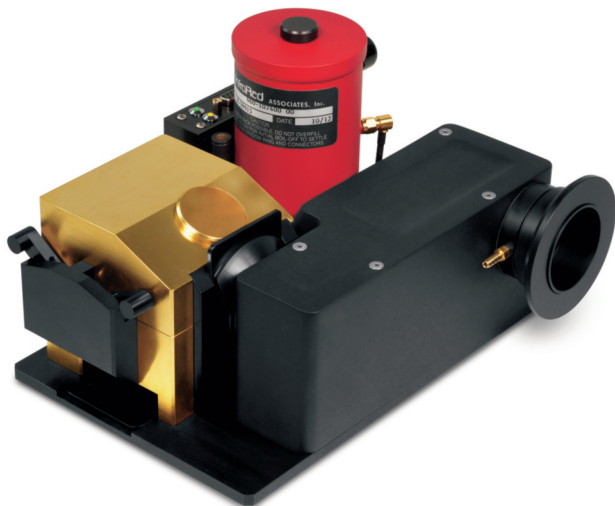


## Mid-IR IntegratIR™ – Integrating Sphere



### FEATURES OF THE MID-IR INTEGRATIR

- 3 inch sphere – gold-coated, Lambertian scatterer for high-performance measurements
- 12 degree hemispherical diffuse reflectance measurement with specular exclusion port
- Diffuse transmission station for measurement of highly scattering samples in transmission mode
- Integrated, high-performance detector MCT or DTGS choice for ultimate configurability
- Upward and downward-looking optical configurations to accommodate a wide range of sample sizes and types
- In-sample compartment design to minimize laboratory space requirements
- Configurations available for most FTIR spectrometers

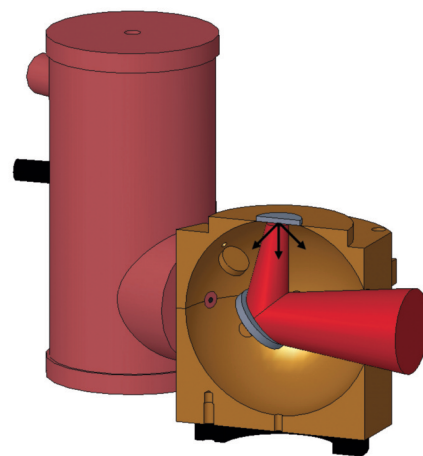
The integrating sphere is very often an accessory of choice when studying reflectance properties of solids, analyzing light scattering and/or highly absorbing samples and collecting spectra difficult to obtain with standard sampling techniques. PIKE Technologies offers Mid-IR integrating spheres, designed for research and standard applications that require high sensitivity and ability to collect high quality data from difficult to analyze samples.

The PIKE IntegratIR spheres are available in the upward and downward looking configurations and are suitable for the measurements of absolute and relative diffuse reflectance of solids, powders and opaque liquids. Both feature 3 inch diameter highly reflective gold-coated integrating spheres. The accessories mount in the sample compartment of the FTIR spectrophotometer, but use a dedicated detector for maximum performance.



Gold-coated Lambertian finish sphere

The upward looking Mid-IR sphere features a 12 degree illumination of the sample, and offers a specular exclusion port. Reflectance samples are placed directly onto the sample port located on the top portion of the sphere. This sphere is ideal for large and/or thick solid samples. For powder samples, a standard ZnSe window is available. If preferred, a KBr window can also be used with the sample plate to minimize the reflection loss compared to the ZnSe.



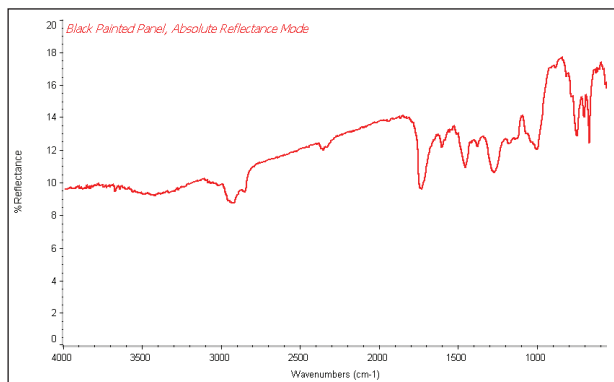
Optical diagram of the upward looking IntegratIR Sphere

The downward looking Mid-IR IntegratIR allows the sample to be placed underneath the sphere. This configuration is desirable for measurements of powders and particulate materials because an incidence beam strikes the sample directly, without passing through an IR transparent window. A specular exclusion port is a standard feature on this accessory.

