Hellma® Analytics
High Precision in Spectro-Optics

Product Catalog | Cuvettes

FOR UV | VIS | NIR SPECTROSCOPY

MADE IN GERMANY

Hellma®

Reliable and Safe Measurement Results in Optical Analytics

For over 100 years **Hellma** has been the world's leading supplier of UV | Vis | NIR spectroscopy cuvettes for laboratory analytics and is now also a solution specialist in process analytical technology for a wide range of applications in research and industry. Products and services of the **Hellma Analytics** and **Hellma Solutions** brands provide the basis for precise and reliable measurement results in laboratory and process and thus safe and high-quality end products in the chemical, pharmaceutical, life science, food and beverage, cosmetics, environment, energy, technology and research industries.
Eight Hellma sales subsidiaries worldwide and over 200 international points of sales are available to customers for direct contact. Hellma is valued worldwide for its high performance, consulting competence and well-proven products.
100% Made in Germany.

www.hellma.com

Hellma Analytics for
OPTICAL ANALYSIS WITH
THE HIGHEST PRECISION

UNIQUE TECHNOLOGICAL EXPERTISE FOR EXACT MEASUREMENT RESULTS

Accurate measurements guaranteed

With over 100 years of experience in glass processing, Hellma Analytics provides an impressive range of services whenever **high-precision, innovative optics are needed for use in analytics**. **From proven, standard high-precision products to complex, technologically advanced custom-built designs, we offer our clients a comprehensive range of services and solutions** for collecting reliable and exact measurement results.

Batch-produced OEM products

Besides our extensive collection of standard products, we also manufacture **custom products according to client specifications**. Our state-of-the-art production facilities and in-depth specialist knowledge enable us to make the seemingly impossible possible. We are always on hand to provide detailed, expert advice to help make your ideas a reality.
Please don't hesitate to contact us.

OPTICAL PATH LENGTH TOLERANCES

Optical path length tolerance is a particularly important parameter for photometric applications because it influences the accuracy of the measurement results. The tight tolerances make Hellma Analytics products ideally suited for collecting reliable and reproducible analysis results.

MATERIAL	OPTICAL PATH LENGTH	TOLERANCE
Quartz	0.01 mm to 0.05 mm	± 0.003 mm
Quartz	0.1 mm to 0.2 mm	± 0.005 mm
Quartz	0.5 mm to 20 mm	± 0.01 mm
Quartz	30 mm to 100 mm	± 0.02 mm
Special Optical Glass	0.1 mm to 10 mm	± 0.01 mm
Special Optical Glass	20 mm to 100 mm	± 0.03 mm
Optical Glass	10 mm to 20 mm	± 0.1 mm
Optical Glass	30 mm to 100 mm	± 0.2 mm

These optical path length tolerances apply to absorption cells.
For fluorescence cells, both for the direction of excitation and emission the tolerance is ± 0.05 mm.

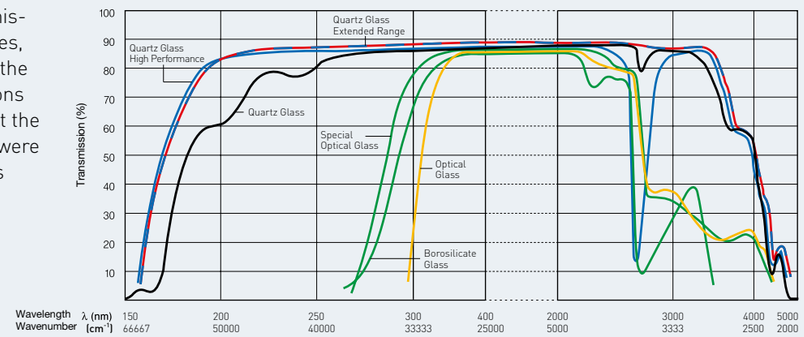
MATERIAL CODES

An original Hellma Analytics product can be identified from the material code on each cuvette.

MATERIAL	MATERIAL CODE	WAVELENGTH
Optical Glass	OG	360 nm – 2500 nm
Borosilicate Glass	BF	330 nm – 2500 nm
Special Optical Glass	OS	320 nm – 2500 nm
Quartz Glass	UV	260 nm – 2500 nm
Quartz Glass High Performance	QS	200 nm – 2500 nm
Quartz Glass Extended Range	QX	200 nm – 3500 nm

TRANSMISSION OF EMPTY CELLS MADE OF DIFFERENT MATERIALS

When comparing the transmission values of various cuvettes, it is essential to ensure that the same measurement conditions are in place. Please note that the transmission curves shown were plotted using measurements taken from empty cuvettes (2 windows).



INFORMATION ABOUT THE MATERIALS

> **www.hellma.com/technical-info**

CELLS

FOR RELIABLE MEASUREMENTS COLLECTED WITH UTMOST PRECISION

HIGH-PRECISION QUARTZ CUVETTE, TYPE 100-QS

- Tried and tested over decades, used in countless applications
- Utmost accuracy in terms of optical path length and parallelism
- Very high temperature resistance
- Very high chemical resistance
- Outstanding measurement reproducibility

Developed using our specialist expertise, Hellma cuvettes stand out for their excellent quality.

Thomas Brenn,
Product Manager Cuvettes

Cuvettes for absorbance and fluorescence measurements

Hellma Analytics produces a wide range of cuvettes for use in spectroscopy and cytometry with optical path lengths spanning 0.01 mm to 100 mm and above. Thanks to their stability, maximum precision and reliability when used for absorbance and fluorescence measurements, **Hellma cuvettes work exceptionally well** in a wide range of areas in the lab. **With a surface flatness of 1 µm, our quartz windows set a benchmark in cuvette production.**

What's more, **the function-optimized design** with beveled edges and corners protects against the risk of damage caused by splitting and assists users in their daily work. On request, we are able to produce custom models customized to specific areas of application.

Measuring of cuvette transmission

If required, cuvettes can be **spectrally calibrated** into sets with equal transmission values (measurement uncertainty ±1%). These cuvettes are given a three-digit calibration code containing coded data about the material and the transmission at a wavelength typical for the cuvette material.

Polarimetric checking of cuvettes

Cuvettes with an inside width greater than 5 mm can be **polarimetrically checked** on request. They are marked with a "P" and delivered with a test certificate confirming that the rotation of the polarization plane does not exceed 0.01 degrees.

ADVANTAGES

- **Extremely high parallelism** of the windows with a maximum tolerance of ± 0.01 mm
- **Exceptional optical path length accuracy** down to 0.003 mm (3 µm) for high dimensional accuracy and reproducible measurements results
- **Unique surface flatness** of the optical windows of 0.001 mm (1 µm)
- Very high **temperature stability** and **chemical resistance** due to thermal bonding of individual components (effectively monolithic)
- **Guaranteed transmission** of at least 82% from 200 nm to 3500 nm depending on the material

CUVETTE FINDER

If you cannot find the right product in the following selection, please use our online cuvette finder.

> **www.hellma.com/cuvette-finder**

UV/VIS/NIR SPECTROSCOPY PERFECTION IN DETAIL

TRUST THE ORIGINAL

Hellma Analytics produces cuvettes in unrivaled high quality which are used in absorbance measurements, fluorescence measurements and special applications such as cytometry, light scattering or reflection measurements and guarantee precise reproducible results.
The comprehensive range of products and solutions provides the right solution for almost every requirement.

