Hellma® Analytics
High Precision in Spectro-Optics



Product Catalog BestCellers

OPTICAL COMPONENTS FOR UV/VIS/NIR SPECTROSCOPY

CELLS
TRAYCELL® MICRO VOLUME ANALYSIS
CERTIFIED REFERENCE MATERIALS
OPTICAL IMMERSION PROBES & FIBER OPTIC CELLS

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MADE IN GERMANY

Hellma®

YOUR PROCESS. OUR SOLUTIONS.

As a leading supplier of high-precision, optical solutions that are 'Made in Germany' from glass, quartz glass and synthetic crystals, Hellma has been a by-word for outstanding quality for more than 95 years. A key supplier, the company is an integral part of its clients' value chains. Reliability, trust and continuity are inherent to Hellma's work, and the company believes it has both a duty and responsibility to ensure these principles are upheld. Clients worldwide put their confidence in Hellma's exceptional level of performance and problem-solving skills to meet and exceed regulatory requirements and to make their products safer.









Hellma Analytics

Optical components and assemblies for use in systems that serve analytical technology.

www.hellma-analytics.com

Hellma Materials

High-quality synthetic crystals for use in the fields of microlithography, optics, laser technology and radiation detection.

www.hellma-materials.com

Hellma Optics

Premium-quality precision optics for use in laser technology as well as all areas of photonics and the optical industry.

www.hellma-optics.com

Hellma Analytics for

OPTICAL ANALYSIS WITH THE HIGHEST PRECISION

WHERE ONLY THE BEST QUALITY WILL DO

All-round expertise – from materials to custom solutions

From raw materials to component manufacturing and from specific technological knowledge to certification, Hellma offers a unique range of products and technologies for collecting exact and reliable results in the field of optical analysis. Extensive engineering prowess, consulting skills and services complement our work. While our comprehensive portfolio means we have the right products at our fingertips to suit a wide variety of requirements, we are, of course, also able to produce customized solutions tailored precisely to your needs.
Please don't hesitate to contact us – we're always happy to help.



Hellma Analytics products and solutions

This product catalog lists our comprehensive range of products and solutions – from cuvettes for spectroscopy and cytometry to micro volume analysis technology, certified reference materials for spectroscopy, and optical immersion probes for use in laboratories.

HOW TO REACH US
Select your local distribution partner:
www.hellma-analytics.com/contacts

IMPORTANT:
Please check your order for completeness with regard to the following points

- Article number
- Quantity needed
- Transmission matched.....yes/no
- Polarimetric certification....yes/no
- Antireflection or reflective coatings, if required.....yes/no

UNIQUE TECHNOLOGICAL EXPERTISE FOR EXACT MEASUREMENT AND PRECISE RESULTS

Accurate measurements guaranteed

Founded on more than 95 years of experience in glass processing, Hellma Analytics provides an impressive range of services whenever **high-precision, innovative optics are needed for use in analysis. 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 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 measurements and precision of the results. These tight tolerances make Hellma Analytics products ideally suited for collecting reliable and reproducible 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	± 0.05 mm
Optical Glass	20 mm to 100 mm	± 0.1 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.

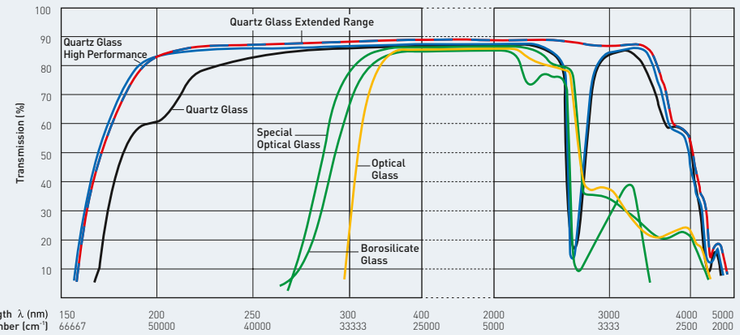
MATERIAL CODES

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

MATERIAL	MATERIAL CODE	WAVELENGTH	REFRACTIVE INDEX n_d AT 588 nm
Optical Glass	OG	360 nm – 2500 nm	1,523
Borosilicate Glass	BF	330 nm – 2500 nm	1,473
Special Optical Glass	OS	320 nm – 2500 nm	1,523
Quartz Glass	UV	260 nm – 2500 nm	1,458
Quartz Glass High Performance	QS	200 nm – 2500 nm	1,458
Quartz Glass Extended Range	QX	200 nm – 3500 nm	1,458

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-analytics.com/materials**

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 designed for 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 85% 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-analytics.com/cuvette-finder**

UV/VIS/NIR SPECTROSCOPY PERFECTION IN DETAIL

TRUST THE ORIGINAL

Hellma Analytics produces cuvettes in unrivaled high quality that are used in absorbance measurements, fluorescence measurements and special applications such as cytometry, light scattering or reflection measurements and guarantee precise reproducible results.
Our comprehensive range of products and support 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 better 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 light wave passing through 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.

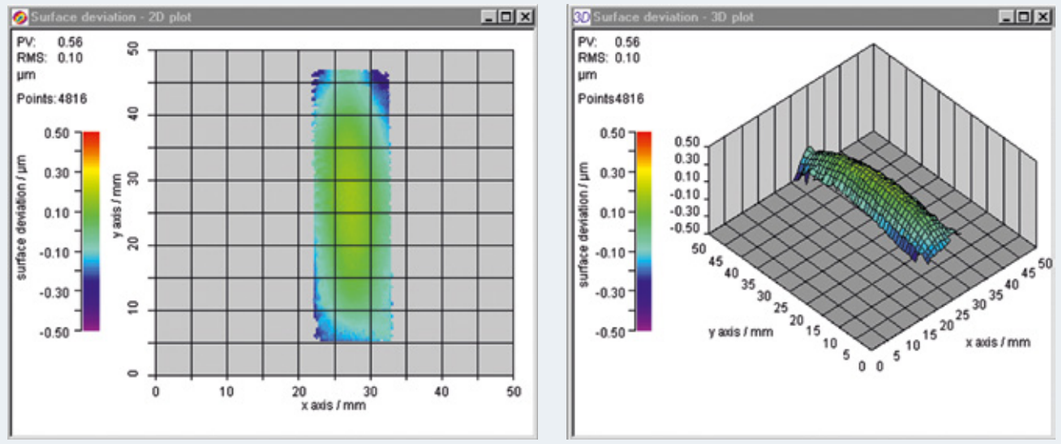


Figure 1: Measurement of the flatness of a Hellma cuvette - the frontal deformation of the wave is extremely low.

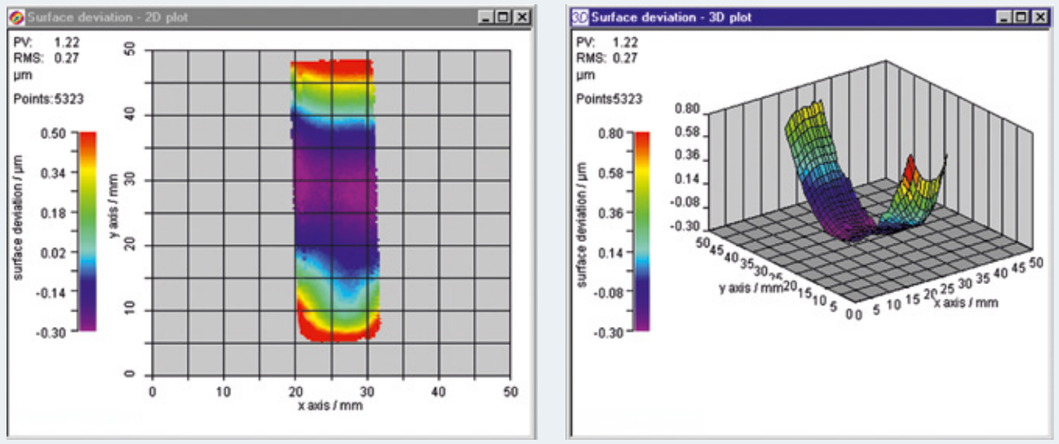


Figure 2: Measurement of the flatness of a competitor's cuvette - the frontal deformation of the wave is more than twice that of a Hellma cuvette.

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	1	45 x 12.5 x 3.5	9.5	1.5	350	100-1-20	glass lid
	2	45 x 12.5 x 4.5	9.5	1.5	700	100-2-20	glass lid
	5	45 x 12.5 x 7.5	9.5	1.5	1750	100-5-20	
	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	
	100	45 x 12.5 x 102.5	9.5	1.5	35000	100-100-46	glass lid
110-OS	1	52 x 12.5 x 3.5	9.5	1.5	350	110-1-20	
	2	52 x 12.5 x 4.5	9.5	1.5	700	110-2-20	
	5	46 x 12.5 x 7.5	9.5	1.5	1750	110-5-20	
	10	46 x 12.5 x 12.5	9.5	1.5	3500	110-10-20	
	50	46 x 12.5 x 52.5	9.5	1.5	17500	110-50-20	with 2 stoppers
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
	50	46 x 12.5 x 52.5	9.5	1.5	17500	110-50-40	with 2 stoppers
	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	
	2	47.5 x 23.6 x 7.5	18.5	2.5	1400	404-2-46	
	10	47.5 x 23.6 x 12.5	18.5	2.5	7000	404-10-46	
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-OS	10	45 x 12.5 x 12.5	4	3.2	1400	104-10-20	
	50	45 x 12.5 x 52.5	4	3.2	7000	104-50-20	
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	
	20	45 x 12.5 x 22.5	4	3.2	2800	104-20-40	
	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
OS	Special Optical Glass	320 nm – 2500 nm	QX	Quartz Glass Extended Range	200 nm – 3500 nm
UV	Quartz Glass	260 nm – 2500 nm			



402.000 10 mm | 404.000 10 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-OS	10	46 x 12.5 x 12.5	4	3.2	1400	114-10-20	
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	∅ 0.8 ∅ 0.8	5 5	10 10	1052101015-40 1052101085-40	

TRAYCELL® FOR MICRO VOLUME ANALYSIS

105.800-UVS and 105.810-UVS – For more information see pages 36 to 39.

