



## UV/VIS CERTIFIED REFERENCE MATERIALS

Quality assurance and quality control regulations, such as ISO 9000, GLP, GMP, and pharmacopoeias, require companies to verify the performance of any spectrophotometer in use. The two most important factors for obtaining precise spectrometer data are the photometric accuracy (absorbance accuracy) and wavelength accuracy of the spectrometer, which should be tested on a regular basis.

In the Hellma Analytics calibration laboratory, which is accredited to DIN EN ISO 17025, we manufacture certified reference materials based on the regulatory codes issued by NIST (National Institute of Standards and Technology), ASTM (American Society for Testing and Materials) and pharmacopoeias (Ph. Eur., DAB, USP). All certified measurement results can be traced back to NIST standard reference materials (SRMs). (Photometric accuracy: SRM® 930e and SRM® 1930, wavelength accuracy: SRM® 2034).

### Hellma Analytics calibration laboratory: accredited to DIN EN ISO 17025

Our lab is a DAkkS calibration laboratory and is accredited to DIN EN ISO 17025, a comprehensive quality management system that acts as a seamless continuation of other systems such as ISO 9000. By achieving this accreditation, we have demonstrated proof of expertise in the calibration activities that we perform and are authorized to issue internationally recognized DAkkS calibration certificates. Accreditation is the key to high quality measurements, international comparability, and trust in both the work of the calibration laboratory and the transparency of results.



Look at our Video  
tutorial via smartphone!



## GLASS FILTERS WITH DAKKS CERTIFICATE

TYPE	MATERIAL	WAVELENGTH nm	ARTICLE-NO.
<b>Glass Filter for testing the wavelength accuracy</b>			
666-F1	Holmium Oxide Glass Filter F1	279; 361; 453; 536; 638	666F1-339
666-F7W	Didymium Glass Filter F7W	329; 472; 512; 681; 875	666F7W-323
<b>Glass Filter for testing the photometric accuracy</b>			
666-F2	Neutral Density Glass Filter F2 (Nominal value of the absorption 0.25)	440; 465; 546,1; 590; 635	666F2-39
666-F201	Neutral Density Glass Filter F201 (Nominal value of the absorption 0.3)	440; 465; 546,1; 590; 635	666F201-39
666-F3	Neutral Density Glass Filter F3 (Nominal value of the absorption 0.5)	440; 465; 546,1; 590; 635	666F3-38
666-F4	Neutral Density Glass Filter F4 (Nominal value of the absorption 1.0)	440; 465; 546,1; 590; 635	666F4-37
666-F202	Neutral Density Glass Filter F202 (Nominal value of the absorption 1.5)	440; 465; 546,1; 590; 635	666F202-36
666-F203	Neutral Density Glass Filter F203 (Nominal value of the absorption 2.0)	440; 465; 546,1; 590; 635	666F203-36
666-F7A	Neutral Density Glass Filter F7A (Nominal value of the absorption approx. 0.5–1.0)	270; 280; 297; 320; 340	666F7A-323
<b>Glass Filter for testing the wavelength accuracy and the photometric accuracy</b>			
666-F7	Didymium Glass Filter F7	A: 270; 280; 297; 320; 340 W: 329; 472; 512; 681; 875	666F7-323
<b>Empty filter mount</b>			
666-F0	Aluminum frame		666F0-71
TYPE	CONSISTING OF	WAVELENGTH nm	ARTICLE-NO.
<b>Sets for testing the wavelength accuracy and the photometric accuracy</b>			
666-S000	Complete Glass Filter Set: F1, F2, F3, F4, F0	A: 440; 465; 546,1; 590; 635 W: 279; 361; 453; 536; 638	666S000
666-S001	Glass Filter Set: F3, F4, F7	A: 270; 280; 297; 320; 340; 440; 465; 546,1; 590; 635 W: 329; 472; 512; 681; 875	666S001
666-S002	Glass Filter Set: F2, F3, F4	A: 440; 465; 546,1; 590; 635	666S002
666-S004	Glass Filter Set: F201, F202, F203	A: 440; 465; 546,1; 590; 635	666S004
666-S300	Glass Filter Set: F301, F303, F390 (Abs: 0.04; 2.5; 3.0)	A: 440; 465; 546,1; 590; 635	666S300