DECISIVE STRENGTHS OF HELLMA ANALYTICS CELLS

Cuvettes are not all the same, even if they sometimes appear identical. The difference lies in the details and can be crucial for measurement results. Take our cuvette windows, for example, which boast outstanding quality and a flatness tolerance of more than **0.001 mm (1 µm)**. The parallelism of both window surfaces relative to one another is just as important. Our high-precision production guarantees that the frontal deformation of the wave of a cuvette window is less than 4 lambda, which works out at approximately **0.001 mm (1 µm) if lambda = 546 nm**. The high level of flatness demonstrates that the cuvettes from Hellma Analytics are setting standards. Overall, an ideal foundation for conducting reliable, reproducible and exact measurements.

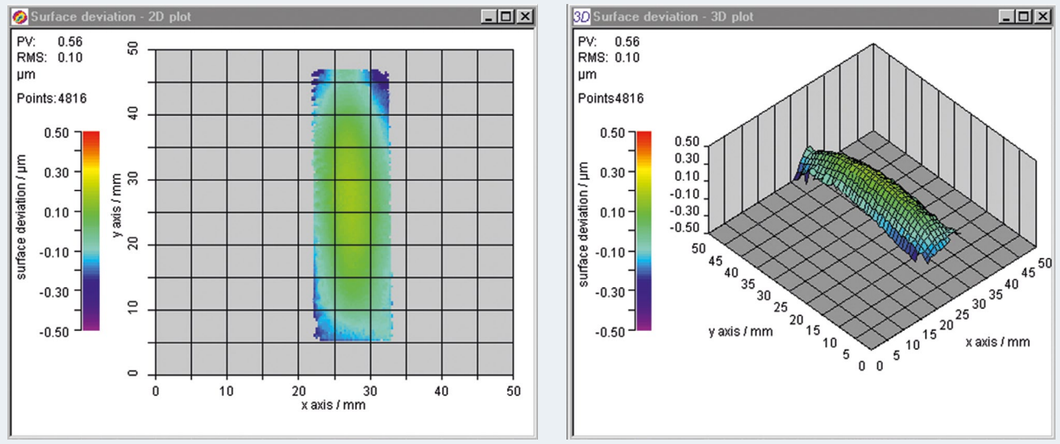


Figure 1: Measurement of the flatness of a Hellma cuvette - the frontal deformation of the wave is extremely low.

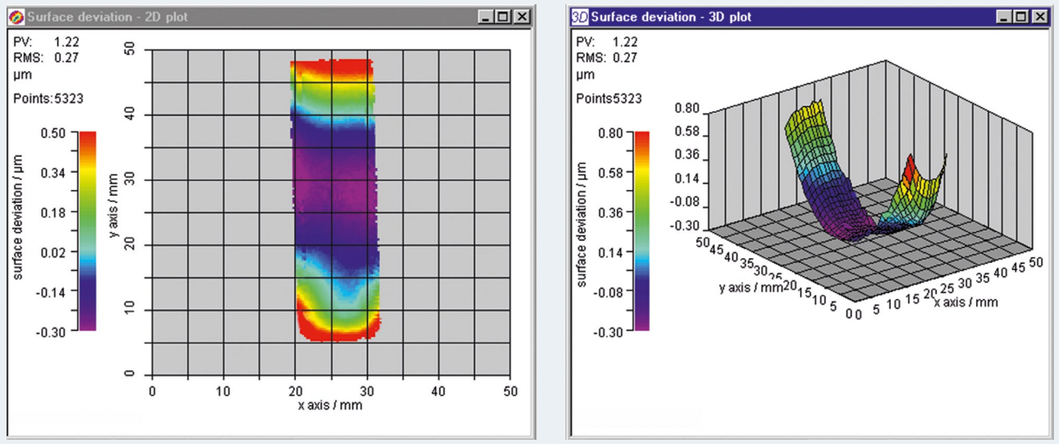


Figure 2: Measurement of the flatness of a competitor's cuvette - the frontal deformation of the wave is more than twice that of a Hellma cuvette.

ABSORPTION CELLS

MACRO CELLS

with PTFE lid or stopper

TYPE/WINDOW MATERIAL	OPTICAL PATH LENGTH mm	OUTSIDE DIM. H × W × D mm	INSIDE WIDTH mm	BASE THICKN. mm	VOL. µl	ARTICLE NO.	REMARKS
100-OS	2	45 x 12.5 x 4.5	9.5	1.5	700	100-2-20	glass lid
	10	45 x 12.5 x 12.5	9.5	1.5	3500	100-10-20	
	20	45 x 12.5 x 22.5	9.5	1.5	7000	100-20-20	
	40	45 x 12.5 x 42.5	9.5	1.5	14000	100-40-20	
	50	45 x 12.5 x 52.5	9.5	1.5	17500	100-50-20	
	100	45 x 12.5 x 102.5	9.5	1.5	35000	100-100-20	glass lid
100-QS	1	45 x 12.5 x 3.5	9.5	1.5	350	100-1-40	glass lid
	2	45 x 12.5 x 4.5	9.5	1.5	700	100-2-40	glass lid
	5	45 x 12.5 x 7.5	9.5	1.5	1750	100-5-40	
	10	45 x 12.5 x 12.5	9.5	1.5	3500	100-10-40	
	20	45 x 12.5 x 22.5	9.5	1.5	7000	100-20-40	
	40	45 x 12.5 x 42.5	9.5	1.5	14000	100-40-40	
	50	45 x 12.5 x 52.5	9.5	1.5	17500	100-50-40	
	100	45 x 12.5 x 102.5	9.5	1.5	35000	100-100-40	glass lid
100-QX	1	45 x 12.5 x 3.5	9.5	1.5	350	100-1-46	glass lid
	2	45 x 12.5 x 4.5	9.5	1.5	700	100-2-46	glass lid
	5	45 x 12.5 x 7.5	9.5	1.5	1750	100-5-46	
	10	45 x 12.5 x 12.5	9.5	1.5	3500	100-10-46	
	50	45 x 12.5 x 52.5	9.5	1.5	17500	100-50-46	
	100	45 x 12.5 x 102.5	9.5	1.5	35000	100-100-46	glass lid
110-QS	1	52 x 12.5 x 3.5	9.5	1.5	350	110-1-40	
	2	52 x 12.5 x 4.5	9.5	1.5	700	110-2-40	
	5	46 x 12.5 x 7.5	9.5	1.5	1750	110-5-40	
	10	46 x 12.5 x 12.5	9.5	1.5	3500	110-10-40	
	20	46 x 12.5 x 22.5	9.5	1.5	7000	110-20-40	
	40	46 x 12.5 x 42.5	9.5	1.5	14000	110-40-40	from 40 mm with 2 stoppers
	50	46 x 12.5 x 52.5	9.5	1.5	17500	110-50-40	
	100	46 x 12.5 x 102.5	9.5	1.5	35000	110-100-40	
110-QX	1	52 x 12.5 x 3.5	9.5	1.5	350	110-1-46	
	5	46 x 12.5 x 7.5	9.5	1.5	1750	110-5-46	
	10	46 x 12.5 x 12.5	9.5	1.5	3500	110-10-46	

WINDOW MATERIAL

OG	Optical Glass	360 nm – 2500 nm	**QS**	Quartz Glass High Performance	200 nm – 2500 nm
OS	Special Optical Glass	320 nm – 2500 nm	**QX**	Quartz Glass Extended Range	200 nm – 3500 nm

