

MaxCell process-scale hollow fiber cartridges

CROSS FLOW FILTRATION

MaxCell™ cartridges allow for cost-efficient, high-volume bioprocessing cross flow filtration operations (Fig 1). System sizing can be accurately scaled from laboratory- and pilot-scale cartridges, such as MidGee™ and Xampler™ cartridges.

The streamline design of the MaxCell cartridge enables effective utilization of space. In fact, MaxCell cartridges can be assembled with spacing as close as 18 cm (7 in) on center for incorporation into a compact membrane separations system. In addition, MaxCell cartridges can be used in place of competitive cartridges.

Key benefits of MaxCell cartridges

- Cost-efficient cross flow filtration operations
- Streamline design for efficient space utilization
- Applicable in a wide variety of applications

The cartridges are provided with an integrally bonded threaded ring at each end. A 2 in sanitary adaptor and gasket are positioned at each end and sealed with a locking ring (Fig 2). The adapters are available in both straight and elbow design to accommodate a variety of high-capacity multicartridge manifold designs. The locking ring is easily tightened by hand or with a MaxCell wrench set. Permeate ports are of 1.5 in sanitary design.

MaxCell cartridges are available in three housing lengths that correspond to the lengths of laboratory- and pilot-scale cartridges. The full length housing size 85 with 0.5 mm inner diameter hollow fibers contains 13 m² (140 ft²) of membrane area in a single, lightweight housing.

Incorporating Cytiva high pressure ultrafiltration membranes, MaxCell cartridges are capable of withstanding up to 3.4 barg (50 psig) transmembrane pressure. The combination of large surface area and high pressure capability provides extremely high productivity for a variety of large-scale bioprocessing applications.



Fig 1. MaxCell cartridges can be built into custom systems to meet almost any process requirements and production capacities.



Fig 2. MaxCell cartridges end-fitting design allows easy inspection and cleaning of the cartridge. Note that a choice of either a straight or elbow end adaptor kit is required for each new MaxCell cartridge application.

Intended for large-volume bioprocessing applications, MaxCell cartridges are available in three different path lengths that correspond to smaller Cytiva laboratory- and pilot-scale cartridges to enable accurate and efficient, linear scale-up. Not only are MaxCell cartridges routinely used in a variety of conventional biopharmaceutical cross flow membrane applications, they are also used for high-capacity water purification and buffer depyrogenation. Cytiva offers membranes with a broad range of ultrafiltration nominal molecular weight cut-offs and microfiltration pore sizes. Most pore sizes are available in several membrane fiber inner diameters.

Specifications

MaxCell cartridge specifications are listed in Table 1.

Table 1. Specifications for MaxCell cartridges

MaxCell cartridge physical dimensions

Housing size	Diameter		Length [†]		End-fitting connections	Permeate connections
	cm	in	cm	in		
45	10.8	4.25	39.4	15.5	2 in sanitary	1.5 in sanitary
65	10.8	4.25	62.5	24.6	2 in sanitary	1.5 in sanitary
85	10.8	4.25	120.0	47.3	2 in sanitary	1.5 in sanitary

[†] Add 4.25 in (10.8 cm) for straight adaptors (2) at retentate ends.

MaxCell cartridge membrane area as a function of housing size and lumen diameter

Housing	Membrane Fiber Inner	Membrane Area size	
	mm	m ²	ft ²
45	0.5	3.5	37
	0.75	2.65	28.5
	1	2.3	25
65	0.5	6.1	66
	1	4.4	47
85	0.5	13	140
	1	9	95

MaxCell ultrafiltration cartridge transmembrane pressure as a function of operating temperature

1KMWC-30KMWC ultrafiltration membranes

Temperature °C	Maximum transmembrane pressure	
	barg	psig
< 10	3.7	60
10 to 25	3.4	50
25 to 50	3.1	45
50 to 80	2.3	35

