



TRAYCELL  
FIBRE-OPTIC ULTRA-MICRO CELL

## TrayCell - Fibre-Optical Ultra-Micro Measuring Cell



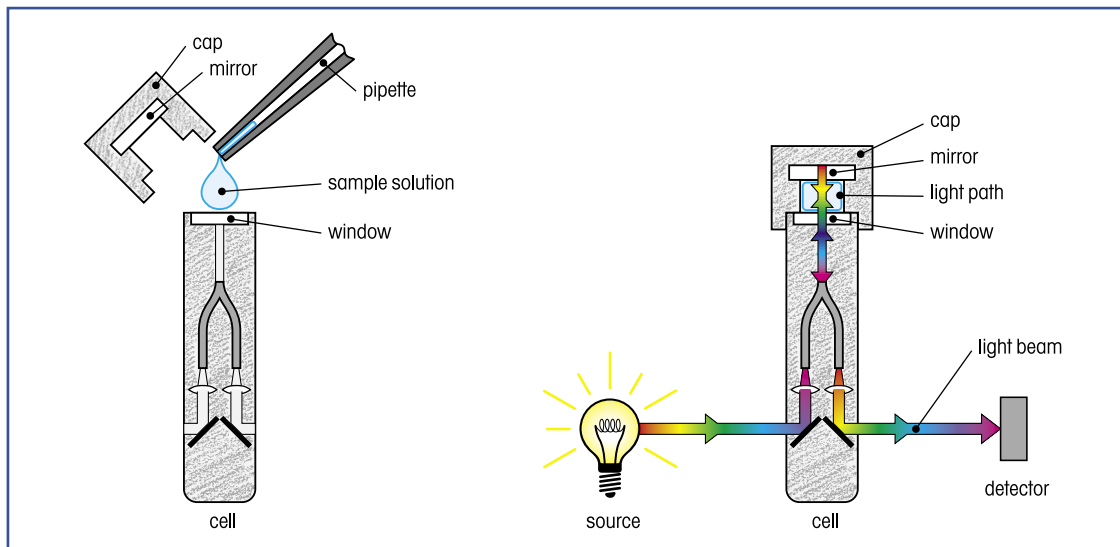
The Hellma TrayCell is designed for measurements e.g. of DNA/RNA or protein samples and enables highly accurate analysis of extremely small samples with remarkable reproducibility. The dimensions of the TrayCell are equivalent to a standard cuvette in order to work in most spectrophotometers.

Using the 1 mm or 0.2 mm cap creates a defined optical light path of 1 mm and 0.2 mm respectively. This generates virtual dilution factors of 1:10 or 1:50 in comparison to a measurement with a standard 10 mm cuvette. This feature saves time and avoids dilution errors. If desired, samples can be retrieved after the measurement for further processing. The required sample volume for the 1 mm cap is 3  $\mu\text{l}$  to 5  $\mu\text{l}$  and for the 0.2 mm cap 0.7  $\mu\text{l}$  to 4  $\mu\text{l}$ .

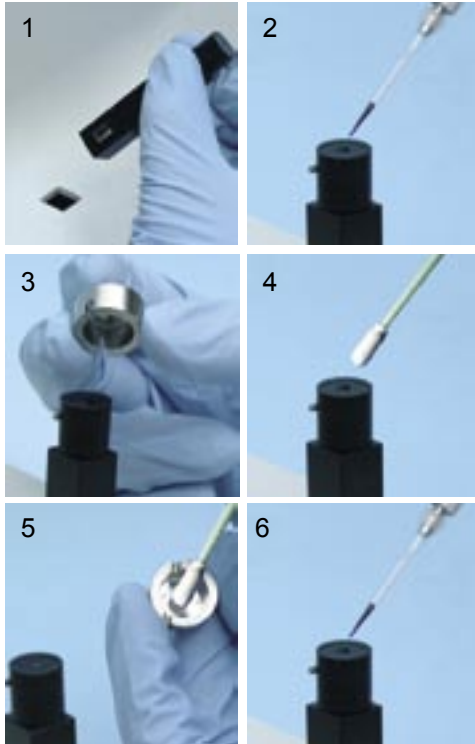
With the Hellma TrayCell the average dynamic range for dsDNA is between 2 ng/ $\mu\text{l}$  and 5,000 ng/ $\mu\text{l}$ . The mean dynamic range depends strongly on the type of photometer used.

Due to the integrated beam deflection and the use of fibre-optic cables it is possible to measure the sample directly on the surface of the optical window. The cap with mirror provides a well-defined optical light path and prevents the sample from drying up. The measurement remains reproducible because the sample will not be enriched by evaporation of the solvent.