100 10 mm | 100 50 mm | 100 100 mm | 110 10 mm | 110 50 mm | 110 100 mm

MACRO CELLS

with PTFE lid or stopper

TYPE/WINDOW MATERIAL	OPTICAL PATH LENGTH mm	OUTSIDE DIM. H × W × D mm	INSIDE WIDTH mm	BASE THICKN. mm	VOL. µl	ARTICLE NO.	REMARKS
402.000-OG	10	40 x 23.6 x 15	18.5	2.5	6000	402-10-10	
	50	40 x 23.6 x 55	18.5	2.5	30000	402-50-10	
404.000-QX	1	47.5 x 23.6 x 7.5	18.5	2.5	700	404-1-46	with 2 stoppers
	2	47.5 x 23.6 x 7.5	18.5	2.5	1400	404-2-46	with 2 stoppers
6030-OG	10	45 x 12.5 x 12.5	9.5	1.5	3500	6030-10-10	
	20	45 x 12.5 x 22.5	9.5	1.5	7000	6030-20-10	
	40	45 x 12.5 x 42.5	9.5	1.5	14000	6030-40-10	
	50	45 x 12.5 x 52.5	9.5	1.5	17500	6030-50-10	
6030-UV	10 (± 0.05)	45 x 12.5 x 12.5	9.5	1.5	3500	6030-UV-10-531	

SEMI-MICRO CELLS

with PTFE lid or stopper

TYPE/WINDOW MATERIAL	OPTICAL PATH LENGTH mm	OUTSIDE DIM. H × W × D mm	INSIDE WIDTH mm	BASE THICKN. mm	VOL. µl	ARTICLE NO.	REMARKS
6040-OG	10	45 x 12.5 x 12.5	4	3.2	1400	6040-10-10	
6040-UV	10 (± 0.05)	45 x 12.5 x 12.5	4	3.2	1400	6040-UV-10-531	
104-QS	5	45 x 12.5 x 7.5	4	3.2	700	104-5-40	
	10	45 x 12.5 x 12.5	4	3.2	1400	104-10-40	
	50	45 x 12.5 x 52.5	4	3.2	7000	104-50-40	
104-QX	10	45 x 12.5 x 12.5	4	3.2	1400	104-10-46	

WINDOW MATERIAL

OG	Optical Glass	360 nm – 2500 nm	**QS**	Quartz Glass High Performance	200 nm – 2500 nm
UV	Quartz Glass	260 nm – 2500 nm	**QX**	Quartz Glass Extended Range	200 nm – 3500 nm

402.000 10 mm | 404.000 2 mm | 6030 10 mm | 6030-UV 10 mm | 6040 10 mm | 6040-UV 10 mm | 104 10 mm

ABSORPTION CELLS

SEMI-MICRO CELLS

with PTFE lid or stopper

TYPE/WINDOW MATERIAL	OPTICAL PATH LENGTH mm	OUTSIDE DIM. H × W × D mm	INSIDE WIDTH mm	BASE THICKN. mm	VOL. µl	ARTICLE NO.	REMARKS
104B-QS	10	45 x 12.5 x 12.5	4	3.2	1400	104-B-10-40	black side walls and base
108-QS	10	45 x 12.5 x 12.5	4	9	1000	108-000-10-40	
108B-QS	10	45 x 12.5 x 12.5	4	9	1000	108B-10-40	black side walls and base
114-QS	10	46 x 12.5 x 12.5	4	3.2	1400	114-10-40	
114B-QS	10	46 x 12.5 x 12.5	4	3.2	1400	114B-10-40	black side walls and base

MICRO CELLS

with PTFE lid or stopper

TYPE/WINDOW MATERIAL	OPTICAL PATH LENGTH mm	OUTSIDE DIM. H × W × D mm	INSIDE WIDTH mm	BASE THICKN. mm	VOL. µl	ARTICLE NO.	REMARKS
104.002-OS	10	45 x 12.5 x 12.5	2	3.2	700	104-002-10-20	
104.002-QS	10	45 x 12.5 x 12.5	2	3.2	700	104-002-10-40	
104.002B-OS	10	45 x 12.5 x 12.5	2	3.2	700	104002B-10-20	black side walls and base
104.002B-QS	10	45 x 12.5 x 12.5	2	3.2	700	104002B-10-40	black side walls and base
105-QS	10	25 x 12.5 x 12.5	2	1.5	300	105-10-40	
108.002-QS	10	45 x 12.5 x 12.5	2	9	500	108-002-10-40	
108.002B-QS	10	45 x 12.5 x 12.5	2	9	500	108002B-10-40	black side walls and base
115-QS	10	40 x 12.5 x 12.5	2	1.25	400	115-10-40	
115B-QS	10	40 x 12.5 x 12.5	2	1.25	400	115B-10-40	black side walls and base

WINDOW MATERIAL
OS Special Optical Glass 320 nm – 2500 nm **QS** Quartz Glass High Performance 200 nm – 2500 nm

104B 10 mm | 108 10 mm | 108B 10 mm | 114 10 mm | 114B 10 mm | 104.002 10 mm | 104.002B 10 mm | 105 10 mm | 108.002 10 mm | 108.002B 10 mm | 115 10 mm | 115B 10 mm

ULTRA-MICRO CELLS

with PE stopper or open with pipette tips

TYPE/WINDOW MATERIAL	OPTICAL PATH LENGTH mm	CENTER HEIGHT mm	OUTSIDE DIM. H × W × D mm	APERTURE H x W mm	CHAMBER VOL. µl	FILLING VOL. µl	ARTICLE NO.	REMARKS
105.200-QS	10 10	15 8.5	45 x 12.5 x 12.5 45 x 12.5 x 12.5	8 x 2 8 x 2	160 160	180 180	105-200-15-40 105-200-85-40	
105.201-QS	10 10	15 8.5	45 x 12.5 x 12.5 45 x 12.5 x 12.5	5 x 2 5 x 2	100 100	120 120	105-201-15-40 105-201-85-40	
105.202-QS	10 10	15 8.5	45 x 12.5 x 12.5 45 x 12.5 x 12.5	2.5 x 2 2.5 x 2	50 50	70 70	105-202-15-40 105-202-85-40	
105.210-QS	10 10	15 8.5	40 x 12.5 x 12.5 40 x 12.5 x 12.5	Ø 0.8 Ø 0.8	5 5	10 10	1052101015-40 1052101085-40	

TRAYCELL 2.0 FOR MICRO VOLUME ANALYSIS

Information about the TrayCell 2.0 (105.830) and its application can be found on the following page: www.hellma.com/traycell

SCAN QR-CODE

DEMOUNTABLE CELLS WITH SMALL VOLUME

TYPE/WINDOW MATERIAL	OPTICAL PATH LENGTH mm	OUTSIDE DIM. H × W × D mm	THICKNESS mm	INSIDE WIDTH mm	VOL. µl	ARTICLE NO.	REMARKS
106-QS	0.01 ± 0.003 0.1 ± 0.005 0.2 ± 0.005 0.5 ± 0.010	45 x 12.5 45 x 12.5 45 x 12.5 45 x 12.5	2.5 2.6 2.7 3	9 9 9 9	2.6 26 52 130	106-0.01-40 106-0.10-40 106-0.20-40 106-0.50-40	demountable rectangular cells Please order cell holder separately – see article no. 013-000-71
013.000		55 x 12.5 x 12.5				013-000-71	cell holder for cell type 106

WINDOW MATERIAL
QS Quartz Glass High Performance 200 nm – 2500 nm

105.200 10 mm | 105.201 10 mm | 105.202 10 mm | 105.210 10 mm | 105.830-UVS | 106 | 013.000

ABSORPTION CELLS

CELLS FOR MAGNETIC STIRRERS

macro, semi-micro, with PTFE lid or stopper

TYPE/WINDOW MATERIAL	OPTICAL PATH LENGTH mm	OUTSIDE DIM. H × W × D mm	INSIDE WIDTH mm	BASE THICKN. mm	VOL. µl	ARTICLE NO.	REMARKS
109.000-QS	10	45 x 12.5 x 12.5	9.5	5	3500	109-000-10-40	
109.004-QS	10	45 x 12.5 x 12.5	4	5	1500	109-004-10-40	
119.000-QS	10	49.5 x 12.5 x 12.5	9.5	5	3500	119-10-40	
119.004-QS	10	49.5 x 12.5 x 12.5	4	5	1500	119-004-10-40	
332.300		6 x 3				332-300-VE10	10-pack PTFE coated magnetic stir bar

