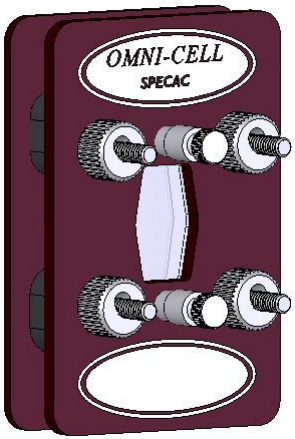


2I-869-149200-2

1. Introduction

The Omni Cell has been designed to study liquid solutions in demountable or sealed liquid cell assemblies or as liquid mulls for both Dispersive and FTIR instruments at ambient temperatures and pressures. The Omni Cell is supplied in separate parts: cell body, spacers and windows for assembly by the user. The cell body accepts a standard gasket/window/spacer construction, which is contained between front and back anodised aluminium plates. The plates are of the standard 3" x 2" dimension allowing the cell to be held in all spectrometer mounting systems via the back plate. Rectangular windows are used for liquid cell applications, whereas circular windows are used for mull cell applications.

2. Operation

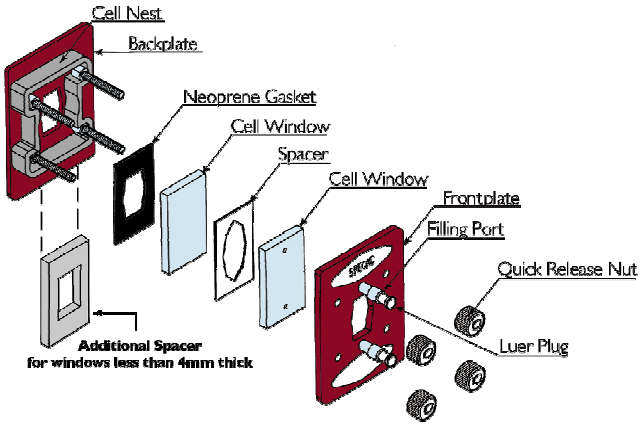
A typical Omni Cell, liquid or mull type, is constructed as shown (Construction, Section 3). Demountable liquid cells have separate windows and a PTFE spacer and sealed liquid cells have windows amalgamated to a lead spacer. The mull cell has circular windows and a PTFE spacer. The front plate has a PTFE gasket permanently bonded into position to allow sealing between the front plate and front window.

The 4 quick release nuts are tightened to provide a sufficient seal between all of the components but not over-tightened such that the windows could break. Window materials have their own physical characteristics; some are soft and can deform, others are hard and brittle. It is a matter of practice and familiarity with the cells and specific window material that determines the ideal sealing conditions.

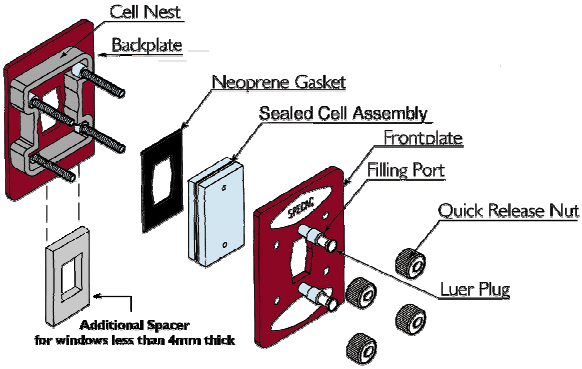
A recommended method for assembly is to place the back plate onto a flat surface. Build up the cell components as in the diagram, but before fixing the quick release nuts, hold the front plate centrally and apply an even pressure over the whole assembly. Slip on the quick release nuts and tighten until just holding. The nuts can then be tightened further, but do so in a diagonal sequence.

The rectangular windows used are nominally 4mm thick. ZnSe, ZnS, Fused Silica, AgBr and Si windows are 2mm thick. With the thinner liquid cell windows it is necessary to use an additional spacer (P/N 869-161900) placed between the back plate and neoprene gasket shown in all diagrams.

