

# IRIS

## AT A GLANCE

- ▶ High-performance monolithic diamond ATR
- ▶ Full spectral range for mid- and far-IR measurements
- ▶ Precision optics and design for high energy throughput
- ▶ Optional Ge ATR crystal for high refractive index samples
- ▶ Additional sampling tools — Flow-Through Attachment and Liquids Retainer



Generate high-quality spectra with the IRIS Diamond ATR. Measure a wide range of sample types, including powders, gels, liquids and solids. Ideal for research, QA/QC and sample identification.

## PERFORMANCE AND DESIGN

### ADVANTAGES OF DIAMOND

The mechanical properties and chemical compatibility of diamond make it an ideal ATR element for nearly all samples. With the diamond's Knoop hardness, 5-10 times greater than other common ATR elements, the IRIS diamond ATR may be used to measure extremely hard samples without concern of damage to the accessory.

The pH tolerance of diamond spans 1-14, adding to this ATR element's versatility to handle samples ranging from strong bases to strong acids, and everything in between. A unique feature of the IRIS, is the PTFE seal between the diamond and the ATR stainless steel plate housing. Unlike many commercial accessories where the ATR crystal is sealed with epoxy, the PTFE seal of the IRIS will stand up to long-term exposure to organic and caustic samples.

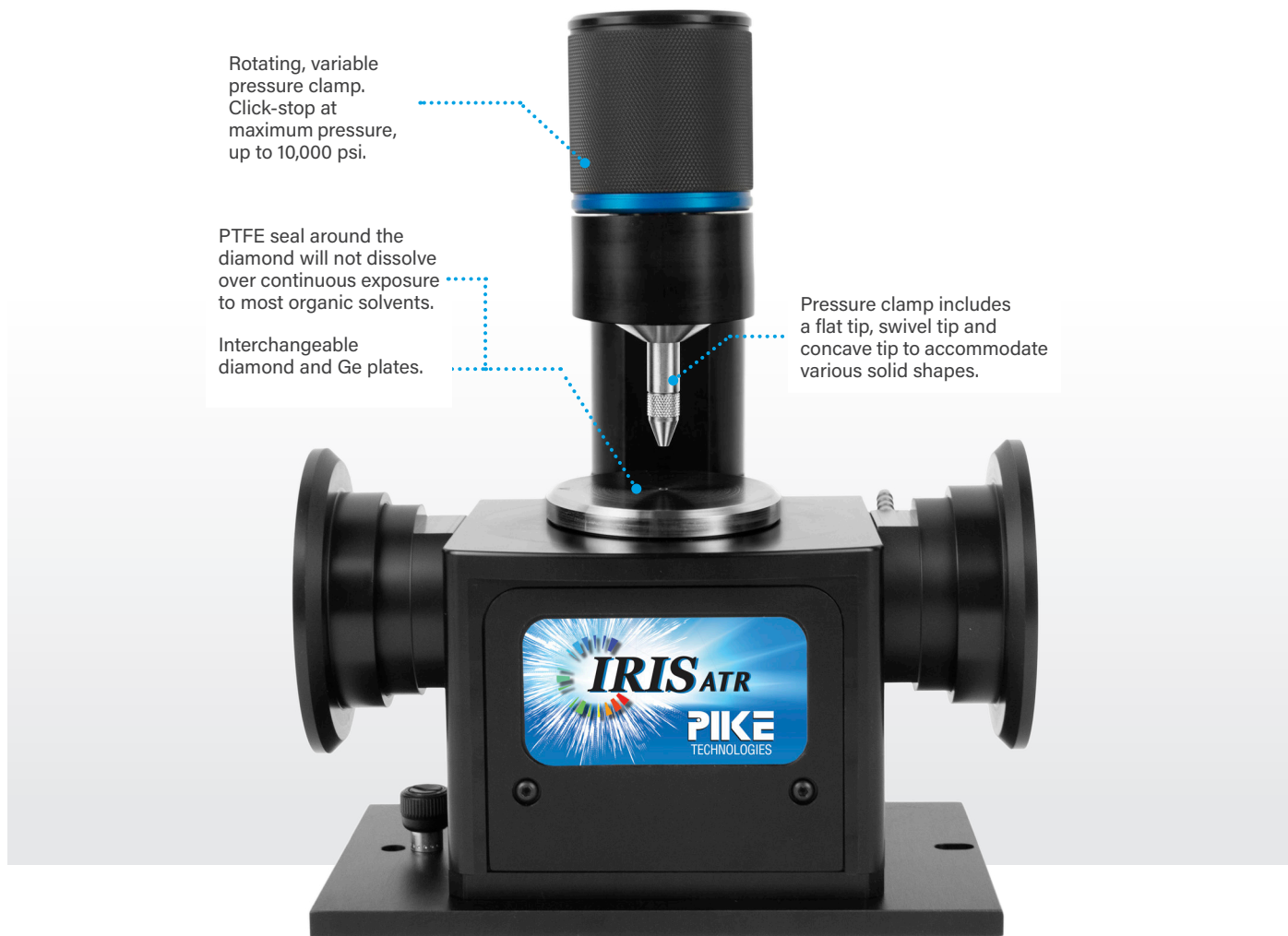
Two monolithic diamond plate models are offered for IRIS. The standard performance diamond plate has a range from 4000–400  $\text{cm}^{-1}$ , and for those wishing to make measurements into the far-IR, an extended-range diamond plate with a cutoff of 30  $\text{cm}^{-1}$  is available. For measurements solidly in the mid-IR range, the standard performance plate is most popular and is recommended.