SEALABLE CELLS

macro, semi-micro, for anaerobic applications

(with ISO thread GL 14 and screw cap with silicone rubber seal, accessories see page 33)

TYPE/WINDOW MATERIAL	OPTICAL PATH LENGTH mm	OUTSIDE DIM. H × W × D mm	INSIDE WIDTH mm	BASE THICKN. mm	VOL. µl	ARTICLE NO.	REMARKS
117.100-QS	10	56 x 12.5 x 12.5	9.5	1.5	3500	117-100-10-40	Open screw cap
117.200-QS	10	56 x 12.5 x 12.5	9.5	1.5	3500	117-200-10-40	Closed screw cap
117.104-QS	10	56 x 12.5 x 12.5	4	1.25	1400	117-104-10-40	Open screw cap
117.204-QS	10	56 x 12.5 x 12.5	4	1.25	1400	117-204-10-40	Closed screw cap

CELLS WITH TUBES

macro, tube Ø 8 mm, tube length 80 mm

TYPE/WINDOW MATERIAL	OPTICAL PATH LENGTH mm	OUTSIDE DIM. H x W x D mm	INSIDE WIDTH mm	BASE THICKN. mm	VOL. µl	ARTICLE NO.	REMARKS
220-QS	10	40 x 12.5 x 12.5	9.5	1.5	3500	220-10-40	Quartz/DURAN® tube

WINDOW MATERIAL
QS Quartz Glass High Performance 200 nm – 2500 nm

109.000 10 mm · 109.004 10 mm · 119.000 10 mm · 119.004 10 mm · 117.100 10 mm · 117.104 10 mm · 220 10 mm

CYLINDRICAL CELLS

macro, with PTFE stopper

TYPE/WINDOW MATERIAL	OPTICAL PATH LENGTH mm	OUTSIDE-DIAMETER mm	INSIDE-DIAMETER mm	OUTSIDE DEPTH mm	VOL. µl	ARTICLE NO.	REMARKS
120-QS	1	22	19	3.5	280	120-000-1-40	
	2	22	19	4.5	560	120-000-2-40	
	5	22	19	7.5	1400	120-5-40	
	10	22	19	12.5	2800	120-10-40	
	20	22	19	22.5	5600	120-20-40	
	50	22	19	52.5	14000	120-50-40	from 50 mm with 2 stoppers
	100	22	19	102.5	28000	120-100-40	
120-QX	10	22	19	12.5	2800	120-10-46	
121.000-QS	0.1	22	13	20	160	121-0.10-40	
	0.2	22	13	20	170	121-0.20-40	
	0.5	22	13	20	210	121-0.50-40	
	1	22	13	20	280	121-1-40	2 ports and stoppers
165-QS	10	22	10	12.5	800	165-10-40	1 stopper and 2 thermostat ports

DEMOUNTABLE CELLS WITH SMALL VOLUME

TYPE	OPTICAL PATH LENGTH mm	OUTSIDE-DIAMETER mm	THICKNESS mm	INSIDE-DIAMETER mm	VOL. µl	ARTICLE NO.	REMARKS
124-QS	0.01 ± 0.003	22	2.51	15	2	124-0.01-40	demountable circular cell
	0.1 ± 0.005	22	2.6	15	18	124-0.1-40	Please order cell holder separately!
	0.2 ± 0.005	22	2.7	15	35	124-0.2-40	Article No.: 020-001-761
	0.5 ± 0.005	22	3	15	85	124-0.5-40	
020.001	0.01 – 1	27 x 23.5 x 11.5				020-001-761	cell holder for cell type 124 and 201/202
202-QS		22	1.25			202-40	circular window made of Quartz Glass High Performance
202-QX		22	1.25			202-46	circular window made of Quartz Glass Extended Range
201	1 ± 0.01	21	1.00			201-1-23	ring made of Duran for cell holder 020.001

WINDOW MATERIAL
QS Quartz Glass High Performance 200 nm – 2500 nm **QX** Quartz Glass Extended Range 200 nm – 3500 nm

120 1 mm · 120 10 mm · 120 50 mm · 121.000 1 mm · 165 10 mm · 020.001 · 124-QS · 201 Duran · 202

ABSORPTION CELLS

CELLS FOR FLOW-THROUGH MEASUREMENTS

macro, with in/outlet tubes

TYPE/WINDOW MATERIAL	OPTICAL PATH LENGTH mm	CENTER HEIGHT mm	OUTSIDE DIM. H × W × D mm	APERTURE H × W mm	VOL. µl	ARTICLE NO.	REMARKS
130-QS	10		45 x 12.5 x 12.5	33 x 9.5	3200	130-10-40	
137-QS	1		45 x 12.5 x 3.5	20 x 9	260	137-1-40	
	2		45 x 12.5 x 4.5	20 x 9	520	137-2-40	
	5		45 x 12.5 x 7.5	20 x 9	1300	137-5-40	
	10		45 x 12.5 x 12.5	20 x 9	2600	137-10-40	
170-QS	1	8.5 – 15	35 x 12.5 x 12.5	17.5 x 6.5	120	170-000-1-40	
	2		35 x 12.5 x 12.5	17.5 x 6.5	240	170-000-2-40	
175.000-QS	10	15	45 x 12.5 x 12.5	11 x 6.5	750	175-15-10-40	
	10	8.5	38.5 x 12.5 x 12.5	11 x 6.5	750	175-85-10-40	

compact, with 2 screw connectors M 6 x 1 and FEP tubes

(outside Ø 1.9 mm, inside Ø 1.1 mm, 500 mm long)

TYPE/WINDOW MATERIAL	OPTICAL PATH LENGTH mm	CENTER HEIGHT mm	OUTSIDE DIM. H × W × D mm	APERTURE H × W mm	VOL. µl	ARTICLE NO.	REMARKS
170.700-QS	0.1	8.5 – 15	35 x 12.5 x 12.5	17.5 x 3.5	6.2	170700-0.1-40	up to 0.5 mm with bypass for flow optimization
	0.2		35 x 12.5 x 12.5	17.5 x 3.5	12.4	170700-0.2-40	
	0.5		35 x 12.5 x 12.5	17.5 x 3.5	31	170700-0.5-40	
	1		35 x 12.5 x 12.5	17.5 x 3.5	62	170-700-1-40	
	2		35 x 12.5 x 12.5	17.5 x 3.5	124	170-700-2-40	

semi-micro, with in/outlet tubes

TYPE/WINDOW MATERIAL	OPTICAL PATH LENGTH mm	CENTER HEIGHT mm	OUTSIDE DIM. H × W × D mm	APERTURE H × W mm	VOL. µl	ARTICLE NO.	REMARKS
176.000-QS	10	15	45 x 12.5 x 12.5	11 x 4	450	176-15-10-40	
	50	15	45 x 12.5 x 52.5	11 x 4	2250	176-50-40	
	50	8.5	38.5 x 12.5 x 52.5	11 x 4	2250	176-50-85-40	

WINDOW MATERIAL

QS Quartz Glass High Performance 200 nm – 2500 nm


130
10 mm


137
10 mm


170
1 mm


175.000
10 mm


170.700
1 mm


176.000
10 mm

CELLS FOR FLOW-THROUGH MEASUREMENTS

compact, with 2 screw connectors M 6 x 1 and FEP tubes

(outside Ø 1.9 mm, inside Ø 1.1 mm, 500 mm long)

