# Omni Cell™

## Transmission Cells




The Omni Cell

The Omni-Cell™ is a demountable system for transmission measurements of liquids, pastes, and mulls. A wide range of window materials are available to cover spectral ranges from the UV to the Far-IR and THz ranges. Windows are supplied in two forms: as permanently sealed window sets with a fixed pathlength, and as demountable combinations of rectangular or circular windows and pathlength spacers.

## Ordering Information

A complete Omni-Cell consists of the Omni-Cell™ Body plus a window and spacer set.

| Ordering Information | |
|---|---|
| **Part-ID** | **Description** |
| 31800 | Omni-Cell ™ Body<br>incl. 3" x 2" mount, quick release nuts, neoprene gaskets(pair), filling ports, fixing screws |
| **Options & Replacement Parts** | |
| 31110 | Luer syringe (2 ml) |
| 33620 | Bottle of Nujol® mulling agent (25 ml) |
| 31890 | Spare Set of neoprene gaskets (pair) |
| 31891 | Spare set of quick release nuts (pack of 4) |
| 31892 | Spare Set of luer plugs (pair) |
| 31893 | Spare insert for windows less than 4 mm thick |
| 31894 | Spare Set of O-Rings |

## Features

- Modular liquid transmission cell
- Permanently sealed or demountable windows
- Pathlengths from 0.006 mm to 1.00 mm
- Window materials for UV-Vis, Near-IR, Mid-IR, and Far-IR/THz
- 3" x 2" slide mounted

The sample is analyzed as a pure substance or as a solution. For quantitative measurements, there are specially sealed cuvettes with a defined layer thickness. The following table provides guidelines for selecting the layer thickness based on sample concentration for the mid-infrared range.

| Concentration of analyte in solution | Typical pathlength required |
|---|---|
| < 10 % | 0.05 mm |
| 10-1 % | 0.1 mm |
| 1-0.1 % | 0.2 mm |
| < 0.1 % | > 0.5 mm |

This table serves as a guide rather than a rule. Different samples have different molar attenuation coefficients that may require a slightly longer or shorter pathlength to obtain an optimal measurement.

You can analyze solids using a mull cuvette. To do this, grind the sample with a paraffin, such as Nujol. This ground mixture is then placed between two round windows in the beam path.

## Window material guide

Window materials should be chosen based on the required spectral range and chemical compatibility. Choosing a window with a lower refractive index will minimize the intensity of interference fringes which can be used for pathlength determination but can also interfere with your measurement.

| Window material | Spectral range ($cm^{-1}$) | Refractive index @1000 $cm^{-1}$ |
|---|---|---|
| KBr | 40.000 - 400 | 1.53 |
| NaCl | 40.000 – 600 | 1.49 |
| $CaF_2$ | 66.000 – 800 | 1.40 |
| $BaF_2$ | 50.000 – 1.100 | 1.31 |
| ZnSe | 20.000 – 500 | 2.41 |
| KRS-5 | 16.000 – 250 | 2.37 |
| Silica (IR) | 22.000 – 300 | 2.17 |
| AgBr | 40.000 – 3.000 | 1.4 |
| Polyethelene | 625 - 4 | ~ 1.5 |

See your Options for the Omni-Cell™ Configuration on the next page.



