GladiATR –
Highest Performance Diamond ATR

Features

- **Diamond crystal design – cannot scratch or fracture**
- **Extreme pressure application – for hard and demanding solid samples**
- **Highest energy throughput design – for excellent-quality FTIR spectra and minimum scan time**
- **All reflective optics – full spectral range for analysis in the mid-IR and far-IR regions**
- **Optional extended spectral range Ge crystal plate – for high refractive index samples**
- **Heated crystal plate options – ATR temperature studies up to 300 °C**
- **Compatible with most FTIR spectrometers**

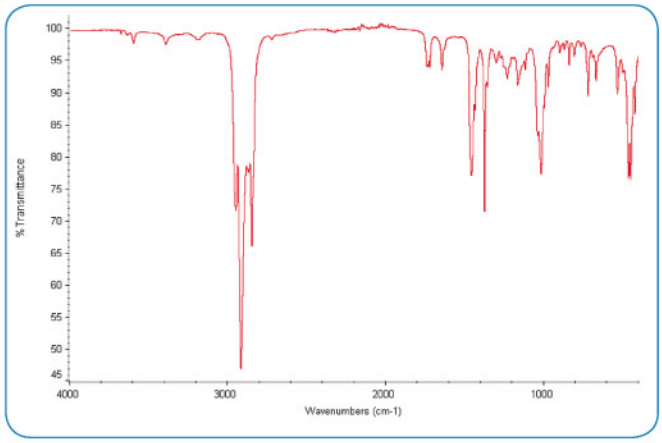
The GladiATR™ ATR from PIKE Technologies features an optical design providing the highest energy throughput, highest available pressure, widest spectral range and offering optional heated or cooled crystal plates. The GladiATR is a highly durable and rugged design to be used in environments where large numbers of samples are measured, where samples may be intractable solids, where you want the best quality spectrum every time and where you need flexibility for new sample types in the future.

The GladiATR diamond crystal is a monolithic design which will not scratch or fracture even at extreme pressures. This design permits analysis of hard, intractable objects such as coated metal wires, polymer pellets and geological samples without damage to the ATR crystal. The diamond crystal is brazed into the stainless steel or Hastelloy plate, which enables this ATR to be compatible with pressure up to 30,000 psi.

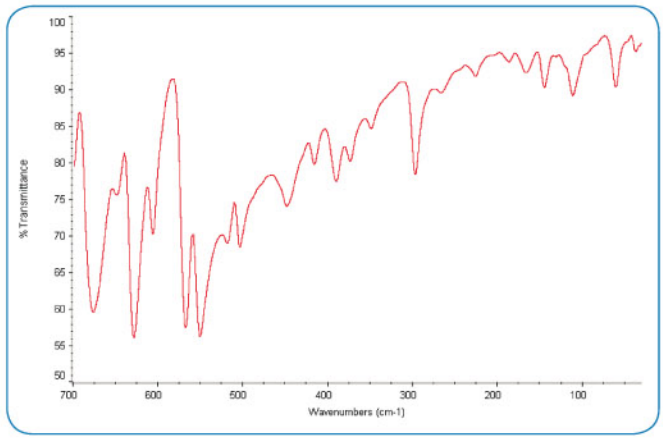
The energy throughput of the GladiATR is exceptional. This significantly improves spectral quality and reduces sampling time.

The GladiATR is designed and manufactured using all reflecting optics providing full spectral range in the mid-IR and far-IR spectral regions. An optional Ge crystal plate is available for analysis of high refractive index samples, and offers a spectral range from 5000 – 450 cm^{-1}. The crystal plates are easily changeable.

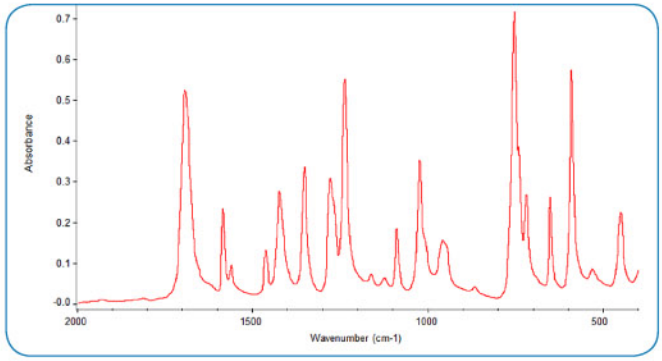
The GladiATR high performance diamond ATR is available in configurations to fit most FTIR spectrometers.