A: Wavelength for Absorbance W: Wavelength for Wavelength accuracy

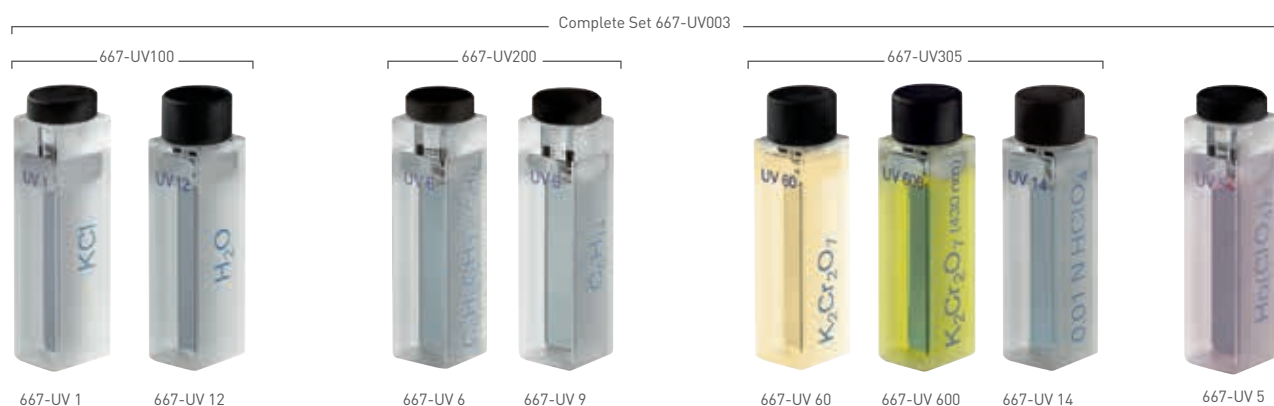





## LIQUID FILTERS WITH DAKKS CERTIFICATE

TYPE	CONTENT	WAVELENGTH nm	ARTICLE-NO.
<b>Liquid Filter for testing the photometric accuracy</b>			
667-UV20	20 mg potassium dichromate in HClO <sub>4</sub> (0.25 Abs)	235; 257; 313; 350	667020
667-UV40	40 mg potassium dichromate in HClO <sub>4</sub> (0.5 Abs)	235; 257; 313; 350	667040
667-UV60	60 mg potassium dichromate in HClO <sub>4</sub> (0.75 Abs)	235; 257; 313; 350	667060
667-UV80	80 mg potassium dichromate in HClO <sub>4</sub> (1.0 Abs)	235; 257; 313; 350	667080
667-UV0100	100 mg potassium dichromate in HClO <sub>4</sub> (1.25 Abs)	235; 257; 313; 350	6670100
667-UV600	600 mg potassium dichromate in HClO <sub>4</sub> (1.0 Abs)	430	667600
667-UV14	Perchloric acid (HClO <sub>4</sub> ), 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
<b>Liquid Filter Set for testing the linearity of the absorption</b>			
667-UV307	Filter-Set: UV20, UV40, UV60, UV80, UV100, UV14	235; 257; 313; 350	667307
<b>Liquid Filter for testing the wavelength accuracy</b>			
667-UV5	Holmium oxide in perchloric acid	241; 287; 361; 536; 640	667005
667-UV400	Filter Set: UV05, UV14	241; 287; 361; 536; 640	667400
<b>Liquid Filter for testing to stray light</b>			
667-UV1	Potassium chloride in pure water	200 (cut-off)	667001
667-UV10	Sodium iodide in pure water	259 (cut-off)	667010
667-UV11	Sodium nitrite in pure water	385 (cut-off)	667011
667-UV12	Pure water (reference filter)	198; 200; 300; 400	667012
667-UV100	Filter Set UV-100: UV1, UV12	200 (cut-off)	667100
667-UV101	Filter Set UV-101: UV10, UV12	259 (cut-off)	667101
667-UV102	Filter Set UV-102: UV11, UV12	385 (cut-off)	667102
667-UV103	Filter Set UV-103: UV1, UV10, UV11, UV12	200; 259; 385 (cut-off)	667103
667-UV104	Filter Set UV-104: UV10, UV11, UV12	259; 385 (cut-off)	667104
<b>Liquid Filter for testing the resolution</b>			
667-UV6*	Toluene in n-hexane	Scan: 265 – 270	667006
667-UV9*	n-hexane (reference filter)	Scan: 265 – 270	667009
667-UV200*	Filter Set UV-200: UV6, UV9	Scan: 265 – 270	667200

