



Membrane elements

Product catalog

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.

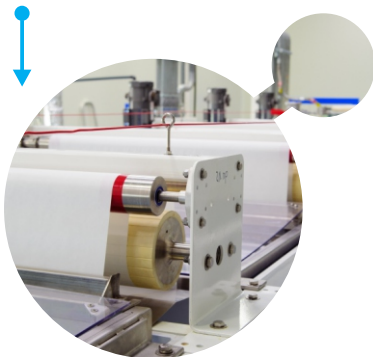
1975

Gas separation membranes lab establishment.

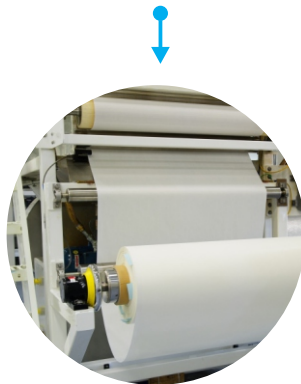
1970

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

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:

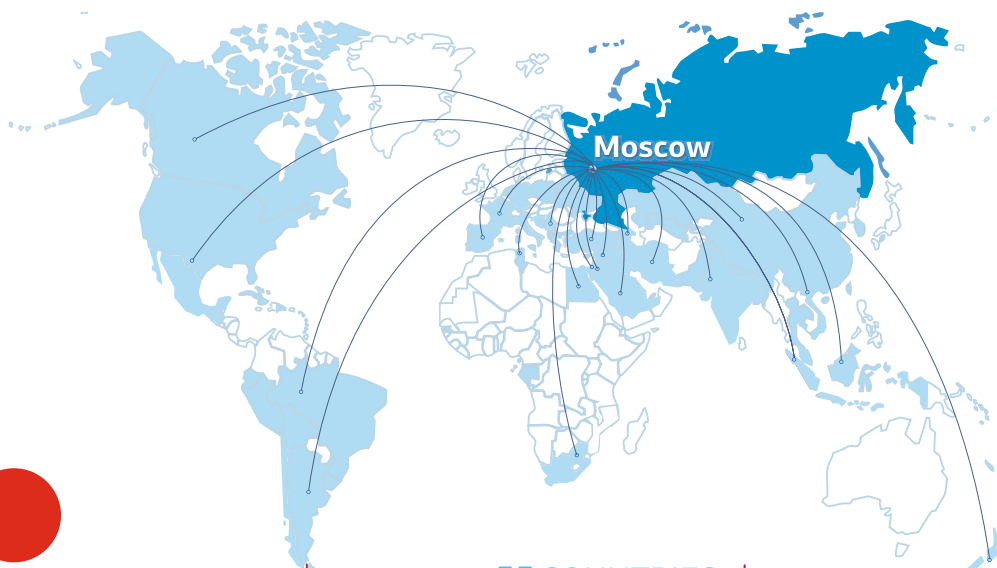
- ✓ SW membrane elements provide higher flow while maintaining high rejection level
- ✓ NF membrane elements do not require active chlorine removal from feed water before introduction into the system
- ✓ Membrane elements can be supplied both in wet or dry conditions
- ✓ Quality Control according to ISO 9001:2015

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



WORLDWIDE PRESENCE



55 COUNTRIES

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تهران، کیلومتر ۲۱ بزرگراه لشگری (جاده مخصوص کرج)

روبروی پالایشگاه نفت پارس، پلاک ۱۲

Reverse osmosis elements					
Sea water					
High rejection elements					
KM 8040-C1M1	SW30HRLE-440i		TM820E-400	AD-440	RE8040-SHA440
KM 8040-C2M1	SW30HRLE-400	SWC4 MAX	TM820E-400		RE8040-SHA400
KM 8040-C3M1	SW30HRLE-370/34i	SWC4-LD	TM820E-400	AD-400,34	RE8040-SHA
KM 4040-C1M1	SW30HR LE-4040	SWC5-LD-4040	TM810V	AD-90	RE4040-SHA
Standart elements					
KM 8040-C	SW30XLE-440i			AE-440	RE8040-SHF440
KM 8040-C2	SW30XLE-400i		TM820F-400		RE8040-SHF400
KM 8040-C3			TM820F-370	AE-440,34	RE8040-SHF
KM 4040-C	SW30-4040	SWC6-4040	TM810F		RE4040-SHF
Brackish water					
High rejection elements					
KC 8040-C1M1	BW30HR-440	CPA3	TM720-440	AG-440	RE8040- BE440
KC 8040-C2M1	BW30-400	CPA3	TM720-400	AG-400	RE8040- BE
KC 8040-C3M1	BW30FR-400/34	CPA2		AG-400, 34	RE8040- BN
	BW30-365				
KC 4040-C1M1	BW30-4040	CPA2-4040	TM710	AG-90	RE4040- BE
Low pressure elements					
KH 8040-C1M1	LE-400	ESPA1	TMG20-400	AK-440-LE	RE8040- BLN
KH 4040-C1M1	LE-4040	ESPA1-4040	TMG10	AK-90-LE	RE4040- BLN
Extra low pressure elements					
KCH 8040-C	XLE-440**				RE8040- BLF
KCH 4040-C	XLE-4040	ESPA4-4040			RE4040- BLF

