure to follow recommendations of operating membrane elements may result in withdrawal of the manufacturer's warranty obligations.
Technical support	MEMBRANIUM's experienced scientific and technical personnel is able to render technical support to end users and engineering companies to design new or optimize existing reverse osmosis systems.
Warranty	Terms and Conditions of warranty on membrane elements you can find on our website: www.membranium.com



membranum®

NANOFILTRATION

membrane elements

Product Description

Membrane material
Membrane type
Design
Features

Poly(piperazine amide)
NaRM
Spiral wound
Shrink film-wrapped (-F)

Specification

*

Test conditions:
test solution of NaCl
500 mg/l, P=0,7 MPa,
T=25 °C, pH=7,5.
Recovery -15%

**

Test conditions:
test solution of MgSO4
2000 mg/l, P=0,7
MPa, T=25 °C, pH=7,5.
Recovery -15%

*

Flow of each single
element in a batch may
vary for +/-20%

For details see
operation manual

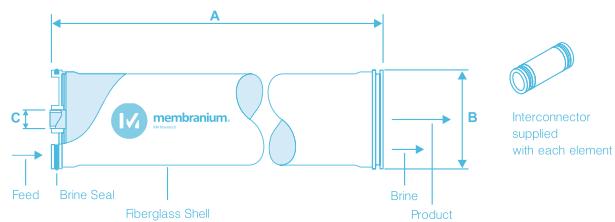
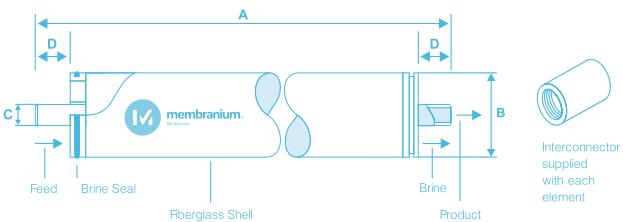
1)

For operation at
a temperature higher than 30°C
pH should be less than 10

Operating conditions

Model	Flow*		Rejec-tion	Area		Spacer	
	m3/hr	GPD		%	m2	ft2	mm
4040-F, C	0,32*/0,26**	2000*/1600**	55*/99**	8	86	0,71	28
4040-F2,C1	0,28*/0,23**	1800*/1440**	55*/99**	7,7	83	0,79	31
4040-F3,C2	0,27*/0,22**	1700*/1350**	55*/99**	7,4	80	0,86	34
4040-F,C-DRY	0,32*/0,26**	2000*/1600**	55*/99**	8	86	0,71	28
4040-F2,C-DRY	0,28*/0,23**	1800*/1440**	55*/99**	7,7	83	0,79	31
4040-F3,C-DRY	0,27*/0,22**	1700*/1350**	55*/99**	7,4	80	0,86	34
8040-F,C	1,5*/1,2**	9500*/7600**	55*/99**	37	400	0,71	28
8040-F2,C2	1,4*/1,1**	9000*/7200**	55*/99**	35	375	0,79	31
8040-F3,C3	1,3*/1,0**	8500*/6800**	55*/99**	33	360	0,86	34
8040-F,C-DRY	1,5*/1,2**	9500*/7600**	55*/99**	37	400	0,71	28
8040-F2,C-DRY	1,4*/1,1**	9000*/7200**	55*/99**	35	375	0,79	31
8040-F3,C-DRY	1,3*/1,0**	8500*/6800**	55*/99**	33	360	0,86	34

Recommended operation pressure, MPa	0,6-2,0
Maximum operation pressure, MPa, tape overwrap	2,1
Maximum pressure drop, MPa	0,07
Operation temperature, °C 1)	4-45
pH at continuous operation at T<35°C	2-11
pH at continuous operation at T<45°C	3-10,5
Chemical cleaning, temperature, °C ****	T<45 T<35 T<25
CIP pH (short time operation)	2-11 1-11,5 1-12
Acceptable Hydrogen peroxide concentration	
during continuous operation, mg/l	20
during disinfection (not longer than 30 min), mg/l	1000
Acceptable free Chlorine concentration	
during continuous operation, mg/l	1
during disinfection (not longer than 30 min), mg/l	5
Maximum feed flow, m3/hr	3,6
Concentrate/permeate ratio on each element, min	5:1
Turbidity, NTU max	1



Model	A mm	B mm	C mm	D mm
4040-F(2,3)	1016	100	19,1	26,7
4040-F-DRY (2,3)	1016	100	19,1	26,7

Model	A mm	B mm	C mm
8040-F(2,3)	1016	200,1	28,6
8040-F-DRY(2,3)	1016	200,1	28,6



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ULTRAFILTRATION

membrane elements

Product Description

Membrane material	Polyethersulfone
Membrane type	URM-20, URM-50 with proteins molecular weight cut-off (MWCO) of over 20 000 Daltons, 50 000 Daltons
Design	Spiral wound
Features	Shrink film-wrapped (-F)