Applications

Typical applications for MaxCell hollow fiber cartridges are:

- Concentration, purification, or diafiltration of monoclonal antibodies, proteins, vaccines, viruses, plasma, liposomes, or plasmids
- Colloidal suspension concentration or diafiltration
- Cell harvesting or clarification
- Continuous buffer exchange
- Removal of suspended solids, viruses, bacteria, or pyrogens
- Harvesting or clarification of cell cultures
- Lysate clarification
- Continuous cell culture perfusion

100KMWC-750KMWC ultrafiltration membranes

Temperature °C	Maximum transmembrane pressure	
	barg	psig
< 10	3.4	50
10 to 25	3.1	45
25 to 50	2.3	35
50 to 80	1.7	25

Ordering information

Housing size 45, ultrafiltration

Model number	NMWC	Membrane fiber inner diameter mm	Cartridge length [†]		Membrane area		Code number
			cm	in	m ²	ft ²	
UFP-10-C-45	10 000	0.5	39.4	15.5	3.5	37	56-4104-69
UFP-30-C-45	30 000	0.5	39.4	15.5	3.5	37	56-4104-70
UFP-500-E-45	500 000	1	39.4	15.5	2.5	27	28-9913-82
UFP-750-C-45	750 000	0.5	39.4	15.5	3.5	37	29-0098-57
UFP-750-E-45	750 000	1	39.4	15.5	2.5	27	56-4109-17

Housing size 45, microfiltration

Model number	Pore size µm	Membrane fiber inner diameter mm	Cartridge length [†]		Membrane area		Code number
			cm	in	m ²	ft ²	
CFP-1-E-45	0.1	1	39.4	15.5	2.5	27	56-4104-71
CFP-2-E-45	0.2	1	39.4	15.5	2.5	27	56-4104-72
CFP-4-E-45	0.45	1	39.4	15.5	2.5	27	56-4104-73
CFP-6-D-45	0.65	0.75	39.4	15.5	2.8	30	56-4109-17

Housing size 65, ultrafiltration

Model number	NMWC	Membrane fiber inner diameter mm	Cartridge length [†]		Membrane area		Code number
			cm	in	m ²	ft ²	
UFP-3-C-65	3000	0.5	62.5	24.6	6.1	66	56-4104-75
UFP-5-C-65	5000	0.5	62.5	24.6	6.1	66	56-4104-77
UFP-5-E-65	5000	1	62.5	24.6	4.4	47	56-4104-78
UFP-10-C-65	10 000	0.5	62.5	24.6	6.1	66	56-4104-79
UFP-10-E-65	10 000	1	62.5	24.6	4.4	47	56-4104-80
UFP-30-C-65	30 000	0.5	62.5	24.6	6.1	66	56-4104-81
UFP-30-E-65	30 000	1	62.5	24.6	4.4	47	56-4104-82
UFP-50-C-65	50 000	0.5	62.5	24.6	6.1	66	56-4104-83
UFP-50-E-65	50 000	1	62.5	24.6	4.4	47	56-4104-84
UFP-100-C-65	100 000	0.5	62.5	24.6	6.1	66	56-4104-85
UFP-100-E-65	100 000	1	62.5	24.6	4.4	47	56-4104-86
UFP-300-C-65	300 000	0.5	62.5	24.6	6.1	66	56-4104-87
UFP-300-E-65	300 000	1	62.5	24.6	4.4	47	56-4104-88
UFP-500-C-65	500 000	0.5	62.5	24.6	6.1	66	56-4104-89
UFP-500-E-65	500 000	1	62.5	24.6	4.4	47	56-4104-90
UFP-750-C-65	750 000	0.5	62.5	24.6	6.1	66	29-0082-50
UFP-750-E-65	750 000	1	62.5	24.6	4.4	47	56-4104-91