** Adapter is required for the core tube

	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)	Recovery (%)	T°C		
Sea water												
Standart elements												
KM 8040-C	99,7	99,55	10500	8925	1,66		3,2% NaCl	5,5	10	25	4,5-6,5	17,1
KM 8040-C2	99,7	99,55	9500	8075	1,50		3,2% NaCl	5,5	10	25	4,5-6,5	17,2
KM 8040-C3	99,7	99,55	9000	7600	1,42		3,2% NaCl	5,5	10	25	4,5-6,5	17,3
KM 4040-C	99,7	99,4	2100	1680		330	3,2% NaCl	5,5	8	25	4,5-6,5	4,1
High rejection membrane elements												
KM 8040-C1M1	99,8	99,6	8000	6800	1,26		3,2% NaCl	5,5	10	25	4,5-6,5	17,1
KM 8040-C2M1	99,8	99,6	7600	6460	1,20		3,2% NaCl	5,5	10	25	4,5-6,5	17,2
KM 8040-C3M1	99,8	99,6	7100	6035	1,12		3,2% NaCl	5,5	10	25	4,5-6,5	17,3
KM 4040-C1M1	99,75	99,4	1700	1360		270	3,2% NaCl	5,5	8	25	4,5-6,5	4,1
Brackish water												
High rejection membrane elements												
KC 8040-C1M1	99,7	99,5	11500	9775	1,81		0,15 % NaCl	1,5	15	25	1,2-2,0	17,1
KC 8040-C2M1	99,7	99,5	11000	9350	1,73		0,15 % NaCl	1,5	15	25	1,2-2,0	17,2
KC 8040-C3M1	99,7	99,5	10300	8755	1,62		0,15 % NaCl	1,5	15	25	1,2-2,0	17,3
KC 4040-C1M1	99,7	99,5	2500	2125		390	0,15 % NaCl	1,5	15	25	1,2-2,0	4,1
KC 4040-C2M1	99,7	99,5	2300	1955		360	0,15 % NaCl	1,5	15	25	1,2-2,0	4,0
KC 4040-C3M1	99,7	99,5	2200	1870		350	0,15 % NaCl	1,5	15	25	1,2-2,0	4,0
Low pressure membrane elements												
KH 8040-C1M1	99,4	99,2	11500	9775	1,81		0,15 % NaCl	1,0	15	25	0,9-1,2	17,1
KH 8040-C2M1	99,4	99,2	11000	9350	1,73		0,15 % NaCl	1,0	15	25	0,9-1,2	17,2
KH 8040-C3M1	99,4	99,2	10500	8925	1,66		0,15 % NaCl	1,0	15	25	0,9-1,2	17,3
KH 4040-C1M1	99,4	99,2	2400	1925		380	0,15 % NaCl	1,0	15	25	0,9-1,2	4,1
KH 4040-C2M1	99,4	99,2	2300	1825		360	0,15 % NaCl	1,0	15	25	0,9-1,2	4,0
KH 4040-C3M1	99,4	99,2	2100	1675		330	0,15 % NaCl	1,0	15	25	0,9-1,2	4,0
Extra low pressure membrane elements												
KCH 8040-C	99,1	98,3	12400	10540	1,96		0,05 % NaCl	0,69	15	25	0,6-0,9	17,1
KCH 8040-C2	99,1	98,3	11500	9775	1,81		0,05 % NaCl	0,69	15	25	0,6-0,9	17,2
KCH 8040-C3	99,1	98,3	10500	8925	1,66		0,05 % NaCl	0,69	15	25	0,6-0,9	17,3
KCH 4040-C	99,1	98,3	2600	2210		410	0,05 % NaCl	0,69	15	25	0,6-0,9	4,1

C1 - Feed spacer 28 mil

C2 - Feed spacer 31 mil

C3 - Feed spacer 34 mil

F - Shrink film wrapped

C - Fiberglass shell

DRY or D - Dry membrane elements

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

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تهران، کیلومتر ۲۱ بزرگراه لشگری (جاده مخصوص کرج)

روبروی پالایشگاه نفت پارس، پلاک ۱۲

KM Series

Product Description

Membrane material	Composite polyamide
Membrane type	ORM45K
Design	Spiral wound

Specification

*

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)

