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Россия +7(495)268-04-70
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Amicon® Stirred Cells

Introduction

Amicon® Stirred Cells are designed for rapid concentration and/or diafiltration of macromolecular solutions. Used in conjunction with an external compressed gas source and a magnetic stirrer, the stirred cells provide high concentration factors and high sample recovery. They are ideal for desalting or buffer exchange applications and can be used in either continuous or discontinuous diafiltration mode.

Amicon® Stirred Cell Features

- Pressure-driven filtration coupled with magnetic stirring provides a gentle method for concentration and reduces shear-induced denaturization of biological samples.
- Magnetic stirrer positioned at the filtration interface greatly minimizes the risk of concentration polarization and subsequent fouling of the membrane.
- Three sizes offer a broad range of process volumes (up to 400 mL) that can be further expanded with the addition of an external reservoir.
- The flexible, easy-to-use design can accommodate a wide range of ultrafiltration and microporous membranes at varying pressures and temperatures.
- Minimal holdup volume and easy sample recovery.
- Autoclavable for sterile applications.

Models Available

Catalogue Number	Maximum Working Volume	Membrane Diameter
UFSC05001	50 mL	44.5 mm
UFSC20001	200 mL	63.5 mm
UFSC40001	400 mL	76 mm

NOTE: Minimum concentrate volume must be determined empirically by the user since it depends on sample composition and stirring speed.

Operating Modes

Stirred cells can be operated in either a concentration or diafiltration mode. In concentration mode, gas pressure is applied directly to the stirred cell. Solutes larger than the membrane's molecular weight cutoff (MWCO)/pore size are retained in the cell, while water and solutes smaller than the MWCO/pore size pass through the membrane into the filtrate.

Diafiltration is a fast and efficient technique for desalting as well as buffer exchange of solutions. It can be performed in a batch (discontinuous) or constant volume (continuous) mode.

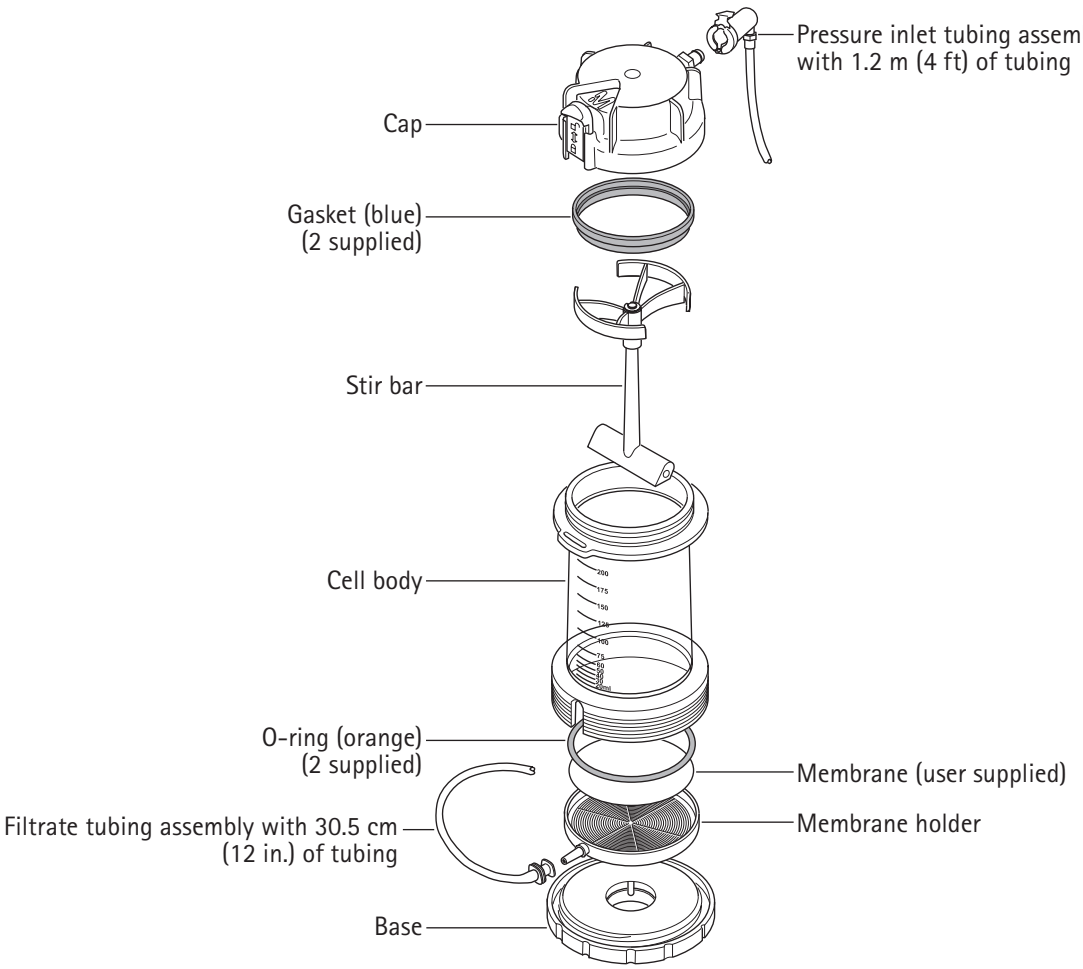
Discontinuous Diafiltration: The sample is first concentrated to a fixed volume, then diluted back to its original starting volume with water or buffer. Conversely, the sample can be diluted to a fixed volume with water or buffer, then concentrated back to its original volume. Either process is repeated until the remaining salt or solvent is removed or lowered in concentration.