Specification

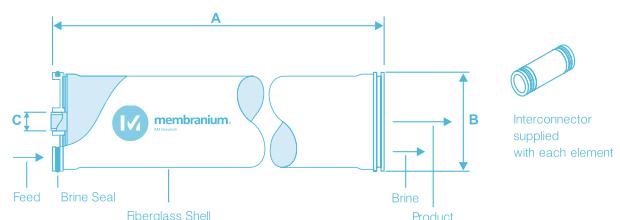
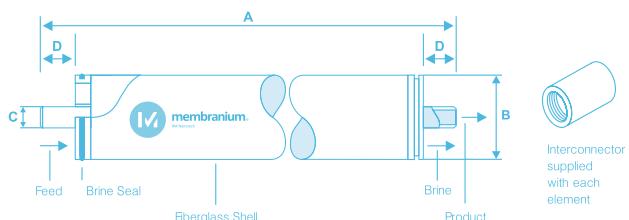
Model	Rejection by protein , %	Area		Spacer	
		m2	ft2	mm	mil
4040-F20-1	90	8	86	0,71	28
4040-F20-2	90	7,7	83	0,79	31
4040-F20-3	90	7,4	80	0,86	34
8040-F20-1	90	39	420	0,71	28
8040-F20-2	90	37	400	0,79	31
8040-F20-3	90	35	375	0,86	34
4040-F50-1	98	8	86	0,71	28
4040-F50-2	98	7,7	83	0,79	31
4040-F50-3	98	7,4	80	0,86	34
8040-F50-1	98	39	420	0,71	28
8040-F50-2	98	37	400	0,79	31
8040-F50-3	98	35	375	0,86	34

Operating conditions

Recommended operation pressure, MPa	0,2-1,5
Maximum operation pressure, MPa	2,1
Maximum pressure drop, MPa	0,07
Operation temperature, °C ¹⁾	4-50
pH at operation	2-11
CIP pH (short time operation)	1-12
Acceptable free Chlorine concentration during disinfection (not longer than 30 min), mg/l	200
Maximum feed flow, m3/hr	6,8
Concentrate/permeate ratio on each element, min	5:1
Turbidity, NTU max	1

1)

For operation at a temperature higher than 30°C pH should be less than 10



Model	A mm	B mm	C mm	D mm
4040-F20,F50-1/2/3	1016	100	19,1	26,7

Model	A mm	B mm	C mm
8040-F20,F50-1/2/3	1016	200,1	28,6

Additional information on nanofiltration & ultrafiltration membrane elements.

Notes	Each nanofiltration element is preserved with a solution containing 1% of sodium metabisulphite and tightly packed under nitrogen in a barrier film bag. •Elements DRY are vacuum packed under nitrogen in a barrier film bag. •Each element is tightly packed under vacuum in a polyethylene bag dry.
Important information	<p>At the first launch an element should be washed for at least 1 hour.</p> <p>In order to prevent destruction of elements the following should be observed:</p> <ul style="list-style-type: none"> •Do not allow excessive feed pressure and feed flow above the levels indicated in the specification. •Take measures for protection of membrane elements from back pressure on the permeate side. The pressure on permeate side under no circumstances must exceed pressure at the feed of membrane element. •Avoid hydraulic hammer during start up, operation and shut down of membrane systems. •During start up of membrane system the feed pressure must be increased up to the operating level gradually within 30-60 second (at the max. rate of 0,1 MPa/sec) •Take measures for prevention of membrane elements' operation in dead-end mode without concentrate discharge.
Operating conditions	<ul style="list-style-type: none"> •Operating pressure may vary: for nanofiltration 0,5 up to 2,0 MPa depending on the salt content of feed water, temperature, recovery, operating life of membrane elements. •Pressure drop must not exceed 0,07 MPa on each element and 0,4 MPa on each pressure vessel. •Feed water temperature must not exceed 45°C. At pH 10 the maximum temperature of the feed water must not exceed 35°C •Time of chemical cleaning of membrane elements within the range of pH 1-13 must not exceed 4 hours. •The maximum turbidity of feed water must not exceed 1 NTU, and SDI<5. For long and stable operation of a nanofiltration plants it is recommended to pre-treat feed water to turbidity below 0,2 NTU and SDI down to the level of 1-3. •Recovery on each membrane element 1 m (40 inch) long must not exceed 15% for all types of membrane elements.
Chemical compatibility	<ul style="list-style-type: none"> •Chlorine, hydrogen peroxide: For disinfection of nanofiltration membrane elements it is recommended to use sodium hypochlorite with maximum concentration of free chlorine up to 5 mg/l or hydrogen peroxide with maximum concentration up to 1000 mg/l. For disinfection of ultrafiltration membrane elements it is recommended to use sodium hypochlorite with maximum concentration of free chlorine up to 200 mg/l. •Cationic polymers and cationic surfactants can cause irreversible changes polypiperazine membranes' properties. For this reason they should not be used during operation and chemical cleaning of nanofiltration membrane elements. •For lubrication of rubber seals glycerin should be used. Using petroleum based lubricants can be the cause of membrane elements' failure.
General	<ul style="list-style-type: none"> •Membrane elements should be stored wet after use. •To prevent biological contamination of membrane elements during prolonged shut-down of reverse osmosis systems it is recommended to run preservation of elements (or system) following the manufacturer's instructions. •The customer shall bear responsibility for use of chemical agents not recommended for use with membrane elements. •The customer's failure to follow recommendations of operating membrane elements may result in withdrawal of the manufacturer's warranty obligations.
Technical support	MEMBRANIUM's experienced scientific and technical personnel is able to render technical support to end users and engineering companies to design new or optimize existing membrane systems.
Warranty	Terms and Conditions of warranty on membrane elements you can find on our website: www.membranium.com

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