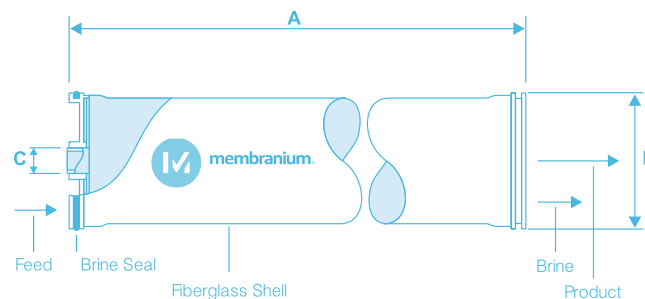
For operation at
a temperature higher than 35°C
pH should be less than 10,5

Model	Flow*		Rejection*	Area		Spacer	
	m3/hr	GPD	normal**/ minimal***	m2	ft2	mm	mil
KM 8040-C	1,66	10500	99,7/99,55	39	420	0,72	28
KM 8040-C2	1,50	9500	99,7/99,55	37	400	0,79	31
KM 8040-C3	1,42	9000	99,7/99,55	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 1-13 1-13
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



Interconnector
supplied
with each element

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

KM Series

Product Description

Membrane material	Composite polyamide
Membrane type	ORM45K
Design	Spiral wound

Specification

Model	Flow*		Rejection*	Area		Spacer	
	l/hr	GPD	normal**/ minimal***	m2	ft2	mm	mil
KM 4040-C	330	2100	99,7 /99,4	8,0	86	0,72	28



*

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.

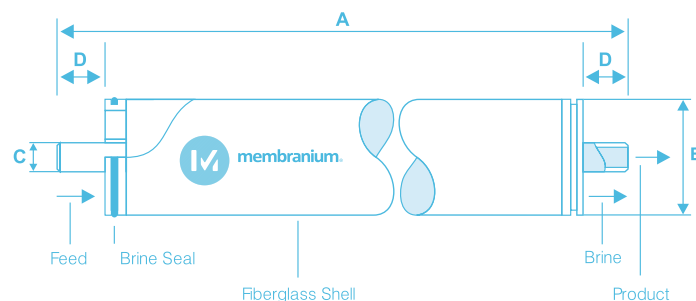
For details see
operation manual

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 1-13 1-13
Free chlorine content, mg/l max	0,1
Maximum feed flow, m3/hr	3,6
Concentrate/permeate ratio on each element, min	10:1
SDI (15 minutes test), max	5
Turbidity, NTU max	1

1)

At continuous operation
with a pH above 10.5,
the temperature must not exceed 35 °C



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

Product Description

Membrane material	Composite polyamide
Membrane type	ORM45KM
Design	Spiral wound

Specification

Model	Flow*		Rejection*	Area		Spacer	
	m3/hr	GPD	normal**/ minimal***	m2	ft2	mm	mil
KM 8040-C1M1	1,26	8000	99,8/99,6	39	420	0,72	28
KM 8040-C2M1	1,20	7600	99,8/99,6	37	400	0,79	31
KM 8040-C3M1	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 1-13 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

*

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

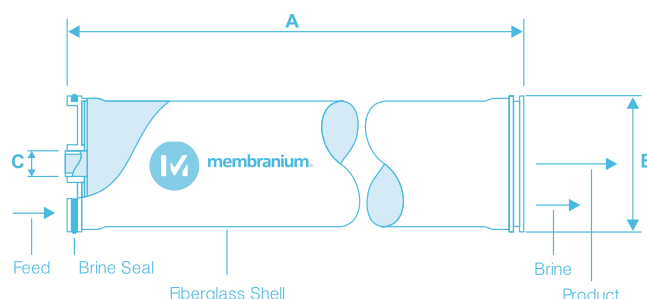
Minimal rejection
of a new element after
20 minutes' test on
test solution.

1)

At continuous operation
with a pH above 10.5,
the temperature must not exceed 35 °C

2)

Max 20 minutes



Model	A mm	B mm	C mm
KM 8040-C1(2,3)M1	1016	200,1	28,6



SEA WATER High Rejection Reverse osmosis Membrane elements KM Series

Product Description

Membrane material	Composite polyamide
Membrane type	ORM45KM
Design	Spiral wound

Specification

*

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.

