Deutsche Akkreditierungsstelle GmbH

Annex to the Accreditation Certificate D-K-19933-01-00 according to DIN EN ISO/IEC 17025:2018

Valid from: 19.12.2019

Date of issue: 19.12.2019

Holder of certificate:

SphereOptics GmbH
Gewerbestr. 13, 82211 Herrsching am Ammersee

Calibration in the fields:

High Frequency & Radiation Quantities
Optical Quantities
- **radiometry**

Abbreviations used: see last page

The certificate together with its annex reflects the status at the time of the date of issue. The current status of the scope of accreditation can be found in the database of accredited bodies of Deutsche Akkreditierungsstelle GmbH.
https://www.dakks.de/en/content/accredited-bodies-dakks

Permanent Laboratory

Calibration and Measurement Capabilities (CMC)

Measurement quantity / Calibration item	Range	Measurement conditions / procedure	Expanded uncertainty of measurement [1)]	Remarks
Radiometry Spectral Reflectance	(for wavelengths 250 nm to 320 nm):	optical spectroscopy		Geometric alignment as follows 8° / d respectively 8° / h d: diffuse h: hemispheric The expanded uncertainty of measurement correspond to absolute values.
	0.5 % to 20 %		1.01 %	
	> 20 % to 40 %		1.15 %	
	> 40 % to 60 %		1.32 %	
	> 60 % to 80 %		1.43 %	
	> 80 % to 100 %		1.56 %	
	(for wavelengths > 320 nm to 1250 nm):			
	0.5 % to 20 %		0.38 %	
	> 20 % to 40 %		0.42 %	
	> 40 % to 60 %		0.52 %	
	> 60 % to 80 %		0.48 %	
	> 80 % to 100 %		0.5 %	
	(for wavelengths > 1250 nm to 1750 nm):			
	0.5 % to 20 %		0.51 %	
	> 20 % to 40 %		0.55 %	
	> 40 % to 60 %		0.63 %	
	> 60 % to 80 %		0.59 %	
	> 80 % to 100 %		0.61 %	
	(for wavelengths > 1750 nm to 2300 nm):			
	0.5 % to 20 %		0.92 %	
	> 20 % to 40 %		1.04 %	
	> 40 % to 60 %		1.19 %	
	> 60 % to 80 %		1.28 %	
	> 80 % to 100 %		1.4 %	
	(for wavelengths > 2300 nm to 2450 nm):			
	0.5 % to 20 %		1.69 %	
	> 20 % to 40 %		1.95 %	
	> 40 % to 60 %		2.23 %	
	> 60 % to 80 %		2.48 %	
	> 80 % to 100 %		2.75 %	

[1)] The expanded uncertainties according to EA-4/02 M:2013 are part of CMC and are the best measurement uncertainties within accreditation. They have a coverage probability of approximately 95 % and have a coverage factor of k = 2 unless stated otherwise. Uncertainties without unit are relative uncertainties referring to the measurement value unless stated otherwise.

Abbreviations used:

CMC	Calibration and measurement capabilities (Kalibrier- und Messmöglichkeiten)

[1)] The expanded uncertainties according to EA-4/02 M:2013 are part of CMC and are the best measurement uncertainties within accreditation. They have a coverage probability of approximately 95 % and have a coverage factor of k = 2 unless stated otherwise. Uncertainties without unit are relative uncertainties referring to the measurement value unless stated otherwise.