

FlexIR – Hollow Waveguide Accessory for Remote Infrared Sampling



FEATURES OF THE FLEXIR

- *Fast, easy identification of solids and liquid samples outside of the sample compartment*
- *1 or 2 meter, hollow waveguides (HWG) offer exceptional durability and high throughput*
- *Full mid-IR spectral range coverage*
- *ATR, specular and diffuse reflectance probes for a complete array of sampling applications*
- *Standard and high temperature/high pressure probes for reaction monitoring*
- *Permanent alignment of sampling probe to the hollow waveguide for consistent analysis results*
- *MCT or DTGS detector choice for maximum sensitivity and convenience*
- *Compatible with most FTIR spectrometers*

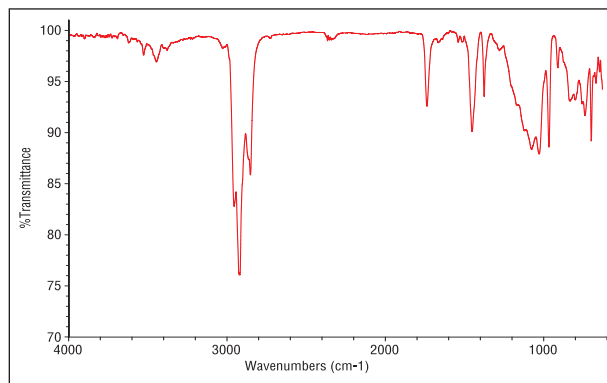
The PIKE FlexIR Hollow Waveguide Accessory is an excellent tool for remote and specific area analysis of a wide variety of samples. Visible surface contamination, small area material identification and bulky materials too large to fit into the FTIR sample compartment are a few of the many samples and application types for the FlexIR accessory.

For reaction monitoring, the accessory can be equipped with a high temperature/high pressure probe. The probe is made of Hastelloy and features two-reflection ATR diamond crystal. The 6.35 mm shaft diameter and 178 mm length make it suitable for use in a wide variety of reaction vessels. The probe maximum temperature is 150 °C, maximum pressure up to 8.3 MPa.



Diamond ATR Probe

The FlexIR Hollow Waveguide Accessory is designed for high throughput, ruggedness and wide spectral range. The FlexIR utilizes a customized optical design with diamond turned focus optics providing exceptional IR throughput. The hollow waveguides are very durable and free from the typical fracture problems encountered with polycrystalline core fibers. The highly reflective hollow waveguides transmit maximum energy through the full mid-IR spectral region – eliminating the need for multiple fibers for complete spectrum coverage when chalcogenide or halide probes are used.



Visible defect on manufactured product – FlexIR HWG Accessory with ATR probe

Two FlexIR bases are available for maximum configurability. The MCT version comes with an integrated detector which offers high sensitivity and fast data collection rates. Three detector options are available to best optimize the signal-to-noise ratio (SNR) against the required spectral range and the application needs. The mid-band MCT is the most versatile and common detector offered with this version of the accessory. A DTGS FlexIR base is available for those applications that do not require a high SNR, and benefit from the flexibility and convenience of a room temperature detector. To optimize its performance, the DTGS detector is integrated into the probe. This probe is equipped with a short handle for ease of positioning and sampling.



FlexIR with DTGS Accessory

The PIKE Technologies FlexIR Hollow Waveguide Accessory is built and tested for optimum performance for your FTIR spectrometer.