TYPE/WINDOW MATERIAL	OPTICAL PATH LENGTH mm	CENTER HEIGHT mm	OUTSIDE DIM. H × W × D mm	APERTURE H × W mm	VOL. µl	ARTICLE NO.	REMARKS
176.700-QS	5	15	35 x 12.5 x 12.5	11 x 3.5	195	1767005-15-40	
	5	8.5	35 x 12.5 x 12.5	11 x 3.5	195	1767005-85-40	
	10	15	35 x 12.5 x 12.5	11 x 3.5	390	1767001510-40	
	10	8.5	35 x 12.5 x 12.5	11 x 3.5	390	1767008510-40	
	50	15	35 x 12.5 x 52.5	11 x 3.5	1950	1767001550-40	
178.710-QS	10	15	35 x 12.5 x 12.5	Ø 3	80	178-710-10-40	
	10	8.5	35 x 12.5 x 12.5	Ø 3	80	1787108510-40	
	50	15	35 x 12.5 x 52.5	Ø 3	370	1787101550-40	
178.711-OS	10	8.5	35 x 12.5 x 12.5	Ø 2	30	1787118510-20	
178.712-OS	10	8.5	35 x 12.5 x 12.5	Ø 1.5	18	178712-10-20	
178.712-QS	10	8.5	35 x 12.5 x 12.5	Ø 1.5	18	1787128510-40	

WINDOW MATERIAL

OS Special Optical Glass 320 nm – 2500 nm

QS Quartz Glass High Performance 200 nm – 2500 nm


176.700
10 mm


176.700
50 mm


178.710
10 mm


178.710
50 mm


178.711
10 mm


178.712
10 mm

ALL-QUARTZ FLOW-THROUGH CUVETTE

THREEFOLD ADVANTAGE UNIQUELY CONVINCING

3 IN 1:
- ABSORBANCE
- FLUORESCENCE
- 2 OPTICAL PATH LENGTHS ALL IN ONE SINGLE CUVETTE

ALL-QUARTZ FLOW-THROUGH CUVETTE
Flexible in application
2 optical path lengths in one single cuvette
Excellent reproducibility of measurement results
Fluorescence measurement possible for each path length
High temperature and chemical resistance because of all-quartz construction

Innovative all-quartz cuvette with 2 optical path lengths. The second path length is available, by simply turning the cuvette 90°

Ideally suited for tablet dissolution analysis (TDA) and flow-through spectroscopic analysis

The all-quartz flow-through cuvette is a high-precision cell for applications in spectroscopy. New technology enables the positioning of precise **internal threads into the quartz glass**. Tubes can now be connected very easily and securely directly to the cuvette. The second path length is available by simply turning the cuvette through 90° – **all tubes remain screwed in place**.

Time consuming changing of the cuvette is no longer necessary. Two different path lengths have a beneficial effect to the costs and the application. Furthermore, it is possible to **measure the fluorescence with each optical path length** – another benefit.

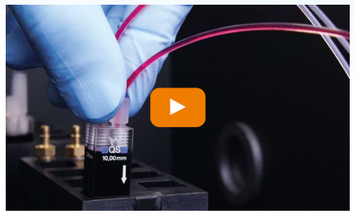
Clear advantages due to the innovative all-quartz design

- No liquid leakage, monolithic quartz glass construction prevents this by design
- Suitable for high and low temperatures
- Fully autoclavable
- Secure tube connection is ensured due to the innovative quartz glass internal threads

Special features for TDA applications:

Second path length can be set without time consuming changing of the tubings

Everything in sight: White point mark for the quick detection of the path length position



VIDEO TUTORIAL
Basic handling and advantages of an all-quartz flow-through cuvette

FLUORESCENCE CELLS

MACRO CELLS

with PTFE lid or stopper

TYPE/WINDOW MATERIAL	OPTICAL PATH LENGTH mm	OUTSIDE DIM. H × W × D mm	INSIDE WIDTH mm	BASE THICKN. mm	VOL. µl	NO. OF WINDOWS	ARTICLE NO.	REMARKS
101-QS	10 x 10 10 x 20	45 x 12.5 x 12.5 45 x 12.5 x 22.5	10 10	1.25 1.25	3500 7000	4 4	101-10-40 101-20-40	
111-QS	10 x 10	46 x 12.5 x 12.5	10	1.25	3500	4	111-10-40	

SEMI-MICRO CELLS

with PTFE lid or stopper

TYPE/WINDOW MATERIAL	OPTICAL PATH LENGTH mm	OUTSIDE DIM. H × W × D mm	INSIDE WIDTH mm	BASE THICKN. mm	VOL. µl	ARTICLE NO.	REMARKS
104F-QS	10 x 4	45 x 12.5 x 12.5	4	1.25	1400	104F-10-40	
108F-QS	10 x 4	45 x 12.5 x 12.5	4	9	1000	108-F-10-40	
114F-QS	10 x 4	46 x 12.5 x 12.5	4	1.25	1400	114F-10-40	

MICRO CELLS

with PTFE lid or stopper

TYPE/WINDOW MATERIAL	OPTICAL PATH LENGTH mm	OUTSIDE DIM. H × W × D mm	INSIDE WIDTH mm	BASE THICKN. mm	VOL. µl	ARTICLE NO.	REMARKS
104.002F-QS	10 x 2	45 x 12.5 x 12.5	2	1.25	700	104002F-10-40	
108.002F-QS	10 x 2	45 x 12.5 x 12.5	2	9	500	108002F-10-40	
115F-QS	10 x 2	40 x 12.5 x 12.5	2	1.25	400	115-F-10-40	

WINDOW MATERIAL
QS Quartz Glass High Performance 200 nm – 2500 nm

101
10 x 10 mm

111
10 x 10 mm

104F
10 x 4 mm

108F
10 x 4 mm

114F
10 x 4 mm

104.002F
10 x 2 mm

108.002F
10 x 2 mm

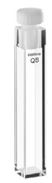
115F
10 x 2 mm

ULTRA-MICRO CELLS

with PE stopper

TYPE/WINDOW MATERIAL	OPTICAL PATH LENGTH mm	CENTER HEIGHT mm	OUTSIDE DIM. H × W × D mm	APERTURE H × W mm	CHAMBER VOL. µl	FILLING VOL. µl	NO. OF WINDOWS	ARTICLE NO.	REMARKS
105.250-QS	10 x 2 10 x 2	15 8.5	45 x 12.5 x 12.5 45 x 12.5 x 12.5	5 x 2 5 x 2	100 100	120 120	3 3	105-250-15-40 105-250-85-40	
105.251-QS	3 x 3 3 x 3	15 8.5	45 x 12.5 x 12.5 45 x 12.5 x 12.5	5 x 3 5 x 3	45 45	70 70	3 3	105-251-15-40 105-251-85-40	
105.252-QS	1.5 x 1.5 1.5 x 1.5	15 8.5	45 x 12.5 x 12.5 45 x 12.5 x 12.5	5 x 1.5 5 x 1.5	12 12	30 30	3 3	105-252-15-40 105-252-85-40	

