Alfa Laval UF-PP spiral membranes

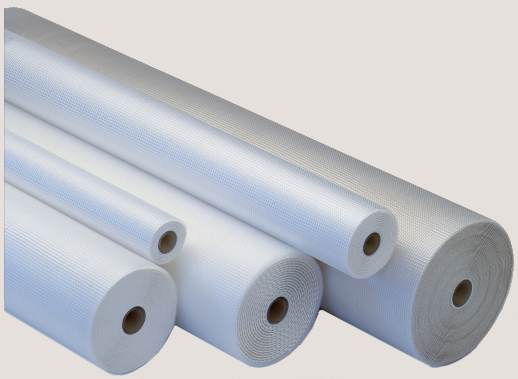
Sanitary spiral membranes for ultrafiltration — FS, RC and ETNA types

Introduction

Cross-flow membrane filtration by Alfa Laval separates out the different components in a feed stream on the basis of the size and the shape of the micro-particles within it.

Ultrafiltration (UF) allows salts, sugars, organic acids and smaller peptides to pass through the pores of the membrane, whereas proteins, fats and polysaccharides are retained.

Alfa Laval UF-PP spiral membranes are manufactured in a sanitary full-fit design that offers optimum cleaning conditions and minimized stagnant spaces.



Applications

Alfa Laval spiral membranes for ultrafiltration are used for a wide range of high-sanitary processes in the food, beverage, dairy, biotech and pharmaceutical industries such as:

- concentration and purification
- clarification and fractionation
- extraction
- product recycling and recovery
- product and effluent upgrading

Benefits

- sanitary and compact full-fit design
- low initial investment and replacement costs
- cost-effective operation thanks to low energy consumption
- operation at low temperature possible
- different types and sizes available
- the same basic membranes available in spiral and flat sheet configurations
- developed and manufactured by Alfa Laval
- all materials in compliance with EU Regulation (EC) 1935/2004, EU Regulation 10/2011, EU Regulation (EC) 2023/2006 and FDA regulations (CFR) Title 21
- Halal certified (FS40PP)

Spiral membrane data

Alfa Laval UF-PP spiral membranes are based on a unique construction of a polymeric membrane with different characteristics and polypropylene (PP) support material that provides optimum cleaning conditions.

Membrane type	Support material	Characteristics	MWCO value
FS40PP	Polypropylene	Fluoro polymer	100,000
RC70PP	Polypropylene	Regenerated cellulose	10,000
ETNA10PP	Polypropylene	Composite fluoro polymer	10,000
ETNA01PP	Polypropylene	Composite fluoro polymer	1,000

Spiral membrane designation

Example: **Alfa Laval RC70PP-6338/48**		
Alfa Laval RC70PP	=	Membrane type
63	=	Outer diameter of spiral (6.3")
38	=	Length of spiral (38") without ATD system
48	=	Thickness of feed spacer (48 mil)

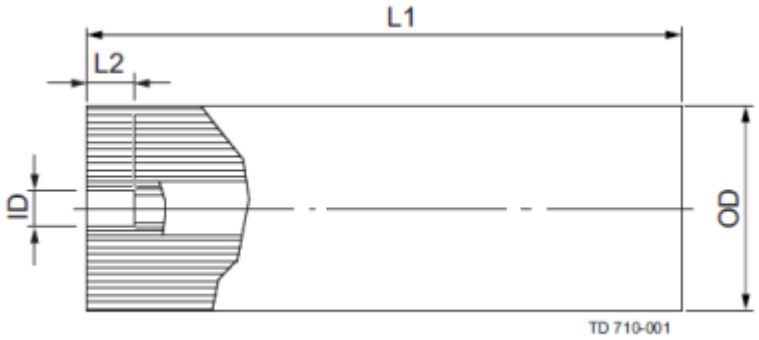
Standard configurations

Size[1]		Membrane type and code number[2]			
Spiral	**Spacer**	**ETNA01PP**	**ETNA10PP**	**FS40PP**	**RC70PP**
2517	48	518265	517590	517588	517591
2538	48	536853	536852	537567	536814
3838	48	517906	517184	517903	516745
	80	517907	517508	516710	516746
6338	30	533719	517509	—	517529
	48	517833	517490	518153	—
	80	518158	517510	518154	516750
8038 (id 28.9)	30	—	—	533971	533959
	48	533721	533727	533972	—
	80	533722	533728	533967	—
8338 (id 28.9)	30	533723	533729	533968	533962
	48	533724	533850	533969	533965
	80	533725	533851	533970	533966