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 | 105.800-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 ∅ 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-OS	50 100	22 22	19 19	52.5 102.5	14000 28000	120-50-20 120-100-20	from 50 mm with 2 stoppers
120-QS	1 2 5 10 20 50 100	22 22 22 22 22 22 22	19 19 19 19 19 19 19	3.5 4.5 7.5 12.5 22.5 52.5 102.5	280 560 1400 2800 5600 14000 28000	120-000-1-40 120-000-2-40 120-5-40 120-10-40 120-20-40 120-50-40 120-100-40	from 50 mm with 2 stoppers
120-QX	10	22	19	12.5	2800	120-10-46	
121.000-QS	0.1 0.2 0.5 1	22 22 22 22	13 13 13 13	20 20 20 20	160 170 210 280	121-0.10-40 121-0.20-40 121-0.50-40 121-1-40	2 ports and stoppers

TEMPERATURE CONTROLLED CELLS

Macro

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



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 ∅ 1.9 mm, inside ∅ 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

OS Special Optical Glass 320 nm–2500 nm 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 ∅ 1.9 mm, inside ∅ 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	

micro, ultra-micro, with in/outlet tubes

178.010-QS	10	8.5	38.5 x 12.5 x 12.5	∅ 3	80	178-010-10-40	
178.011-OS	10	8.5	38.5 x 12.5 x 12.5	∅ 2	30	178011-85-20	

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

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

178.710-QS	10	15	35 x 12.5 x 12.5	∅ 3	80	178-710-10-40	
	10	8.5	35 x 12.5 x 12.5	∅ 3	80	1787108510-40	
	50	15	35 x 12.5 x 52.5	∅ 3	370	1787101550-40	
178.711-OS	10	8.5	35 x 12.5 x 12.5	∅ 2	30	1787118510-20	
178.712-OS	10	8.5	35 x 12.5 x 12.5	∅ 1.5	18	178712-10-20	
178.712-QS	10	8.5	35 x 12.5 x 12.5	∅ 1.5	18	1787128510-40	
178.765-OS*	10	8.5	45 x 12.5/17 x 12.5	∅ 1.5	18	178-765-10-20	without tubes

*Please order tubes separately – see page 33.

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



178.010
10 mm

178.011
10 mm



178.710
10 mm

178.710
50 mm

178.711
10 mm

178.712
10 mm

178.765
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 through 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 the time consuming replacement of the cuvette and the disconnecting and reconnection of the tubing

Everything in sight: Red 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, triangular cell

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-OS	10 x 10	45 x 12.5 x 12.5	10	1.25	3500	4	101-10-20	
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-OS	10 x 10	46 x 12.5 x 12.5	10	1.25	3500	4	111-10-20	
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
OS Special Optical Glass 320 nm – 2500 nm
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

MICRO CELLS

with and without PTFE stopper

TYPE/WINDOW MATERIAL	OPTICAL PATH LENGTH mm	CENTER HEIGHT mm	OUTSIDE DIM. H × W × D mm	INSIDE WIDTH H × W × D mm	BASE THICKN. mm	VOL. µl	NO. OF WINDOWS	ARTICLE NO.	REMARKS
101.015-QS	3 x 3		21 x 5.4 x 5.4	19.9 x 3 x 3	1.1	130	5	101-015-40	
013.013		15 8.5	50.5 x 12.5 x 12.5 44 x 12.5 x 12.5					013-013-15-71 013-013-85-71	holder for cell type 101.015
111.057-QS	5 x 5		46 x 7.5 x 7.5	38.75 x 5 x 5	1.25	850	5	111-057-40	
013.011			44 x 12.5 x 12.5					013-011-71	holder for cell type 111.057

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


101.015
3 x 3 mm


111.057
5 x 5 mm


013.011
013.013


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 ∅ 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 ∅ 1.9 mm, inside ∅ 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 20 to 21
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 EXACT MEASUREMENT AND RELIABLE 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-analytics.com/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 95 years of experience in producing glass and quartz components. Thanks to our use of advanced glass processing we are able to manufacture micro-channel, cytometer cuvettes 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)
- Analysis of the cycle of the cell
- 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

with glass lids

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

740.000
34.5 mm


700.016
18 mm


704.000
20 mm


704.001
30 mm


704.002
40 mm


704.003
50 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	∅ 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

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


665.000



202

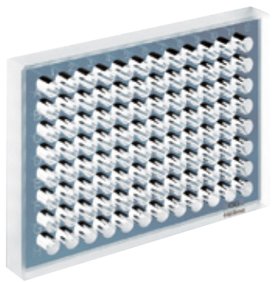
QUARTZ MICROPLATES AND ACCESSORIES FOR CELLS

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
730.009B-QG	Black Quartz Microplate with 96 wells Base: Synthetic Quartz Glass	14.5 x 127 x 85.5	2*	6.6	12.5	300	730009-B-44

QG is synthetic quartz glass with a transmission over 80% between 200 nm and 2500 nm for an empty cell.
* On request base with reduced thickness down to 0.5 mm.
** Available made of Borosilicate Glass on request.



730.009-QG



730.009B-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 ∅ 1.9 mm; inside ∅ 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 ∅ 1.6 mm; inside ∅ 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 types: 110, 111, 114, 120 with 1 – 5 mm path length; and for cell type 404 with 1 – 10 mm path length
011.002	PTFE stopper with fitting NS 7 5 pcs pack	011-002-VE5-72	for cell types: 110, 111, 114/114F, 115/115F, 119/119F, 120 with 10 – 100 mm path length; and for cell type 770
011.103	PE stopper, 10 mm 10 pcs pack	011-103-VE10-73	for cell types: 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 types: 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 types: 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 types: 117.200; 117.200F, 117.204, 117.204F
011.650	Replacement silicone rubber seals (septum) 10 pcs pack	011-650-VE10-72	for cell types: 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 types: 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	∅ ca. 3 – 4 mm, Length 6 – 7 mm for cell types: 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 and precise 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 leaving 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 Hellmanex III diluted to 2% with water. 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 during rinsing.
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.

TRAYCELL® – ULTRA-MICRO CELL FOR UV/VIS ANALYSIS





VIDEO
The TrayCell® in action

TRAYCELL®

Measurement volume: 0.7 µl–10 µl

Can be used in almost all standard spectrophotometers

Precise and stable optical path length

Effective Dillution ratios from factor 5 to factor 100 possible thanks to the ease with which the cap can be changed



It is quick and easy to clean the optics before measuring the next sample, as the TrayCell® remains in the cuvette holder.

Stefanie Greiffenreich,
Development engineer

Photometric analysis of extremely small volume samples

The TrayCell® is a fiber optic ultra-micro measuring cell for the UV/Vis micro volume analysis of DNA, RNA and proteins. It is designed to measure samples, such as DNA/RNA or protein, with an outstanding level of reproducibility.

As TrayCell® is the same size as a standard cuvette, it can be used in almost all conventional spectrophotometers.

Areas of application

- Determination of the purity and concentration of proteins (direct measurement, chromatographic and colorimetric assays)
- Determination of the purity and contents of DNA/RNA
- Determination of the labeling efficiency for microarray experiments (FOI)
- All micro volume, spectrophotometric measurements (0.7 µl–10 µl) in the UV/Vis range from 190 nm to 1,100 nm

PLEASE NOTE
The user manual for the TrayCell® can be found at the following link:

› **www.hellma-analytics.com/traycell-en**

Benefits

- Capable of analyzing very **small sample volumes of 0.7 µl to 10 µl**
- TrayCell® is suitable for almost all conventional spectrophotometers
- TrayCell® boasts **outstanding reproducibility**
- After the measurement process, samples can be easily retrieved with a pipette and reused
- **No need to dilute** samples, as very short optical path lengths are used
- **Cap is simple to remove**, enabling samples to be easily measured at different path lengths
- Optics are quick and easy to clean before measuring the next sample, as the TrayCell® remains in the cuvette holder

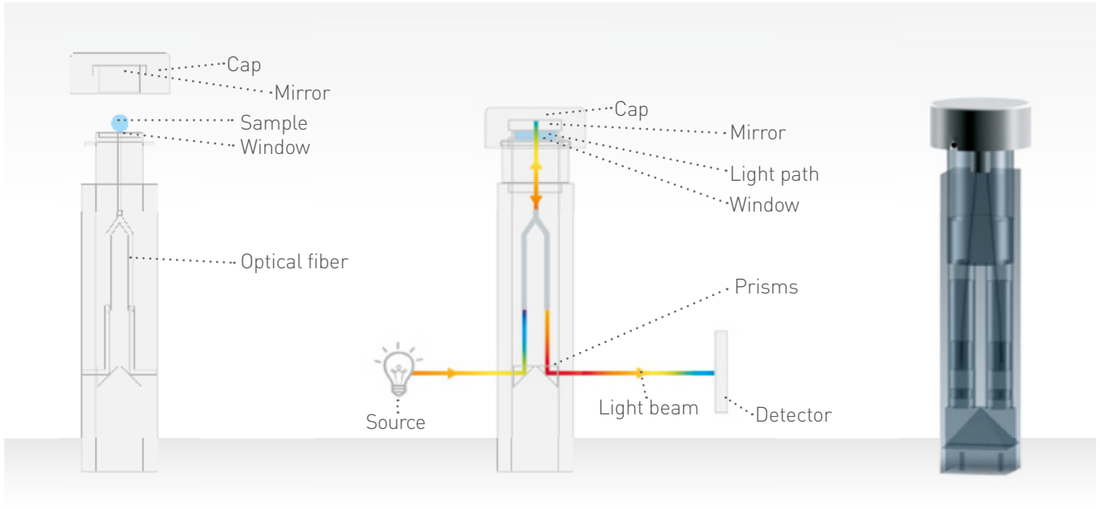
Subject to technical modifications.

TRAYCELL® – ULTRA-MICRO MEASURING CELL

HIGH TECH, TINY FOOTPRINT, PATENTED OPERATING PRINCIPLE

The TrayCell® comprises a fiber optic measuring cell and a cap with an integrated mirror. A small drop (0.7 µl – 10 µl) of sample is pipetted onto the window and the cap is then placed on top. The precisely defined spacing between the window and the mirror inside the cap ensures that the optical path length is accurate and remains constant. It is therefore impossible for the path length to change, rendering costly calibrations and readjustments unnecessary. Light is guided through the sample via prisms and fiber optic waveguides, reflected in the mirror and then guided back out of the TrayCell® to the detector via the waveguides.