Adjustable Probe Holder

Standard Probe Holder

Adjustable and standard Hollow Waveguide probe holders

FLEXIR ACCESSORY SPECIFICATIONS

Optical Design	All reflective, diamond turned focus optics
Probe Design	Hollow waveguide (HWG), full mid-IR reflective
Bend Radius, Minimum	150 mm
HWG Dimensions	1 or 2 m long, 1.6 mm OD, 1.0 mm ID
Diamond High Temperature/High Pressure ATR Probe	
Probe Body	Hastelloy C-276
ATR Crystal	Monolithic Diamond
ATR Crystal Diameter	4.5 mm
Number of Reflections	2
Maximum Temperature	150 °C
Maximum Pressure	8.3 MPa
Shaft Dimensions	Length: 178 mm, Diameter: 6.35 mm
Diamond ATR Probe – Basic	
Probe Body	Hastelloy C-276
ATR Crystal	Monolithic Diamond
ATR Crystal Diameter	4.5 mm
Number of Reflections	2
Maximum Temperature	80 °C
Maximum Pressure	8.3 MPa
Shaft Dimensions	Length: 178 mm, Diameter: 6.35 mm
Standard ATR Probes	
Probe Body	Handle: Aluminum Sampling Tip: Stainless Steel
Maximum Sample Depth	60 mm
ATR Crystal Types	Diamond/ZnSe composite, ZnSe, and Ge
ATR Crystal Diameter	4.5 mm
Maximum Operating Temperatures	Diamond/ZnSe: Ambient ZnSe: 60 °C Germanium: 60 °C
Specular Reflectance Probe	Gold-coated, 20 degree A01
Diffuse Reflectance Probe	Gold-coated, 2.5 mm port
Shaft Dimensions of all Standard Probes	Length: 102 mm, Diameter: 22 mm
Other Specifications	
Detector Choices	DTGS or MCT
Spectral Range Diffuse and Specular Reflectance, MCT Model	Mid-band: 5000–650 cm ⁻¹ Narrow-band: 5000–800 cm ⁻¹
Spectral Range ATR, Mid Band MCT Model	ZnSe: 5000–650 cm ⁻¹ Ge: 5000–700 cm ⁻¹ Diamond/ZnSe: 5000–650 cm ⁻¹
Spectral Range and Specular Reflectance, DTGS Model (CsI window)	5000–650 cm ⁻¹
Spectral Range ATR, DTGS Model	ZnSe: 5000–650 cm ⁻¹ Ge: 5000–600 cm ⁻¹ Diamond/ZnSe: 5000–650 cm ⁻¹
Accessory Dimensions, MCT Model (W x D x H)	153 x 132 x 150 mm (excludes FTIR baseplate and mount)
Accessory Dimensions, DTGS Model (W x D x H)	60 x 70 x 75 mm (excludes FTIR baseplate and mount)

ORDERING INFORMATION

FlexIR Hollow Waveguide Base with MCT Detector

PART NUMBER	DESCRIPTION
045-30XX	FlexIR Hollow Waveguide Base for MCT Version

Notes: The FlexIR is provided with base optics mounting for the sample compartment of your FTIR spectrometer and an onboard MCT detector. Your FTIR spectrometer must be capable of interfacing with an external detector.

Hollow Waveguide MCT Detector Choice (select one or more)

PART NUMBER	DESCRIPTION
045-3200	Mid-band MCT Detector
045-3100	Narrow-band MCT Detector

Probe Choices for Hollow Waveguide with MCT Detector (select one or more)

PART NUMBER	DESCRIPTION
045-4200	Diamond ATR Probe – Basic, 1 m
045-4300	Diamond ATR Probe – High Temperature/High Pressure, 1 m
045-4100	Diamond/ZnSe ATR Probe, 1 m
045-4102	Diamond/ZnSe ATR Probe, 2 m
045-4010	ZnSe ATR Probe, 1 m
045-4012	ZnSe ATR Probe, 2 m
045-4050	Ge ATR Probe, 1 m
045-4052	Ge ATR Probe, 2 m
045-4030	Specular Reflectance Probe, 1 m
045-4032	Specular Reflectance Probe, 2 m
045-4020	Diffuse Reflectance Probe, 1 m

Notes: Sampling probes are fixed to the Hollow Waveguides for maximum sampling reproducibility. Diffuse and specular probes are open-tipped and are not suitable for powder sampling.

FlexIR Hollow Waveguide Base with DTGS Detector

PART NUMBER	DESCRIPTION
045-35XX	FlexIR Hollow Waveguide Base for DTGS Version

Notes: The FlexIR is provided with base optics mounting for the sample compartment of your FTIR spectrometer. Your FTIR spectrometer must be capable of interfacing with an external detector. The DTGS detector is integrated into the probe.

Probe Choices for Hollow Waveguide with DTGS Detector (select one or more)

PART NUMBER	DESCRIPTION
045-5100	Diamond/ZnSe ATR Probe, 1 m
045-5010	ZnSe ATR Probe, 1 m
045-5050	Ge ATR Probe, 1 m
045-5030	Specular Reflectance Probe, 1 m

Notes: Sampling probes are fixed to the Hollow Waveguides for maximum sampling reproducibility. DTGS detector integrated into the probe. Specular probe is open-tipped and is not suitable for powder sampling.

Hollow Waveguide Probe Holders

PART NUMBER	DESCRIPTION
045-3400	Adjustable Probe Holder
045-3410	Standard Probe Holder

Notes: Probe holders may be used with all Standard Hollow Waveguide probes.