

# STERLITECH

*C o r p o r a t i o n*

## **Polymeric Stirred Cells** **ASSEMBLY & OPERATION** **MANUAL**



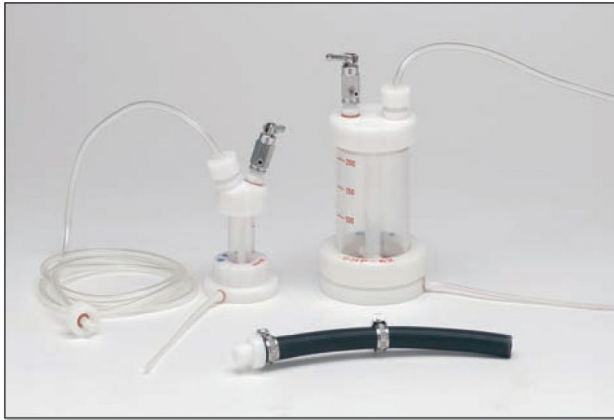


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## 1. INTRODUCTION

Polymeric stirred cells are chemically resistant and capable of performing a wide variety of membrane separations. These cells are available in UHP type or autoclavable UHP-K type. With a maximum pressure rating of 73 psi (5.5 Bar), these stirred cells are ideal for ultrafiltration (UF) and microfiltration (MF) applications. The polymeric construction and chemically resistant components enable filtration of both aqueous and non-aqueous solutions.



### Features

- Tangential flow design: increases membrane life and sample throughput
- PTFE stir bar: mounted to stay clear of the membrane
- Non-metal wetted parts: extends lifetime of cell
- Clear plastic reservoir: allows for easy visual monitoring of fluid levels and sample conditions
- Removable top cap: (25 mm, 43 mm, and 62 mm units) and sample port (76 mm, 90 mm, 150 mm units) allow sample to be added during filtration
- Pressure relief valve included
- Autoclavable options in 25, 43, 62, and 76 mm sizes

### Applications

- Desalting and concentrating proteins, enzymes, virus, and other biologically important samples
- Diafiltration or buffer exchange
- Nanodispersion studies
- Filtering fluids that contain a heavy particle burden (e.g. bacteria, silts)

**Table 1. UHP Type Stirred Cell Specifications**

	<b>HP-25 (341000)</b>	<b>UHP-43 (341100)</b>	<b>UHP-62 (341200)</b>	<b>UHP-76 (341300)</b>	<b>UHP-90 (341400)</b>	<b>UHP-150 (341500)</b>
<b>Filter Size</b>	25 mm	43 mm	62 mm	76 mm	90 mm	150 mm
<b>End Cap &amp; Stir Rod</b>	Polyacetal	Polyacetal	Polyacetal	Polyacetal	Polyacetal	Polyacetal
<b>Cell Barrel</b>	Polycarbon-ate	Polycarbon-ate	Polycarbon-ate	Acrylic	Acrylic	Acrylic
<b>O-Rings</b>	Silicone	Silicone	Silicone	Silicone	Silicone	Silicone
<b>Stir Bar</b>	PTFE-Coated	PTFE-Coated	PTFE-Coated	PTFE-Coated	PTFE-Coated	PTFE-Coated
<b>Autoclavable</b>	No	No	No	No	No	No
<b>Pressurizing Connections</b>	1/2 NPTM	1/2 NPTM	1/2 NPTM	1/2 NPTM	1/2 NPTM	1/2 NPTM
<b>Vent Valve Connection</b>	10 mm Screw, Female	10 mm Screw, Female	10 mm Screw, Female	10 mm Screw, Female	10 mm Screw, Female	10 mm Screw, Female
<b>Max. Pressure</b>	0.5 mPA (73 psi)	0.5 mPA (73 psi)	0.5 mPA (73 psi)	0.5 mPA (73 psi)	0.5 mPA (73 psi)	0.5 mPA (73 psi)
<b>Vent Relief Valve Pressure</b>	0.44 ± 0.04 mPa (63 ± 6 psi)	0.44 ± 0.04 mPa (63 ± 6 psi)	0.44 ± 0.04 mPa (63 ± 6 psi)	0.44 ± 0.04 mPa (63 ± 6 psi)	0.44 ± 0.04 mPa (63 ± 6 psi)	0.44 ± 0.04 mPa (63 ± 6 psi)
<b>Max. Operating Temp.</b>	40°C	40°C	40°C	40°C	40°C	40°C
<b>Diameter</b>	60 mm	68 mm	82 mm	117 mm	230 mm	268.5 mm
<b>Height</b>	138 mm	161 mm	190 mm	211 mm	230 mm	265 mm
<b>Weight</b>	0.5 kg (1.1 lbs)	0.54 kg (1.2 lbs)	0.8 kg (1.7 lbs)	1.5 kg (3.25 lbs)	2.2 kg (4.8 lbs)	4.7 kg (10.25 lbs)
<b>Capacity</b>	10 mL	70 mL	200 mL	450 mL	600 mL	2000 mL
<b>Min. Recoverable Upstream</b>	0.5 mL	2.5 mL	4.5 mL	10 mL	15 mL	60 mL
<b>Downstream Holdup</b>	1.3 mL	4.6 mL	9.1 mL	13 mL	20 mL	41 mL