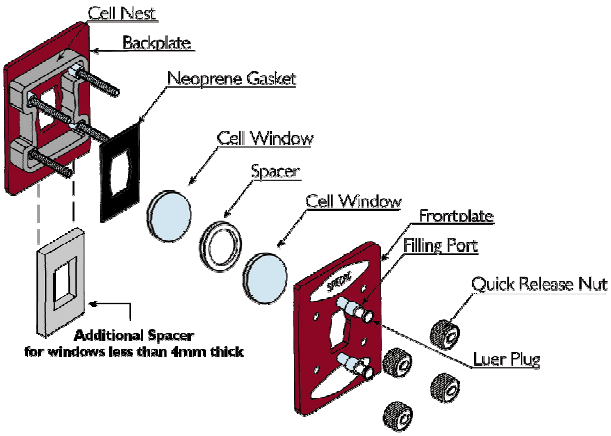
3. Construction: *Demountable Cell*



3. Construction: *Sealed Cell*



3. Construction: *Mull Cell*



4. Filling the Liquid Cell

A Luer Syringe (Specac P/N GS01110) can be used to introduce a solution into the Omni Liquid Cell via the Luer fittings. Lay the Omni Cell on a flat surface, and remove the PTFE plugs and fit the syringe into one of the Luer ports. Allow the cell to fill with sample by gentle pressure onto the syringe. (*Tip: Holding the Omni Cell at an upwards angle whilst filling can help remove any trapped air*.) When the solution is visible in the "open" Luer port remove the syringe and replace the PTFE plugs into the Luer ports. Any seepage around the Luer port when fitting the PTFE plugs can be wiped away with a tissue.

Note: *When using fairly viscous solutions with short pathlength cells (less than 0.012mm) care must taken when filling that there are no trapped pockets of air in the cell. An incomplete filled cell will show a fringing pattern spectrum. Any trapped air pockets can usually be removed by pumping the syringe alternatively sucking and blowing the liquid through the cell cavity. Once the window surfaces have been wetted the liquid will fill the cell.*

5. Omni Cell Used for Mulls

A mull is generally a mixture of a solid sample ground to a paste with liquid paraffin (Nujol) or Fluorolube. This paste is supported between two windows (with an optional pathlength spacer) and a transmission measurement is made. The Omni Cell mount allows for a mull window assembly to be supported in a spectrometer. The mull cell is built as a "sandwich" construction. The sample paste is placed on to the surface of one circular window and is then squashed between this window and another. Avoid overloading the mull cell as excess sample will be squeezed out and may contaminate the mount. When clamping the windows between the front and back plates a similar method of tightening as for liquid cells should be adopted.

6. Care of Windows

The Omni Cell's performance is only as good as the quality of the windows. To keep the windows in good and serviceable condition the Specac Polishing Kit P/N GS04000 is recommended. The kit contains all the essential materials required to clean and repolish NaCl and KBr windows to within a few fringes of flatness. Repolishing can be achieved efficiently and economically with a minimum degree of skill.

7. Catalogue Part Numbers

All Omni Cell windows are 4mm thick except ZnSe, ZnS, Silica (IR), AgBr and Si, which are 2mm thick. These thinner window pairs include the additional spacer 869-161900.

Rectangular Liquid Omni Cell Windows (Pair) (41mm x 23mm)	**Circular Mull Omni Cell Windows (Pair) (25mm diameter)**
P/N 869-159100 Sodium Chloride (NaCl)	P/N 869-160300 Sodium Chloride (NaCl)
P/N 869-159200 Potassium Bromide (KBr)	P/N 869-160400 Potassium Bromide (KBr)
P/N 869-159300 Calcium Fluoride (CaF2)	P/N 869-160500 Calcium Fluoride (CaF2)
P/N 869-159400 Barium Fluoride (BaF2)	P/N 869-160600 Barium Fluoride (BaF2)
P/N 869-159500 Zinc Selenide (ZnSe)	P/N 869-160700 Zinc Selenide (ZnSe)
P/N 869-159600 KRS-5	P/N 869-160800 KRS-5
P/N 869-159700 Cesium Iodide (CsI)	P/N 869-160900 Cesium Iodide (CsI)
P/N 869-160100 Zinc Sulphide (ZnS)	P/N 869-161300 Zinc Sulphide (ZnS)
P/N 869-159800 Fused Silica (IR) (SiO2)	P/N 869-161000 Fused Silica (IR) (SiO2)
P/N 869-159900 Silver Bromide (AgBr)	P/N 869-161100 Silver Bromide (AgBr)
P/N 869-160000 Silicon (Si)	P/N 869-161200 Silicon (Si)