Operating Modes, continued

Continuous Diafiltration: Buffer salts are removed, exchanged, or lowered by adding water or exchange buffer at the same rate as the filtrate is collected. Continuous diafiltration is gentler and more efficient than discontinuous diafiltration, as it maintains product stability by keeping the sample concentration and volume constant during diafiltration.

The Amicon® Stirred Cell Reservoir (cat. no. 6028) or Dispensing Pressure Vessel (cat. no. XX6700P01) can be used for diafiltration applications and to increase the volume capacity of the stirred cells. In continuous diafiltration mode, the reservoir/pressure vessel containing diafiltration solution is connected to the stirred cell and gas pressure supply via the Amicon® Stirred Cell Selector Valve (cat. no. 6003) or similar user-supplied valve(s). The selector valve allows instant switching between concentration and diafiltration modes without interrupting system operation. The combination of an external reservoir and the Amicon® Selector Valve create a simple diafiltration system that keeps the stirred cell fluid volume and macrosolute concentration constant as the filtrate volume is replaced by the diafiltration solution. In either mode, the Amicon® Stirred Cell Manifold (cat. no. 6015) can be used to operate multiple stirred cells in parallel.

Amicon® Stirred Cell Components



Sterilization/Sanitization

Amicon® Stirred Cells are compatible with standard sterilizing gas mixtures. They can also be autoclaved for at least 10 cycles at 121 °C, 1 bar (250 °F, 15 psi) for 30 minutes, with slow exhaust cycle. However, due to variables beyond our control, no warranty is provided or implied for more than 10 autoclave cycles. The pressure inlet tubing assembly is **NOT** autoclavable.

WARNING: To avoid damage to the cell body, the base and cap should be only partially tightened before autoclaving.

To sanitize, use 70% ethanol or isopropanol. To disinfect, use 5% formalin.

Chemical Compatibility

Do not use the stirred cell with strong acids or bases (pH < 2 or > 10), ketones (including acetone), aromatic hydrocarbons (including toluene), Cellosolve® solvent, halogenated hydrocarbons, dimethyl formamide, aliphatic esters, dimethyl sulfoxide, and polar aromatics.

For other solvent compatibilities, consult a standard text or contact Technical Service. For the chemical resistance of disc membranes, refer to product instructions.