MADE IN GERMANY



TRAYCELL®

TYPE	WINDOW MATERIAL	OPTICAL PATH LENGTH (± 0.02 mm)	CENTER HEIGHT mm*	EXTERNAL HEIGHT mm*	VOL. µl	ARTICLE NO.
105.800-UVS	Quartz SUPRASIL®	0.2 (factor 50) 1.0 (factor 10)	8.5 15 20	68.5 75 80	0.7 – 5	105800-A3-V1-46
105.810-UVS	Quartz SUPRASIL®	0.2 (factor 50) 1.0 (factor 10)	8.5 15 20	53 59.5 64.5	0.7 – 5	105810-A3-V1-46

Included in delivery: TrayCell® (Type: 105.800-UVS or 105.810-UVS), 2 caps with an optical path length of 0.2 and 1.0 mm, 2 adapters for a center height of 15 mm and 20 mm, screwdriver for center height adapter, premium storage box, with built in fiber optics suitable for wavelengths 190 nm to 1,100 nm.



105.800-UVS 105.810-UVS

CAPS FOR TRAYCELL®

TYPE	MATERIAL	OPTICAL PATH LENGTH (± 0.02 mm)	VOL. µl	ARTICLE NO.
665.703	Cap made of stainless steel with a mirror made of Quartz Glass High Performance with an aluminum mirror layer	1 mm (factor* 10)	3 – 5	665-703-1-40
665.704		0.2 mm (factor* 50)	0.7 – 4	665-704-0.2-40
665.705		2 mm (factor* 5)	6 – 10	665-705-2-40
665.706		0.1 mm (factor* 100)	0.7 – 3	665-706-0.1-40

* factor = dilution factor compared to a standard cell with a path length of 10 mm



665.703 665.704 665.705 665.706

CERTIFIED UV/VIS REFERENCE MATERIALS/CALIBRATION STANDARDS



UV 857 FILTER SET

Wavelength accuracy,
photometric accuracy,
stray light and spectral resolution
in one set

Can be extended according to requirements

Only available from Hellma Analytics: 5 mm stray light filter fits in 10 mm cuvette holder WITHOUT a spacer!



With the certified UV/Vis reference materials from Hellma Analytics, we create the basis for reliable measurement results for our customers.

Birgit Kehl, Compliance Manager
Calibration Laboratory

Continuously reliable measurements and precise results through certified validation

The regular **testing of spectrophotometers** ensures accurate results and plays an important role in **quality assurance** and production control. Hellma Analytics **reference materials** for UV/Vis spectrophotometry meet internationally recognized standards and provide ultimate process transparency. Besides enabling the spectral resolution and wavelength accuracy to be **reliably tested**, they can check for stray light and photometric accuracy, too.

Areas of application

The safe and easy testing of UV/Vis spectrophotometers for the following parameters:

- Wavelength accuracy
- Photometric accuracy
- Stray light level
- Spectral resolution

Benefits

- Outstanding quality and high levels of compliance (Ph. Eur., USP, DAB, GLP, DIN 9001, etc.)
- Traceable to NIST standards
- With DAkkS certificate
- Possible to certify each filter separately
- No need to prepare solutions
- Cost-effective and environmentally friendly



VIDEO TUTORIAL
Preparation and carrying out of measurements with glass filters

Handling instructions for download

> **www.hellma-analytics.com/calibrationstandards**



ACCURATE MEASUREMENTS GUARANTEED

UV/Vis certified reference materials

Quality assurance and quality control regulations, such as ISO 9000, GLP, GMP and pharmacopoeias, require companies to verify that any spectrophotometers in use are performing at a consistently high level. Hellma Analytics' **certified reference materials** can be used to test the following parameters easily and efficiently: wavelength accuracy, photometric accuracy, stray light and spectral resolution in UV/Vis spectrophotometers.

DAkkS
Deutsche Akkreditierungsstelle
D-K-18752-01-00

NIST TRACEABLE

DIN EN ISO 17025

Hellma Analytics calibration laboratory: accredited to DIN EN ISO 17025

Our calibration laboratory is accredited by DAkkS to DIN EN ISO 17025. By achieving this accreditation, we have provided proof of our expertise in the calibration activities that we perform and are authorized to issue internationally **recognized DAkkS calibration certificates**. All certified measurement results can be traced back to NIST standard reference materials (SRMs) and to the PTB (Physikalisch-Technische Bundesanstalt – Germany's national metrology institute).

Quality management

Hellma Analytics' reference materials comply with the provisions stipulated by quality management systems and pharmacopoeias, meeting the highest quality requirements and ensuring that measurement results can be compared internationally.

Spectrophotometers in instrumental analytics are considered as subject to examination.

UV/VIS CERTIFIED REFERENCE MATERIALS

GLASS FILTERS WITH DAKKS CERTIFICATE

TYPE	MATERIAL	WAVELENGTH nm	ARTICLE NO.
Glass Filters for testing the wavelength accuracy			
666-F1	Holmium Glass Filter F1	279; 361; 453; 536; 638	666F1-339
666-F7W	Didymium Glass Filter F7W	329; 472; 512; 681; 875	666F7W-323
Glass Filters for testing the photometric accuracy			
666-F390	Neutral Density Glass Filter F390; 0.04 Abs	440; 465; 546.1; 590; 635	666F390-25
666-F2	Neutral Density Glass Filter F2; 0.25 Abs	440; 465; 546.1; 590; 635	666F2-39
666-F201	Neutral Density Glass Filter F201; 0.3 Abs	440; 465; 546.1; 590; 635	666F201-39
666-F3	Neutral Density Glass Filter F3; 0.5 Abs	440; 465; 546.1; 590; 635	666F3-38
666-F204	Neutral Density Glass Filter F204; 0.7 Abs	440; 465; 546.1; 590; 635	666F204-37
666-F4	Neutral Density Glass Filter F4; 1.0 Abs	440; 465; 546.1; 590; 635	666F4-37
666-F202	Neutral Density Glass Filter F202; 1.5 Abs	440; 465; 546.1; 590; 635	666F202-36
666-F203	Neutral Density Glass Filter F203; 2.0 Abs	440; 465; 546.1; 590; 635	666F203-36
666-F301	Neutral Density Glass Filter F301; 2.5 Abs	440; 465; 546.1; 590; 635	666F301-361
666-F303	Neutral Density Glass Filter F303; 3.0 Abs	440; 465; 546.1; 590; 635	666F303-361
666-F7A	Didymium Glass Filter F7A; ca. 0.5 – 1.0 Abs	270; 280; 297; 321; 342	666F7A-323
Glass Filter for testing the photometric accuracy and wavelength accuracy			
666-F7	Didymium Glass Filter F7	A: 270; 280; 297; 321; 342 W: 329; 472; 512; 681; 875	666F7-323
Empty filter mount			
666-F0	Reference filter frame made of aluminum (without glass)		666F0-71

A: Wavelength for absorbance W: Wavelength for wavelength accuracy



666-F1 666-F2 666-F3 666-F4 666-F201 666-F202 666-F203 666-F7

TYPE	MATERIAL	WAVELENGTH nm	ARTICLE NO.
Sets for testing the photometric accuracy and wavelength accuracy			
666-S000	Complete Glass Filter Set: F1, F2, F3, F4, F0 (Abs: 0.25; 0.5; 1.0)	A: 440; 465; 546.1; 590; 635 W: 279; 361; 453; 536; 638	666S000
666-S001	Glass Filter Set: F3, F4, F7 (Abs: 0.5; 1.0; F7: ca. 0.5 – 1.0)	A (F7): 270; 280; 297; 321; 342 A (F3, F4): 440; 465; 546.1; 590; 635 W (F7): 329; 472; 512; 681; 875	666S001
666-S002	Glass Filter Set: F2, F3, F4 (Abs: 0.25; 0.5; 1.0)	A: 440; 465; 546.1; 590; 635	666S002
666-S003	Glass Filter Set: F1, F2, F3, F4, F7; (Abs: 0.25; 0.5; 1.0; F7: ca. 0.5 – 1.0)	A (F7): 270; 280; 297; 321; 342; A (F2, F3, F4): 440; 465; 546.1; 590; 635 W (F1): 279; 361; 453; 536; 638 W (F7): 329; 472; 512; 681; 875	666S003
666-S004	Glass Filter Set: F201, F202, F203, F0 (Abs: 0.3; 1.5; 2.0)	A: 440; 465; 546.1; 590; 635	666S004
666-S005	Glass Filter Set: F0, F1, F3, F4; (Abs: 0.5; 1.0)	A: 440; 465; 546.1; 590; 635 W: 279; 361; 453; 536; 638	666S005
666-S006	Glass Filter Set: F0, F2, F3, F4; (Abs: 0.25; 0.5; 1.0)	A: 440; 465; 546.1; 590; 635	666S006
666-S300	Glass Filter Set: F390, F301, F303 (Abs: 0.04; 2.5; 3.0)	A: 440; 465; 546.1; 590; 635	666S300

