UPB-150-ART - 6 inch Multiport Integrating Sphere for Universal Use

One typical use of the integrating sphere is the determination of optical material properties such as reflection, transmission and absorption. The essential feature of the integrating sphere in this application is its integrating function for optical radiation. This enables the measurement of optical emissions irrespective of whether they are directional or scattered.

6-inch integrating sphere

Integrating spheres with 6-inch (150mm) diameters provide a good compromise with regards to precision measurement geometry as well as the height of the measurement signal when used in reflection and transmission measurements. In the case of integrating spheres with smaller diameters, the port area is increased in relation to the sphere's surface area. This impairs homogenous light distribution in the sphere. The limited light throughput affiliated with integrating spheres that have large diameters usually has negative impacts on the level of the measurement signal.

Multiport integrating sphere

Integrating spheres with multiport designs are ideal for the universal use in various measurement tasks. The elaborate production of the UPK-150 ART from a massive aluminum block enables an extremely precise alignment of the measurement ports to each other.

Universally usable integrating sphere

Typical measurement setups that are supported by our multiport integrating sphere UPB-150-ART's five-port design include:
- 0°/d Reflection
- 8°/d Reflection with or without gloss
- 0°/d Transmission
- Measurement with sample absorption correction
- Double-beam measurement setups

30mm measurement ports with knife edges

For complete capture of scattered radiation, the integrating sphere's measurement ports should be having the thinnest possible lips. It is only with such a knife edge possible that hemispherical scattered emission can enter into the sphere without touching the sphere port side wall. The 30mm measurement ports of the integrating sphere UPB-150-ART offer a wall thickness that's only 0.5mm high. Another special feature are the +/-8° measurement ports that are not aligned in the center of the sphere and have a circumferential knife edge that is 0.5mm high.

UPB-150-ART multiport integrating sphere with optional accessories.
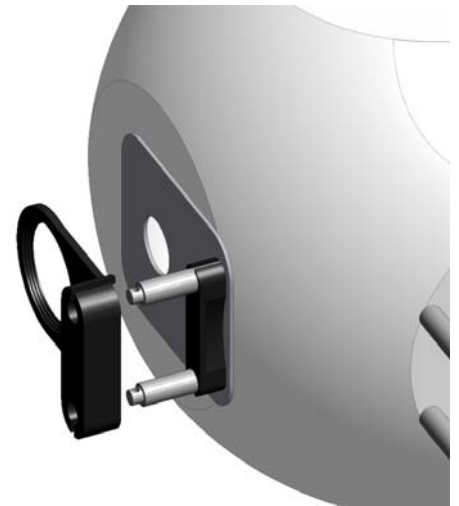
The arrangement of the UPB-150-ART's five measurement ports enables its universal use.
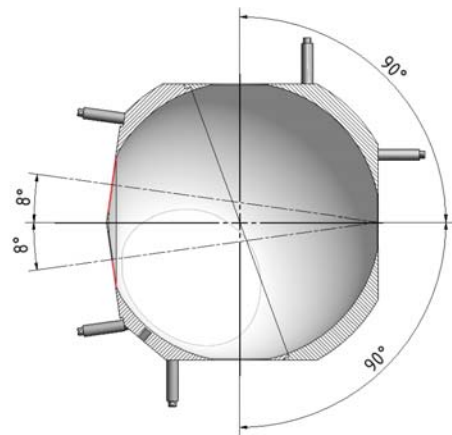
UPB-150-ART multiport integrating sphere with „Slide & Fix" System for fastening the accessories.

Accessories for sphere customization

Port plugs and port reducers for closure and reduction of the measurement ports' diameters are available. These are easily attachable using the "Slide & Fix" holder without the need of any toolkit. As an exceptional feature, the front side of the port reducers is at the same level as the sphere surface.

The sample holder enables the use of the 30mm measurement port's free diameter in transmission measurements. Its "Slide & Fix" clamp facilitates the fastening of very thin samples. The sample holder can be used with the port reducers and light traps.

The light trap comprises the entire measurement port and facilitates, through its interior design and deep black coating, limited back reflection over the total usable spectral range of the integrating sphere. With the help of the Slide & Fix holder, the light trap can be combined with the port reducers and the sample holders.