Housing size 65, microfiltration

Model number	Pore size µm	Membrane fiber inner diameter mm	Cartridge length [†]		Membrane area		Code number
			cm	in	m ²	ft ²	
CFP-1-E-65	0.1	1	62.5	24.6	4.4	47	56-4104-92
CFP-2-E-65	0.2	1	62.5	24.6	4.4	47	56-4104-93
CFP-4-E-65	0.45	1	62.5	24.6	4.4	47	56-4104-94
CFP-6-D-65	0.65	0.75	62.5	24.6	4.9	53	56-4108-12

Housing size 85, ultrafiltration

Model number	NMWC	Membrane fiber inner diameter mm	Cartridge length [†]		Membrane area		Code number
			cm	in	m ²	ft ²	
UFP-3-C-85	3000	0.5	120	47.3	13	140	56-4104-95
UFP-5-C-85	5000	0.5	120	47.3	13	140	56-4104-97
UFP-5-E-85	5000	1	120	47.3	8.8	95	56-4104-98
UFP-10-C-85	10 000	0.5	120	47.3	13	140	56-4104-99
UFP-10-E-85	10 000	1	120	47.3	8.8	95	56-4105-00
UFP-30-C-85	30 000	0.5	120	47.3	13	140	56-4105-01
UFP-30-E-85	30 000	1	120	47.3	8.8	95	56-4105-02

Model number	NMWC	Membrane fiber inner diameter mm	Cartridge length [†]		Membrane area		Code number
			cm	in	m ²	ft ²	
UFP-50-C-85	50 000	0.5	120	47.3	13	140	56-4105-03
UFP-50-E-85	50 000	1	120	47.3	8.8	95	56-4105-04
UFP-100-C-85	100 000	0.5	120	47.3	13	140	56-4105-05
UFP-100-E-85	100 000	1	120	47.3	8.8	95	56-4105-06
UFP-300-E-85	300 000	1	120	47.3	8.8	95	56-4105-07
UFP-500-C-85	500 000	0.5	120	47.3	13	140	56-4105-08
UFP-500-E-85	500 000	1	120	47.3	8.8	95	56-4105-09
UFP-750-C-85	750 000	0.5	120	47.3	13	140	29-0082-54
UFP-750-E-85	750 000	1	120	47.3	8.8	95	56-4105-10

Housing size 85, microfiltration

Model number	Pore size µm	Membrane fiber inner diameter mm	Cartridge length [†]		Membrane area		Code number
			cm	in	m ²	ft ²	
CFP-1-E-85	0.1	1	120	47.3	8.8	95	56-4111-77
CFP-2-E-85	0.2	1	120	47.3	8.8	95	56-4106-12

[†] Add 4.25 in (10.8 cm) for straight adaptors.

Housing size 85, microfiltration

Model number	Description	Code number
RBMX-16PS-ST	Straight adaptor for MaxCell cartridge, polysulfone	56-4107-26
KAMX-16PS	Straight Adaptor Kit for installation. Either kit KAMX-16PS or kit KAMX-16EL-PS, required for each new MaxCell cartridge. Contains 2 each: RBMX-16PS-ST straight adaptors in polysulfone, cartridge end nuts in polysulfone, O-rings in silicone.	56-4107-37
KAMX-16EL-PS	Elbow Adaptor Kit for Installation. Either kit KAMX-16PS or kit KAMX-16EL-PS, required for each new MaxCell cartridge. Contains 2 each: RBMX-16PS-EL elbow adaptors in polysulfone, cartridge end nuts in polysulfone, O-rings in silicone.	56-4107-38
CL16-LT	2 in TC toggle clamp, 304 SS	56-4106-70
KG16S	2 in TC gasket, silicone, pack of 4	56-4109-98
K04ORS	MaxCell O-ring set, 2 each, silicone	56-4106-92
SWR-MX01	MaxCell Wrench Set, standard	56-4107-39
SWR-MX02	MaxCell Wrench Set, applied torque	56-4107-40

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