### BENEFITS OF GERMANIUM

To provide users with the added flexibility, IRIS may be configured with a Ge ATR plate for measuring samples with a high refractive index such as carbon black-filled samples and inorganic materials (e.g. oxides, aluminas, titania and minerals). The Ge element offers an expanded transmission range, 4000–450  $\text{cm}^{-1}$ . Swapping the ATR plates is easy, and efficient.

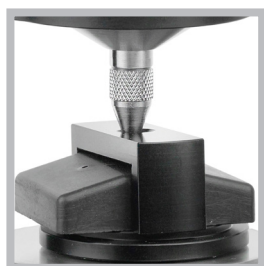
### PRECISION OPTICS - OPTIMAL PERFORMANCE

By using the precision diamond-turned mirrors in its efficient optical design, IRIS is a high energy throughput ATR accessory. This allows for quick measurements to be made, generally less than one minute to complete. Adding to the accessories robustness and reliability is the mechanical construction of the ATR crystal plate, which uses a strong metal brace underneath the ATR element to prevent microscopic movements of the ATR crystal. These features in combination with a small monolithic diamond (1.8 mm diameter) produce high quality spectra across the full mid-IR region including the diamond phonon bands region, inherent to all diamonds.



## IRIS SAMPLING TOOLS

The Liquids Retainer with Volatiles Cover (left) offers a trough configuration while reducing the amount of evaporation when taking IR measurements of highly volatile liquid samples. The Flow-Through Attachment (right) allows for handling samples that pose a hazard, and are degraded from ambient exposure.



### DIGITAL FORCE ADAPTER

The high-pressure clamp may be mated with the Digital Force Adapter, which is ideal for applications that require controlled and reproducible pressure. The magnitude of applied force is displayed on an external easy-to-read LCD readout.

