

Alfa Laval UF-pHt™ spiral membranes

Sanitary spiral membranes for ultrafiltration - GR 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.

The Alfa Laval UF-pHt™ spiral membranes are characterized by their tolerance to high temperatures and pH values.

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
- tolerance to high pH and temperature
- 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
- USDA approved (GR40PP, GR60PP, GR61PP, GR70PP, GR95PP)
- Halal certified (GR60PP, GR61PP, GR70PP, GR80PP, GR90PP)



Spiral membrane data

Alfa Laval UF-pHt™ spiral membranes are based on a unique construction of a polymeric membrane of either polysulphone or polyethersulphone with polypropylene (PP) support material that provides optimum cleaning conditions.

Membrane type	Support material	Characteristics	MWCO value
GR40PP	Polypropylene	Polysulphone	100,000
GR60PP	Polypropylene	Polysulphone	25,000
GR61PP	Polypropylene	Polysulphone	20,000
GR70PP	Polypropylene	Polysulphone	20,000
GR80PP	Polypropylene	Polyethersulphone	10,000
GR90PP	Polypropylene	Polyethersulphone	5,000
GR95PP	Polypropylene	Polyethersulphone	2,000

Spiral membrane designation

Example: Alfa Laval GR61PP-8038/30

Alfa Laval GR61PP	=	Membrane type
80	=	Outer diameter of spiral (8.0")
38	=	Length of spiral (38") without ATD system
30	=	Thickness of feed spacer (30 mil)

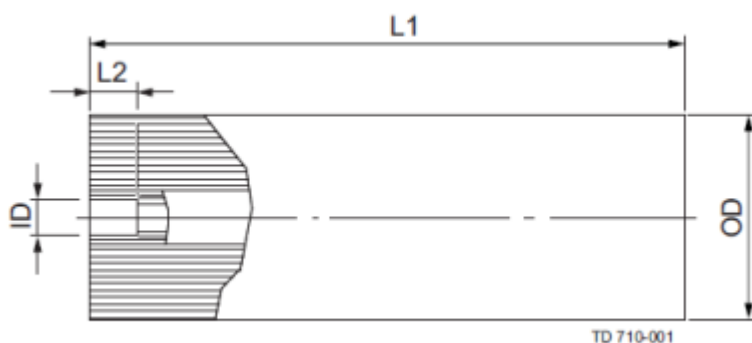
Standard configurations

Size ¹		Membrane type and code number ²						
Spiral	Spacer	GR40PP	GR60PP	GR61PP	GR70PP	GR80PP	GR90PP	GR95PP
2517	48	517582	517584	517585	—	532026	533251	517587
2538	48	536785	540985	528041	—	536815	533926	533927
	30	—	—	516495	—	—	—	—
3838	48	516739	516544	516496	—	532028	533253	516825
	80	516768	516545	516497	—	532029	533254	517890
	30	—	516540	516435	519398	532030	533255	518144
6338	48	518142	516541	516436	519399	532031	533256	517142
	80	518143	516542	516437	—	532032	—	518145
8038 (id 28.9)	30	532002	—	532021	—	532033	533258	533264
	48	532003	532015	—	—	532034	533259	533265
8338 (id 28.9)	80	532004	532016	—	533350	532035	533260	533266
	30	532005	532017	532024	533351	532036	533261	533267
	48	532006	532018	531981	533352	532037	533262	533268
	80	532007	532019	531982	533353	532038	533263	533269

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 housing¹
 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 (m³/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	—	—	6	1.1	17	1.1 ¹	18	0.9	23	0.9
48 mil	1.3–1.8	0.6	8	1.1	23	1.1 ¹	29	0.9	32	0.9
80 mil	—	—	11	1.1	30	1.1 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

¹ During production at < 50°C, 1.3 bar

Recommended operating limits

Production¹

pH range (reference temperature 25°C)	2 – 10
Typical operating pressure, bar	1 – 10
Temperature, °C	5 – 75

¹ Tolerant to wider pH ranges and higher temperatures under certain conditions. Please contact Alfa Laval for specific requirements

Cleaning¹ (3 hours per day)

pH range (reference temperature 25°C)	1 – 13
Typical pressure, bar	1 – 4
Temperature, °C	5 – 70

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

Cleaning and sanitization limitations – caustic / chlorine

GR40PP, GR61PP, GR95PP:	<200 ppm at 50°C, pH 10.5–11.0, max. ½ hour per day
GR60PP, GR70PP, GR80PP, GR90PP:	<200 ppm at 50°C, pH 10.5–11.0, max exposure: ppm x hours <25000 ppm hours

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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