Rectangular Liquid Omni Cell Spacers (Packet of 5)	Circular Mull Omni Cell Spacers (Packet of 5)
P/N 869-162000 0.05mm PTFE material	P/N 869-163400 0.05mm PTFE material
P/N 869-162100 0.10mm PTFE material	P/N 869-163500 0.10mm PTFE material
P/N 869-162200 0.20mm PTFE material	P/N 869-163600 0.20mm PTFE material
P/N 869-162300 0.50mm PTFE material	P/N 869-163700 0.50mm PTFE material
P/N 869-162400 1.00mm PTFE material	P/N 869-163800 1.00mm PTFE material
P/N 869-162500 0.025mm Lead material	P/N 869-163900 0.025mm Lead material
P/N 869-162600 0.05mm Lead material	P/N 869-164000 0.05mm Lead material
P/N 869-162700 0.10mm Lead material	P/N 869-164100 0.10mm Lead material
P/N 869-162800 0.20mm Lead material	P/N 869-164200 0.20mm Lead material
P/N 869-162900 0.50mm Lead material	P/N 869-164300 0.50mm Lead material
P/N 869-163000 1.00mm Lead material	P/N 869-164400 1.00mm Lead material
P/N 869-163100 0.006mm Mylar material	P/N 869-164500 0.006mm Mylar material
P/N 869-163200 0.012mm Mylar material	P/N 869-164600 0.012mm Mylar material
P/N 869-163300 0.025mm Mylar material	P/N 869-164700 0.025mm Mylar material

Spares

P/N 869-149200 Omni Cell body mount assembly complete.
P/N 869-161400 Rear neoprene gaskets (Packet of 2).
P/N 869-161500 Quick release nuts (Packet of 4).
P/N 869-161600 Luer port PTFE filling plugs (Packet of 2).
P/N 869-161800 Omni Cell spacers PTFE rectangular assorted (pkt of 16) for liquid cells.
P/N 869-161900 Additional packing spacer for thin windows (1).

8. Permanently Sealed Omni-Cell Window Units

Window Material	Pathlength							
	0.015mm	0.025 mm	0.05 mm	0.1 mm	0.2 mm	0.5 mm	1 mm	3 mm
NaCl	869-153300	869-154000	869-154700	869-155400	869-156100	869-156800	869-157500	869-152400
KBr	869-153400	869-154100	869-154800	869-155500	869-156200	869-156900	869-157600	869-153200
CaF2	869-153500	869-154200	869-154900	869-155600	869-156300	869-157000	869-157700	N/A
BaF2	869-153600	869-154300	869-155000	869-155700	869-156400	869-157100	869-157800	N/A
ZnSe	869-153900	869-154600	869-155300	869-156000	869-156700	869-157400	869-158000	N/A
KRS-5	869-153800	869-154500	869-155200	869-155900	869-156600	869-157300	869-157900	N/A
ZnS	869-153700	869-154400	869-155100	869-155800	869-156500	869-157200	N/A	N/A
Silica	N/A	869-158100	869-158200	869-158300	869-158400	869-158500	869-158600	N/A

Silicon, AgBr and Polythene are not offered as permanently sealed Omni Cell window units.
Thinner windows (ZnSe, ZnS and Silica) as sealed window units include additional spacer 869-161900.

Brilliant Spectroscopy™

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