**Table 2. UHP-K Type Stirred Cell Specifications**

	<b>UHP-25K (31351000)</b>	<b>UHP-43K (31351100)</b>	<b>UHP-62K (31351200)</b>	<b>UHP-76K (31351300)</b>
<b>Filter Size</b>	25 mm	43 mm	62 mm	76 mm
<b>End Cap &amp; Stir Rod</b>	Polysulfone (PSF, Top Cap Only)	Polysulfone (PSF, Top Cap Only)	Polysulfone (PSF, Top Cap Only)	Polysulfone (PSF, Top Cap Only)
<b>Cell Barrel</b>	Polysulfone (PSF)	Polysulfone (PSF)	Polysulfone (PSF)	Polysulfone (PSF)
<b>O-Rings</b>	Silicone	Silicone	Silicone	Silicone
<b>Stir Bar</b>	Polysulfone (PSF)	Polysulfone (PSF)	Polysulfone (PSF)	Polysulfone (PSF)
<b>Autoclavable</b>	Yes	Yes	Yes	Yes
<b>Pressurizing Connections</b>	PT 1/8"	PT 1/8"	PT 1/8"	PT 1/8"
<b>Vent Valve Connection</b>	10 mm Screw, Female	10 mm Screw, Female	10 mm Screw, Female	10 mm Screw, Female
<b>Max. Pressure</b>	0.49 mPa (71 psi)	0.49 mPa (71 psi)	0.49 mPa (71 psi)	0.49 mPa (71 psi)
<b>Vent Relief Valve Pressure</b>	0.39 ± 0.09 mPa (57 ± 13 psi)	0.39 ± 0.09 mPa (57 ± 13 psi)	0.39 ± 0.09 mPa (57 ± 13 psi)	0.39 ± 0.09 mPa (57 ± 13 psi)
<b>Max. Operating Temp.</b>	Autoclavable at 121°C, 20 minutes for Main body	Autoclavable at 121°C, 20 minutes for Main body	Autoclavable at 121°C, 20 minutes for Main body	Autoclavable at 121°C, 20 minutes for Main body
<b>Diameter</b>	97 mm	108 mm	132mm	146 mm
<b>Height</b>	140 mm	164 mm	198 mm	212 mm
<b>Weight</b>	0.8 kg (1.76 lbs)	1.0 kg (2.20 lbs)	1.8 kg (3.97 lbs)	2.2 kg (4.85 lbs)
<b>Capacity</b>	10 mL	70 mL	200 mL	380 mL
<b>Min. Recoverable Upstream</b>	0.5 mL	2.5 mL	4.5 mL	10 mL
<b>Downstream Holdup</b>	0.1 mL	0.2 mL	0.3 mL	0.4 mL

## 2. OPERATION, MAINTENANCE, CLEANING, & STERILIZATION

### 2.1. Pre-Assembly

All component parts should be washed with a neutralized detergent and rinsed with distilled or deionized water. See cleaning instructions below.

