

# FR SERIES ULTRAFILTRATION (UF) SANITARY SPIRAL ELEMENTS

800,000 MWCO PVDF Membrane

Synder's FR Series Ultrafiltration Sanitary Spiral Elements are the best choice for dairy applications of fat removal and casein fractionation. The Polyvinylidene Fluoride (PVDF) membrane provides excellent chemical and temperature resistance under any circumstance.

## FR SERIES FEATURES

- Designed for maximum durability and long life
- Conforms to 3-A, FDA, and USDA standards
- Available in standard diameter sizes or customized configurations for a wide range of applications
- High resistance to fouling

## APPLICATIONS

**Food:** Yeast removal from secondary fermentation of wines and beers / Clarification of Corn Dextrose

**Dairy:** Fat removal from whey / Casein separation from whey proteins in skim milk / Concentration of cheese milk

**Biotech/Pharm:** Bacterial Cell Harvesting / Fungal Cell Harvesting / Yeast Concentration / Enzyme Purification / Antibiotic Clarification

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## SANITARY ELEMENT OPERATING SPECIFICATIONS

### Pressure

	PSI	Bar
Max. Inlet Pressure	15	1.03
Min. Outlet Pressure	2-3	0.14-0.21
Min. Differential Pressure per Element	13	0.90
Max. Permeate Backpressure	0	0

NOTE: Soft start on boost pumps required to minimize pressure/flow shocks to elements

### Temperature

	Fahrenheit	Celsius
Max. Operating	122°	50°
Max. CIP Temperature	122°	50°

### PH Parameters

	pH
pH Range during Operation @ 25°C Max.	1.0 - 11.0
pH Range during CIP Operation @ 50°C Max.	2.0 - 11.0

NOTE: Do not exceed pH 11.0

### Chlorine

	Norm. ppm	Max. ppm
Free Chlorine in DF Water or Product	0	<0.1
Chlorine during CIP @ pH 10.8-11.0 and 50°C	150	180

NOTE: Maximum chlorine exposure for all elements is 30 minutes per day at pH and temperature conditions listed above

### Peroxide

	Max. ppm
Free Peroxide in Product during Operation	<3 ppm
Peroxide as a sanitizer @ 25°C Max, pH 6-7, 10 minutes recirculation	0.1%

# FR SERIES ULTRAFILTRATION (UF) SANITARY SPIRAL ELEMENTS

800,000 MWC0 PVDF Membrane Designed for Fat Removal & Casein Separation from Whey

## ELEMENT DIMENSIONS

Element	Model Number	Diameter (Inches)	Length (Inches)	P.W.T. ID
3.8"	3838	3.8	38	0.83
	3838.75	3.8	38.75	0.83
	3850	3.8	50	0.83
	3851	3.8	51	0.83
4.3"	4333	4.3	33	0.83
	4335	4.3	35	0.83
	4335.5	4.3	35.5	0.83
	4336	4.3	36	0.83
	4338	4.3	38	0.83
	4350	4.3	50	0.83
	4351	4.3	51	0.83
	4355	4.3	55	0.83
5.8"	5838	5.8	38	1.138
6.3"	6338	6.3	38	1.138
	6356	6.3	56	1.138
8"	8038	8.0	38	1.138
	8238	8.2	38	1.138
	8338	8.3	38	1.138
10"	10338	10.3	38	1.138

## ELEMENT AREA (SQUARE FEET)

Element		Feed Spacer (in mils)				
		24	31	46	65	80
3.8"	3838	88	76	56	47	39
	3838.75	89	77	60	46	39
	3850	111	118	102	75	52
	3851	114	121	104	77	53
	4333	96	87	74	58	50
4.3"	4335	100	95	79	61	53
	4335.5	104	97	82	63	54
	4336	108	100	83	63	55
	4338	112	105	88	66	58
	4350	150	133	99	81	71
	4351	154	136	101	83	72
	4355	166	147	109	90	78
	5.8"	5838	186	180	136	109
6.3"	6338	236	228	171	133	109
	6356	357	345	259	201	165
8"	8038	372	330	258	205	168
	8238	440	389	310	240	181
	8338	447	396	319	253	205
10"	10338	n/a	655	493	384	324

## RECOMMENDED ELEMENT CROSS FLOW RATE

Element		Feed Spacer (in mils)				
		24	31	46	65	80
3.8"	m <sup>3</sup> /hr	6	6	7	9	10
	gpm	26	26	32	38	44
4.3"	m <sup>3</sup> /hr	7	8	9	11	13
	gpm	32	34	42	49	59
5.8"	m <sup>3</sup> /hr	13.4	14.0	16.8	19.8	23.1
	gpm	59	62	74	87	102
6.3"	m <sup>3</sup> /hr	17	18	21	24	28
	gpm	75	78	93	106	123
8"	m <sup>3</sup> /hr	27	26	32	37	43
	gpm	118	113	140	164	190
10"	m <sup>3</sup> /hr	n/a	51	61	70	83
	gpm	n/a	224	268	307	366

## TECHNICAL NOTES:

For element sizes not listed, please call or email Synder Filtration for details. We can design an element to fit your exact needs – just specify the element outer diameter (OD) or vessel/housing inner diameter (ID), element inner diameter (ID), and length. Elements are available with or without a controlled bypass tail. Additional feed spacers are also available.

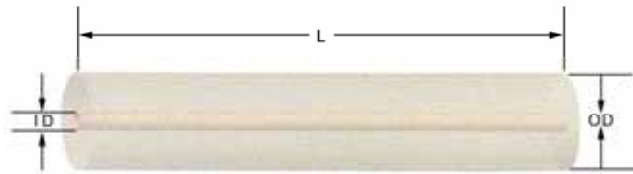
Maximum allowed differential pressure per element is 1.2 bar.

The recommended cross flow rate will be subject to differential pressure limitations and specific application conditions.

Trials should be conducted to determine optimal application conditions.

High temperature elements are available and can be specified by adding the suffix "HT" to the end of model name. †

## ORDERING INFORMATION



ELEMENT MODEL NUMBER EXAMPLE: **FR - 2 A - 6338**

Spacer Size	Model Number
24 mil	1
31 mil	2
46 mil	3
65 mil	4
80 mil	5

Outerwrap
A = Control Bypass with Tail
B = Control Bypass without Tail

Element Descriptions					
Model	OD * Inches	L Inches	ID Inches	Weight LB	Weight kg
3838	3.8	38	0.83	10	4.5
3838.75	3.8	38.75	0.83	10	4.5
3850	3.8	50	0.83	13	5.9
3851	3.8	51	0.83	14	6.3
4333	4.3	33	0.83	11	5.0
4335	4.3	35	0.83	11	5.2
4335.5	4.3	35.5	0.83	11	5.2
4336	4.3	36	0.83	11	5.2
4338	4.3	38	0.83	12	5.4
4350	4.3	50	0.83	15	7
4351	4.3	51	0.83	15	7
4355	4.3	55	0.83	16	7
5838	5.8	38	1.138	15	7
6338	6.3	38	1.138	16	7
6356	6.3	56	1.138	24	11
8038	8.0	38	1.138	38	17.2
8238	8.2	38	1.138	38	17.2
8338	8.3	38	1.138	40	18
10338	10.3	38	1.138	43	20

### Notes:

\* Different diameters are available. Please specify your requirements when ordering.

† HT CIP Limits: pH 6-8; Temp 70°C; Duration 30 minutes; 50°C or lower – normal pH limits



Specifications are subject to change without notice.  
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