

# Reflection and transmission measurement

Our measurement setup is suitable for all possible reflection and transmission measurements on any sample.

## How it works:

Fibre collimators project light from a glass fibre onto the sample. This creates a homogeneous light spot. By selecting the core diameter of the fiber, the size of this light spot can also be varied depending on the measuring task.

A removable element is located where the light spot hits the opposite wall of the sphere (without sample).

This element consists of the same reflection material as the rest of the sphere. The skin of the sphere can therefore be opened at this point and when open this represents the ideal case of transmission.

## Example transmission measurement:

When the element is in place, the sphere contains the sum of the directional and diffuse radiation. If the element is removed, the direct radiation leaves the sphere and only the diffuse radiation remains in the sphere.

Subtracting the result of the second measurement (diffuse only) from the first (sum) leads to the value of just the direct radiation. In the example "ideal transmission" (no sample) all light in the sphere would be measured with element. Without element all light would escape - it would be completely dark in the sphere. The difference between the two measurements would result in 100% transmission - which is ideal transmission.

Measurements on real objects are made analogously.

For transmission measurements, the sample can be irradiated at  $20^\circ$ ,  $8^\circ$  and  $0^\circ$  (=AOI).



# Integrating sphere setup for measurement of reflection, transmission and haze

## Datasheet

## Example reflection measurement:

The operating principle is comparable to the transmission measurement, with the difference that the collimators for the stimulating light are placed inside the spherical skin. Thus the light spot is created on the underside of the sample and is reflected back into the sphere for the reflection measurements.

For reflection measurements, the sample can be irradiated at  $20^\circ$  and  $8^\circ$  (=AOI).

## Summary:

### Transmission:

- Measurement of total transmission (directional and diffuse)
- Measurement of diffuse transmission only
- Derived from this calculation of the directional transmission
- Angle of incidence (AOI) Transmission:  $0^\circ$ ,  $8^\circ$  or  $20^\circ$

### Reflection:

- Measurement of total reflection (directional and diffuse)
- Measurement of diffuse reflection only
- Derived from this calculation of the directional transmission
- Angle of incidence (AOI) Reflection:  $8^\circ$  or  $20^\circ$

### Size parameters of the sample:

- Sample area (measuring spot) approx. 4 mm, variable via the fiber core diameter
- Sample size up to 25 mm, limited only by the input port of the sphere.

Ideally, the sample is inserted / clamped in a Cage 30 carrier (industry standard).

### Technical Data:

- Sphere diameter inside: 100mm
- Reflective material: PTFE
- Wavelength range: 250 ... 2000 nm

Mountain Photonics offers a wide range of accessories for the individual solution of your measurement task in transmission and reflection:

- Light sources for 350 ... 2500 nm
- Light sources for 200 ... 1200 nm
- Spectrometer
- Electronic shutter (for dark current adjustment)
- Collimating lenses
- Optical waveguide
- Cage 30mm accessories for the sample

Order reference:

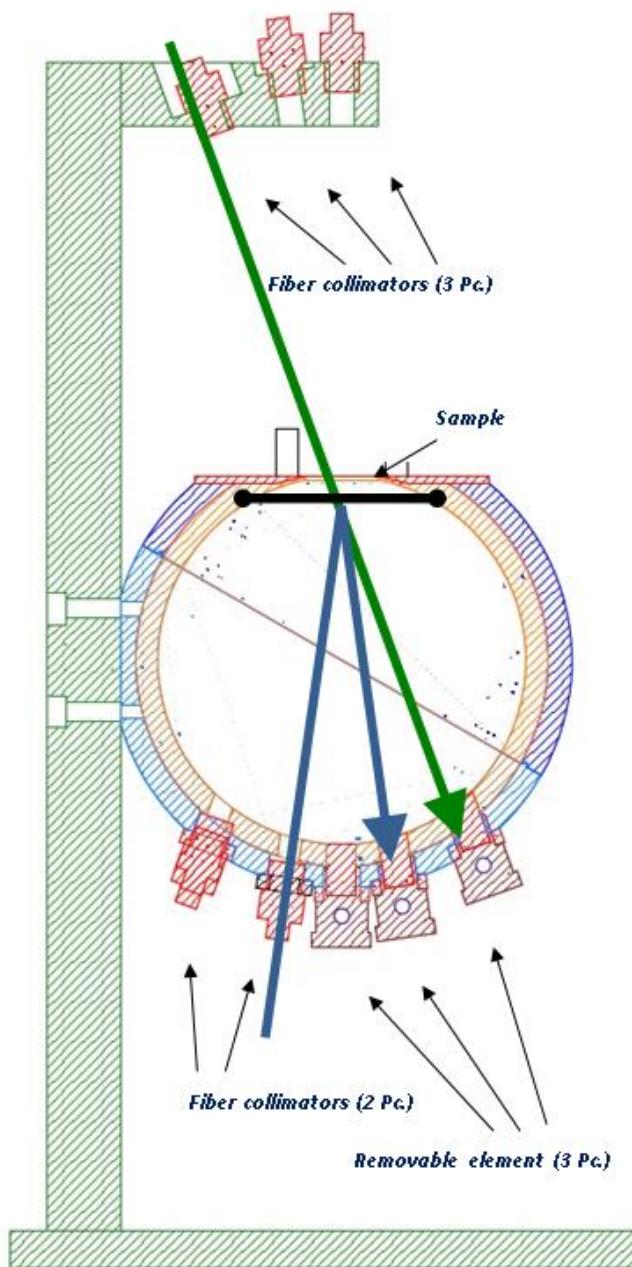
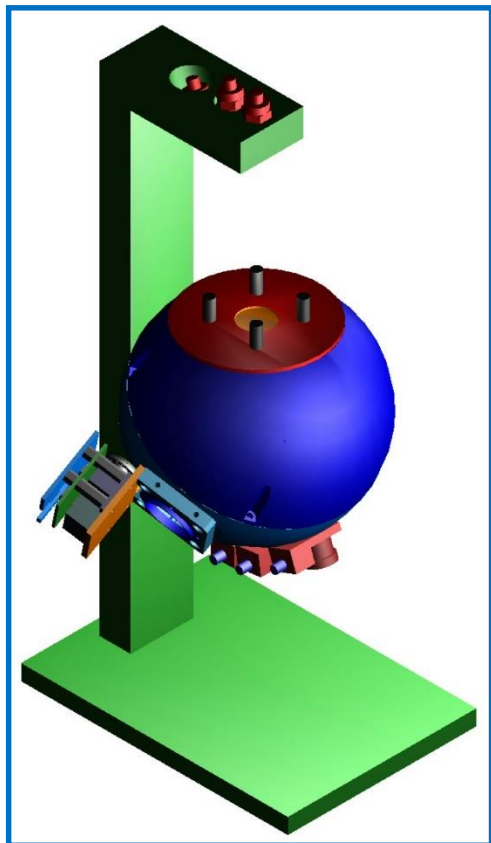
**MSP REFLTRANS1**

Integrating sphere setup for reflection and transmission measurement on samples up to 25 mm diameter

Example of possible beam paths:

Green: Transmission  $20^\circ$

Blue: Reflection  $8^\circ$



Fiber collimator

### About us

Mountain Photonics is a well established distribution company located in Landsberg, Germany. We aim at adding value to our customers by offering technical service, product development and proprietary products.

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