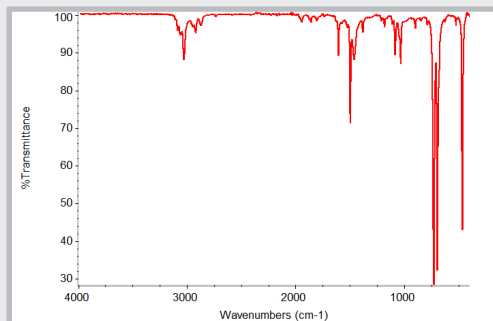


### SPECIFICATIONS

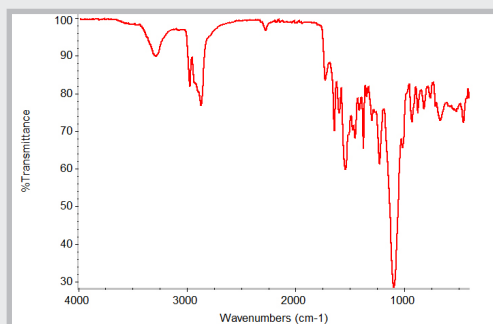
<b>ATR Crystal Choices</b>	Monolithic diamond or Ge
<b>Spectral Range, Diamond</b>	4000 to 400 $\text{cm}^{-1}$
<b>Spectral Range, Diamond Ext. Range</b>	4000 to 30 $\text{cm}^{-1}$
<b>Spectral Range, Ge</b>	4000 to 450 $\text{cm}^{-1}$
<b>Crystal Plate Mounting</b>	User-changeable plates
<b>Crystal Plate Housing</b>	Stainless steel
<b>Angle Of Incidence</b>	45 degrees, nominal
<b>Diamond Surface Diameter</b>	1.8 mm
<b>Digital Force Adapter (option)</b>	Load cell sensor for precise and reproducible pressure control. Attaches directly to High-Pressure IRIS clamps. Digital readout.
<b>Press Clamp</b>	Rotating, continuous variable pressure; click-stop at maximum pressure.
<b>Maximum Pressure</b>	10,000 psi
<b>Sample Access</b>	47 mm, ATR crystal to pressure mount
<b>Accessory Dimensions (W X D X H)</b>	102 x 97 x 91 mm (excludes FTIR baseplate and mount)
<b>FTIR Compatibility</b>	Most, specify model and type

# IRIS APPLICATION

The IRIS is a robust and reliable diamond ATR that allows for IR analysis of most all samples in the lab. Whether it is a rigid polymer, strong organic solvent, powder and more—IRIS has it covered.



**Toluene spectrum**, showing absorbance bands across the full spectral range to 400  $\text{cm}^{-1}$ .



**Polyurethane spectrum**, showing unreacted isocyanate monomer at 2280  $\text{cm}^{-1}$ . Usable spectral results can be obtained across this diamond phonon band region.

PART NUMBER	DESCRIPTION
<b>Base Optics (required)</b>	
027-18XX	IRIS <b>Notes:</b> Replace XX with your spectrometer's Instrument Code listed in the back of the catalog. Base includes purge tubes, purge kit, and selected spectrometer base mount.
<b>Crystal Plates (must select 1 or more)</b>	
027-2100	Diamond Crystal Plate
027-2110	Diamond Crystal Plate, Extended Range
027-2120	Ge Crystal Plate <b>Notes:</b> Crystal plates are pre-aligned. Plate housing is stainless steel. Contact PIKE for Hastelloy options.
<b>Clamp and Clamp Accessories (required for solid or powdered samples)</b>	
027-3025	High-Pressure Clamp
027-3027	High-Pressure Confined Space Clamp
076-6029	Digital Force Adapter
025-3095	Flat Tip for High-Pressure Clamp
025-3093	Swivel Tip for High-Pressure Clamp
025-3092	Concave Tip for High-Pressure Clamp
025-3099	Tip Assortment for High-Pressure Clamp <b>Notes:</b> The High-Pressure Clamp is required for analysis of solids, powders and use of Liquids Retainer, Flow-Through Attachment or the Digital Force Adapter. Pressure clamp includes a flat tip, a swivel tip and a concave tip.
<b>Optional Sampling Tools</b>	
026-5013	Liquids Retainer and Volatiles Cover Set
026-5010	Liquids Retainer
026-5012	Flow-Through Attachment, 100 $\mu\text{L}$ <b>Notes:</b> Flow-Through Attachment and Liquids Retainer require High-Pressure Clamp.