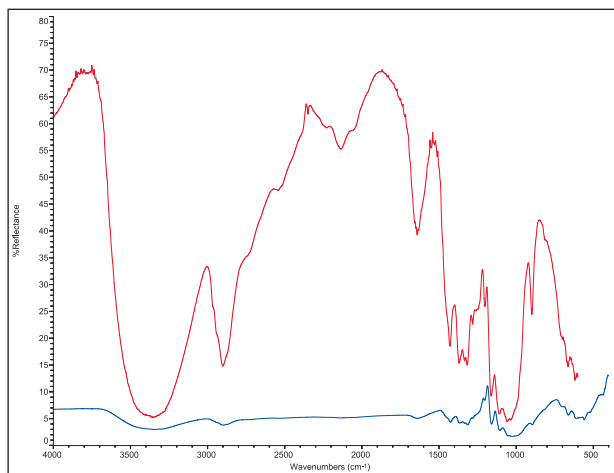
For all spheres, the selection of light illumination onto the sample or onto the reference surface is done via a flipper mirror. This allows the background to be collected using either the substitution method or the Taylor method.

Diffuse transmittance of partially transmitting materials can be measured with either sphere. This is done by placing the sample on a standard 2" x 3" sample holder and siding it in the mount located in front of the transmission port.

A selection of Mercury cadmium telluride (MCT) or deuterated triglycine sulfate (DTGS) detectors is offered with the IntegratIR spheres. This allows the accessory to be optimized for the application and sample type. The wide band MCT is the commonly configured detector while the less sensitive DTGS is an option for users who require the convenience of a room temperature detector. The accessory comes with built-in detector electronics and can be interfaced to most FTIR spectrometers.



Absolute reflectance spectrum of painted black panel measured using the PIKE Mid-IR IntegratIR



Comparison of transmission spectrum of paper collected using the integrating sphere to a spectrum collected in transmission mode without a sphere

#### INTEGRATIR ACCESSORY SPECIFICATIONS

<b>Optical Design</b>	Upward or downward looking sample spheres
<b>Sphere Size and Surface</b>	3" (76.2 mm) gold-coated Lambertian surface
<b>Sample Port Size</b>	23.5 mm
<b>Specular Exclusion Port, 12 Degree Sphere</b>	Standard
<b>12 Degree Sphere Dimensions (W x D x H)</b>	159 x 248 x 154 mm (excludes baseplate)
<b>Detector Choice</b>	DTGS or MCT
<b>Spectral Range, MCT Detectors</b>	Wide-band: 5000–500 $\text{cm}^{-1}$ Mid-band: 5000–650 $\text{cm}^{-1}$ Narrow-band: 5000–800 $\text{cm}^{-1}$
<b>Spectral Range, Extended DTGS Detectors with CsI Window</b>	5000–250 $\text{cm}^{-1}$

#### ORDERING INFORMATION

##### IntegratIR Spheres

###### PART NUMBER DESCRIPTION

048-12XX	12 Degree Upward Sample Positioning Mid-Infrared IntegratIR Integrating Sphere Accessory
048-11XX	12 Degree Downward Sample Positioning Mid-Infrared IntegratIR Integrating Sphere Accessory

Notes: The IntegratIR spheres include the sphere, purge enclosure and tubing, one diffuse gold reference. The Downward IntegratIR includes a powder sample cup. Your FTIR spectrometer must be capable of interfacing with an external detector.

##### IntegratIR Detector Choice (must select one)

###### PART NUMBER DESCRIPTION

048-3350	Wide-band MCT Detector
048-3250	Mid-band MCT Detector
048-3150	Narrow-band MCT Detector
048-3450	DTGS Detector with CsI Detector Window

Notes: The detector includes the preamplifier electronics. MCT detectors require liquid nitrogen for cooling.

##### Replacement Parts and Sampling Options

###### PART NUMBER DESCRIPTION

048-0108	Sample Plate with 18 x 2 mm ZnSe Window, Upward IntegratIR
048-0208	Sample Plate with 18 x 2 mm KBr Window, Upward IntegratIR
048-3000	Diffuse Gold Reference, Upward Sample Position
048-3001	Diffuse Gold Reference, Downward Sample Position
048-2020	Powder Sample Cup for Downward IntegratIR