UV Flow-Through Cells
As the name indicates these cells are designed to use solvent flow through them

Measuring Chamber: Flow-through cells, until now, had measuring chambers that are either rectangular or circular in shape. These shapes were dictated by limitations in the manufacturing processes. Such cells do not offer the best geometry for clean flushing and thereby reduced cross-contamination. We have now introduced new oval apertured cells, which combine low volume with excellent flow characteristics. These oval flow cells are strongly recommended for automated analyses such as dissolution testing.

Black quartz is used in the vicinity of the aperture to ensure that no light passes through the side walls of the cell.

Volume: In the tables, where the flow-through cells are listed, we have specified in the column "volume" the measuring volume, i.e. the volume of liquid, which is actually irradiated. Please note that, depending on the cell type, the filling volume can be significantly larger.

Light Beam Cross Section: It is important especially for cells with very small apertures, to ensure that the light beam lies in the center of measuring chamber.

Center Height: A very important dimension for flow-through cells is height of the center of the light beam. All our flow cells have the aperture centered at 15 mm from the bottom of the cuvette.

Bubble Formation: Flow-through cells are often subject to bubble formation in the measuring chamber, which can lead to erroneous measurements. This problem is most prominent in cells with light paths and small apertures. In the design of all our flow-through cells, one or all of the following steps are taken to combat the problem:

• A dome-shaped cavity, into which bubbles can rise and thus cannot interfere with the measurement, is introduced above the measuring chamber.
• Each flow-through cell is subjected to a special chemical treatment that inhibits the adhesion of bubbles to the surfaces within the measuring chamber.
• The channel that runs from the inlet tube to the outlet tube is designed to have minimal changes in cross section.

We also recommend that you note the following points:

• The choice of suitable inflow and outflow tubing, such as the recommended PTFE or FEP, is in part dependent on their cross section.
• When working with a sippet system you should make sure that the partial vacuum does not get too high in order to prevent gases from coming out of solution.
• Each cell should be thoroughly cleaned and rinsed after it has been in use for a given interval of time.

Carry-over: Carry-over occurs when, during the process of changing samples residual fluids of one sample become mixed with the next sample or the cleaning solution. This phenomenon can lead to inaccurate results. Carry-over is influenced by the following factors:

• design of the cell
• method used for filling / emptying the cell
• physical properties of the sample, such as viscosity and surface tension.

Flow Rate: The flow rate is dependent on the cross-sectional area of the inlet/outlet tubing, the smallest cross-sectional area within the cell, the power of the pump being used, and the physical properties of the sample (viscosity). Because of the many factors influencing the flow rate, we are unable to offer any details for specific cell types.

Pressure Load: Every single flow-through cell is pressure tested at 3 bars during final inspection. Due to their design, many cells can withstand much higher pressures. However, the maximum sustainable pressure is also dependent on the type of connectors used. For example, compact cells with screw connectors can sustain higher pressures than cells with glass inlet/outlet tubes, and are pressure tested at 5 bars.
Flow-through Cells with round aperture, screw fitting connections

<table>
<thead>
<tr>
<th>Path Length [mm]</th>
<th>External Dimensions H x W x D [mm]</th>
<th>Aperture Diameter [mm]</th>
<th>Center Height [mm]</th>
<th>Volume [µl]</th>
<th>Part No.</th>
<th>Quartz</th>
</tr>
</thead>
<tbody>
<tr>
<td>10</td>
<td>35 x 125 x 12.5</td>
<td>2</td>
<td>15</td>
<td>30</td>
<td>0100-1224</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>35 x 125 x 12.5</td>
<td>3</td>
<td>15</td>
<td>80</td>
<td>0100-1225</td>
<td></td>
</tr>
</tbody>
</table>

Flow-through Cells with oval aperture, screw fitting connections

<table>
<thead>
<tr>
<th>Path Length No.</th>
<th>External Dimensions H x W x D [mm]</th>
<th>Aperture Diameter [mm]</th>
<th>Center Height [mm]</th>
<th>Volume [µl]</th>
<th>Part No.</th>
<th>Quartz</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>39 x 12.5 x 12.5</td>
<td>8 x 3</td>
<td>15</td>
<td>40</td>
<td>5063-8570</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>39 x 12.5 x 12.5</td>
<td>8 x 3</td>
<td>15</td>
<td>80</td>
<td>5063-8571</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>39 x 12.5 x 12.5</td>
<td>8 x 3</td>
<td>15</td>
<td>200</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5063-8572
The new flow cell (PN 5065-9907) with an optimized shape of the measuring chamber, inlet and outlet channels exhibits superior flow characteristics. Compared with different shaped cells the time to exchange the liquid in the cell has been minimized. This allows the user to reduce pump time, sample volume and minimize cross contamination. The new cell has been compared with a similar cell (path length and volume) by using the flow test utility of the Agilent UV-Visible ChemStation Software and the 8453 Spectrophotometer. With a flow rate of 6 ml/min 99.5% of the volume in the new cell is exchanged within 14s, whereas it takes more than 30s to replace 99.5% of the volume in the other cell.