During filling and cleaning stages, the cell remains in the photometer. This guarantees a continuously identical position of the aperture in the light beam and no variation in comparison to the reference measurement.



## Simple and Efficient Measurements



- 1 Position the TrayCell inside the cell holder...
- 2 ... pipette sample onto the centre of the measuring window ...
- 3 ... fit cap for the measurement, start measurement on spectrophotometer ...
- 4 ... take off cap, retrieve sample with a pipette, if desired ...
- 5 ... clean well with a lint free swab or a lint free wipe. Remove sample residues from the mirror by utilizing a lint free swab and, if necessary, pressurised clean and dry air. The cell remains in the cell holder for cleaning ...
- 6 ... pipette sample onto the centre of the measuring window, fit cap for the measurement, start measurement on the spectrophotometer ...

### Application Example:

#### Quantification of Nucleic Acids

To determine the nucleic acid concentration in solutions the absorbance at wavelength 260 nm (A<sub>260</sub>) is used. The following function, derived from Lambert-Beer's Law, is applied:

$$\text{Concentration [ng/}\mu\text{l]} = \text{Absorbance (260 nm)} \times \text{Factor}$$

$$(\text{with Factor} = \text{Sample Specific Factor} \times \text{Virtual Dilution Factor})$$

The Sample Specific Factor represents the specific absorbance for example of a sample of 50 ng/ $\mu$ l dsDNA that gives a reading of 1 Abs (A<sub>260</sub>), measured with an optical light path of 10 mm inside a standard cuvette. Due to the optical light paths of the TrayCell of 0.2 mm or 1 mm, additionally, a Virtual Dilution Factor of 50 or 10 must be taken into account.

For the different types of nucleic acid solutions the average dynamic range of the absorbance relating to the concentration (ng/ $\mu$ l) results as follows (depending on the lightpath):

	Sample Specific Factor	1 mm Cap (Virtual Dilution Factor 10) [ng/ $\mu$ l] *	0.2 mm Cap (Virtual Dilution Factor 50) [ng/ $\mu$ l] *	Total Detection Range [ng/ $\mu$ l] *
dsDNA	50	25 - 850	125 - 4,250	25 - 4,250
ssDNA	37	18 - 630	90 - 3,150	18 - 3,150
ssRNA	40	20 - 680	100 - 3,400	20 - 3,400
Oligo	30	15 - 510	75 - 2,550	15 - 2,550

\* characteristic concentration values as obtained with an average spectrophotometer



## Optimise your results and avoid experiment failures!

The fibre-optic microlitre cell TrayCell is designed for the following applications:

- nucleic acid analysis
- determination of the incorporation frequency of fluorescent dye labels (FOI)
- protein analysis (A280, BCA, Bradford, Lowry etc.)
- all UV/Vis analysis utilizing the wavelength range of 190 to 1100 nm

Catalogue No.	105.800-UVS	105.810-UVS
Width	12.5 mm	
Depth	12.5 mm	
Height	68.5 mm (Centre Height 8.5) 75 mm (Centre Height 15) 80 mm (Centre Height 20)	53 mm (Centre Height 8.5) 59.5 mm (Centre Height 15) 64.5 mm (Centre Height 20)
Window Material	Quartz SUPRASIL®	
Seal	Epoxy Glue	
Volume	0.7-5 µl	
Light Path	0.2 mm or 1 mm (± 0.02 mm)	
max. Temperature	50° C	
Centre Height	8.5 mm, 15 mm or 20 mm* other centre heights available on request	
Fibre-Optic Cables	built in, not exchangeable <b>UV/Vis low solarisation</b> 190 nm - 1,100 nm (52,632 cm <sup>-1</sup> - 9,100 cm <sup>-1</sup> )	

\* The TrayCell is offered with two basic heights to allow its use in as much spectrophotometers as possible. Please check which total height fits your instrument. Please specify also the centre height or name of instrument, model number, and manufacturer to ensure that the centre of the aperture coincides with the centre of the light beam.



- Filling, measuring and cleaning within seconds
- Width and depth are equivalent to a standard cuvette
- Works with 0.7-5 µl sample volume in most UV/Vis-spectrophotometers

## Caps for TrayCell

Catalogue No.	665.703	665.704
Description	Cap for TrayCell to adjust the light path, suitable for both versions	
Mirror Material	Quartz SUPRASIL® with Aluminium Mirror Layer	
Light Path	1 mm	0.2 mm