A: Wavelength for absorbance W: Wavelength for wavelength accuracy



666-F0 666-F1 666-F2 666-F3 666-F4

UV/VIS CERTIFIED REFERENCE MATERIALS

LIQUID FILTERS WITH DAKKS CERTIFICATE

TYPE	CONTENT	WAVELENGTH nm	ARTICLE NO.
Liquid Filters for testing the photometric accuracy			
667-UV20	20 mg/l potassium dichromate in $HClO_4$ (0.1 – 0.3 Abs)	235; 257; 313; 350	667020
667-UV40	40 mg/l potassium dichromate in $HClO_4$ (0.2 – 0.6 Abs)	235; 257; 313; 350	667040
667-UV60	60 mg/l potassium dichromate in $HClO_4$ (0.3 – 0.9 Abs)	235; 257; 313; 350	667060
667-UV80	80 mg/l potassium dichromate in $HClO_4$ (0.4 – 1.2 Abs)	235; 257; 313; 350	667080
667-UV0100	100 mg/l potassium dichromate in $HClO_4$ (0.5 – 1.45 Abs)	235; 257; 313; 350	6670100
667-UV0120	120 mg/l potassium dichromate in $HClO_4$ (0.6 – 1.7 Abs)	235; 257; 313; 350	6670120
667-UV0140	140 mg/l potassium dichromate in $HClO_4$ (0.7 – 2.0 Abs)	235; 257; 313; 350	6670140
667-UV0160	160 mg/l potassium dichromate in $HClO_4$ (0.8 – 2.3 Abs)	235; 257; 313; 350	6670160
667-UV0180	180 mg/l potassium dichromate in $HClO_4$ (0.9 – 2.6 Abs)	235; 257; 313; 350	6670180
667-UV0200	200 mg/l potassium dichromate in $HClO_4$ (1.0 – 3.0 Abs)	235; 257; 313; 350	6670200
667-UV600	600 mg/l potassium dichromate in $HClO_4$ (1.0 Abs)	430	667600
667-UV14	Perchloric acid (reference filter)	235; 257; 313; 350	667014
667-UV301	Filter Set for UV-range: UV60, UV14	235; 257; 313; 350	667301
667-UV304	Filter Set for Vis-range: UV600, UV14	430	667304
667-UV305	Filter Set for UV/Vis-range: UV60, UV600, UV14	235; 257; 313; 350; 430	667305
Liquid Filter Set for testing the linearity of the absorption			
667-UV307	Filter Set: UV20, UV40, UV60, UV80, UV0100, UV14	235; 257; 313; 350	667307
Niacin Liquid Filters for testing the photometric accuracy			
667-UV51 NEW	6 mg/l Niacin in HCl (0.25 Abs)	213; 261	667051
667-UV52 NEW	12 mg/l Niacin in HCl (0.5 Abs)	213; 261	667052
667-UV53 NEW	18 mg/l Niacin in HCl (0.75 Abs)	213; 261	667053
667-UV54 NEW	24 mg/l Niacin in HCl (1.0 Abs)	213; 261	667054
667-UV59 NEW	Reference filter (HCl)	213; 261	667059
667-UV350 NEW	Filter Set: UV51, UV52, UV53, UV54, UV59	213; 261	667350
Liquid Filters for testing the wavelength accuracy			
667-UV5	Holmium in perchloric acid	241; 287; 361; 536; 640	667005
667-UV400	Filter Set: UV5, UV14	241; 287; 361; 536; 640	667400
667-UV25	Didymium in perchloric acid	329; 469; 575; 740; 864	667025
667-UV35	Rare Earth	201; 211; 222; 239; 252	667035
667-UV45	Holmium/Didymium in perchloric acid	241; 354; 444; 575; 641; 740; 864	667045

TYPE	CONTENT	WAVELENGTH nm	ARTICLE NO.
Liquid Filters for testing the wavelength accuracy acc. to USP <857>			
667-UV5USP	Holmium in perchloric acid	241; 250; 278; 287; 333; 345; 361; 385; 416; 452; 468; 485; 536; 640	667005USP
667-UV25USP	Didymium in perchloric acid	732, 740, 794, 801, 864	667025USP
667-UV425	Filter Set: UV5, UV25	UV5: 241; 250; 278; 287; 333; 345; 361; 385; 416; 452; 468; 485; 536; 640 UV25: 732; 740; 794; 801; 864	667425
Liquid Filters for testing stray light			
667-UV1	Potassium chloride in pure water, LP 10 mm	200 (cut-off)	667001
667-UV1H*	Potassium chloride in pure water, reference filter, LP 5 mm	200 (cut-off)	667001H
667-UV10	Sodium iodide in pure water, LP 10 mm	259 (cut-off)	667010
667-UV10H*	Sodium iodide in pure water, reference filter, LP 5 mm	259 (cut-off)	667010H
667-UV11	Sodium nitrite in pure water, LP 10 mm	385 (cut-off)	667011
667-UV11H*	Sodium nitrite in pure water, reference filter, LP 5 mm	385 (cut-off)	667011H
667-UV12	Pure water, reference filter, LP 10 mm	198; 200; 300; 400	667012
667-UV19	Acetone, LP 10 mm	325 (cut-off)	667019
667-UV19H*	Acetone, reference filter, LP 5 mm	325 (cut-off)	667019H
Liquid Filter Sets for testing stray light according to Ph. Eur.			
667-UV100	Filter Set: UV1, UV12; LP 10 mm	200 (cut-off)	667100
667-UV101	Filter Set: UV10, UV12; LP 10 mm	259 (cut-off)	667101
667-UV102	Filter Set: UV11, UV12; LP 10 mm	385 (cut-off)	667102
667-UV103	Filter Set: UV1, UV10, UV11, UV12; LP 10 mm	200; 259; 385 (cut-off)	667103
667-UV104	Filter Set: UV10, UV11, UV12; LP 10 mm	259; 385 (cut-off)	667104
Liquid Filter Sets for testing stray light according to USP <857>			
667-UV100H	Filter Set: UV1, UV1H, LP 10 and 5 mm	200 (cut-off); SR: 190 – 205	667100H
667-UV101H	Filter Set: UV10, UV10H, LP 10 and 5 mm	259 (cut-off); SR: 210 – 259	667101H
667-UV102H	Filter Set: UV11, UV11H, LP 10 and 5 mm	385 (cut-off); SR: 300 – 386	667102H
667-UV119H	Filter Set: UV19, UV19H, LP 10 and 5 mm	325 (cut-off); SR: 250 – 324	667119H
667-UV105H	Filter Set: UV1/UV1H; UV10/UV10H; UV11/UV11H; UV19/UV19H, LP 10 and 5 mm	200, 259, 325, 385 (cut-off)	667105H
667-UV106H	Filter Set: UV1/UV1H; UV10/UV10H; UV19/UV19H; LP 10 mm and 5 mm	200; 259; 325 (cut-off)	667106H
Liquid Filters for testing the resolution			
667-UV6*	Toluene in n-hexane	Scan: 265 – 270	667006
667-UV9*	n-hexane (Reference Filter)	Scan: 265 – 270	667009
667-UV200*	Filter Set: UV6, UV9	Scan: 265 – 270 Slit widths: 0.5; 1.0; 1.5; 2.0; 3.0	667200

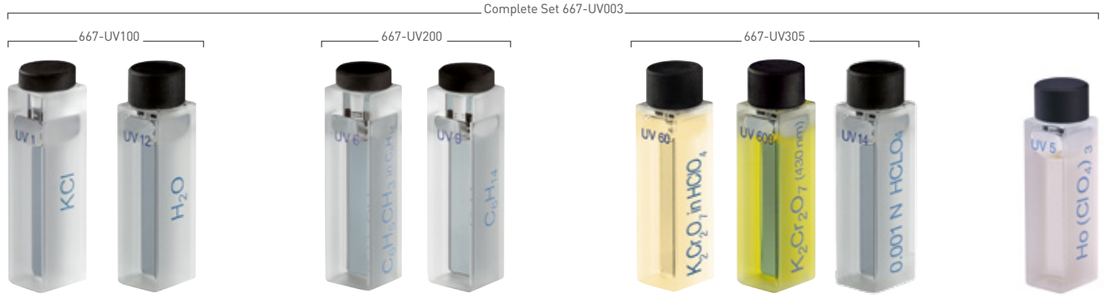
R: Wavelength for spectral resolution SR: Spectral range
* with Hellma Analytics calibration certificate

UV/VIS CERTIFIED REFERENCE MATERIALS

FILTER SETS ACCORDING TO PH. EUR. AND USP 857 WITH DAKKS CERTIFICATE

TYPE	CONTENT	WAVELENGTH nm	ARTICLE NO.
Complete Filter Set for testing the spectrophotometer according to Ph.Eur.			
667-UV003	Potassium dichromate filters: UV60/ UV600/UV 14 (Abs: 0.3 – 0.9; 1.0) Holmium liquid filter: UV5 Potassium chloride in H2O: UV1/UV12 Toluene in hexane: UV6/UV9	A: 235; 257; 313; 350; 430 W: 241; 287; 361; 536; 640 S: 200 (cut-off) R: Scan 265 – 270	667003

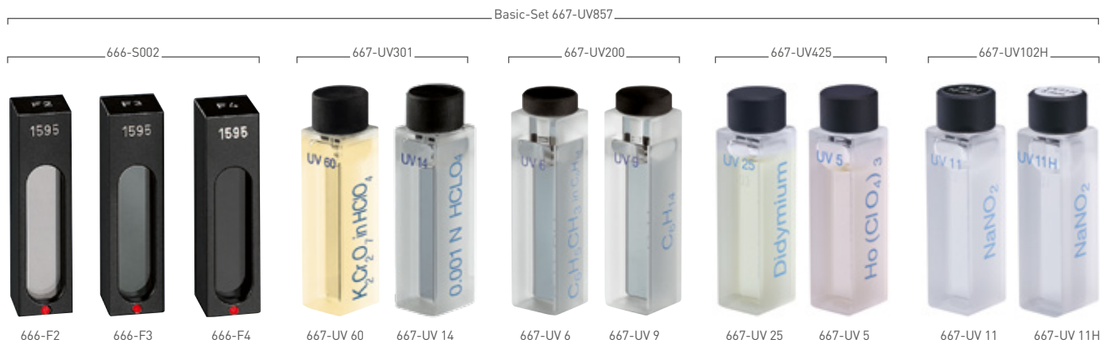
A: Wavelength for absorbance W: Wavelength for wavelength accuracy S: Wavelength for stray light R: Wavelength for spectral resolution



