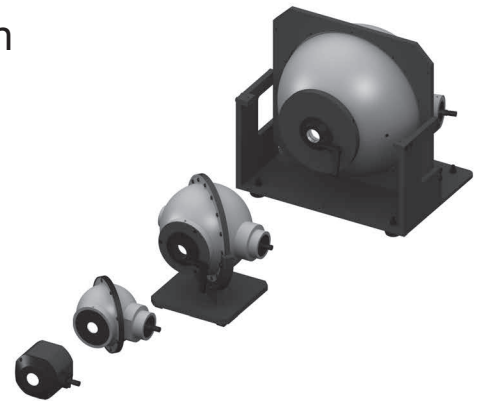


PTFE Integrating Spheres

UV Measurement for Laboratory and Production

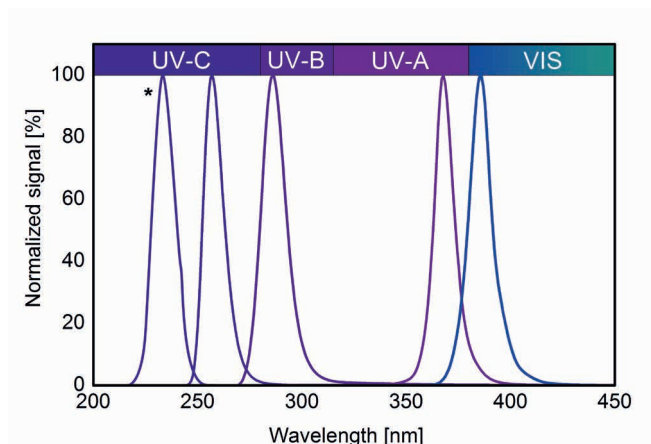
Key features at a glance

- ▲ Complete UV measurement solutions
- ▲ High sensitivity measurements for UV radiation from 200 nm
- ▲ PTB traceable calibration
- ▲ State-of-the-art stray light correction



\\ SOLUTIONS FOR UV-A/B/C MEASUREMENT

Instrument Systems offers complete measurement solutions for UV-A, -B and -C radiation starting from 200 nm. The operation of the proven Instrument Systems spectroradiometers, e.g. CAS series, with integrating spheres made from PTFE, facilitate high sensitivity measurements of UV radiant flux.



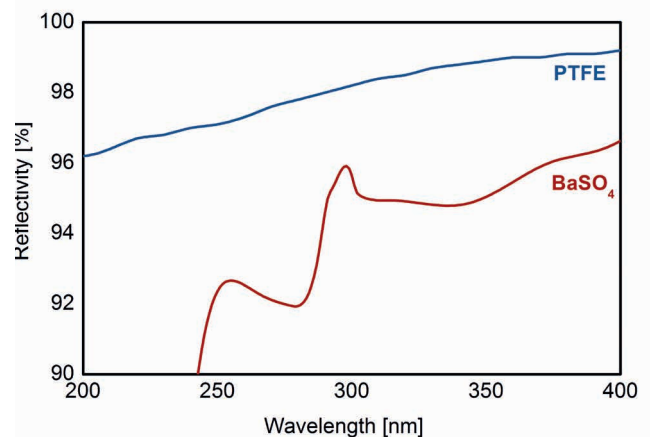
▲ Normalized spectra of different UV-LEDs with peak wavelengths at 235, 255, 285, 365 and 385 nm measured with CAS 140CT/D and PTFE integrating spheres at Instrument Systems.

* UV-LED spectra (220-260 nm) used with kind permission from TU Berlin and Ferdinand-Braun-Institut Berlin.

\\ HIGH THROUGHPUT AND SENSITIVITY FOR UV

Instrument Systems' integrating spheres for UV measurements of radiant flux use Polytetrafluoroethylene (PTFE) as a reflective material. PTFE is highly reflective in the UV spectral range down to 200 nm. It therefore allows high throughput, even for challenging UV-B and UV-C emitters down to 200 nm where other reflective materials, such as barium sulfate (BaSO_4), have an extremely low throughput.

The combined use of Instrument Systems PTFE integrating spheres and high-end CAS array spectroradiometers permits high sensitivity measurements with high dynamic measuring range in the entire UV spectral region.



▲ Comparison of typical BaSO_4 and PTFE reflectivity in the UV spectral range.

