VinoCon* RO3 series

wine processing – grape juice & must concentration

The VinoCon family of proprietary thin-film reverse osmosis membrane elements are characterized by high sodium chloride rejection and a smooth, fouling-resistant membrane surface. The S-Series membrane has an average rejection of 99.0% on 2,000ppm NaCl at 25°C and 425psi (2,930kPa).

The VinoCon RO3 Elements provide high rejection of sugars and low molecular weight organic constituents at operating pressures up to 1,200psi (8,274kPa). This element is designed for high crossflow, daily CIP, and the ability to handle suspended solids, and periodic hot-water sanitation, while still maintaining element integrity. They are typically used for concentrating grape juice in wineries requiring stringent sanitary procedures. Other applications may include wine must concentration, wine concentration and adjustment.

The VinoCon RO3 Elements feature a Durasan* Cage patented outer wrap, standard feed spacers, and polysulfone parts.

The VinoCon RO3 elements comply with:

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

Table 1: Element Specification

Membrane	Thin Film Membrane (TFM*)

Model	Spacer mil (mm)	Active area ft² (m²)	Part number
VinoCon RO3 4040C35	35 (0.89)	80 (7.4)	1230072

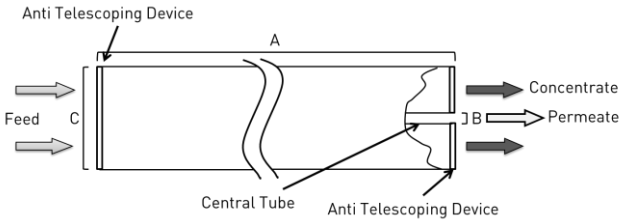

Figure 1 : Element Dimensions Diagram – Female

Table 2: Dimensions and Weight

Model	Dimensions, inches (cm)			Boxed Weight lbs (kg)
	A	B	C	
VinoCon RO3 4040C35	40.00 (101.6)	0.625 (1.59)	3.98 (10.1)	11 (5.0)

(1) Includes interconnector, refer to Technical Bulletin TB1206.

Table 3: Operating parameters

Typical Operating Pressure	200-800psi (1,379 – 5,516kPa)
Typical Operating Flux	5-20 GFD (8-34 LMH)
Clean Water Flux (CWF) (1)	16-18 GFD (27 – 31 LMH) @ 425psi
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, VinoCon RO3 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, between 30% and 50% 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.