Water Technologies & Solutions
fact sheet

Duracon RO5 series

sugar purification and concentration – HWS compatible

The Duracon family of proprietary thin-film reverse osmosis membrane elements are characterized by high sodium chloride rejection. The A-series membrane has an average rejection of 99.2% on 2,000ppm NaCl at 25°C and 225psi.

The Duracon RO5 Elements provide high flux rates at operating pressures up 1,200psi (8,274kPa). These elements are designed for daily CIP and periodic hot-water sanitation, while still maintaining element integrity. They are typically used for concentrating sugar in food-related processes requiring stringent sanitary procedures. Applications include protein and sugar concentration, lactose recovery, and wastewater applications requiring reduction of BOD.

The Duracon RO5 Elements feature a Durasan* Cage patented outerwrap, standard feed spacers, and polysulfone parts.

The Duracon RO5 elements comply with:

- FDA Regulations relevant sections of 21CFR
- EU Framework 1935/2004/EC

Table 1: Element Specification

Membrane	A-series, thin-film membrane (TFM*)

Model	Spacer mil (mm)	Active area ft² (m²)	Part number
Duracon RO5 8040C35	35 (0.89)	343 (31.9)	1226495
Duracon RO5 8040C50	50 (1.27)	275 (25.6)	1231100

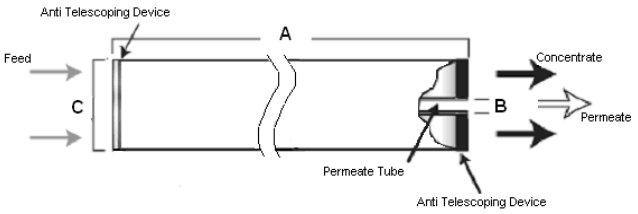

Figure 1 : Element Dimensions Diagram - female

Table 2: Dimensions and Weight

Model[1]	Dimensions, inches (cm)			Boxed
	A	B[3]	C[2]	Weight lbs (kg)
Duracon RO5 8040C	40.00 (101.6)	1.125 (2.86)	7.91 (20.1)	29 (13.2)

[1] These elements are dried and bagged before shipping.
[2] the element diameter (dimension C) is designed for optimum performance in SUEZ pressure vessels. Others pressure vessel dimension and tolerance may result in excessive bypass and loss of capacity.
[3] Internal Diameter.

Table 3: Operating and CIP parameters

Typical Operating Pressure	200 - 800psi (1,379 - 5,516kPa)
Typical Operating Flux	5-20 GFD (8-34 LMH)
Clean Water Flux (CWF)[1]	14 GFD (24 LMH) @ 225psi
Maximum Operating Pressure[2]	1,200psi (8,276kPa)
Maximum Temperature	122°F (50°C)
Sanitization Temperature	194°F (90°C)
pH Range	3.0-10.0
Maximum Pressure Drop	Over an element: 15 psi (103 kPa) Per housing: 60 psi (414 kPa)
Chlorine Tolerance	500 ppm-hours dechlorination recommended

[1] Clean water flux (CWF) is the rate of water permeability through the membrane after cleaning (CIP) at reproducible temperature and pressure. It is important to monitor CWF after each cleaning cycle to determine if the system is being cleaned effectively. CWF can vary ±25%.
[2] Operating pressure in bar multiplied by operating temperature in degree Celsius should not exceed 2000.

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Table 4: CIP limits for RO elements

Temperature	'pH minimum	'pH maximum
50°C (122°F)	2.0	11.5
45°C (113°F)	1.5	11.5
35°C (95°F)	1.5	11.5
25°C (77°F)	1.0	12.0

hot water sanitization recommendations

For optimal performance, Duracon RO5 elements should always be cleaned using approved CIP procedures and flushed with fouling free water before the sanitization process. Feed pressure during sanitization should not exceed 40psi (275kPa) and the crossflow should not incur a pressure drop greater than 2psi (14kPa) per element. Heating rate to sanitizing temperature and cool down should not be faster than 5°C/minute. Maximum sanitization temperature is 90°C.

loss of permeate flow after repeated 90°C sanitization cycles

It is almost impossible to exactly predict the percentage of permeate flow rate lost from the high temperature sanitations, which among other factors depends on:

1) Rate of temperature increase and decrease.
2) Presence of other species like organics, ionic and metallic compounds that could locally decrease or increase the temperature at the surface of the membrane.
3) Feed flow rate and specifically the heat transfer rate to the membrane surface.
4) The thickness and geometry of the feed spacer used.

At optimum conditions measured in controlled environment with deionized water, around 30% of the original permeate flow rate was lost before the element performance had stabilized after repeated heat treatments (over 90% of this flow reduction occurred during the first heat treatment). With the loss of permeate flow rate, the salt rejection increases. The rate of cooling, and heating was not more than 5°C per minute, and the differential pressure drop per element did not exceed 2 psi.

Pilot testing based on the criteria noted above will give the best operating parameters for any specific application.