Operating conditions

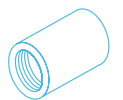
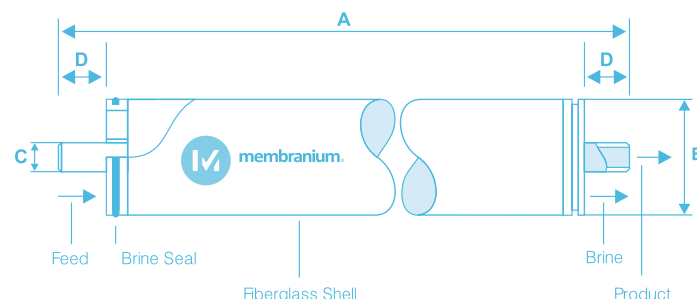
Recommended operation pressure, MPa	4,5-6,5
Maximum operation pressure, MPa	7
Maximum pressure drop, MPa	0,1
Operation temperature, °C ¹⁾	4-45
pH at continuous operation at T<35°C	2-11
pH at continuous operation at T<45°C	3-10.5
Chemical cleaning, temperature, °C	T<45 T<35 T<25
CIP pH (short time operation)	2-11 1-13 1-13 ²⁾
Free chlorine content, mg/l max	0,1
Maximum feed flow, m3/hr	3,6
Concentrate/permeate ratio on each element, min	10:1
SDI (15 minutes test), max	5
Turbidity, NTU max	1

1)

At continuous operation
with a pH above 10.5,
the temperature must not exceed 35 °C

2)

Max 20 minutes



Interconnector
supplied
with each
element

Model	A mm	B mm	C mm	D mm
KM 4040-C1M1	1016	100	19,1	26,7

Product Description

Membrane material Composite polyamide
Membrane type ORM31K
Design Spiral wound

KC Series

Specification

Model	Flow*		Rejection*	Area		Spacer	
	m3/hr	GPD	normal**/ minimal***	m2	ft2	mm	mil
KC 8040-C1M1	1,81	11 500	99,7/99,5	39	420	0,72	28
KC 8040-C2M1	1,73	11 000	99,7/99,5	37	400	0,79	31
KC 8040-C3M1	1,62	10 300	99,7/99,5	35	375	0,86	34
KC 8040-C3M1-D	1,62	10 300	99,7/99,5	35	375	0,86	34



*

Test conditions:
test solution of NaCl
1500 mg/l, P=1,5
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

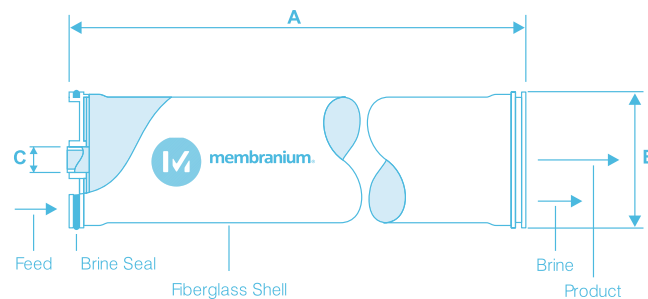
Minimal rejection
of a new element after
20 minutes' test
on test solution

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 1-13 1-13
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

1)

At continuous operation
with a pH above 10,5,
the temperature must not exceed 35 °C



Interconnector
supplied
with each element

Model	A mm	B mm	C mm
KC 8040-C1(2,3)M1/C1(2,3)M1-D	1016	200,1	28.6

Product Description

Membrane material
Composite polyamide

Membrane type
ORM31K

Design
Spiral wound

KC Series

Specification

*

Test conditions:
test solution of NaCl
1500 mg/l, P=1,5
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)

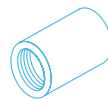
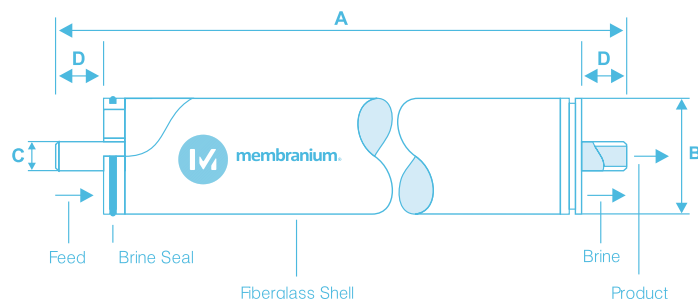
At continuous operation
with a pH above 10.5,
the temperature must not exceed 35 °C

Model	Flow*		Rejection*	Area		Spacer	
	l/hr	GPD		m2	ft2	mm	mil
KC 4040-C1M1	390	2500	99,7/99,5	8,3	90	0,72	28
KC 4040-C2M1	360	2300	99,7/99,5	7,9	85	0,79	31
KC 4040-C3M1	350	2200	99,7/99,5	7,5	80	0,86	34
KC 4040-C3M1-D	350	2200	99,7/99,5	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	1-13	1-13
Free chlorine content, mg/l max	0,1		
Maximum feed flow, m3/hr	3,6		
Concentrate/permeate ratio on each element, min	5:1		
SDI (15 minutes test), max	5		
Turbidity, NTU max	1		