667-UV 1 667-UV 12 667-UV 6 667-UV 9 667-UV 60 667-UV 600 667-UV 14 667-UV 5

TYPE	CONTENT	WAVELENGTH nm	ARTICLE NO.
Basic set for testing the spectrophotometer according to United States Pharmacopoeia (USP <857>)			
667-UV857 NEW Depending on the application, this basic set can be supplemented with further USP filters. More information: www.hellma-analytics.com/USP857	Neutral Density Glass Filters: F2, F3, F4 (Abs: 0.25; 0.5; 1.0) Potassium dichromate 60mg/L: UV60/UV14 (Abs: 0.3 – 0.9) Holmium and Didymium liquid filter: UV5/UV25 Sodium nitrite in H2O: UV11/UV11H; LP 10 mm and 5 mm	A (F2,F3,F4): 440; 465; 546.1; 590; 635 A (UV60/14): 235; 257; 313; 350 W (UV5): 241; 250; 278; 287; 333; 345; 361; 385; 416; 452; 468; 485; 536; 640 W (UV25): 732; 740; 794; 801; 864 S (UV11/11H): 385 (cut-off), R (UV6/9): Scan: 265 – 270	667857

A: Wavelength for absorbance W: Wavelength for wavelength accuracy S: Wavelength for stray light R: Wavelength for spectral resolution



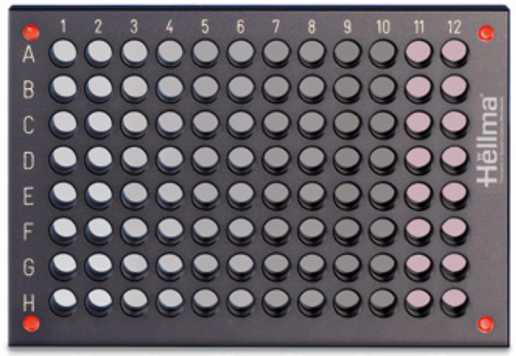
666-F2 666-F3 666-F4 667-UV 60 667-UV 14 667-UV 6 667-UV 9 667-UV 25 667-UV 5 667-UV 11 667-UV 11H

REFERENCE PLATES FOR QUALIFYING MICROPLATE READERS WITH DAkkS CERTIFICATE

With reference plates from Hellma Analytics you can check the photometric and wavelength accuracy of microplate readers. They have the same dimensions as a microplate with 96 wells and a 6.6 mm diameter per window (height 14.5 x width 125 x length 85.5 mm).

TYPE	USAGE	MATERIAL Nominal value of absorption (Abs.)	WAVELENGTH nm	ARTICLE NO.
666-R013	To check photometric accuracy	Neutral Density Glass Filter NG 11 (0.25), NG 5 (0.5), NG 4 (1.0), NG 3 (1.5), (2.5)	A: 405; 450; 490; 650	666R013
666-R113	To check photometric accuracy and wavelength accuracy	Neutral Density Glass Filter NG 5 (0.5), NG 4 (1.0), NG 3 (1.5), (2.0) Holmium Glass Filter	A: 405; 450; 490; 650 W: 279; 361; 453; 536; 638	666R113

A: Wavelength for absorbance W: Wavelength for wavelength accuracy



666-R113

THE DAkkS ACCREDITED CALIBRATION LABORATORY FROM HELLMA ANALYTICS

DAkkS
Deutsche
Akkreditierungsstelle
D-K-18752-01-00

Proven reliability, completely documented

The Hellma Analytics calibration laboratory is **the only calibration laboratory in Germany** accredited for the certification of UV/Vis reference materials.
After careful manufacture, the reference materials are certified according to the DAkkS regulations, using a high performance UV/Vis spectrometer.

Advantages

- **Most important information at a glance:** Users are able to test and calibrate their spectrometers by using the values documented and certified on the calibration certificate.
- **Legally secure:** DAkkS calibration certificates are certificates from the "Deutsche Kalibrierdienst" (German Calibration Authority) and may only be issued by accredited partners.


Hellma Analytics
High Precision in Spectro-Optics

Hellma GmbH & Co. KG
Klosterrunsstr. 5, 79379 Müllheim, Germany
Telefon / Phone: +49 7631 182 0

Sample

akkreditiert durch die / *accredited by the*
Deutsche Akkreditierungsstelle GmbH

DAkkS Deutsche Akkreditierungsstelle D-K-18752-01-00

als Kalibrierlaboratorium im / *as calibration laboratory in the*
Deutschen Kalibrierdienst DKD

Kalibrierschein
Calibration certificate

Kalibrierzeichen
Calibration mark

38000
D-K-18752-01-00
2017-03

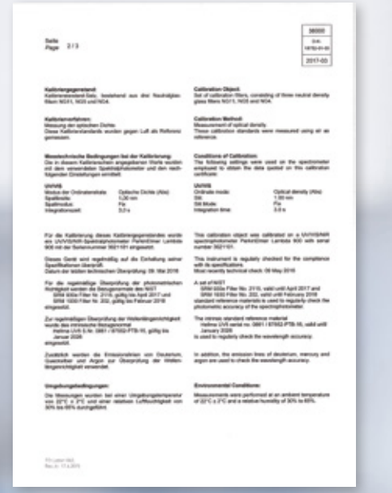
Gegenstand *Object*	**Neutralglasfilter-Satz** *Set of Neutral Density Glass Filters*
Hersteller *Manufacturer*	**Hellma GmbH & Co. KG**
Typ *Type*	**666S000 (666-F2 / 666-F3 / 666-F4)**
Fabrikat/Serien-Nr. *Serial number*	**6666**
Auftraggeber *Customer*	**Hellma Analytics GmbH Klosterrunsstr. 5 79379 Müllheim**
Auftragsnummer *Order No.*	**678123**
Anzahl der Seiten des Kalibrierscheines *Number of pages of the certificate*	**3**
Datum der Kalibrierung *Date of calibration*	**08. März 2017** *08 March 2017*

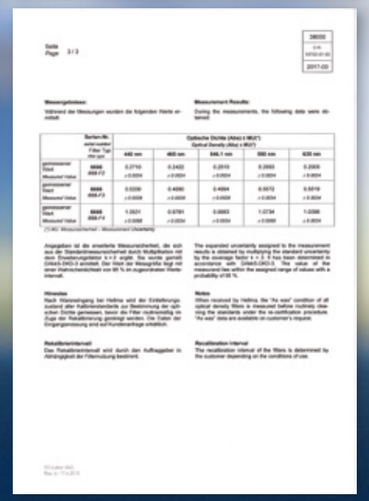
Dieser Kalibrierschein dokumentiert die Rückführung auf nationale Normale zur Darstellung der Einheiten in Übereinstimmung mit dem Internationalen Einheitensystem (SI).
Die DAkkS ist Unterzeichner der multilateralen Übereinkommen der European Co-operation for Accreditation (EA) und der International Laboratory Accreditation Cooperation (ILAC) zur gegenseitigen Anerkennung der Kalibrierscheine.
Für die Einhaltung einer angemessenen Frist zur Wiederholung der Kalibrierung ist der Benutzer verantwortlich.
This calibration certificate documents the traceability to national standards, which realize the units of measurement according to the International System of Units (SI).
The DAkkS is signatory to the multilateral agreements of the European co-operation for Accreditation (EA) and of the International Laboratory Accreditation Cooperation (ILAC) for the mutual recognition of calibration certificates.
The user is obliged to have the object recalibrated at appropriate intervals.

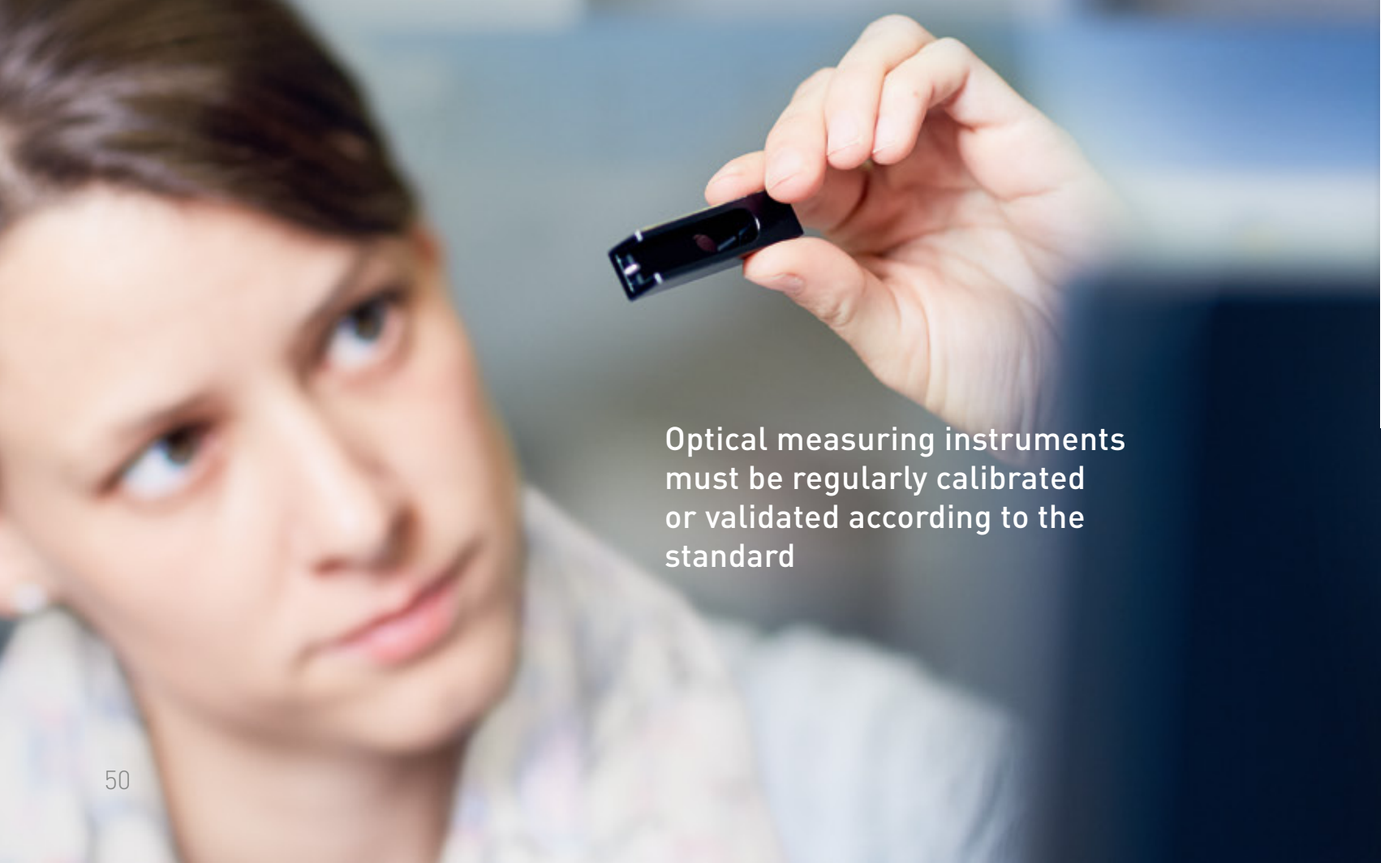
Dieser Kalibrierschein darf nur vollständig und unverändert weiterverbreitet werden. Auszüge oder Änderungen bedürfen der Genehmigung sowohl der Deutschen Akkreditierungsstelle GmbH als auch des ausstellenden Kalibrierlaboratoriums. Kalibrierscheine ohne Unterschrift haben keine Gültigkeit.
This calibration certificate may not be reproduced other than in full except with the permission of both the Deutsche Akkreditierungsstelle GmbH and the issuing laboratory. Calibration certificates without signature are not valid.