[1] For other sizes, please contact Alfa Laval

[2] Please specify code number when ordering

Dimensions



OD = outer diameter of spiral membrane
HD = nominal inner diameter of housing[1]
L1 = total length of spiral membrane without ATD
ID = diameter of ATD socket
L2 = depth of ATD socket

[1] For specific measurements of Alfa Laval housings please see the product specification

Standard sizes

Size[1]	Outer diameter (OD)		Housing diameter (HD)		Spiral length (L1)[2]		ATD socket diameter (ID)		ATD socket depth (L2)	
	mm	**inches**	**mm**	**inches**	**mm**	**inches**	**mm**	**inches**	**mm**	**inches**
2517	64.0– 65.0	2.52– 2.56	66.0	2.60	432	17.01	21.10	0.83	50.0	1.97
2538	64.0– 65.0	2.52– 2.56	66.0	2.60	965	37.99	21.10	0.83	50.0	1.97
3838	95.0– 96.5	3.74– 3.80	97.55	3.84	965	37.99	21.10	0.83	50.0	1.97
6338	160.0–162.0	6.30–6.38	163.10	6.42	965	37.99	28.90	1.14	76.0	2.99
8038	198.5–201.5	7.82– 7.93	204.14	8.04	965	37.99	28.90	1.14	76.0	2.99
8338	208.5–210.5	8.21–8.29	213.10	8.34	965	37.99	28.90	1.14	76.0	2.99

[1] For other sizes, please contact Alfa Laval

[2] Without ATD system

Cross-flow and pressure drop

Typical cross-flow (m^3/h) and max. pressure drop (bar) at cP 1:

Outer diameter:	2.5”		3.8”		6.3”		8.0”		8.3”	
Spacer thickness:	m^3/h	bar	m^3/h	bar	m^3/h	bar	m^3/h	bar	m^3/h	bar
30 mil	—	—	—	—	17	1.1	18	0.9	23	0.9
48 mil	1.3 — 1.8	0.6	8	1.1	23	1.1	29	0.9	32	0.9
80 mil	—	—	11	1.1	30	1.1	34	0.9	36	0.9

Note: Calculated at tight fit of spiral membrane and housing by use of standard ATD system

Maximum pressure drop across the entire housing not to exceed 4.1 bar

Recommended operating limits

Production	
pH range (reference temperature 25°C)	2 — 10
Typical operating pressure, bar	1 — 10
Temperature, °C	5 — 60

Cleaning[1] (3 hours per day)	
pH range (reference temperature 25°C)	1 — 11.5
Typical pressure, bar	1 — 4
Temperature, °C	5 — 65

[1] Please consult the Alfa Laval cleaning instructions and water quality specifications

Note:

- Washing procedure indicated on the cover of each spiral membrane package must be strictly followed. Please consult the Alfa Laval cleaning instructions and water quality specifications.
- The use of oxidation agents and similar chemicals might influence the membrane performance over time.

Important information

- New spiral membranes must be cleaned prior to first use. Please see detailed instructions on the packaging of the product.
- The customer is fully responsible for the effects that any incompatible chemicals may have on the spiral membranes.
- After initial wetting, the spiral membranes must be kept moist at all times.
- If the operating specifications provided in this product description are not strictly followed, the limited warranty will be null and void.
- To prevent biological growth during system shutdowns, Alfa Laval recommends that spiral membranes should be immersed in a protective solution.
- Avoid permeate-side back pressure at all times.
- Alfa Laval recommends using a rigid stainless steel ATD end device at the housing outlet end.
- Alfa Laval recommends that the inner diameter of the housing should be approx. 2 mm (0.08”) bigger than the outer diameter of the spiral membrane.
- For storage conditions, please see Shelf Life and Storage document.
- For warranties, please see spiral membrane warranty document.

Operating guidelines

Alfa Laval recommends the following start-up procedure from standstill to operating condition:

- The unpressurized plant should be refilled with water.
- Feed pressure should be gradually increased over a 30–60 second time scale.
- Before initiating cross-flow at high permeate flux condition (start-up with high-temperature water) the set feed pressure should be maintained for 5–10 minutes.
- Cross-flow velocity at the set operating point should be gradually achieved over a period of 15–20 seconds.
- Temperature variations should be implemented gradually over a period of 3–5 minutes.
- Avoid any abrupt pressure or cross-flow variations on the membranes during start-up, shutdown, cleaning or other sequences in order to prevent possible damage.

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How to contact Alfa Laval

Up-to-date Alfa Laval contact details for all countries are always available on our website at www.alfalaval.com