Interconnector
supplied
with each
element

Model	A mm	B mm	C mm	D mm
KC 4040-C1(2,3)M1/C1(2,3)M1-D	1016	100	19,1	26,7

KH Series

Product Description

Membrane material Composite polyamide
Membrane type ORM32KM
Design Spiral wound

Specification

*

Test conditions:
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%

**

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)

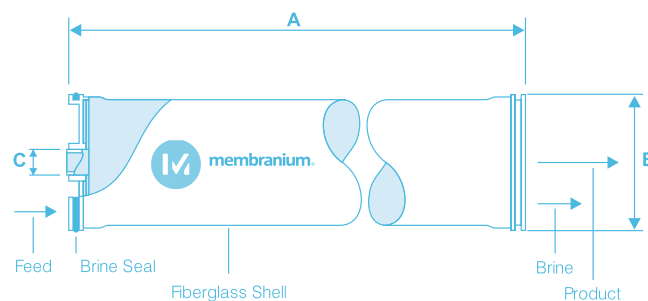
At continuous operation
with a pH above 10.5,
the temperature must not exceed 35 °C



Model	Flow*		Rejection*	Area		Spacer	
	m3/hr	GPD		m2	ft2	mm	mil
KH 8040-C1M1	1,81	11 500	99,4/99,2	39	420	0,72	28
KH 8040-C2M1	1,73	11 000	99,4/99,2	37	400	0,79	31
KH 8040-C3M1	1,66	10 500	99,4/99,2	35	375	0,86	34

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 1-13 1-13
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
KH 8040-C1(2,3)M1	1016	200,1	28,6

KH Series

Product Description

Membrane material
Composite polyamide

Membrane type
ORM32KM

Design
Spiral wound

Specification

Test conditions:
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 +/- 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

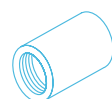
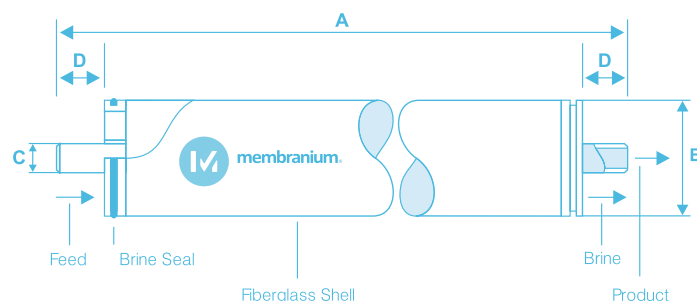
1)
At continuous operation
with a pH above 10.5,
the temperature must not exceed 35 °C



Model	Flow*		Rejection*	Area		Spacer	
	l/hr	GPD		m2	ft2	mm	mil
KH 4040-C1M1	380	2400	99,4/99,2	8,0	86	0,72	28
KH 4040-C2M1	360	2300	99,4/99,2	7,9	85	0,79	31
KH 4040-C3M1	330	2100	99,4/99,2	7,5	80	0,86	34

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	1-13	1-13
Free chlorine content, mg/l max	0,1		
Maximum feed flow, m3/hr	3.6		
Concentrate/permeate ratio on each element, min	5:1		
SDI (15 minutes test), max	5		
Turbidity, NTU max	1		



Interconnector
supplied
with each
element

Model	A mm	B mm	C mm	D mm
KH 4040-C1(2,3)M1	1016	100	19,1	26,7

LOW-MINERALIZED WATER

Extra low pressure

Reverse osmosis Membrane elements

KCH Series

Product Description

Membrane material	Composite polyamide
Membrane type	ORM33K
Design	Spiral wound

Specification

*

Test conditions:
test solution of NaCl
500 mg/l, P=0,69 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)

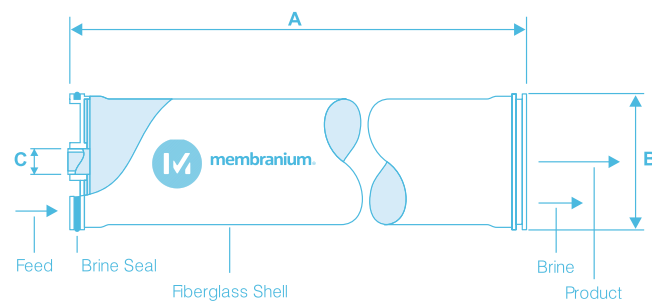
At continuous operation
with a pH above 10.5,
the temperature must not exceed 35 °C