Datum *Date*	Leiter des Kalibrierlaboratoriums *Head of the calibration laboratory*	Bearbeiter *Person in charge*
08. März 2017 *08 March 2017*	Birgit Kehl	Carola Steinger

FO-Labor-042, Rev.:6 – 17.4.2015







Optical measuring instruments must be regularly calibrated or validated according to the standard

18605
D-K-18752-01-00
2018-01

IMPORTANT INFORMATION
Only if the DAkkS calibration certificate has been issued and the calibration mark has been affixed, do the reference materials actually become certified reference materials.

RECERTIFICATION

Continuously assured quality: Recertification intervals for reference materials

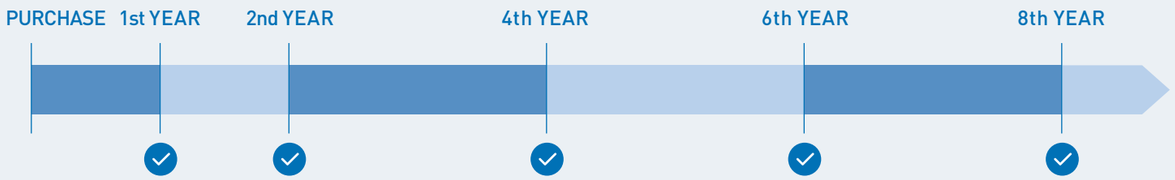
As is the case for all measuring devices, the **reference materials used to verify spectrophotometers must also be checked and recertified at regular intervals** (see for example ISO 9001:2008 "Control of Monitoring and Measuring Equipment"). This allows you to ensure that you consistently fulfill your in-house **quality requirements and guarantees high levels of accuracy and reliability in your measurements**.

Important parameters for recertification

The **length of intervals** between the recertification of reference materials depends on how frequently materials are used, the wear associated with this, accuracy requirements, and the requirements of a company's internal auditing. In general, a recertification interval of **12 months** is recommended for checking and recertifying **glass filters** during the first two years of use, with an interval of **24 months** thereafter. We recommend verifying and recertifying **liquid filters** within a maximum of **12 months**. Intervals should be specified individually in accordance with your QA system.

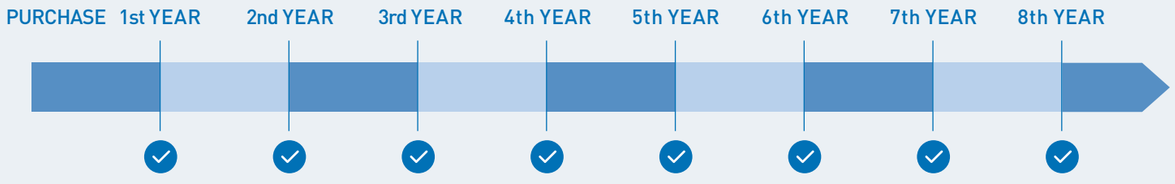


GLASS FILTERS RECERTIFICATION EVERY 24 MONTHS





LIQUID FILTERS RECERTIFICATION INTERVAL OF 12 MONTHS IS RECOMMENDED



Fast and reliable – recertification service

In our DAkkS-accredited calibration laboratory, your reference materials are cleaned and are recertified in accordance with your requirements using a high-performance spectrophotometer. If necessary, filters are repaired, or are exchanged following a consultation.
You will receive your filters with a new DAkkS calibration certificate or Hellma Analytics calibration certificate. **Filters are usually recertified within five working days** of their arrival at the calibration laboratory.

Recertification of reference materials from other manufacturers.
We also recertify reference materials for UV/Vis spectroscopy from other suppliers. If you require a quotation first, **please send your inquiry via email to your local Hellma partner**.

PLEASE NOTE:

Liquid filters can only be sent when the external temperature is above 4°C, as the liquid can freeze, which will destroy the reference materials.

Returning your reference materials for recertification

Efficient processing of the reference materials you send us ensures that you will be able to use your filters again within just a few days.
We need your support to make this possible. Please include all information needed to process the reference materials:

- **Article no.***
- **Serial no.***
- **Wavelength(s) to be measured***
- **Slit width(s) to be measured***
- **Documentation of measurement data prior to cleaning** ** **Yes / No**
- **Quotation no.** (if you have already received a quotation from us)
- **Billing address**
- **Delivery address** (if different from billing address)
- **Special requests, e.g. additional wavelengths etc**

Please enclose a copy of your order or send this via email to your local Hellma partner.
If you send your reference materials with only a delivery note, **it is essential that you indicate your order number.** Please include this on the delivery note, otherwise we will be unable to process your order.

*This information is not necessary if you enclose a copy of the current calibration certificate.
** Documentation of measurement data prior to cleaning
If you require documentation of measurement data prior to cleaning, please note this on your order. Depending on your quality management requirements, you have two options:
1. Documentation of measurement data prior to cleaning with DAkkS certificate.
2. Documentation of measurement data prior to cleaning with simple measurement report.

RECERTIFICATION

RECERTIFICATION OF THE FILTERS WITH DAKKS CERTIFICATE

Glass Filters

TYPE	SERVICE	ARTICLE NO.
Recertification of the Glass Filters for checking photometric accuracy		
666-F2	Neutral Density Glass Filter (0.25 Abs)	666F2RE
666-F3	Neutral Density Glass Filter (0.5 Abs)	666F3RE
666-F4	Neutral Density Glass Filter (1 Abs)	666F4RE
666-F201	Neutral Density Glass Filter (0.3 Abs)	666F201RE
666-F202	Neutral Density Glass Filter (1.5 Abs)	666F202RE
666-F203	Neutral Density Glass Filter (2.0 Abs)	666F203RE
666-F204	Neutral Density Glass Filter (0.7 Abs)	666F204RE
666-F301	Neutral Density Glass Filter (2.5 Abs)	666F301RE
666-F303	Neutral Density Glass Filter (3.0 Abs)	666F303RE
666-F390	Neutral Density Glass Filter (0.04 Abs)	666F390RE
666-F7A	Didymium Glass Filter (ca. 0.5 – 1.0 Abs)	666F7ARE
Recertification of the Glass Filters for checking wavelength accuracy		
666-F1	Holmium Glass Filter	666F1RE
666-F7W	Didymium Glass Filter	666F7WRE
Recertification of the Glass Filters for checking photometric accuracy and wavelength accuracy		
666-F7	Didymium Glass Filter	666F7RE
Recertification of the Glass Filter Sets		
666-S000	Glass Filter Set: F0, F1, F2, F3, F4	666S000RE
666-S001	Glass Filter Set: F3, F4, F7	666S001RE
666-S002	Glass Filter Set: F2, F3, F4	666S002RE
666-S003	Glass Filter Set: F1, F2, F3, F4, F7	666S003RE
666-S004	Glass Filter Set: F201, F202, F203, F0	666S004RE
666-S005	Glass Filter Set: F0, F1, F3, F4	666S005RE
666-S006	Glass Filter Set: F0, F2, F3, F4	666S006RE
666-S300	Glass Filter Set: F301, F303, F390	666S300RE



Reference Plates

TYPE	SERVICE	ARTICLE NO.
Recertification of the Reference Plates for Microplate Readers		
666-R013	Neutral Density Glass Filter: NG11, NG5, NG4, NG3	666R013RE
666-R113	Neutral Density Glass Filter: NG5, NG4, NG3, Holmium Glass Filter	666R113RE



Liquid Filters

TYPE	SERVICE	ARTICLE NO.
Recertification of the Liquid Filters for checking photometric accuracy		
667-UV20	Potassium Dichromate Filter (20mg/l)	667020RE
667-UV40	Potassium Dichromate Filter (40mg/l)	667040RE
667-UV60	Potassium Dichromate Filter (60mg/l)	667060RE
667-UV80	Potassium Dichromate Filter (80mg/l)	667080RE
667-UV0100	Potassium Dichromate Filter (100mg/l)	6670100RE
667-UV0120	Potassium Dichromate Filter (120mg/l)	6670120RE
667-UV0140	Potassium Dichromate Filter (140mg/l)	6670140RE
667-UV0160	Potassium Dichromate Filter (160mg/l)	6670160RE
667-UV0180	Potassium Dichromate Filter (180mg/l)	6670180RE
667-UV0200	Potassium Dichromate Filter (200mg/l)	6670200RE
667-UV600	Potassium Dichromate Filter (600mg/l)	667600RE
667-UV51	Niacin Filter (6 mg/l)	667051RE
667-UV52	Niacin Filter (12 mg/l)	667052RE
667-UV53	Niacin Filter (18 mg/l)	667053RE
667-UV54	Niacin Filter (24 mg/l)	667054RE
667-UV350	Filter Set: UV51, UV52, UV53, UV54, UV59	667350RE
667-UV14	Perchloric acid (Reference Filter)	667014RE
667-UV301	Filter Set: UV60, UV14	667301RE
667-UV304	Filter Set: UV600, UV14	667304RE
667-UV305	Filter Set: UV60, UV600, UV14	667305RE
667-UV307	Filter Set: UV20, UV40, UV60, UV80, UV0100, UV14	667307RE