\\ OPTICAL PORTS AND EQUIPMENT

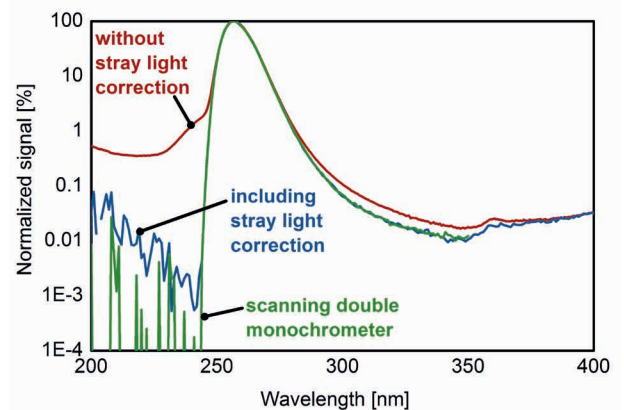
The PTFE integrating spheres are compatible with all Instrument Systems spectroradiometers. They are equipped with an appropriate fiber bundle adapter. The customer has an assortment of measurement port adapters at his disposal to suit all respective applications in laboratory and production. Flat protective windows, protective domes and adapter plates for a variety of LED test sockets (including a protective dome) also prevent contamination in the integrating sphere.

The ISP 150-UV and ISP 250-UV are furthermore equipped with an SMA fiber connector for an auxiliary light source, e.g. Instrument Systems' LS 500, for self absorption correction.

\\ STRAY LIGHT CORRECTION AND PTB TRACEABILITY

All Instrument Systems UV measurement solutions with PTFE integrating spheres are delivered with PTB traceable calibration.

In addition to the very low stray light design of the CAS spectrographs, state-of-the-art numerical stray light correction is optionally available for CAS spectroradiometers. This routine achieves very low noise and high measurement accuracy down to 200 nm which additionally facilitates high accuracy measurements in the UV spectral range.

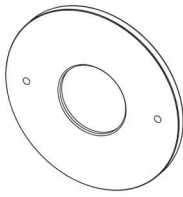
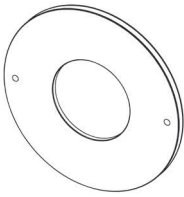
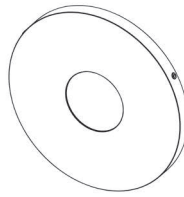
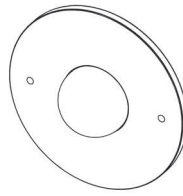
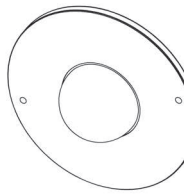
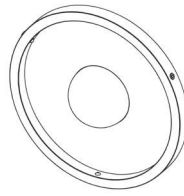
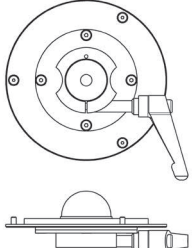
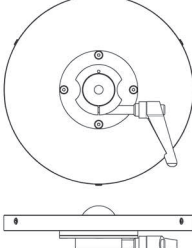
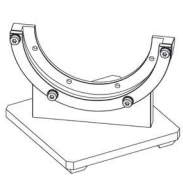
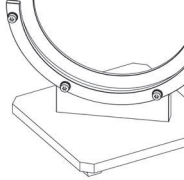
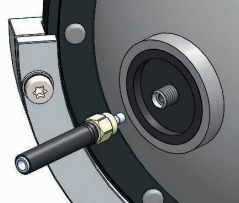
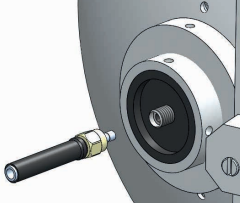


▲ Numerical stray light correction applied to a 260 nm UV LED spectrum measured with CAS 140CT. Stray light is significantly suppressed to a level close to a scanning double monochromator.

\\ TECHNICAL SPECIFICATIONS

Model	ISP 50-UV	ISP 100-UV	ISP 150-UV	ISP 250-UV
Integrating sphere main unit Order extension: -100				
Inner diameter	50 mm	100 mm	150 mm	250 mm
Usable wavelength	200 - 2500 nm	200 - 2500 nm	200 - 2500 nm	200 - 2500 nm
Application	Production (e.g. wafer probing, chip testing)	Production (e.g. wafer probing, chip testing)	Laboratory and production (e.g. single- / multi-chip testing)	Laboratory and production (e.g. multi-die / - chip testing)

\\ TECHNICAL SPECIFICATIONS

Model	ISP 50-UV	ISP 100-UV	ISP 150-UV	ISP 250-UV
Entrance port adapters				
Protective flat window (front side view) Order extension: -140	Always included			
Port diameter	15 mm	25 mm	33 mm	50 mm
Protective dome (back side view) Order extension: -143				
Port diameter		20 mm	25 mm	44 mm
LED adapter plate for LED test sockets with 25 mm diameter including protective dome and aperture set Order extension: -216				
Port diameter			Without aperture: 25 mm With aperture: 7, 10, 15, 20 mm	Without aperture: 25 mm With aperture: 7, 10, 15, 20 mm
Accessories				
Base Order extension: -901				Always included
Features				
SMA connector for auxiliary lamp				