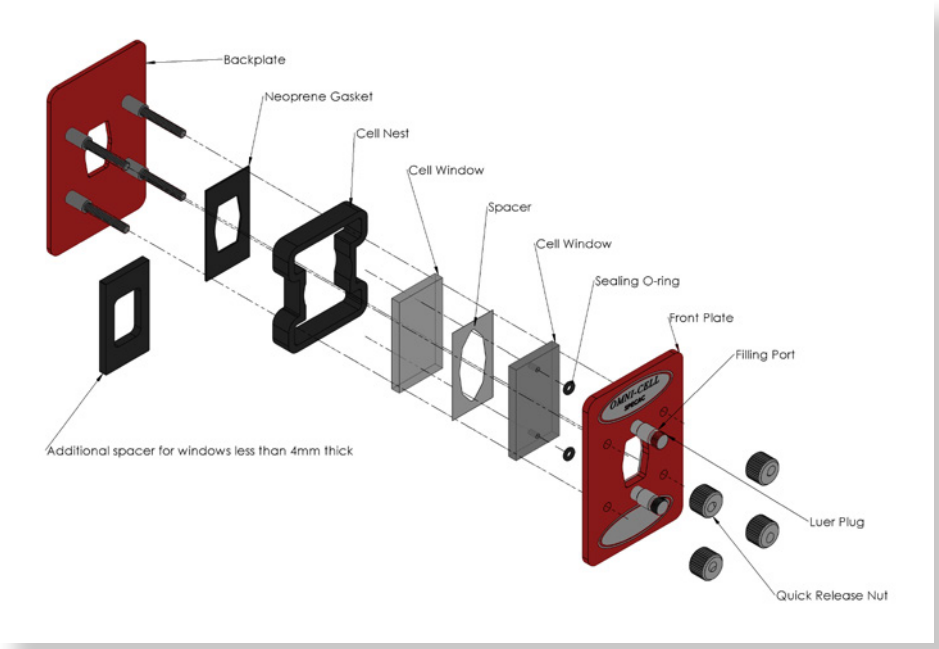
Quantum Design

Quantum Design GmbH
Breitwieserweg 9
D-64319 Pfungstadt

Please contact: Julia Holzmann
✆ +49 6157 80710-495, julia.holzmann@qd-europe.com
Find your local contact at www.qd-europe.com

# Omni Cell™

## Demountable Cell (rectangular windows)




Construction of a Demountable Omni Cell

The **demountable** option is best for applications requiring frequent changes of pathlength. The ports on the front of the cell can be used for drawing liquid samples into the cell.

### Application:

- Universally applicable
- Quantitative analysis

| **Demountable Windows** – rectangular- 41 x 23 mm (pair) one drilled, one undrilled | |
|---|---|
| **Part-ID** | **Window Material** |
| 31810 | NaCl |
| 31811 | KBr |
| 31812 | $CaF_2$ |
| 31813 | $BaF_2$ |
| 31814 | ZnSe* |
| 31815 | KRS-5 |
| 31818 | Silica (IR) Quartz* |
| 31819 | AgBr* |
| 31820 | Silicon* |
| 31821 | Polyethylene* |
| **includes thin window insert (31893)* | |

| **Spacer for Demountable Windows** - rectangular | | |
|---|---|---|
| **Part-ID** | **Pathlength (mm)** | **Material** |
| 31850 | 0.05 | PTFE |
| 31851 | 0.1 | |
| 31852 | 0.2 | |
| 31853 | 0.5 | |
| 31854 | 1.0 | |
| 31864 | 2 each of all above | |
| 31861 | 0.006 | Mylar |
| 31862 | 0.012 | |
| *31863* | 0.025 | |



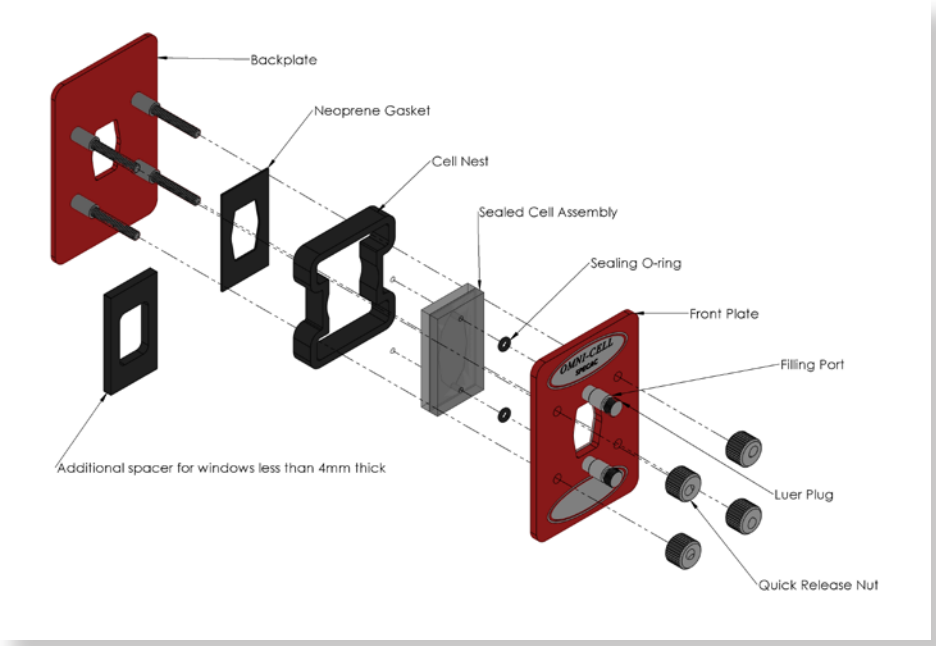
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# Omni Cell™

## Sealed Cell (rectangular windows)




Construction of a sealed Omni Cell

A **sealed** cell is a fixed combination of window and spacer forming a sealed unit. It is used where the pathlength must remain constant and stable between measurements