WINDOW MATERIAL
QS Quartz Glass High Performance 200 nm – 2500 nm



111.057
5 x 5 mm

013.011

105.250
10 x 2 mm

105.251
3 x 3 mm

105.252
1.5 x 1.5 mm

FLUORESCENCE CELLS

FLUORESCENCE CELLS FOR MAGNETIC STIRRERS

macro, semi-micro, with PTFE lid or stopper

TYPE/WINDOW MATERIAL	OPTICAL PATH LENGTH mm	OUTSIDE DIM. H × W × D mm	INSIDE WIDTH mm	BASE THICKN. mm	VOL. µl	NO. OF WINDOWS	ARTICLE NO.	REMARKS
109.000F-QS	10 x 10	45 x 12.5 x 12.5	10	5	3500	4	109000F-10-40	
119.000F-QS	10 x 10	49.5 x 12.5 x 12.5	10	5	3500	4	119F-10-40	
109.004F-QS	10 x 4	45 x 12.5 x 12.5	4	5	1500	4	109004F-10-40	
119.004F-QS	10 x 4	49.5 x 12.5 x 12.5	4	5	1500	4	119004F-10-40	
332.300		6 x 3					332-300-VE10	see page 31

SEALABLE CELLS

macro, semi-micro, for anaerobic applications

TYPE/WINDOW MATERIAL	OPTICAL PATH LENGTH mm	OUTSIDE DIM. H × W × D mm	INSIDE WIDTH mm	BASE THICKN. mm	VOL. µl	NO. OF WINDOWS	ARTICLE NO.	REMARKS
117.100F-QS	10 x 10	56 x 12.5 x 12.5	10	1.25	3500	4	117100F-10-40	Open screw cap
117.200F-QS	10 x 10	56 x 12.5 x 12.5	10	1.25	3500	4	117200F-10-40	Closed screw cap
117.104F-QS	10 x 4	56 x 12.5 x 12.5	4	1.25	1400	4	117104F-10-40	Open screw cap
117.204F-QS	10 x 4	56 x 12.5 x 12.5	4	1.25	1400	4	117204F-10-40	Closed screw cap

With ISO thread GL 14 and screw cap with silicone rubber seal; accessories see page 33.

CELLS WITH TUBES QUARTZ/DURAN®

macro, tube Ø 8 mm, tube length 80 mm

TYPE/WINDOW MATERIAL	OPTICAL PATH LENGTH mm	OUTSIDE DIM. H × W × D mm	INSIDE WIDTH mm	BASE THICKN. mm	VOL. µl	NO. OF WINDOWS	ARTICLE NO.
221-QS	10 x 10	40 x 12.5 x 12.5	10	1.25	3500	4	221-10-40
221.001-QS*	10 x 10 Tol.+- 0.2	40 x 12.5 x 12.5	10	1.25	3500	4	221001-10-80

*** for measurements at high and low temperatures**

WINDOW MATERIAL
QS Quartz Glass High Performance 200 nm – 2500 nm

109.000F 10 x 10 mm · 119.000F 10 x 10 mm · 109.004F 10 x 4 mm · 119.004F 10 x 4 mm

117.200F-QS 10 x 10 mm · 117.204F-QS 10 x 4 mm

221 10 x 10 mm

221.001 10 x 10 mm

CELLS FOR FLOW-THROUGH MEASUREMENTS

macro, with in/outlet tubes

TYPE/WINDOW MATERIAL	OPTICAL PATH LENGTH mm	OUTSIDE DIM. H × W × D mm	APERTURE H × W mm	VOL. µl	NO. OF WINDOWS	ARTICLE NO.	REMARKS
131-QS	10 x 10	45 x 12.5 x 12.5	33 x 10	3300	4	131-10-40	base and lid 6 mm

compact, with 2 screw connectors M 6 x 1 and FEP tubes
(outside Ø 1.9 mm, inside Ø 1.1 mm, 500 mm long)

TYPE/WINDOW MATERIAL	OPTICAL PATH LENGTH mm	CENTER HEIGHT mm	OUTSIDE DIM. H × W × D mm	APERTURE H × W mm	VOL. µl	NO. OF WINDOWS	ARTICLE NO.
176.751-QS	3 x 3	8.5	35 x 12.5 x 12.5	11 x 3	100	3	176-751-85-40
176.754-QS	10 x 2.5	15	35 x 12.5 x 12.5	11 x 2.5	275	4	176-754-10-15-40

ALL-QUARTZ FLOW-THROUGH CELLS WITH TWO OPTICAL PATH LENGTHS

with screw connectors M6 x 1, with FEP tubing 500 mm length

TYPE/WINDOW MATERIAL	OPTICAL PATH LENGTH mm	CENTER HEIGHT mm	OUTSIDE DIM. H × W × D mm	APERTURE H × W mm	VOL. µl	NO. OF WINDOWS	ARTICLE NO.	REMARKS
176.760-QS	5 and 10	15 8.5	35 x 12.5 x 12.5	11 x 6/11 x 5	550	4	176-760-15-40 176-760-85-40	for further information, see page 18 to 19
176.761-QS	2.5 and 5	15 8.5	35 x 12.5 x 12.5	11 x 4/11 x 2.5	140	4	176-761-15-40 176-761-85-40	
176.762-QS	1.5 and 3	15 8.5	35 x 12.5 x 12.5	11 x 2.5 /11x1.5	50	4	176-762-15-40 176-762-85-40	
176.765-QS	1 and 10	15 8.5	35 x 12.5 x 12.5	11 x 6/11 x 1	110	4	176-765-15-40 176-765-85-40	
176.766-QS	2 and 10	15 8.5	35 x 12.5 x 12.5	11 x 6/11 x 2	220	4	176-766-15-40 176-766-85-40	

WINDOW MATERIAL
QS Quartz Glass High Performance 200 nm – 2500 nm

131 10 x 10 mm

176.751 3 x 3 mm · 176.754 10 x 2.5 mm

176.760-QS 5 and 10 mm

FLOW CYTOMETRY AND PARTICLE ANALYSIS

EXCEPTIONALLY FINE MICRO-CHANNELS FOR EXTREMELY EXACT AND RELIABLE MEASUREMENT RESULTS

Example of use:
Mobile analysis in the fight against HIV, tuberculosis and malaria

Flow cytometry is used to analyze particles and cells quickly and accurately. Hellma Analytics micro-channel cuvettes can be employed in mobile laboratories for the detection of life-threatening diseases such as HIV, tuberculosis and malaria. Set up in secure vehicles, these analytical facilities can provide fast and reliable diagnoses. Hellma's technology is able to **simultaneously analyze up to 16 parameters in more than 100,000 cells per minute**, making a vital contribution towards rapidly helping people in need.

CYTOMETER CUVETTE

- Channels with polished inner surfaces
- Manufacture of cones of various shapes and sizes possible
- Very tight tolerances
- Outstanding surface precision
- Manufacture of extremely narrow channels

FOR INFORMATION
For further information on the topic of cytometry and the fields of application, see
> **www.hellma.com/en/cytometry**

Quality and technology

A high-precision quartz glass flow-through cuvette with a superfine channel is at the heart of every cytometer. This channel lends stability to the fluidic system, enabling the accurate optical analysis of individual cells or particles.