ATR/FTIR spectrum of polymer pellet run on GladiATR with diamond crystal. Spectral range in the mid-IR is 4000–400 cm^{-1}.



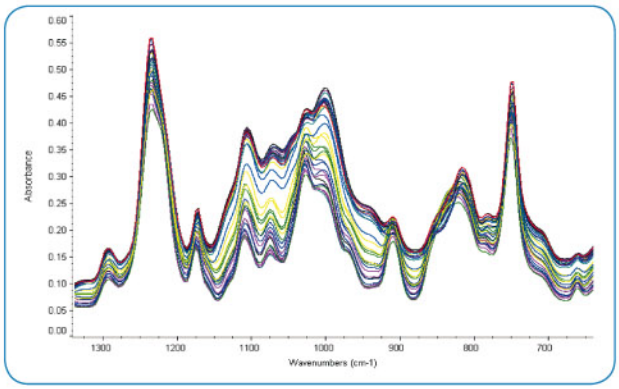
Spectrum of sulfathiazole collected using GladiATR with diamond crystal plate and far-IR optics in FTIR instrument.



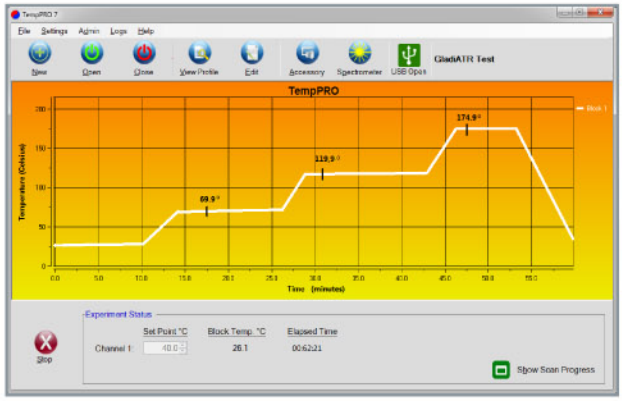
Spectrum of bromoacetophenone collected using GladiATR with extended range Ge crystal plate.

GladiATR with 300 °C heated diamond crystal plate and temperature controller.

Temperature-controlled crystal plates are available for thermal study of materials. The resistively heated diamond plate has a range from ambient to 210 or 300 °C. PIKE Technologies offers temperature controllers with digital and PC programmable set points with TempPRO software (sold separately). This allows for easily programmed temperature profiles and unattended data collection with most FTIR software platforms. For sub-ambient studies, liquid jacketed plates are an option. The new liquid jacketed/heated GladiATR diamond plate blends the benefits of both resistively heated and liquid jacketed.



ATR/FTIR spectra from cure of thermoset epoxy using the heated diamond crystal plate on the GladiATR.



If PC control is desired, PIKE TempPRO™ software can be used for graphical setup and automated data collection with most FTIR spectrometers for thermal experiments.

SPECIFICATIONS

ATR Crystal Choices	Diamond, Ge
Crystal Plate Mounting	User changeable plates
Crystal Type	Monolithic
Diamond Mounting	Brazed
Crystal Plate Mounts	Stainless steel
Angle of Incidence	45 degrees, nominal
Crystal Dimensions (surface)	3.0 mm diameter
Optics	All reflective
Pressure Device	Rotating, continuously variable pressure; click stop at maximum
Digital Force Adapter (option)	Load cell sensor for precise and reproducible pressure control. Attaches directly to GladiATR clamp. Digital readout. For ambient temperature measurements only.
Maximum Pressure	30,000 psi
Sample Access	80 mm, ATR crystal to pressure mount
Spectral Range, Diamond	4000 to 30 cm^{-1} (IR optics dependent)
Spectral Range, Ge	4000 to 450 cm^{-1}
Heating Options	Diamond, 210 or 300 °C maximum Ge, 130 °C maximum
Accuracy	+/- 0.5% of set point
Sensor Type	3 wire Pt RTD (low drift, high stability)
Temperature Control	Touch-panel display with USB interface. PIKE TempPRO software (sold separately) for PC control with unlimited ramps and automated data collection.
Input	100–240 VAC, auto setting, external power supply
Output	4A/24 VDC, 100 W maximum 6A/24 VDC, 150 W max. (300 °C version)
Cooling Options	Liquid jacketed crystal plates available
Specular Reflection Option	Optional, 45 degree nominal angle of incidence
Purge Sealing	Purge tubes and purge line connector included
Accessory Dimensions (W x D x H)	140 x 205 x 340 mm (excludes FTIR baseplate and mount)
FTIR Compatibility	Most, specify model and type