### Application:

- volatile samples
- low-viscosity liquids
- Quantitative analysis

| **Permanently Sealed Windows** – rectangular with fixed pathlength | | | | | | |
|---|---|---|---|---|---|---|
| **Window Material** | **Pathlength (mm)** | | | | | |
| | **0.025** | **0.05** | **0.1** | **0.2** | **0.5** | **1.0** |
| NaCl | 32211 | 32221 | 32231 | 32241 | 32251 | 32261 |
| KBr | 32212 | 32222 | 32232 | 32242 | 32252 | 32262 |
| $CaF_2$ | 32213 | 32223 | 32233 | 32243 | 32253 | 32263 |
| $BaF_2$ | 32214 | 32224 | 32234 | 32244 | 32254 | 32264 |
| ZnSe | 32215 | 32225 | 32235 | 32245 | 32255 | 32264 |
| KRS-5 | - | - | 32236 | - | - | - |
| *Sealed window sets with a fixed pathlength. The windows are sealed together with a stainless-steel spacer using a proprietary technique.* | | | | | | |



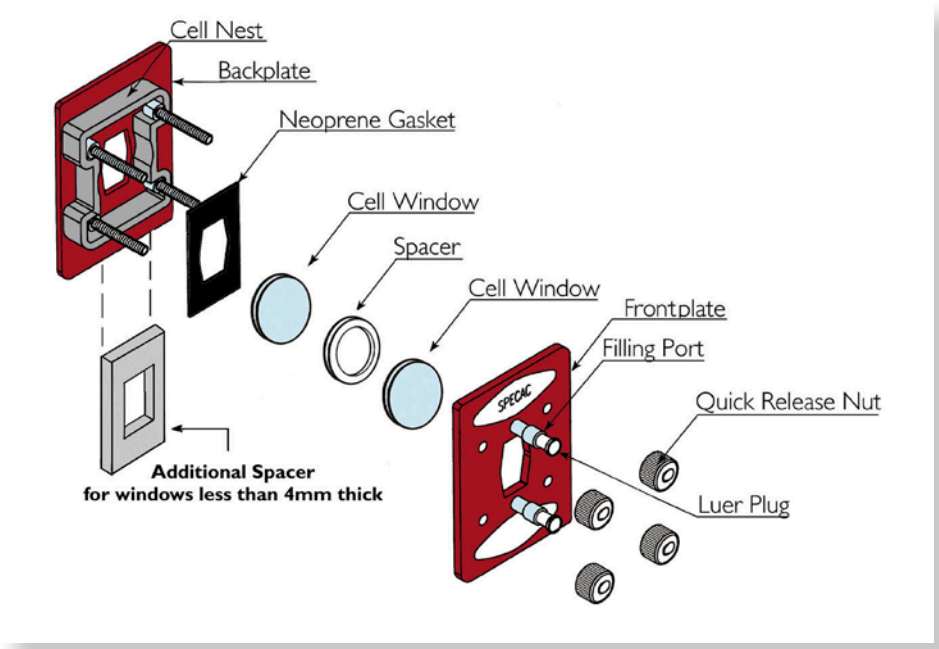
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# Omni Cell™

## Mull Cell (circular windows)




Construction of an Mull Omni Cell

Viscous or greasy samples can be sandwiched between circular "**mull**" windows. An older technique for solid sampling involved mixing powders with a mulling agent, such as Nujol, which was then applied to a circular window.

### Application:

- high-viscosity liquids
- pastes and gels
- oils and fats
- liniments

| **Demountable Windows** – circular (mull) – 25 mm dia (pair) | |
|---|---|
| **Part-ID** | **Window Material** |
| 31830 | NaCl |
| 31831 | KBr |
| 31832 | $CaF_2$ |
| 31833 | $BaF_2$ |
| 31834 | ZnSe* |
| 31835 | KRS-5 |
| 31838 | Silica (IR) Quartz* |
| 31839 | AgBr* |
| 31840 | Silicon* |
| 31841 | Polyethylene* |
| **includes thin window insert (31893)* | |

| **Spacer for Demountable Windows** – circular (mull) | | |
|---|---|---|
| **Part-ID** | **Pathlength (mm)** | **Material** |
| 31870 | 0.05 | PTFE |
| 31871 | 0.1 | |
| 31872 | 0.2 | |
| 31873 | 0.5 | |
| 31874 | 1.0 | |
| 31881 | 0.006 | Mylar |
| 31882 | 0.012 | |
| *31883* | 0.025 | |



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