At Hellma Analytics, the production of cytometer cuvettes draws on more than 90 years of experience in producing glass and quartz components. Thanks to its use of advanced glass processing technology, Hellma Analytics is able to manufacture channels featuring polished channel surfaces and made from fluorescence-free materials in custom sizes as small as **50 µm x 50 µm**. The consistently high production quality guarantees maximum reproducibility with minimum tolerances. Our exceptional production expertise combined with our state-of-the-art production machinery enable us to manufacture cuvettes **with various cone shapes as well as solutions tailored to our clients' requirements.**

Areas of application

- Medical diagnostics (HIV, TB, malaria)
- Cell cycle analysis
- Cell biology
- Cell and particle separation
- Bead-based assays
- DNA analysis

Benefits

- Extremely tight tolerances for easy system integration
- Extremely flat and flawless channels for excellent cell morphology analysis
- Completely fluorescence-free quartz glass for accurate detection of fluorescence
- Perfectly rectangular channels allow laser beams to pass through uninhibited
- Unrivaled production capacity and flexibility thanks to Hellma's specially designed production plant

Fantastic OEM product!
Made on a batch production line and tailored to the measuring equipment

CELLS AND OPTICAL ELEMENTS FOR SPECIAL APPLICATIONS

DYE-LASER CELL

macro, with PTFE stoppers

TYPE/WINDOW MATERIAL	OUTSIDE DIM. H × W × D mm	INSIDE CROSS SECTION mm	VOL. µl	NO. OF WINDOWS	ARTICLE NO.	REMARKS
111.070-QS	46 x 12.5 x 12.5	10 x 10	3500	4	111-070-40	on request with a polished base

CELL WITH TWO CHAMBERS

TYPE/WINDOW MATERIAL	OPTICAL PATH LENGTH mm	OUTSIDE DIM. H × W × D mm	INSIDE WIDTH mm	BASE THICKN. mm	VOL. µl	ARTICLE NO.	REMARKS
238-QS	2 x 4.375	46 x 12.5 x 12.5	9.5	1.5	2 x 1000	238-000-40	with 2 stoppers

CELLS FOR LIGHT SCATTERING MEASUREMENTS

with PTFE stoppers

TYPE/WINDOW MATERIAL	OUTSIDE DIM. H × DIAMETER mm	INSIDE DIM. H × DIAMETER mm	VOL. µl	ARTICLE NO.	REMARKS
540.110-QS	75 x 10	74 x 8	3200	540-110-80	
540.111-QS	75 x 10	74 x 8	3200	540-111-80	polished outer cylinder
540.135-QS	75 x 20	74 x 18	14000	540-135-20-40	

WINDOW MATERIAL
QS Quartz Glass High Performance 200 nm – 2500 nm

111.070
10 x 10 mm

238
2 x 4.375 mm

540.110

540.135

CELLS FOR REFLECTION MEASUREMENTS

cylindrical cells without lid

TYPE/WINDOW MATERIAL	OUTSIDE DIM. H × DIAMETER mm	INSIDE DIM. H × DIAMETER mm	VOL. µl	ARTICLE NO.	REMARKS
692.091-OG	25 x 34	23 x 31.6	12000	692-091-12	
692.103-BF	30 x 50	27.5 x 45	32000	692-103-23	
692.104-BF	40.5 x 60	39 x 55.6	73000	692-104-23	
692.455-BF	52 x 65	50 x 60	110000	692-455-23	acc. to ISO 17223 with markings at 25 mm and 45 mm

WINDOW MATERIAL
OG Optical Glass 360 nm – 2500 nm **BF** Borosilicate Glass 330 nm – 2500 nm

692.091

692.103

692.104

692.455

CELLS AND OPTICAL ELEMENTS FOR SPECIAL APPLICATIONS

CELL FOR TURBIDITY MEASUREMENTS

rectangular cell

TYPE/WINDOW MATERIAL	OPTICAL PATH LENGTH mm	OUTSIDE DIM. H × W × D mm	INSIDE DIM. H × W × D mm	VOL. µl	ARTICLE NO.	REMARKS
402.013-OG	25 x 25	70 x 30 x 30	67 x 25 x 25	35000	402-013-10	25 ml marking, 5 windows

LARGE CELLS

700.000-OG	10 ± 0.2 20 ± 0.2	53 x 55 x 15 53 x 55 x 25	50 x 50 x 10 50 x 50 x 20	20000 40000	700-000-10-10 700-000-20-10	with glass lid
700.010-OG	20 ± 0.2	82 x 44.4 x 24.4	80 x 40 x 20	56000	700-010-20-10	without lid
700.015-OG	28 ± 0.2	35 x 35 x 32	33 x 31 x 28	22000	700-015-10	without lid
700.016-OG	18 ± 0.2	38 x 22 x 22	36 x 18 x 18	10000	700-016-10	without lid
700.061-OG	50 ± 0.5	100 x 150 x 55	96.5 x 143 x 50	600000	700-061-10	without lid
704.000-OG	20 ± 0.2	22.5 x 25 x 25	20 x 20 x 20	6000	704-000-20-10	with glass lid
704.001-OG	30 ± 0.2	32.5 x 35 x 35	30 x 30 x 30	22500	704-001-30-10	with glass lid
704.002-OG	40 ± 0.2	42.5 x 45 x 45	40 x 40 x 40	56000	704-002-40-10	with glass lid
704.003-OG	50 ± 0.5	52.5 x 55 x 55	50 x 50 x 50	88000	704-003-50-10	with glass lid
740.000-OG	34.5 ± 0.2	100 x 50 x 39.5	97 x 44 x 34.5	100000	740-000-10	with markings at 100 ml without lid

WINDOW MATERIAL
OG Optical Glass 360 nm – 2500 nm

402.013

700.000
10 mm

700.010
20 mm

700.015
30 mm

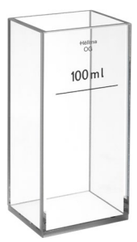
700.016
18 mm

704.000
20 mm

704.001
30 mm

704.002
40 mm

704.003
50 mm



740.000
34.5 mm

OPTICAL PARTS

TYPE/WINDOW MATERIAL	OPTICAL PATH LENGTH mm	OUTSIDE DIM. H × W × D mm	THICKNESS mm	INSIDE WIDTH mm	VOL. µl	ARTICLE NO.	REMARKS
665.000-QS		45 x 12.5	1.25			665-000-40	rectangular window made of Quartz Glass High Performance
665.000-QX		45 x 12.5	1.25			665-000-46	rectangular window made of Quartz Glass Extended Range

TYPE/WINDOW MATERIAL	OUTSIDE-DIAMETER mm	THICKNESS mm	INSIDE-DIAMETER mm	VOL. µl	ARTICLE NO.	REMARKS
202-QS	Ø 22	1.25			202-40	circular window made of Quartz Glass High Performance
202-QX	Ø 22	1.25			202-46	circular window made of Quartz Glass Extended Range

WINDOW MATERIAL
QS Quartz Glass High Performance 200 nm – 2500 nm
QX Quartz Glass Extended Range 200 nm – 3500 nm

665.000

202

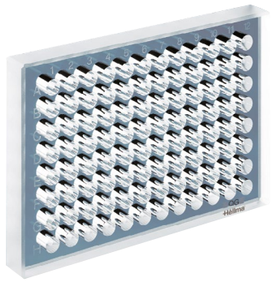
QUARTZ MICROPLATES AND ACCESSORIES FOR CELLS

QUARTZ MICROPLATES

made of quartz

TYPE/WINDOW MATERIAL	DESCRIPTION	OUTSIDE DIM. H × W × D mm	BASE mm	WELLS			ARTICLE NO.
				DIAMETER mm	DEPTH mm	VOLUME µl	
730.009-QG	Quartz Microplate with 96 wells Base: Synthetic Quartz Glass	14.5 x 127 x 85.5	2	6.6	12.5	300	730-009-44

QG is synthetic quartz glass with a transmission over 80% between 200 nm and 2500 nm for an empty cell.