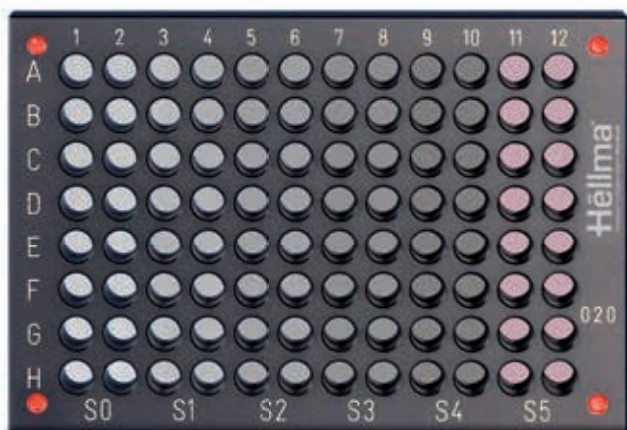
A: Wavelengths for absorbance W: Wavelengths for wavelength accuracy S: Wavelengths for stray light R: Wavelengths for spectral resolution \*with Hellma Analytics calibration certificate



TYPE	CONTENT	WAVELENGTH nm	ARTICLE-NO.
<b>Liquid Filter – Set according to USP 851</b>			
667-UV004	F0: Aluminum frame, F2: Neutral Density Glass filter(0.25 Abs), F3: Neutral Density Glass filter (0.5 Abs), F4: Neutral Density Glass filter (1.0 Abs), UV60: 60 mg potassium dichromate in HClO <sub>4</sub> , UV 14: Perchloric acid (HClO <sub>4</sub> , reference filter , UV 5: Holmium oxide in perchloric acid	A: 440; 465; 546.1; 590; 635 A: 440; 465; 546.1; 590; 635 A: 440; 465; 546.1; 590; 635 A: 235; 257; 313; 350 A: 235; 257; 313; 350 W: 241; 250; 278; 287; 333; 345; 361; 385; 416; 452; 468; 485; 536; 640	667004 
<b>Complete Filter Set for testing the photometer according to Ph.Eur.</b>			
667-UV003	Complete Filter Set: UV1, UV12, UV6, UV9, UV60, UV600, UV14, UV5	A: 235; 257; 313; 350; 430 W: 241; 287; 361; 536; 640 S: 200 (cut-off) R: Scan 265 – 270	667003

A: Wavelengths for absorbance W: Wavelengths for wavelength accuracy S: Wavelengths for stray light R: Wavelengths for spectral resolution \*with Hellma Analytics calibration certificate

## REFERENCE PLATES FOR QUALIFYING MICROPLATE READERS WITH DAKKS CERTIFICATE



666.113

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	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)	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 Oxide glass filter	405; 450; 490; 650 279; 361; 453; 536; 638	666R113