### 2.2. Assembly

1. Assemble units using Figures 1 and 2 for reference.
2. Place filter shiny (active) side up on the porous filter support base.
3. Install red silicone O-ring over filter.
4. Place clear cell barrel over O-ring.
5. For 25, 43 and 62 mm cells, lock cell body to cell base with fastening ring. Hand-tighten only. For 76, 90 and 150 mm cells, place top cap on cell barrel. The red silicone cap should fit snugly within the inlet cap. Align tie rods with top cap. Washers should be on the top cap. Hand-tighten bolts one-quarter turn each, working around the diameter of the holder until sealed.

Figures 1A and 1B: Stirred Cell Components (UHP Type)

Figure 1A: 25, 43, 62mm Units

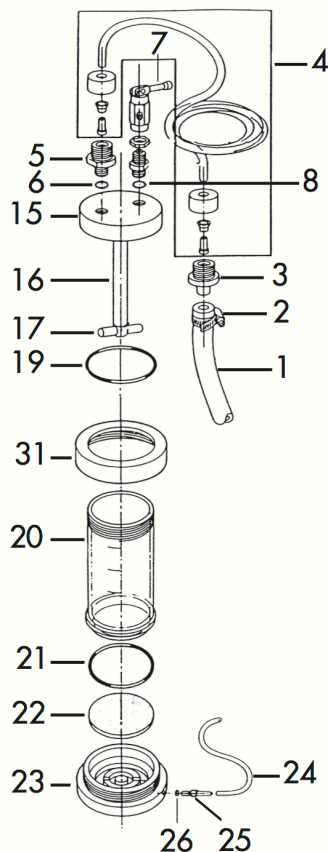
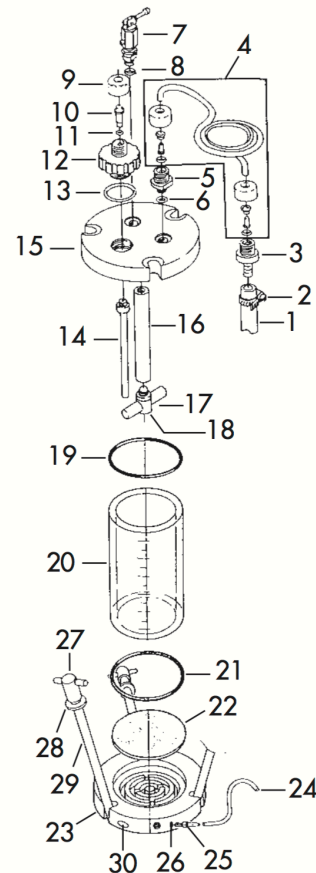


Figure 1B: 76, 90, 150mm Units



### 2.3. Initial Operation

1. Fill cell with sample to be filtered through inlet port. With 25, 43 and 62 mm cells, sample can also be poured directly into the cell before screwing inlet cap onto cell.
2. Connect pressure tubing to pressure supply.
3. Mount holder on a magnetic stirring plate. Adjust stirrer speed as needed.
4. Apply pressure slowly. Vent relief valve on inlet cap is preset to 71 psi (5 Bar).

### 2.4. Continuous Operation

1. Shut off pressure source.
2. Lift handle on vent relief valve slowly.
3. Open cap or sample port and add solution.
4. Close cap or port.
5. Close vent relief valve.
6. Apply pressure slowly.

### 2.5. Cleaning, Sterilization, and Maintenance

1. Polycarbonate-constructed cells (UHP-K Type) can be autoclaved to sterilize. The Acrylic/Polycarbonate (UHP Type) cells are not autoclavable. To sterilize, treat with ethylene oxide gas or formalin.
2. After each use, the stirred cell and all fluid-carrying tubing should be cleaned with mild laboratory detergent and rinsed with deionized water. Avoid alkaline cleaning solutions like Alconox. Air-dry all components.
3. Replace O-ring and gasket at the first sign of damage or wear.
4. Periodically inspect the cell body for cracks and inspect the stir bar for washer wear or rough edges which could damage the membrane.
5. The stirred cell should be disassembled whenever it is unlikely to be used for several weeks.
6. Store all components at room temperature.