RECERTIFICATION

RECERTIFICATION OF THE FILTERS WITH DAKKS CERTIFICATE

Liquid Filters

TYPE	SERVICE	ARTICLE NO.
Recertification of the Liquid Filters for testing the wavelength accuracy		
667-UV5	Holmium Liquid Filter	667005RE
667-UV5USP	Holmium in perchloric acid according to USP <857>	667005USPRE
667-UV25	Didymium Liquid Filter	667025RE
667-UV25USP	Didymium in perchloric acid according to USP <857>	667025USPRE
667-UV35	Rare Earth Liquid Filter	667035RE
667-UV45	Holmium/Didymium Liquid Filter	667045RE
667-UV400	Filter Set: UV5, UV14	667400RE
667-UV425	Filter Set according to USP <857>: UV5, UV25	667425RE
Recertification of the Liquid Filters for testing the resolution		
667-UV6*	Toluene in n-hexane	667006RE
667-UV200*	Filter Set: UV6, UV9	667200RE
Recertification of the Liquid Filters for testing stray light		
667-UV1	Potassium chloride in pure water	667001RE
667-UV10	Sodium iodide in pure water	667010RE
667-UV11	Sodium nitrite in pure water	667011RE
667-UV12	Pure water	667012RE
667-UV19	Acetone	667019RE
667-UV100	Filter Set: UV1, UV12	667100RE
667-UV101	Filter Set: UV10, UV12	667101RE
667-UV102	Filter Set: UV11, UV12	667102RE
667-UV103	Filter Set: UV1, UV10, UV11, UV12	667103RE
667-UV104	Filter Set: UV10, UV11, UV12	667104RE

*with Hellma Analytics calibration certificate

Liquid Filters

TYPE	SERVICE	ARTICLE NO.
Recertification of the stray light filter set according to USP <857>		
667-UV100H	Filter Set: UV1, UV1H	667100HRE
667-UV101H	Filter Set: UV10, UV10H	667101HRE
667-UV102H	Filter Set: UV11, UV11H	667102HRE
667-UV119H	Filter Set: UV19, UV19H	667119HRE
667-UV105H	Filter Set: UV1/UV1H; UV10/UV10H; UV11/UV11H; UV19/UV19H	667105HRE
667-UV106H	Filter Set: UV1/UV1H; UV10/UV10H; UV19/UV19H	667106HRE
Recertification of the Liquid Filter Complete Sets		
667-UV003	Pharm. Eur. Filter Set: UV1, UV12, UV6, UV9, UV60, UV600, UV14, UV5	667003RE
667-UV857	USP <857> Filter Set: F2, F3, F4, UV60, UV14, UV5, UV25, UV11, UV11H, UV6, UV9	667857RE

30-YEAR MANUFACTURER'S WARRANTY ON ALL HELLMA ANALYTICS REFERENCE MATERIALS

We're confident of our quality and you can be confident of reliable results!
All **Hellma Analytics reference materials** come with a **30-year warranty**, provided that they are regularly recertified – every two years – at the Hellma Analytics calibration laboratory. Certified reference materials sent for recertification are carefully cleaned and recertified before being sent back with a new DAkkS calibration certificate and calibration mark. Damaged filters and filters that deviate significantly from nominal values are usually replaced in consultation with the customer.

All of our reference materials come with a 30-year warranty, provided that they are regularly recertified (at least every two years) at the Hellma Analytics calibration laboratory.



OPTICAL IMMERSION PROBES AND FIBER OPTIC CELLS

EXTREMELY ROBUST AND HIGHLY PRECISE – IN THE LABORATORY AND IN THE PROCESS

EXCALIBUR STANDARD IMMERSION PROBE

Suitable for a variety of process and laboratory applications

High optical path length accuracy (± 0.01 mm) ensures accurate results

Chemical-resistant measuring head made from Quartz Glass Extended Range



Online, atline, inline – continously reliable measurements with high reproducibility

Fiber optic immersion probes and cells for flow-through measurements support engineers, researchers and analysts to make **their processes more efficient**. They collect accurate and **reliable results** when used to take online measurements during production processes.

In the lab, they are especially useful in cleanrooms, for automated methods and scaling up processes.

Areas of application

- Chemical and petrochemical engineering
- Pharmaceuticals and life sciences
- Food and beverage industry
- And many more

Benefits at a glance

- World's largest range of optical immersion probes
- UV/Vis/NIR/IR/Raman
- Fiber optic cells and immersion probes available
- Various sealing technologies to choose from
- Extremely robust products
- Interfaces to connect to instruments from different manufacturers

Here you will find further information as well as a product configurator for immersion probes and fiber optic cells.

> **www.mypatprobe.com**



The benefits of optical immersion probes and fiber optic cells include their ease of use, flexibility and ability to boost efficiency. Our comprehensive portfolio enables us to meet our clients' requirements as closely as possible.

Dr. Oliver Mandal,
Product Manager Fiber Optic Systems

OPTICAL IMMERSION PROBES – TRANSMISSION FOR THE UV/VIS/NIR RANGE

EXCALIBUR LAB

All-Round Probe

This classic transmission probe features a broad range of possible applications. Whether for use in the lab, for online monitoring in process environments or even for TDA measurements – it is always the right choice.



Optical Path Length mm (tolerance ± 0.01)	1 mm, 2 mm, 5 mm, 10 mm, 20 mm
Outer Diameter	probe head: 15 mm probe shaft: 20 mm protective sleeve: 20 mm
Optical Material	Quartz
Probe Body Material	Stainless steel (316 L)
Sealing Technology	Viton Kalrez® 4079
Spectral Range	UV/Vis ((210 nm – 1100 nm, low solarization) NIR (400 nm – 2300 nm)
Fiber Optic Connection	1.8 m external fiber optic cables with SMA connectors
Temperature Range	5 °C to 150 °C
Pressure Range	-1 bar to 6 bar
Immersion Depth	100 mm (10 mm optical path length)

	UV	NIR
Path Length mm	ARTICLE NO.	
1	LEIX**01U**E20AN	LEIX**01N**E20AN
2	LEIX**02U**E20AN	LEIX**02N**E20AN
5	LEIX**05U**E20AN	LEIX**05N**E20AN
10	LEIX**10U**E20AN	LEIX**10N**E20AN
20	LEIX**20U**E20AN	LEIX**20N**E20AN

Immersion Probe Configurator

Hellma offers the world's largest product selection and the highest level of expertise to support your online measurements from UV to IR.

Find the right immersion probe/measuring cell quickly and easily or configure your individual solution at:

www.mypatprobe.com

EXCALIBUR ALL-QUARTZ

All-Quartz Probe

These Hellma Analytics all-quartz probes are outstanding due to their unique design which makes additional sealing material superfluous. This makes them the ideal tool for measuring aggressive samples even at the lowest temperatures – measuring beyond the limits.



Optical Path Length mm (tolerance ± 0.01)	1 mm, 2 mm, 5 mm, 10 mm, 20 mm
Outer Diameter	Probe head: 15 mm Quartz barrel: 18 mm
Optical Material	Quartz
Probe Body Material	Quartz
Sealing Technology	Directly fused
Spectral Range	UV/Vis ((210 nm – 1100 nm, low solarization) NIR (400 nm – 2300 nm)
Fiber Optic Connection	1.8 m external fiber optic cables with SMA connectors
Temperature Range	5 °C to 150 °C (-180 °C to 150 °C with vacuum jack)
Pressure Range	-1 bar to 6 bar
Immersion Depth	210 mm (10 mm optical path length)

	UV	NIR
Path Length mm	ARTICLE NO.	
1	LQID**01U**E20AY	LQID**01N**E20AY
2	LQID**02U**E20AY	LQID**02N**E20AY
5	LQID**05U**E20AY	LQID**05N**E20AY
10	LQID**10U**E20AY	LQID**10N**E20AY
20	LQID**20U**E20AY	LQID**20N**E20AY

WITH VACUUM JACK FOR LOW TEMPERATURE APPLICATIONS

	UV	NIR
Path Length mm	ARTICLE NO.	
1	LQID**01U**E20AY	LQID**01N**E20AY
2	LQID**02U**E20AY	LQID**02N**E20AY
5	LQID**05U**E20AY	LQID**05N**E20AY
10	LQID**10U**E20AY	LQID**10N**E20AY
20	LQID**20U**E20AY	LQID**20N**E20AY

EXCALIBUR ALL-QUARTZ NS19/35

All-Quartz Probe, tapered version with ground glass joint NS 19/35



Optical Path Length mm (tolerance ± 0.01)	1 mm, 2 mm, 5 mm,10 mm, 20 mm
Outer Diameter	Probe head: 15.5 mm Taper: NS 19/35
Optical Material	Quartz
Probe Body Material	Quartz
Sealing Technology	Directly fused
Spectral Range	UV/Vis (210 nm – 1100 nm, low solarization) NIR (400 nm – 2300 nm)
Fiber Optic Connection	1.8 m external fiber optic cables with SMA connectors
Temperature Range*	5 °C to 150 °C
Pressure Range	-1 bar to 6 bar
Immersion Depth	130 mm (10 mm optical path length)

*With vacuum connection for use at low temperatures possible, from -180 °C to 150 °C

	UV	NIR
Path Length mm	ARTICLE NO.	
1	LQID**01U**E20DN	LQID**01N**E20DN
2	LQID**02U**E20DN	LQID**02N**E20DN
5	LQID**05U**E20DN	LQID**05N**E20DN
10	LQID**10U**E20DN	LQID**10N**E20DN
20	LQID**20U**E20DN	LQID**20N**E20DN

OPTICAL IMMERSION PROBES – TRANSFLECTION FOR THE UV/VIS/NIR RANGE

These transflection immersion probes have been specifically designed for laboratories and small volume analyses. They are available with fixed path lengths and very small outer diameters e.g. 3.2 mm/4 mm/6 mm. The 6 mm version offers increased flexibility due to interchangeable path length tips.

FALCATA LAB

with 3.2 mm and 4 mm diameter

These micro immersion probes have been specifically developed for measurements in small volumes. Due to their slim form, less sample material is required for a measurement to be taken.