Model	Flow*		Rejection*	Area		Spacer	
	m3/hr	GPD		m2	ft2	mm	mil
KCH 8040-C	1,96	12 400	99,1/98,3	41	440	0,67	26
KCH 8040-C2	1,81	11 500	99,1/98,3	37	400	0,79	31
KCH 8040-C3	1,66	10 500	99,1/98,3	35	375	0,86	34
KCH 8040-C (-D)	1,96	12 400	99,1/98,3	41	440	0,67	26

Operating conditions

Recommended operation pressure, MPa	0,6-0,9
Maximum operation pressure, MPa	4,1
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 1-13 1-13
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



Interconnector
supplied
with each element

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

KCH Series

Product Description

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

Specification

Model	Flow*		Rejection*	Area		Spacer	
	l/hr	GPD	normal** / minimal***	m2	ft2	mm	mil
KCH 4040-C	410	2600	99,1/98,3	8,6	93	0,67	26
KCH 4040-C(-D)	410	2600	99,1/98,3	8,6	93	0,67	26
KCH 4040-F	410	2600	99,1/98,3	8,6	93	0,67	26
KCH 4040-F(-D)	410	2600	99,1/98,3	8,6	93	0,67	26



*

Test conditions:
test solution of NaCl
500 mg/l, P=0,69 MPa
T=25°C, pH=7,5
Recovery -15%t

*

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

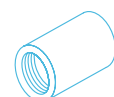
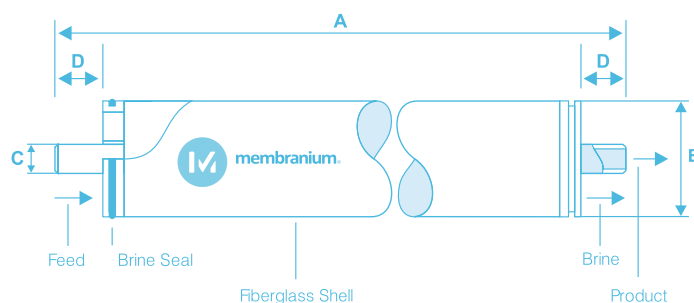
For details see operation manual

Operating conditions

Recommended operation pressure, MPa	0,6-0,9
Maximum operation pressure, MPa Fiberglass shell / shrink film-wrapped	4,1/2,1
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 1-13 1-13
Free chlorine content, mg/l max	0,1
Maximum feed flow, m3/hr	3,6
Concentrate/permeate ratio on each element, min	5:1
SDI (15 minutes test), max	5
Turbidity, NTU max	1

1)

At continuous operation with a pH above 10,5, the temperature must not exceed 35 °C



Interconnector supplied with each element

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

Additional information on reverse osmosis membrane elements

Comments	Performance of each element in the batch may vary by $\pm 15\%$ ($\pm 20\%$ for the elements of KM4040-C/C1M1, KH4040-C1(2,3)M1). Nominal rejection of 4040 and 8040 membrane elements is achieved after 48 hours of continuous operation on the test solution. To preserve operational characteristics and prevent microbiological effects, membrane elements are preserved with a solution containing 2% sodium propionate (for the elements of KC, KCH series); 1 % sodium metabisulfite (for the elements of KM series); 1 % sodium metabisulfite and 10 % propylene glycol (for the elements of KH series).
Important information	The element should be washed off from the preservative for at least 1 hour at the first start. Measures to prevent destruction of reverse osmosis spiral wound membrane element: - Do not exceed input pressure and input flow above the values indicated in the specification. - Take measures to protect membrane elements from back pressure (return pressure) from the permeate side. The pressure from the permeate side must not exceed the pressure at the inlet of the membrane element under any circumstances. - Avoid hydraulic shocks when starting, operating and stopping reverse osmosis systems. - When starting a reverse osmosis system, increase the inlet pressure to the operating value smoothly for 30 ± 60 seconds (at a speed of no more than 0.1 MPa/s). Take measures to prevent operation of membrane elements in a dead-end mode without dumping the concentrate.
Operating conditions	• Operating pressure may vary depending on the type of membrane elements, salinity of feed water, temperature, degree of filtrate extraction, service life of membrane elements • Pressure drop should not exceed 0.07-0.1 MPa (depending on the type of spiral wound membrane element) on each element and 0.35 MPa on each membrane vessel of 6 elements. • Temperature of feed water should not exceed 45 °C. At pH above 10.5 the maximum temperature of feed water should not exceed 35 °C * • Chemical washes of spiral wound membrane elements are carried out in the pH range of 1 ± 13 depending on the type of cleaning compositions. At the same time, frequency of wash should be no more than 1 time per month. • Maximum turbidity of feed water should not exceed 1 NTU, and SDI <5. For long-term and stable operation of reverse osmosis plants, it is recommended to pre-purify feed water to a turbidity of less than 0.2 NTU and SDI to the level of 1-3. • Permeate recovery ratio (PRR) on each membrane element with a length of 1 m (40 inches) should not exceed 15 % for the elements of KC, KH, KCH series. PRR for the elements of KM series should not exceed 10 %. For long-term and stable operation of marine reverse osmosis plants, it is recommended to maintain PRR on each membrane element with a length of 1 m within 6-8 %.
Chemical combatibility	• Chlorine: When operating or washing reverse osmosis membrane elements, the presence of free chlorine or other oxidizing agents (permanganate, ozone, bromine, iodine) in feed or washing water is not allowed. In case of the presence of residual free chlorine in the quantity of more than 0.1 mg/l, dechlorination is necessary. • Cationic polymers and cationic surfactants can cause irreversible changes in the properties of composite polyamide membranes. Therefore, they should not be used during operation and chemical wash of reverse osmosis membrane elements. • Glycerin should be used to lubricate rubber seals. The use of lubricants based on petroleum products can cause failure of membrane elements.
General information	• Membrane elements should be stored in wet condition after use. • It is necessary to apply the preservation of reverse osmosis membrane elements in the event of a stop of membrane system for more than 48 hours. For short stops, we recommend to carry out usual cleaning procedure. • Consumer is responsible for the use of chemicals that are not recommended for use with membrane elements. • Ignoring the recommendations for the operation of membrane elements by the consumer can cause warranty cancellation from the side of manufacturing company.
Technical support	Membranium has an experienced scientific and technical staff capable of providing technical support to both end users and engineering companies when designing new or optimizing existing reverse osmosis systems