**Table 2. Stirred Cell Replacement Parts (UHP Type\*)**

### Inlet Assembly

	All Models
1. Pressuring Hose	341001
2. Hose Clamp	341002
3. Male hose adapter	341003
4. Hose adapter assembly	341033
5. Inlet nipple adapter	341115
6. Intel adapter O-ring (silicone)	341013
7. Vent/relief valve (with washer)	341012
8. Vent valve O-ring (silicone)	341008

### Inlet Port Assembly

	UHP 76	UHP 90	UHP 150
9. End cap adapter	341006	341006	341006
10. Intel port adapter	341438	341438	341438
11. Intel cap O-ring	341436	341436	341436
12. Sample port inlet cap	341335	341435	341539
13. Sample port adapter O-ring	341336	341432	341532
14. Sample port tube	141334	341434	341534

### Outlet Assembly

	UHP 25, 43, 62	UHP 76	UHP 90	UHP 150
24. Outlook tubing	341019	341319	341419	341519
25. Outlook adapter	341018	341318	341418	341518
26. Outlook adapter O-ring	341016	341316	341416	341516

\* Please contact us for replacement part information on UHP-K type stirred cells.

## Body

	UHP 25	UHP 43	UHP 62	UHP 76	UHP 90	UHP 150
15. Inlet end cap	341026	341126	341226	341326	341425	341525
16. Stir Rod	341027	341127	341227	341327	341426	341526
17. Stir bar and adapter	341028	341128	341228	341328	341427	341527
18. Set bolt for stir bar	-	-	-	341331	341431	341531
19. Inlet cap O-ring (silicone)	341030	341130	341230	341322	341422	341522
20. Cell barrel	341024	341124	341224	341324	341424	341524
21. Outlet cap O-ring (silicone)	341022	341122	341228	341322	341422	341522
22. Support screen (polypropylene)	341021	341121	321221	341321	341421	341521
23. Outlet end cap	341020	341120	341220	341320	341420	341520
31. Locking ring	341025	341125	-	-	-	-

## Clamp Assembly

	UHP 76	UHP 90	UHP 150
27. Nut for tie rod	341332	341441	341441
28. Washer for tie rod	341331	341440	341440
29. Tie rod	341330	341439	341543
30. Set pins	341342	341442	341546

### 3. RETURN MATERIAL AUTHORIZATION

If materials are to be returned to Sterlitech for repair, evaluation, or warranty consideration, a Return Material Authorization (RMA) number and form must be obtained from Sterlitech prior to the return. Contact Sterlitech's Customer Service Department for these forms.

The form must be completed and returned with the material. Be sure to include a complete, detailed written reason for the return. Also, include serial numbers, installation and removal dates, and any other pertinent information that is available. Stirred Cells have a serial number imprinted on the cell bottom.

Indicate the proposed disposition of the material, and reference the RMA number on all packages or cartons. All material must be shipped to Sterlitech with freight prepared by the customer.

### 4. WARRANTY

The following is made in lieu of all other warranties expressed or implied. Sterlitech Corporation guarantees equipment to be free from defects in material and workmanship when operated in accordance with written instructions for a period of one year from receipt. Parts not manufactured by Sterlitech are covered by their manufacturer's warranties, which are normally for one year.

Manufacturers and Seller's only obligation shall be to issue credit against the purchase or replacement of equipment proved to be defective in material or workmanship. Neither manufacturer nor seller shall be liable for any injury, loss or damage, direct or indirect, special or consequential, arising out of the use of, misuse, or the inability to use such product.

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The foregoing may not be altered except by a written agreement signed by officers of the manufacturer.