Optical Path Length mm (tolerance ± 0.02)	5 mm, 10 mm
Outer Diameter	3.2 mm/4 mm
Optical Material	Quartz
Probe Body Material	Stainless steel 1.4435 (316 L)
Sealing Technology	Epoxy glue
Spectral Range	UV/Vis (210 nm – 1100 nm, low solarization) NIR (400 nm – 2300 nm)
Fiber Optic Connection	1.8 m external fiber optic cables with SMA connectors
Temperature Range	5 °C to 100 °C
Pressure Range	-1 bar to 6 bar
Immersion Depth	75 mm/130 mm (10 mm path length)

FALCATA STANDARD IMMERSION PROBE 3.2 MM DIAMETER

	UV	NIR
Optical Path Length mm	ARTICLE NO.	
5	LFCI**05U**E20AN	LFCI**05N**E20AN
10	LFCI**10U**E20AN	LFCI**10N**E20AN

FALCATA STANDARD IMMERSION PROBE 4 MM DIAMETER

	UV	NIR
Optical Path Length mm	ARTICLE NO.	
5	LFDI**05U**E20AN	LFDI**05N**E20AN
10	LFDI**10U**E20AN	LFDI**10N**E20AN

FALCATA LAB

with 6 mm diameter

Increased flexibility due to interchangeable path length tips.



Optical Path Length mm (tolerance ± 0.02)	1 mm, 2 mm, 5 mm, 10 mm, 20 mm through interchangeable tips
Outer Diameter	6 mm
Optical Material	Quartz
Probe Body Material	Stainless Steel 1.4435 (316 L)
Sealing Technology	Epoxy glue
Spectral Range	UV/Vis (210 nm – 1100 nm, low solarization) NIR (400 nm – 2300 nm)
Fiber Optic Connection	1.8 m external fiber optic cables with SMA connectors
Temperature Range	5 °C to 100 °C
Pressure Range	-1 bar to 6 bar
Immersion Depth	175 mm (10 mm optical path length)

	UV	NIR
Optical Path Length mm	ARTICLE NO.	
1/2/5/10/20	LFEI**TSU**E20AN	LFEI**TSN**E20AN
1	LFEI**01U**E20AN	LFEI**01N**E20AN
2	LFEI**02U**E20AN	LFEI**02N**E20AN
5	LFEI**05U**E20AN	LFEI**05N**E20AN
10	LFEI**10U**E20AN	LFEI**10N**E20AN
20	LFEI**20U**E20AN	LFEI**20N**E20AN

ACCESSORIES INTERCHANGEABLE PATH LENGTH TIPS

	Path Length Tips
Optical Path Length mm	ARTICLE NO.
1/2/5/10/20 Set	IPLTL1**S**QSI
1	IPLTL1**A**QSI
2	IPLTL1**B**QSI
5	IPLTL1**C**QSI
10	IPLTL1**D**QSI
20	IPLTL1**E**QSI

OPTIC CELLS – ATR FOR MIR RANGE

KATANA TUNNEL CELL

ATR tunnel cells provide a high degree of analytical accuracy.
They are ideal for the chemical analysis of liquids in the IR range.



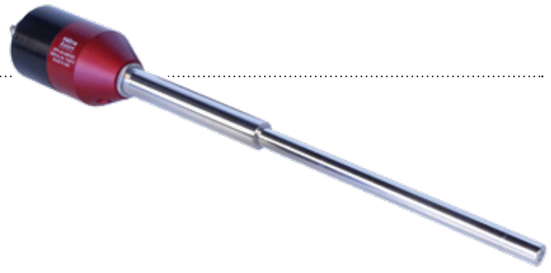
	KATANA TNL 120 (Micro)	KATANA TNL 130
Reflections	10	11
Aperture	8 mm	16 mm
Filling Volume	40 µl	2 ml
Optical Material	ZnSe, (AMTIR-1, ZNS, others on request)	
Spectral Range	NIR, IR to: 670 cm^{-1} (ZnSe); 880 cm^{-1} (AMTIR-1); 980 cm^{-1} (ZnS)	
Body Material	316 L	316 L
Sealing Technology	Kalrez® 6375	Kalrez® 6375
ARTICLE NO.	CKHZZSEIA000WNNAN	CKDZZSEIA000WNNAN

Also available as heatable version.

OPTICAL PROBE – RAMAN

TIDUS LAB

The RFP-400 Raman series was developed for laboratory use.
A big advantage of this series is the high flexibility due to exchangeable optics.



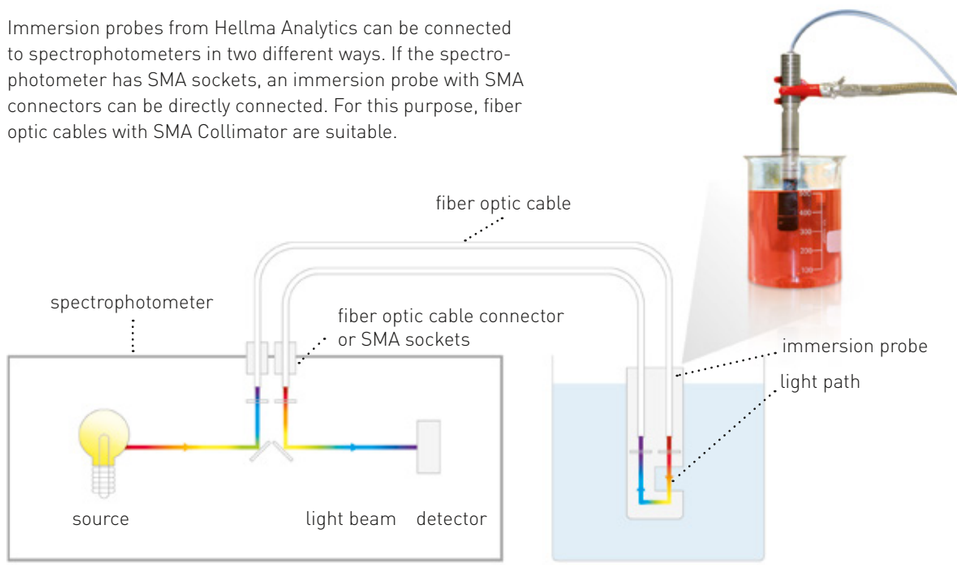
	TIDUS RFP 442
Outer Diameter	12,7 mm
Optical Material	Sapphire
Probe Body Material	316 L
Sealing Technology	PTFE coated nickel alloy
Spectral Range	150 – 4000 cm^{-1} (Raman shift)
Excitation wavelength	532 nm (633, 785 nm possible)
Fiber Optic Connection	FC (Excitation); F-SMA (Detection)
Temperature Range	5 to 200 °C
Pressure Range	0 to 100 bar
Immersion Depth	200 mm
ARTICLE-NO.	RA2BSSHDKALM200N

ACCESSORIES

CONNECTION TO THE SPECTROPHOTOMETER

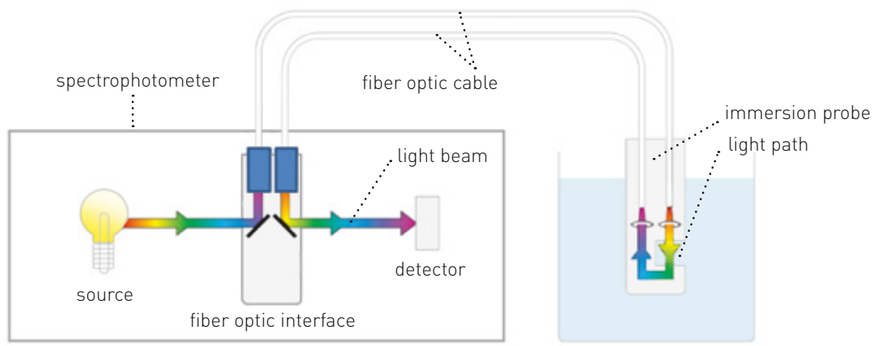
Direct Connection via SMA Connector

Immersion probes from Hellma Analytics can be connected to spectrophotometers in two different ways. If the spectrophotometer has SMA sockets, an immersion probe with SMA connectors can be directly connected. For this purpose, fiber optic cables with SMA Collimator are suitable.



Connection via Fiber Optic Interface

For spectrophotometers equipped only with a cell holder, an immersion probe can be connected to the instrument using the fiber optic interface 662.000 and special fiber optic cables with 2 collimating lenses.



ACCESSORIES

FIBER OPTIC INTERFACE

This accessory is used when the available spectrophotometer does not have an SMA connector. Probes with collimators as a connection option can be **directly connected to the interface**. The adapter has the dimensions of a standard cuvette and fits into a standard cuvette holder.



Effective Aperture	4 mm Diameter
Outside Dimension	60 mm x 12.5 mm x 12.5 mm
Center Height	8.5/15/20 mm
Wavelength Range	190 nm to 2300 nm depends on cables used
Notes	Other center heights on request
Center Height 8.5 mm 15 mm 20 mm	ARTICLE NO. 662-85-UVNIR-46 662-15-UVNIR-46 662-20-UVNIR-46

FIBER OPTIC CABLES

Fiber optic cables can be supplied with either SMA connectors or special collimating lenses to suit the application that they are being used for.

Core Diameter	600 µm
Numerical Aperture	0.22
Beam Diameter (lens)	3.7 mm
Max. Temperature	150 °C



A large selection of fiber optic cables can be found on: www.mypatprobe.com "Accessories".

EXTERNAL CELL HOLDER

The external cell holder is useful when the spectrophotometer does not have an internal cell holder or when measurements with cells are to be made at some distance from the spectrophotometer, e.g. in a fume hood. To connect this cell holder properly to your system you will require 2 x 1 m fiber optic cables in the corresponding spectral range. You should select the option "SMA-Collimator".

Material	Aluminum, Black Anodized
Dimensions	123 mm x 40 mm x 45 mm
Temperature of solution in cell	Max. 120 °C (Quartz Cells Only)
Fiber Optic Cables	These must be ordered separately (see page 65)
Notes	Suitable for cells with path length 1 mm to 20 mm
ARTICLE NO.	664-15-71



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Subject to modifications 064-507-PB01-725//EN//01//2018