Three exchangeable adapters are offered for the assembly of detectors and light guides. Each of these has a baffle that can be aligned to one of the five measurement ports depending on the measurement task. The circumferential frame with a V-groove corresponds to that of Gigahertz-Optik's modular UM Series integrating spheres and is available in different sizes ideal for the various types of port adapters.
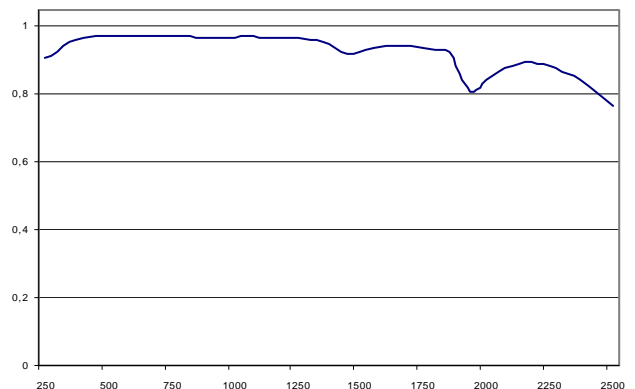
Barium sulfate coating

The inner surface of the UPB-150-ART integrating sphere and the corresponding port reducers' and plugs' surface are coated with the Gigahertz-Optik's ODP97 coating. This ensures there's a diffuse and high reflectance over a wide spectral range between 300 and 2500nm.

Sphere Port
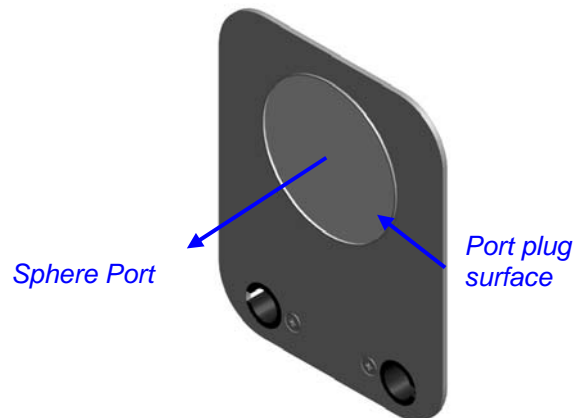
Port plug surface

The front side of the port plugs and port reducers conforms to that of sphere surface.
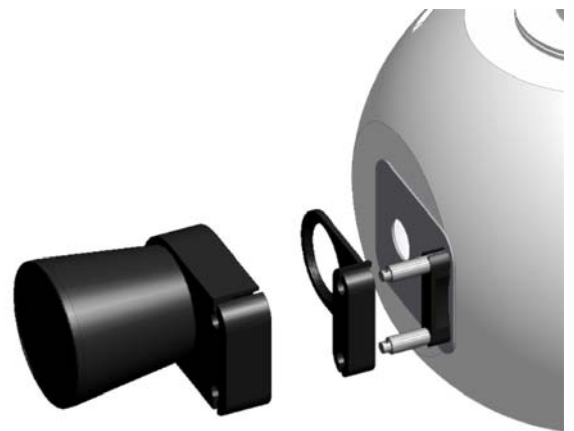

Light trap for the absorption of the directed portion of the reflection in an 8°/d measurement setup and that of the transmission in 0°/d transmission measurements of transparent samples respectively.

Typical spectral reflectance of the ODP97 barium sulfate sphere coating.

Datasheet UPB-150-ART / Gigahertz-Optik GmbH - D 82299 Tuerkenfeld - www.gigahertz-optik.com

UPB-150-ART Components
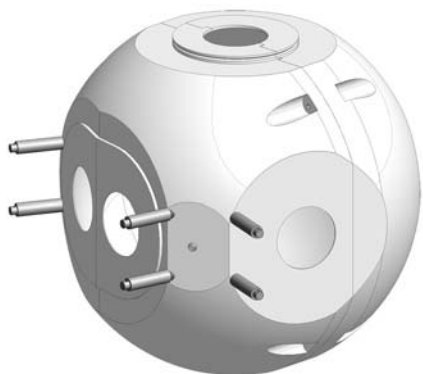
UPB-150-ART, Integrating Sphere