\\ ORDERING INFORMATION

Order number	Description
Integrating spheres	
ISP50UV-100	Integrating sphere with 50 mm internal diameter for UV measurements; PTFE reflective material; protective quartz window; measurement port 15 mm diameter; connector for fiber bundle; for mounting on a mechanical sorter or prober
ISP100UV-100	Integrating sphere with 100 mm internal diameter for UV measurements; PTFE reflectance material; spectral range 200 - 2500 nm; measurement port 25 mm diameter; connector for fiber bundle; for mounting on a mechanical sorter or prober
ISP100UV-140	Protective window for measurement port of ISP100UV-100; quartz window; 25 mm diameter
ISP100UV-143	Protective dome for measurement port of ISP100UV-100; quartz dome; 20 mm diameter
ISP100UV-901	Base for ISP100UV-100
ISP150UV-100	Integrating sphere with 150 mm internal diameter for UV measurements; PTFE reflectance material; spectral range 200 - 2500 nm; measurement port 33 mm diameter; connector for fiber bundle; SMA fiber connector for auxiliary light source
ISP150UV-140	Protective window for measurement port of ISP150UV-100; quartz window; 33 mm diameter
ISP150UV-143	Protective dome for measurement port of ISP150UV-100; quartz dome; 25 mm diameter
ISP150UV-216	Adapter plate for LED test sockets with 25 mm diameter for measurement port of ISP150UV-100; including protective dome for dust protection; including apertures with 7, 10, 15 and 20 mm
ISP150UV-251	Integrating sphere with 150 mm internal diameter for UV measurements, complete for laboratory applications; includes ISP150UV-100, adapter plate for LED test sockets with 25 mm diameter (ISP150UV-216), base (ISP150UV-901), fiber bundle (OFG-424), fiber bundle adapter (PLG-420), SMA fiber connector for auxiliary light source (LS500-110 optional); spectral range 200 – 1350 nm
ISP150UV-901	Base for ISP150UV-100
ISP250UV-100	Integrating sphere with 250 mm internal diameter for UV measurements; PTFE reflectance material; spectral range 200 - 2500 nm; measurement port 50 mm diameter; connector for fiber bundle; SMA fiber connector for auxiliary light source; base included
ISP250UV-140	Protective window for measurement port of ISP250UV-100; quartz window; 50 mm diameter
ISP250UV-143	Protective dome for measurement port of ISP250UV-100; quartz dome; 44 mm diameter
ISP250UV-216	Adapter plate for LED test sockets with 25 mm diameter for measurement port of ISP250UV-100; including protective dome for dust protection; including apertures with 7, 10, 15 and 20 mm
ISP250UV-251	Integrating sphere with 250 mm internal diameter for UV measurements, complete for laboratory applications; includes ISP250UV-100, adapter plate for LED test sockets with 25 mm diameter (ISP250UV-216), base (included in ISP250UV-100), fiber bundle (OFG-424), fiber bundle adapter (PLG-420); SMA fiber connector for auxiliary light source (LS500-110 optional); spectral range 200 - 1350 nm
Accessories, fibers and connectors	
OFG-424	Fiber bundle; 1.5 mm diameter; 2 m length; quartz; spectral range 190 to 1350 nm
PLG-421	Fiber bundle adapter optimized for UV; spectral range 190 to 3200 nm; supports accessory recognition with CAS 140D
LS500-110	Dual light source with tungsten halogen lamp (20 W) and deuterium lamp (26 W); power supply included; SMA connector; spectral range 190 to 2500 nm
OFG-323	Optical fiber guide with SMA plug; 1000 µm diameter; 2 m length; quartz; spectral range 190 to 1350 nm; e.g. for connection of LS500-110 to auxiliary port of ISP150UV and ISP250UV
Calibrations and stray light correction	
CAL-141	Calibration of radiant flux for integrating spheres from Instrument Systems up to 1000 mm diameter (absolute value set with standard LED at the measurement port of the sphere); wavelength range UV and VIS/NIR; e.g. for calibration of ISP150UV and ISP250UV with LED adapter plates.
CAL-145	Calibration of the input port of integrating spheres in irradiance; calibration certificate for irradiance; calibration file converted to radiant flux; wavelength range UV and VIS/NIR; e.g. for calibration of ISP50UV, ISP100UV, ISP150UV and ISP250UV with protective window or dome
CAL-191	Spectral calibration of the UV density filters; spectral range UV/VIS/NIR
CAL-195	Creation of stray light correction matrix for CAS140CT(S); accessory calibration separately