Ordering Information

GladiATR Base Optics

(must select)

Part Number	Description
026-18XX	GladiATR Single Reflection ATR Base Optics, with heating capability up to 210 °C or 300 °C

Notes: Replace XX with your spectrometer's Instrument Code listed on page 164. All GladiATRs include purge tubes, purge kit, and selected spectrometer base mount. Crystal plates must be selected from the table below. High-Pressure Clamp, Digital Force Adapter and Liquids Retainer/Volatiles Cover are optional and need to be ordered separately, if required.

GladiATR Stainless Top

(must select one or more)

Part Number	Description
026-2001	GladiATR Standard Stainless Top
026-2002	GladiATR Heated Stainless Top
026-2003	GladiATR Liquid Jacketed Stainless Top

Notes: Stainless top is not required for 300 °C version. For liquid jacketed/heated plate (P/N 026-4200) order 026-2002.

Crystal Plates for GladiATR

(must select one or more)

Part Number	Description
026-2100	Diamond Crystal Plate
026-2050	Ge Crystal Plate
026-2200	Specular Reflection Plate

Notes: GladiATR crystal plates are pre-aligned and pinned-in-place. Changing crystal plates is easy and fast to optimize sampling results. Plate housing is stainless steel; contact us for Hastelloy options. Reconditioning service is available.

Pressure Clamp for GladiATR, all models

(must select for solid or powdered samples)

Part Number	Description
026-3020	High-Pressure Clamp
076-6026	Digital Force Adapter for High-Pressure Clamp

Notes: The High-Pressure Clamp is required for analysis of solids, powders and use of Liquids Retainer, Flow-Through Attachment and/or Digital Force Adapter (Digital Force Adapter may be used when measuring samples at ambient temperature only). Pressure clamp includes a flat tip, a swivel tip and a concave tip.

GladiATR Temperature Controlled Crystal Plates

Part Number	Description
026-4102	Heated Diamond Crystal Plate, 300 °C
026-4100	Heated Diamond Crystal Plate, 210 °C
026-4200	Liquid Jacketed/Heated Diamond Crystal Plate
026-4110	Liquid Jacketed Diamond Crystal Plate
026-4050	Heated Ge Crystal Plate, 130 °C
026-4150	Liquid Jacketed Ge Crystal Plate, 130 °C
076-1610	Digital Temperature Control Module
007-0207	PIKE TempPRO Software

Notes: For heated diamond crystal plates, maximum crystal temperature is 300 or 210 °C. Ge becomes optically opaque at 150 °C; maximum recommended temperature for this crystal is 130 °C. Temperature controller is required for heated crystal plates. If PC control is desired, TempPRO software must be purchased (sold separately). Liquid jacketed crystal plates require customer-provided circulator.

GladiATR Sampling Options

Part Number	Description
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	High-Pressure Tip Assortment
026-5012	Flow-Through Attachment, 210 °C, 100 µL
026-5014	Flow-Through Attachment, 300 °C, 100 µL
026-5013	Liquids Retainer and Volatiles Cover Set
026-5015	Liquids Retainer and Volatiles Cover Set, 300 °C
026-5010	Liquids Retainer, 260 °C

Note: Flow-Through Attachment and Liquids Retainer are compatible with all crystal offerings (require High-Pressure Clamp).

