

Dairy DK Series

FACT SHEET

Dairy processing sanitary nanofiltration

Description and Use

The D-Series family of proprietary thin-film nanofiltration membrane elements is characterized by an approximate molecular weight cut-off of 150-300 Dalton for uncharged organic molecules. Divalent and multivalent anions are preferentially rejected by the membrane while monovalent ion rejection is dependent upon feed concentration and composition. Since monovalent ions pass through the membrane, they do not contribute to the osmotic pressure, thus enabling D-Series nanofiltration membrane systems to operate at feed pressures below those of RO systems.

The DK membrane has a minimum rejection of 98% on 2,000 ppm MgSO₄ at 25°C (77°F) and 110psi operating pressure.

The Dairy Processing DK Elements are typically used in food related processes requiring stringent sanitary procedures. Applications include lactose desalting, deacidification and demineralization of whey or UF permeate.

These elements feature a Durasan® Cage patented outer wrap, a selection of feed spacers, and polysulfone parts.

The Dairy DK elements comply with:

- FDA Regulations relevant sections of 21CFR
- EU Framework 1935/2004/EC
- Halal and Kosher certifications

Table 1: Element Specification

Membrane	D-Series, Thin Film Membrane (TFM*)		
Model	Spacer mil (mm)	Active Area ft ² (m ²)	Part Number
Dairy DK3838C30	30 (0.76)	75 (7.0)	1227618
Dairy DK3838C50	50 (1.27)	60 (5.6)	3161358
Dairy DK3840C30	30 (0.76)	77 (7.2)	1206940
Dairy DK3840C50	50 (1.27)	58 (5.4)	1206942
Dairy DK8038C30	30 (0.76)	372 (34.6)	1226591
Dairy DK8038C50	50 (1.27)	282 (26.2)	1206977
Dairy DK8038C65	65 (1.65)	220 (20.4)	1269441
Dairy DK8040C30	30 (0.76)	374 (34.7)	1229937

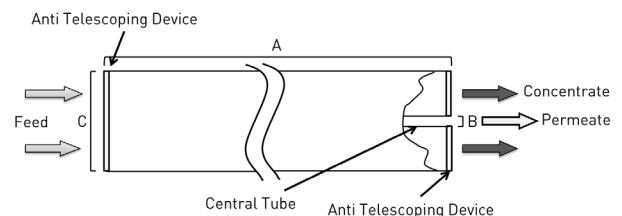


Figure 1: Element Dimensions Diagram – 8040

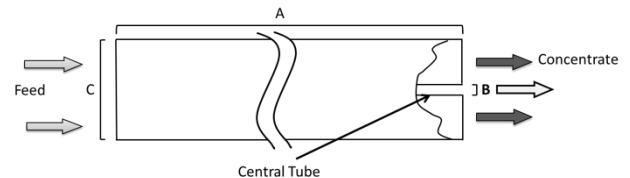


Figure 2: Element Dimensions Diagram – All Except 8040

Table 2: Dimensions and Weight

Model	Figure	Dimensions, inches (cm)			Boxed
		A	B	C	Weight lbs (kg)
Dairy DK3838C	2	38.00 (96.5)	0.833 (2.12)	3.79 (9.6)	9 (5)
Dairy DK3840C	2	38.75 (98.4)	0.833 (2.12)	3.79 (9.6)	9 (5)
Dairy DK8038C	2	38.00 (96.5)	1.125 (2.86)	7.91 (20.1)	35 (16)
Dairy DK8040C	1	40.00 (101.6)	1.125 (2.86)	7.91 (20.1)	35 (16)

Table 3: Operating Parameters

Typical Operating Pressure	70-400psi (483-2,757kPa)
Typical Operating Flux	5-20 GFD (8-34 LMH)
Clean Water Flux (CWF) (1)	14 GFD (24 LMH) @ 110psi
Maximum Operating Pressure	600psi (4,137kPa)
Maximum Permeate Pressure (2)	60 psi (413 kPa)
Maximum Temperature	122°F (50°C)
pH Range	3.0-9.0
Recommended Pressure Drop	Over an element: 12psi (83kPa)
Maximum Pressure Drop	Over an element: 15psi (103kPa) Per housing: 60psi (414kPa)
Chlorine Tolerance	500ppm-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 $\pm 25\%$.

(2) Permeate pressure should never exceed the concentrate pressure.

Table 4: CIP Limits for Nanofiltration Membranes

Temperature	pH Minimum	pH Maximum
50°C (122°F)	2.0	11.0 (1)
50°C (122°F)	2.0	10.5
45°C (113°F)	2.0	11.0
35°C (95°F)	1.5	11.5
25°C (77°F)	1.0	11.5

(1) CIP at pH 11 and 50°C is acceptable for heavily fouled systems. For the optimum membrane element lifetime, pH 10.5 at 50°C (122°F) is recommended for daily CIP protocol.