\*at least every 2 years



## RECERTIFYING OF THE FILTERS WITH DAKKS CERTIFICATE

### Glass Filters

TYPE	SERVICE	ARTICLE-NO.
666-F1	Recertifying Holmium Oxide Glass Filter	666F1RE
666-F2	Recertifying Neutral Density Glass Filter (0.25 Abs)	666F2RE
666-F3	Recertifying Neutral Density Glass Filter (0.5 Abs)	666F3RE
666-F4	Recertifying Neutral Density Glass Filter (1 Abs)	666F4RE
666-F201	Recertifying Neutral Density Glass Filter (0.3 Abs)	666F201RE
666-F203	Recertifying Neutral Density Glass Filter (2.0 Abs)	666F203RE
666-F7A	Recertifying Didymium Glass Filter (0.5 - 1.0 Abs) for checking photometric accuracy	666F7ARE
666-F7	Recertifying Didymium Glass Filter for checking wavelength and photometric accuracy	666F7RE
666-F7W	Recertifying Didymium Glass Filter for checking wavelength accuracy	666F7WRE
666-S000	Recertifying Neutral Density Glass Filter (2.0 Abs) for checking wavelength and photometric accuracy	666S000RE
666-S001	Recertifying Glass Filter Set (F3, F4, F7) for checking wavelength and photometric accuracy	666S001RE
666-S002	Recertifying Glass Filter Set (F2, F3, F4) for checking photometric accuracy	666S002RE
666-S004	Recertifying Glass Filter Set F201, F202, F203 for checking	666S004RE
666-S300	Recertifying Glass Filter Set F301, F303, F390 for checking photometric accuracy	666S300RE



### Reference Plates

TYPE	SERVICE	MATERIAL	ARTICLE-NO.
666-R013	Recertifying Reference Plate for Microplate Reader	Neutral Density Glass Filter NG 11, NG 5, NG 4, NG 3	666R013RE
666-R113	Recertifying Reference Plate for Microplate Reader	Neutral Density Glass Filter NG 5, NG 4, NG 3 Holmium Oxide Glass Filter	666R113RE





## RECERTIFYING OF THE FILTERS WITH DAKKS CERTIFICATE

### Liquid Filters

TYPE	SERVICE	ARTICLE-NO.
667-UV5	Recertifying Holmium Oxide Liquid Filter for checking wavelength accuracy according to Ph. Eur.	667005RE
667-UV6*	Recertifying Toluene in n-hexane Liquid Filter for checking the resolution according to Ph. Eur.	667006RE
667-UV1	Recertifying Potassium Chloride Liquid Filter for checking to stray light according to Ph. Eur.	667001RE
667-UV10	Recertifying Sodium Iodide Liquid Filter for checking to stray light	667010RE
667-UV11	Recertifying Sodium Nitrite Liquid Filter for checking to stray light	667011RE
667-UV12	Recertifying Pure Water for checking to stray light	667012RE
667-UV14	Recertifying Reference Liquid Filter (HClO <sub>4</sub> ) for checking photometric accuracy	667014RE
667-UV20	Recertifying Potassium Dichromate Liquid Filter (20 mg) for checking photometric accuracy	667020RE
667-UV40	Recertifying Potassium Dichromate Liquid Filter (40 mg) for checking photometric accuracy	667040RE
667-UV60	Recertifying Potassium Dichromate Liquid Filter (60 mg) for checking photometric accuracy according to Ph. Eur.	667060RE
667-UV80	Recertifying Potassium Dichromate Liquid Filter (80 mg) for checking photometric accuracy	667080RE
667-UV100	Recertifying Potassium Dichromate Liquid Filter (100 mg) for checking photometric accuracy	667100RE
667-UV600	Recertifying Potassium Dichromate Liquid Filter (600 mg) for checking photometric accuracy for Vis range according to Ph. Eur.	667600RE
667-UV100	Recertifying Filter Set for checking to stray light according to Ph. Eur.	667100RE
667-UV101	Recertifying Filter Set for checking to stray light	667101RE
667-UV102	Recertifying Filter Set for checking to stray light	667102RE
667-UV103	Recertifying Filter Set for checking to stray light	667103RE
667-UV104	Recertifying Filter Set for checking to stray light	667104RE
667-UV200 *	Recertifying Filter Set for checking the resolution according to Ph. Eur.	667200RE
667-UV301	Recertifying Filter Set for checking photometric accuracy according to Ph. Eur.	667301RE
667-UV304	Recertifying Filter Set for checking photometric accuracy according to Ph. Eur.	667304RE
667-UV305	Recertifying Filter Set for checking photometric accuracy according to Ph. Eur.	667305RE
667-UV307	Recertifying Filter Set for checking the linearity of the absorption	667307RE
667-UV400	Recertifying Filter Set for checking wavelength accuracy	667400RE
667-UV004	Recertifying Filter Set according to USP 851	667004RE
667-UV003	Recertifying Complete Filter Set for checking the photometer according to Ph. Eur.	667003RE