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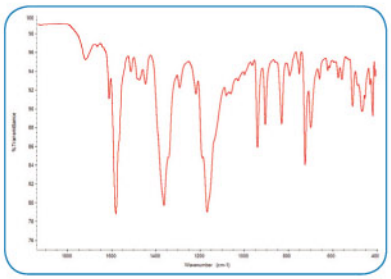
Dedicated GladiATR and GladiATR Vision Sampling Tools – *More Options to Address Your Specific Application Requirements*

Extended Range Ge Crystal Plate

Due to the compact crystal size and the all reflective optics of the GladiATR platform, the Ge Crystal Plate offers an extended spectral range from 4000–450 cm^{-1}. A Ge ATR crystal is used to measure samples with a high refractive index. Types of high refractive materials that would benefit from sampling on the extended range Ge ATR crystal are carbon black filled samples and inorganic materials such as oxides, aluminas, titania, and minerals. The Ge crystal plate (non-viewing) may be fitted to the GladiATR or GladiATR Vision. Crystal plates are easily interchangeable. A heated version is available.



Spectrum of malachite green oxalate collected using the GladiATR with Ge crystal plate.

Specular Reflection Plate

The GladiATR may be converted from an ATR accessory to a specular reflection accessory by using the Specular Reflection Plate. A viewing Specular Reflection Plate is available for the GladiATR Vision. The angle of incidence is 45 degrees, and plate is easily interchangeable with ATR plates.

GladiATR Specular Reflection Plate

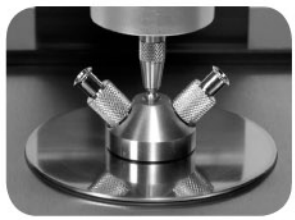
Temperature Control

The GladiATR and GladiATR Vision can be fitted for temperature control by configuring the accessory with a liquid jacketed or resistively heated diamond or Ge plate. When coupled with the digital temperature controller, unlimited temperature ramps are easily programmed using PIKE TempPRO software (sold separately), which also interfaces with many FTIR software packages for data collection as a function of time or temperature.

Heated GladiATR with Temperature Control Module

Flow-Through Attachment

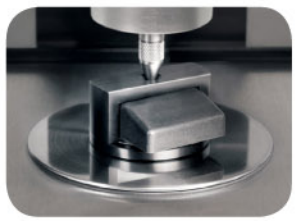
The Flow-Through Attachment is used for continuous monitoring or handling samples that pose a hazard from ambient exposure. Samples are introduced using the Luer-Lok fitting by connecting a syringe or a flow line. 1/16 inch compression fittings are optional. The High-Pressure Clamp is required.



Flow-Through Attachment

Liquids Retainer and Volatiles Cover

The Liquids Retainer offers a trough configuration for GladiATR and GladiATR Vision. The volatiles cover reduces the amount of evaporation of a highly volatile liquid sample placed on the surface of the crystal. The High-Pressure Clamp is required.



Liquids Retainer and Volatiles Cover Set

Ordering Information

GladiATR and GladiATR Vision Options

Part Number	Description
026-2050	Ge Crystal Plate (non-viewing)
026-4050	Heated Ge Crystal Plate, 130 °C (non-viewing)
026-4100	Heated Diamond Crystal Plate, 210 °C (non-viewing)
026-4101	Heated Diamond Crystal Plate, 210 °C (viewing)
026-4102	Heated Diamond Crystal Plate, 300 °C (non-viewing)
076-1610	Digital Temperature Control Module
007-0207	PIKE TempPRO Software
026-4110	Liquid Jacketed Diamond Crystal Plate (non-viewing)
026-4112	Liquid Jacketed Diamond Crystal Plate, 210 °C max (viewing)
026-2200	Specular Reflection Plate (non-viewing)
026-2202	Specular Reflection Plate (viewing)
026-5012	Flow-Through Attachment, 210 °C, 100 µL
026-5014	Flow-Through Attachment, 300 °C, 100 µL
026-5013	Liquids Retainer and Volatiles Cover Set
026-5010	Liquids Retainer
026-3051	Volatiles Cover
026-5015	Liquids Retainer and Volatiles Cover Set, 300 °C

Notes: The heated crystal plates require a temperature control module and appropriate stainless steel top. For more heated options, please review the GladiATR and GladiATR Vision accessory product data sheets. If PC control is desired, PIKE TempPRO software (sold separately) can be used for graphical setup and automated data collection with most FTIR spectrometers for thermal experiments.

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