Product Description

Membrane material
Membrane type
Design
Features

Polypiperazineamide
NaRM
Spiral wound
Fiberglass shell (-C) or 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%

*

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

**

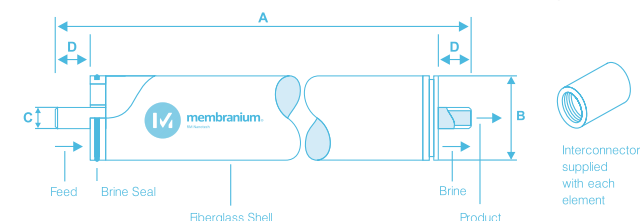
Nominal rejection
is reached after 48
hours of continuous
operation on test
solution

For details see
operation manual

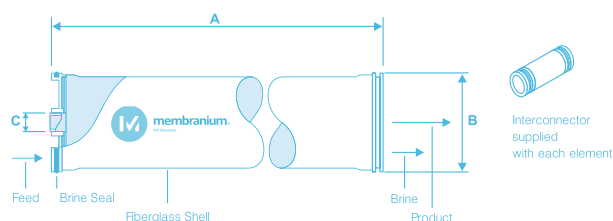
Model	Flow nom/min		Rejection* nom**/min	Area		Spacer	
	m3/hr	GPD	%	m2	ft2	mm	mil
4040-C,F	0,32 / 0,27	2000 / 1700	60/55	8	86	0,71	28
4040-C2,F2	0,28 / 0,24	1800 / 1500	60/55	7,7	83	0,79	31
4040-C3,F3	0,27 / 0,23	1700 / 1450	60/55	7,4	80	0,86	34
4040-C,F-D	0,32 / 0,27	2000 / 1700	60/55	8	86	0,71	28
4040-C2,F2-D	0,28 / 0,24	1800 / 1500	60/55	7,7	83	0,79	31
4040-C3,F3-D	0,27 / 0,23	1700 / 1450	60/55	7,4	80	0,86	34
8040-C,F	1,5 / 1,28	9500/8100	60/55	37	400	0,71	28
8040-C2,F2	1,4 / 1,2	8900/7600	60/55	35	375	0,79	31
8040-C3,F3	1,3 / 1,1	8300/7000	60/55	33	360	0,86	34
8040-C,F-D	1,5 / 1,28	9500/8100	60/55	37	400	0,71	28
8040-C2,F2-D	1,4 / 1,2	8900/7600	60/55	35	375	0,79	31
8040-C3,F3-D	1,3 / 1,1	8300/7000	60/55	33	360	0,86	34

Operating conditions

Recommended operation pressure, MPa	0,5-2,0
Maximum operation pressure, MPa, Fiberglass shell / shrink film-wrapped	4,1/2,1
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 1-13 1-13
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 (8040/4040)	17/3,6
Concentrate/permeate ratio on each element, min	5:1
Turbidity, NTU max	1