### 5. TECHNICAL ASSISTANCE

Please contact us if you have any questions or technical inquiries about our products by calling Sterlitech Corporation at 1-877-544-4420 or by visiting [www.sterlitech.com](http://www.sterlitech.com).

## APPENDIX: STERLITECH BENCH SCALE FILTRATION PRODUCTS

	Discoverer	Innovator	Explorer	Developer	Investigator
					
	<b>HP4750(X)</b>	<b>CF016</b>	<b>CF042</b>	<b>Sepa</b>	<b>1812</b>
<b>Filter Holder</b>					
<b>Membrane Active Area</b>	14.6 cm <sup>2</sup> (2.26 in <sup>2</sup> )	20.6 cm <sup>2</sup> (3.2 in <sup>2</sup> )	42 cm <sup>2</sup> (6.5 in <sup>2</sup> )	140 cm <sup>2</sup> (24 in <sup>2</sup> )	0.27-0.46 m <sup>2</sup> (3-5 ft <sup>2</sup> )
<b>Typical Permeate Flux</b>	30-300 LMH (17.6-176 GFD)	30-300 LMH (17.6-176 GFD)	30-300 LMH (17.6-176 GFD)	30-300 LMH (17.6-176 GFD)	30-300 LMH (17.6-176 GFD)
<b>Typical Permeate Flow Rate (per Cell)</b>	1.5-15 mL/min	1-10 mL/min	2-20 mL/min	7-70 mL/min	350-2,300 mL/min
<b>System Capacity</b>	0.7-7 L/day (0.2-2 GPD)	1.5-15 L/day (0.4-4 GPD)	3-30 L/day (0.5-5 GPD)	10-100 L/day (2.6-26 GPD)	194-1,940 L/day (51-510 GPD)
<b>Min. Batch Volume (per Cell)</b>	300 mL	3.7 L (1 gal)	3.7 L (1 gal)	3.7 L (1 gal)	15 L (4 gal)
<b>Max. Pump Capacity</b>	N/A	6.8 LPM (76 bar) 1.8 GPM (1,100 psi)	6.8 LPM (76 bar) 1.8 GPM (1,100 psi)	6.8 LPM (76 bar) 1.8 GPM (1,100 psi)	6.8-38 LPM (76 bar) 1.8-10 GPM (1,100 psi)
<b>Cell Material</b>	SS316, Hastelloy™	PTFE, Delrin, Acrylic, SS316, Hastelloy™	PTFE, Delrin, Acrylic, SS316, Hastelloy™	Acrylic, SS316, Hastelloy™	SS316
<b>Max. Operating Pressure</b>	HP4750: 69 bar (1,000 psi) HP4750X: 172 bar (2,500 psi)	PTFE/Acrylic: 27.6 bar (400 psi) Delrin/SS316/Hastelloy™: 69 bar (1,000 psi)	PTFE/Acrylic: 27.6 bar (400 psi) Delrin/SS316/Hastelloy™: 69 bar (1,000 psi)	Acrylic: 27.6 bar (400 psi) SS316/Hastelloy™: 69 bar (1,000 psi)	41.4 bar (600 psi)
<b>Filtration Mode(s)</b>	Dead-End Stirred Cell	Cross Flow, Forward Osmosis	Cross Flow, Forward Osmosis	Cross Flow, Forward Osmosis	Cross Flow

Founded in 2001 in Kent, WA, Sterlitech Corporation manufactures and markets filtration-focused laboratory products to a broad spectrum of scientific and industrial sectors. Its line of flat sheet membranes and tangential flow cells deliver industry-leading performance and reliable results. Configured for reverse osmosis, nanofiltration, ultrafiltration, and microfiltration applications, Sterlitech's bench scale test equipment provides the versatility required to innovate.

Sterlitech's comprehensive line of products is supported by the expertise of its technical specialists who can assist with application-specific product selection, and provide customized solutions where necessary. Unique problem-solving approaches, flexibility, and consistent quality have made Sterlitech Corporation a renowned global provider of filtration products and equipment.

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