

Vinocon R05 series

wine processing – grape juice & must concentration

The Vinocon R05 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 2,000 ppm NaCl at 25°C and 225 psi operating pressure.

The Vinocon R05 Elements provide high flux rates at operating pressures up to 1,200 psi (8,274 kPa). This element is designed periodic hot-water sanitation while still maintaining element integrity. They are typically used for concentrating grape juice from harvested grapes requiring stringent sanitary procedures. Other applications may include wine must concentration and wine adjustment and concentration.

The Vinocon R05 Elements feature a Durasan* Cage patented outer wrap, standard feed spacers and polysulfone parts.

The Vinocon R05 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 ft ² (m ²)	Part number
Vinocon R05 4040C35	35 (0.89)	80 (7.4)	1228904
Vinocon R05 4040C50	50 (1.27)	70 (6.5)	3160910

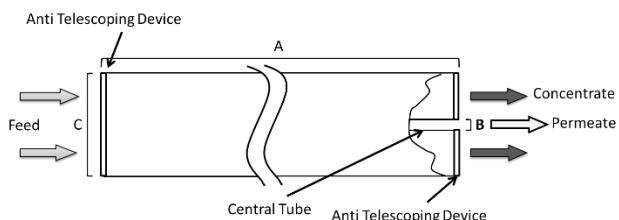


Figure 1: Element Dimensions Diagram – Female

Table 2: Operating and CIP parameters

Typical Operating Pressure	200-800 psi (1,379 – 5,516 kPa)
Typical Operating Flux	5-20 GFD (8-34 LMH)
Clean Water Flux (CWF) (1)	16-18 GFD (27-31LMH) @ 425 psi
Maximum Operating Pressure ²	1,200 psi (8,274 kPa)
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)

(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 3: Dimensions and Weights

Model	Type	Dimensions, inches (cm)			Boxed Weight lbs (kg)
		A	B	C	
Vinocon R05 4040C**	Female	40.0 (101.6) ⁱ	0.625 (1.59)	3.98 (10.1)	7 (3.2)

**Includes interconnector. Refer to TB1206 for further information.

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 R05 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 sanitizations, 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.