Specifications

Catalogue Number	UFSC05001	UFSC20001	UFSC40001
Maximum working volume	50 mL	200 mL	400 mL
Hold-up volume without tubing (non-recoverable volume below membrane surface)	< 0.5 mL	< 1.0 mL	< 1.25 mL
Membrane diameter	44.5 mm	63.5 mm	76 mm
Effective membrane area	13.4 cm^2 (2.1 in^2)	28.7 cm^2 (4.4 in^2)	41.8 cm^2 (6.5 in^2)
Empty weight (without pressure inlet tubing)	160 g (5.6 oz)	265 g (9.3 oz)	390 g (13.8 oz)
Overall height	11.7 cm (4.6 in.)	15.5 cm (6.1 in.)	18.7 cm (7.4 in.)
Base diameter	6.6 cm (2.6 in.)	8.4 cm (3.3 in.)	9.9 cm (3.9 in.)
Tubing — Filtrate	5/32 in. (4.0 mm) OD × 3/32 in. (2.4 mm) ID ×12 in. (30.5 cm)		
Tubing — Pressure	1/4 in. (6.4 mm) OD × .17 in. (4.3 mm) ID × 4 ft (1.2 m)		
Maximum operating pressure	5.2 bar (75 psi)		
Maximum diafiltration operating pressure	3.8 bar (55 psi)		
Working temperature range	4–40 °C (39–104 °F)		
Materials of Construction			
Cap, stir bar, body, membrane holder	Polysulfone		
Gasket, O-ring	Silicone		
Base, stir bar support,	Acetal		
Stir bar retaining ring, washer	316 stainless steel		
Filtrate tubing	Tygon® E-3603 tubing		
Luer connector on filtrate tubing	Nylon		
Pressure tubing	Polyethylene		

Statement Regarding Compliance with the Pressure Equipment Directive 97/23/EC

EMD Millipore Corporation certifies that this product complies with the European Pressure Equipment Directive, 97/23/EC of 29 May 1997. This product is classified under Article 3 § 3 of the Pressure Equipment Directive. It has been designed and manufactured in accordance with sound engineering practices to ensure safe use. The product is accompanied by user instructions and bears markings to permit identification of EMD Millipore Corporation as the manufacturer or authorized representative of this product within the European Community. In compliance with Article 3 § 3 of the Pressure Equipment Directive, this product does not bear the CE mark.

Ordering Information

This section lists catalogue numbers for the Amicon® Stirred Cells, replacement parts, and accessories.

Product Description	Cat. No.	Qty/Pk
Amicon® Stirred Cell, 50 mL	UFSC05001	1
Seal Kit (3 O-rings and 3 gaskets)	UFSC050SL	1
Maintenance Kit (1 stir bar assembly, 2 gaskets, 1 tubing kit)	UFSC050MT	1
Amicon® Stirred Cell, 200 mL	UFSC20001	1
Seal Kit (3 O-rings and 3 gaskets)	UFSC200SL	1
Maintenance Kit (1 stir bar assembly, 2 gaskets, 1 tubing kit)	UFSC200MT	1
Amicon® Stirred Cell, 400 mL	UFSC40001	1
Seal Kit (3 O-rings and 3 gaskets)	UFSC400SL	1
Maintenance Kit (1 stir bar assembly, 2 gaskets, 1 tubing kit)	UFSC400MT	1
Accessories		
Amicon® Stirred Cell Selector Valve For instant switching from concentration to diafiltration. Includes selector valve, tube fittings, tubing.	6003	1
Amicon® Stirred Cell Manifold For operation of multiple cells or reservoirs; individually valved. Includes manifold, tube fittings, tubing, mounting hardware.	6015	1
Amicon® Stirred Cell Reservoir Provides 800 mL extra fluid volume; can be used for diafiltration. Includes reservoir, tube fittings, tubing.	6028	1
Dispensing Pressure Vessel, 1 gal	XX6700P01	1
Dispensing Pressure Vessel, 5 L	XX6700P05	1
Dispensing Pressure Vessel, 10 L	XX6700P10	1
Dispensing Pressure Vessel, 20 L	XX6700P20	1
Dispensing Pressure Vessel Fitting Kit	XX67000PK	1

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