\*Recertifying with Hellma Analytics calibration certificate

# DAKKS CALIBRATION CERTIFICATE

**Hellma Analytics**  
High Precision in Spectro-Optics

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

akkreditiert durch die / accredited by the  
**Deutsche Akkreditierungsstelle GmbH**  
als Kalibrierlaboratorium im / as calibration laboratory in the  
**Deutschen Kalibrierdienst DKG**

Sample

Deutsche Akkreditierungsstelle  
D-K-18752-01-00

**Kalibrierschein**  
Calibration certificate

**Gegenstand**  
Objekt: **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: **1234**

**Auftraggeber**  
Customer: **Hellma Analytics GmbH**  
Klosterstr. 5  
79379 Müllheim

**Auftragsnummer**  
Order No.: **866666**

**Anzahl der Seiten des Kalibrierscheines**  
Number of pages of the certificate: **3**

**Datum der Kalibrierung**  
Date of calibration: **21. Mai 2014**  
21 May 2014

**Kalibrierzeichen**  
Calibration mark

21112
D-K-
18752-01-00
2014-05

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 Cooperation 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: **21. Mai 2014**  
21 May 2014

Leiter des Kalibrierlaboratoriums  
Head of the calibration laboratory:  
  
**Birgit Kahl**

Besitzer  
Person in charge:  
  
**Timo Rapp**

Page: 1/1

**Abmessungen**  
Dimensions: 100 mm x 100 mm x 10 mm

**Material**  
Material: BK7

**Wellenlänge**  
Wavelength: 632.8 nm

**Transmission**  
Transmission: 0.1%

**Hersteller**  
Manufacturer: Hellma

**Datum**  
Date: 21.05.2014

Page: 1/1

**Abmessungen**  
Dimensions: 100 mm x 100 mm x 10 mm

**Material**  
Material: BK7

**Wellenlänge**  
Wavelength: 632.8 nm

**Transmission**  
Transmission: 0.1%

**Hersteller**  
Manufacturer: Hellma

**Datum**  
Date: 21.05.2014

DAKKS CALIBRATION CERTIFICATE FROM HELLMA ANALYTICS.  
GUARANTEE FOR CERTIFIED REFERENCE MATERIALS.

After careful manufacture, the reference materials are measured and certified using a high-performance UV/Vis Spectrometer in the Hellma Analytics' DIN EN ISO 17025 accredited calibration laboratory.



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.



Users are then able to test and calibrate their spectrometers by using the values documented and certified on the calibration certificate. DAKKS calibration certificates are certificates from the "Deutsche Kalibrierdienst" (German Calibration Service) and may only be issued by accredited partners.

The Hellma Analytics calibration laboratory is the only calibration laboratory in Germany accredited for the certification of UV/Vis reference materials.