730.009-QG

ALUMINUM SPACERS

TYPE	DESCRIPTION	ARTICLE NO.	REMARKS
013.101	Aluminum spacer 38 x 12.5 x 9 mm	013-101-71	to fit cells with 1 mm optical path length into 10 mm cell holder
013.102	Aluminum spacer 38 x 12.5 x 8 mm	013-102-71	to fit cells with 2 mm optical path length into 10 mm cell holder
013.105	Aluminum spacer 38 x 12.5 x 5 mm	013-105-71	to fit cells with 5 mm optical path length into 10 mm cell holder

013.102

TUBINGS

TYPE	DESCRIPTION	ARTICLE NO.	REMARKS
040.111	FEP tubing set 500 mm long; outside Ø 1.9 mm; inside Ø 1.1 mm	040-111-722	for compact and 3-in-1 cells; with one short and one long screw fitting
040.222	PTFE tubing set 500 mm long with Omnifit gripper outside Ø 1.6 mm; inside Ø 1.0 mm	040-222-72	for compact and 3-in-1 cells; with one short and one long Omnifit Gripper

LIDS, STOPPERS AND OTHER ACCESSORIES

010.010	PTFE lid 010.010, 10 mm 10 pcs pack	010-001-10-VE10-72	for cell models with 10 mm path length
010.050	PTFE lid 010.050, 50 mm 5 pcs pack	010-001-50-VE5-72	for cell models with 50 mm path length
011.001	PTFE stopper with fitting NS 5 5 pcs pack	011-001-VE5-72	for cell models: 110, 111, 114, 120 with 1 – 5 mm path length; and for cell model 404 with 1 – 10 mm path length
011.002	PTFE stopper with fitting NS 7 5 pcs pack	011-002-VE5-72	for cell models: 110, 111, 114/114F, 115/115F, 119/119F, 120 with 10 – 100 mm path length; and for cell model 770
011.103	PE stopper, 10 mm 10 pcs pack	011-103-VE10-73	for cell models: 105.200, 105.201, 105.202, 105.203, 105.204, 105.250, 105.251, 105.252, 105.253, 105.254
011.550	Pipette tip for Ultra-Micro cells 10 pcs pack	011-550-VE10	for cell models: 105.210-QS
011.600	Open screw caps, with ISO GL 14 thread and silicone seal (septum) 10 pcs pack	011-600-VE10-734	for cell models: 117.100; 117.100F, 117.104, 117.104F
011.601	Closed screw caps, with ISO GL 14 thread and silicone seal 10 pcs pack	011-601-VE10-734	for cell models: 117.200; 117.200F, 117.204, 117.204F
011.650	Replacement silicone rubber seals (septum) 10 pcs pack	011-650-VE10-72	for cell models: 117.100; 117.100F, 117.104, 117.104F, 117.200; 117.200F, 117.204, 117.204F
011.651	Replacement silicone rubber seals (septum), PTFE coated on one side 10 pcs pack	011-651-VE10-72	for cell models: 117.100; 117.100F, 117.104, 117.104F, 117.200; 117.200F, 117.204, 117.204F
332.300	PTFE coated magnetic stir bars 10 pcs pack	332-300-VE10	Ø ca. 3 – 4 mm, Length 6 – 7 mm for cell models: 109.000, 109.000F, 109.004, 109.004F, 119.000, 119.000F, 119.004, 119.004F

040.111

040.222

010.010

010.050

011.650

011.651

011.600

011.601

CLEANING CUVETTES AND OPTICAL PARTS

FOR ACCURATE, UNTAINTED RESULTS

Regularly using Hellmanex® III to clean your cuvettes and optical parts ensures accurate measurement results. This highly effective alkaline cleaning concentrate is ideal for use on glass and quartz glass cuvettes, sensitive optical parts and laboratory equipment made of glass, quartz, sapphire and porcelain. It effectively removes dirt and prevents loosened dirt particles from redepositing. After cleaning, the parts can be rinsed without any residue, including UV/Vis active substances, being left on the optical surfaces.

320.003

325.000

USE

Cleaning

1. Place the cuvettes in a bath of water and 2% Hellmanex® III. Clean flow-through cuvettes by pumping the cleaning solution through the cuvette.
2. The cleaning process can be sped up by gently heating the solution.
3. Agitate the cleaning solution to boost cleaning performance.
4. After cleaning, thoroughly rinse the cuvettes using ultrapure water. Replace the contents of the cleaning bath at least three times.
5. Blow the cuvettes dry using clean air and leave them to dry out in a dust-free environment. Alternatively, rinse them with a highly volatile solvent, such as alcohol. Then allow the solvent to evaporate.

TYPE	DESCRIPTION	ARTICLE NO.
320.003	Hellmanex® III Liquid cleaning concentrate, for glass, quartz cells and optical components 1.4 kg PE bottle (1.0 l)	9-307-011-4-507
325.000	CleanAssist plastic cell holder for 4 cells with 10 mm optical path lenght for cleaning purposes	325.000

PLEASE NOTE

- **Avoid extreme changes in temperature.** Fragile!
- **Avoid exposure to ultrasound waves:** Excessive energy density and/or unfavorable frequencies may break the cuvettes. Cuvettes made of multiple materials (glass, metal, etc.) are especially at risk. Cavitation attacks polished surfaces, rendering them unusable.
- **Do not leave the cleaning solution in the cuvette at high temperatures for so long** that it evaporates. This is because an increase in concentration and the high pH value may damage the surface of the glass.

Cleaning and Dilution

The optimal dilution depends on several factors, such as the hardness of the water, the degree and type of contamination, the temperature etc. The use of demineralized water improves the cleaning characteristics.

CONCENTRATION (% BY VOL.)	TEMPERATURE (°C)	TIME (MINUTES)
0.5 – 2	20 – 25	120 – 180
0.5 – 2	30 – 35	30 – 40
0.5 – 2	50 – 60 (Quartz only)	10 – 15
0.5 – 2	70 – 80 (Quartz only)	< 5

TIPS ON HANDLING CUVETTES

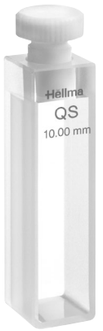
PLEASE PAY ATTENTION TO THE FOLLOWING

1. Our precision cuvettes are made of glass or quartz glass and have all the advantages and disadvantages (such as the inherent fragility) of these materials. Once the measurement process is complete, we generally recommend that you immediately clean, dry and store the cuvettes in cases.
2. Do not store the cuvettes in the open in a corrosive atmosphere, and do not leave the polished windows in contact with liquids for an extended period of time. This could lead to the formation of deposits or stains on the polished surfaces, rendering the cuvettes unusable.
3. In order to avoid scratching the precision-polished windows, cuvettes should never come into contact with objects made of hard materials, such as glass or metal.

IMPORTANT TIPS

- Care is required when inserting cuvettes into a metal cuvette holder.
- When using a pipette to fill cuvettes with liquids, never touch the polished window with the pipette.
- Never use metal tweezers or pliers to carry or hold cuvettes.

SPECIAL INSTRUCTIONS FOR CUVETTES SEALED WITH STOPPERS



Cuvettes containing liquid and sealed with stoppers may break if the internal pressure increases.

The most common reason for such an increase in pressure is the expansion of the liquid in the cuvette due to a rise in temperature. This may be caused by:

- heat from an external source, such as thermal conduction via the cuvette holder
- a chemical reaction in the liquid
- radiation absorption in the liquid

TAKING THE FOLLOWING PRECAUTIONS WILL HELP PREVENT CUVETTES FROM BREAKING:

1. Fill the cuvette just high enough for the light beam to pass through the liquid unimpeded. This allows the liquid to expand into the remaining air volume if the temperature increases.
2. If you fill the cuvette to the rim, put the stopper on loosely so that any excess liquid can escape.
3. Do not try to force the stopper into place, as this will inevitably damage the cuvette.
4. Use stoppers with a capillary hole.

CARE MUST ALSO BE TAKEN AT LOW TEMPERATURES.

Although it is possible to cool an empty cuvette down to a few degrees Kelvin without breaking it, when filled with water and cooled to just a few degrees below the freezing point, the same cuvette may burst, even if it is not sealed. This is because water expands in all directions when cooled and if it freezes may cause the cuvette to burst.

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