UPB-150-ART-Z01, Port Plug

UPB-150-ART-Z02-3, 3mm diam. Port Reducer

UPB-150-ART-Z02-15, 15mm diam. Port Reducer

UPB-150-ART-Z02-35, 25mm diam. Port Reducer

UPB-150-ART-Z03, Sample Holder

UPB-150-ART-Z04, Light Trap

UPB-150-ART-Z05, 0.5" Detector Adapter with Baffle

UPB-150-ART-Z06, 1.0" Detector Adapter with Baffle

UPB-150-ART-Z07, 2.0" Detector Adapter with Baffle

Specifications

Integrating sphere

Sphere diameter	150mm
Sphere coating	ODP97 derived from barium sulfate
Measurement port diameter	30mm
Thickness of the measurement port wall	0.5mm (knife edge design)
Number of measurement ports	Five
Angular tolerance of the port alignment	+/- 0.1°
Accessories and sample fixation	Every two removable posts of the Slide & Fix System
Detector's aperture	30mm with a circumferential frame (58mm Ø) with a lateral V groove
Mounting	Flat base with four M5 threaded holes within a 50mm pitch circle
Weight	approx. 1.6kg
Dimensions	102257_UPB-150-ART.pdf

Accessories

Model	Description	Dimensions
UPB-150-ART-Z01	Port plug. Sphere surface coated with ODP97.	102258_UPB-150-ART-Z01.pdf
UPB-150-ART-Z02	Port reducer. Aperture diameter specified by customer set in 0.1mm steps. Sphere surface coated with ODP97.	102259_UPB-150-ART-Z02.pdf
UPB-150-ART-Z02-3	Port reducer. 3mm aperture. Sphere surface coated with ODP97.	102196_UPB-150-ART-Z02-3.pdf
UPB-150-ART-Z02-15	Port reducer. 15mm aperture. Sphere surface coated with ODP97.	102197_UPB-150-ART-Z02-15.pdf
UPB-150-ART-Z02-25	Port reducer. 25mm aperture. Sphere surface coated with ODP97.	102198_UPB-150-ART-Z02-25.pdf
UPB-150-ART-Z03	Sample holder	102260_UPB-150-ART-Z03.pdf
UPB-150-ART-Z04	Light trap	102261_UPB-150-ART-Z04.pdf
UPB-150-ART-Z05	UMPF-0.5 Detector adapter with Baffle. Sphere surface and baffle coated with ODP97.	102262_UPB-150-ART-Z05.pdf
UPB-150-ART-Z06	UMPF-1.0 Detector adapter with Baffle. Sphere surface and baffle coated with ODP97.	102263_UPB-150-ART-Z06.pdf
UPB-150-ART-Z07	UMPF-2.0 Detector adapter with Baffle. Sphere surface and baffle coated with ODP97.	102264_UPB-150-ART-Z07.pdf
UPB-150-ART-Z09	Port plug with spherical surface. Sphere surface coated with ODP97.	102761_UPB-150-ART-Z09.pdf
UPB-150-ART-Z10	Port reducer. Aperture diameter set in 0.1mm steps. Sphere surface coated with ODP97.	102762_UPB-150-ART-Z10.pdf

Purchasing Information

Model	Item number	Description
UPB-150-ART	102257	Integrating sphere
UPB-150-ART-Z01	102258	Port plug
UPB-150-ART-Z02	102259	Port reducer. **xx** aperture diameter set in 0.1mm steps. **xx =**
UPB-150-ART-Z02-3	102196	Port reducer 3mm
UPB-150-ART-Z02-15	102197	Port reducer 15mm
UPB-150-ART-Z02-25	102198	Port reducer 25mm
UPB-150-ART-Z03	102260	Sample holder
UPB-150-ART-Z04	102261	Light trap
UPB-150-ART-Z05	102262	UMPF-0.5 Detector adapter
UPB-150-ART-Z06	102263	UMPF-1.0 Detector adapter
UPB-150-ART-Z07	102264	UMPF-2.0 Detector adapter
UPB-150-ART-Z09	102761	Port plug
UPB-150-ART-Z10	102762	Port reducer. **xx** aperture diameter set in 0.1mm steps. **xx =**