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



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

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

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

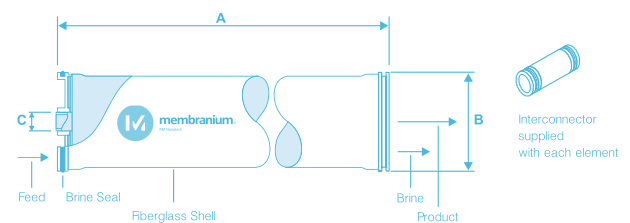
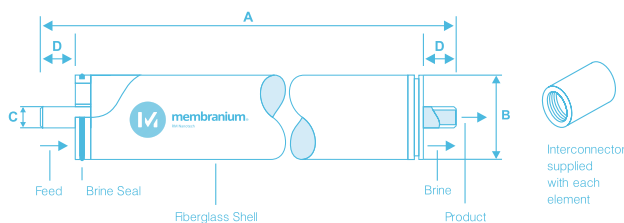
* Rejection by myoglobin

** Rejection by albumin

Operating conditions

Recommended operation pressure, MPa	0,2-0,8
Maximum pressure drop, MPa	0,07
Operation temperature, °C ¹⁾	4-45
pH at operation	2-10
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	18
Concentrate/permeate ratio on each element, min	5:1
Turbidity, NTU max	1

1)
At continuous operation
with a pH above 10.5,
the temperature must not exceed 35 °C



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

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

Comments	Each nanofiltration element is preserved with a solution containing 1% sodium metabisulfite solution, 10 % propylene glycol solution and vacuum-packed under nitrogen in a barrier film bag. DRY nanofiltration elements are vacuum-packed under nitrogen in a barrier film bag. Each ultrafiltration element is vacuum-packed in a plastic bag in a dry form.
Important information	The element should be washed off from the preservative for at least 1 hour at the first start. In order to protect membrane elements from destruction one should do the following: Do not exceed the input pressure and input flow above the values indicated in the specification. Take measures to protect membrane elements from back pressure (return pressure) from the permeate side. The pressure from the permeate side must not exceed the pressure at the inlet of the membrane element under any circumstances. Avoid hydraulic shocks when starting, operating and stopping reverse osmosis systems. When starting a reverse osmosis system, increase the inlet pressure to the operating value smoothly for 30±60 seconds (at a speed of no more than 0.1 MPa/s). Take measures to prevent operation of membrane elements in a dead-end mode without dumping the concentrate.
Operating conditions	- Operating pressure may vary: - for nanofiltration from 0.5 to 2.0 MPa, depending on solid contents of feed water, temperature, degree of filtrate extraction, service life of membrane elements; - for ultrafiltration from 0.2 to 0.8 MPa, depending on solid contents of feed water, temperature, degree of filtrate extraction, service life of membrane elements. - Pressure drop should not exceed 0.1/0.07 MPa on each nano - / ultrafiltration element and 0.35/0.4 MPa on each NF/UF membrane vessel. - The inlet water temperature should not exceed 45 °C for nano - / ultrafiltration . At pH 10, the maximum temperature of feed water should not exceed 35 °C. - The time of chemical wash of membrane elements in the pH range 1-12 should not exceed 4 hours. At the same time, the frequency of wash should be no more than 1 time per month. For nanofiltration, the maximum turbidity of feed water should not exceed 1 NTU, colloidal index SDI should be less than 5. For long-term and stable operation of reverse osmosis plants, it is recommended to pre-purify feed water to a turbidity of less than 0.2 NTU and SDI to the level of 1-3. - Permeate rejection ratio (PRR) on each membrane element with a length of 1 m (40 inches) should not exceed 15% for all types of membrane elements.
Chemical combatibility	- Chlorine: The presence of free chlorine or other oxidizing agents (permanganate, ozone, bromine, iodine) in the inlet water is not allowed. - Cationic polymers and cationic surfactants can cause irreversible changes in the properties of composite polyamide membranes. Therefore, they should not be used during operation and chemical wash of ultrafiltration membrane elements. - Glycerin should be used to lubricate rubber seals. The use of lubricants based on petroleum products can cause failure of membrane elements.
General information	- Membrane elements should be stored in wet condition after use. To prevent biological contamination of membrane elements during a prolonged shutdown of membrane plant, it is recommended to preserve the elements (or the installation) in accordance with the recommendations of the manufacturer. - Consumer is responsible for the use of chemicals that are not recommended for use with membrane elements. - Ignoring the recommendations for the operation of membrane elements by the consumer can cause warranty cancellation from the side of manufacturing company..
Technical support	Membranium has an experienced scientific and technical staff capable of providing technical support to both end users and engineering companies when designing new or optimizing existing reverse osmosis systems.

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DESIGNATION FOR MEMBRANE ELEMENTS

