

4500, 4500A, 5500, 4100 ExoScan, 4200 FlexScan

Технические характеристики

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Agilent 4500 Series FTIR spectrometers



Fully integrated, portable FTIR.

The Agilent 4500 Series FTIR are mid-IR spectrometers specifically designed for analysis outside of laboratory environments. The system is compact and packaged in a weather-resistant housing making it ideal for outdoor use. It is perfect for obtaining fast, high quality answers about your liquid and solid samples on-site.

At the heart of the system is a unique, rugged interferometer, field-proven to be used in challenging environments. The internal components are mounted on shock-dampening platforms to protect the components from damage in the field, making this one of the most rugged spectrometers available.

Use the 4500 Series FTIR to easily perform spectroscopic analyses on a range of liquids, powders, pastes and gels. MicroLab PC software, operating on a standard laptop or ruggedized tablet, is designed for simple push button, method driven operation to obtain valuable information about the identity and amount of chemical substances present in a material.

Using the 4500 Series FTIR, you can:

- Monitor product quality.
- Determine if ingredients in a mixture are at the proper levels.
- Assess quality of incoming raw materials.
- Identify contaminants.

Simple to use – no training required

With the innovative sampling interface of the 4500 Series FTIR, no sample preparation is required. Perform measurements in less than 2 minutes and clean up in seconds – so you can spend your valuable time doing other things. The software and user interface are intuitive, with no technical training required to use the system.

Specific systems for your samples.

The 4500 Series FTIR offers three sampling systems tailored to different types of analysis.

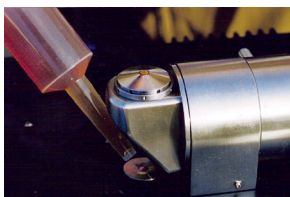
To quickly and easily determine the identity and/or quantity of components in a liquid, choose the 4500t TumbIR or 4500 DialPath, containing unique Agilent technology and configured pathlengths between 30 to 1000 μm .

Simply place a drop on the lower window and rotate the top window into place to encompass the liquid and get a reproducible pathlength every time. The 4500t is ideal for quantifying minor components in a liquid sample.

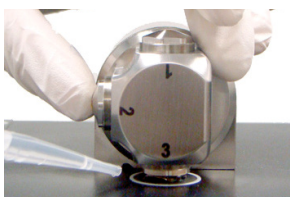
For analyzing and measuring virtually any type of solid, paste or gel substance, select the 4500a, featuring a diamond ATR (Attenuated Total Reflectance) sampling system.

Just place the substance on the diamond window and take the measurement. A pressure device ensures that powders and solids uniformly contact the diamond, providing the best possible quality information.

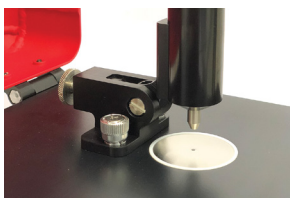
Product highlights	<ul style="list-style-type: none"> • Small and lightweight • Highly accurate mid-IR analysis • No to little sample preparation • Designed for field use • Internal 4 hour battery • Available with general purpose and specific methods • USB or Bluetooth computer connection to any computer • Integrated sampling interfaces • Water-resistant for inclement weather conditions designed to IP54 specifications
System specifications	<ul style="list-style-type: none"> • Size: 22 x 29 x 19 cm (8.5 x 11.5 x 7.5 in) • Weight: 6.8 kg (15 lb) • Operating ranges: 0 to 50 °C (32 to 122 °F) • Power: Internal battery (4 h), 100/120/240 V AC, 50/60 Hz • Spectral range: 4000–650 cm^{-1} • Resolution: 4–32 cm^{-1} • Controller: Handheld or Laptop computer with Microsoft® Windows® 10 Professional • Software: Agilent MicroLab PC • Warmup time: 10 min • Response time: 2 min



Effortlessly determine the amount of minor components in your liquids with the TumbIR sampling system of the Agilent 4500t FTIR



Get reproducible pathlengths every time, between 30 and 1000 μm , using the Agilent 4500 DialPath FTIR



Measure all your solid, paste and gel samples with the diamond ATR sampling system of the Agilent 4500a FTIR

Sample types	<ul style="list-style-type: none"> • Polymers • Oils • Gels • Greases • Pastes • Dairy 	<ul style="list-style-type: none"> • Acids • Gasoline • Bases • Diesel • Liquids • Wine 	<ul style="list-style-type: none"> • Foodstuffs • Powders • Solids • Soil
Applications	<ul style="list-style-type: none"> • Food adulteration • Soil analysis • Incoming QA/QC 	<ul style="list-style-type: none"> • Final product QA/QC • Petrochemical blending • Regulatory compliance 	<ul style="list-style-type: none"> • Fine chemicals • Recycling

4500A FORENSICS ANALYZER

PORTABLE FTIR SYSTEM FOR USE IN THE IDENTIFICATION OF UNKNOWN SUBSTANCES

The Measure of Confidence



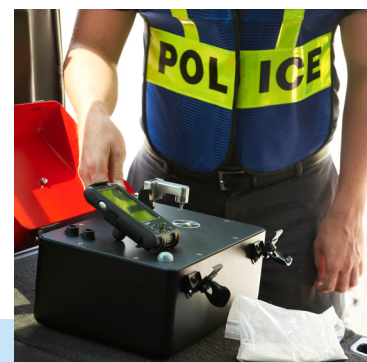
Portable FTIR Forensics Analyzer Package

FTIR spectroscopy is a proven, powerful technology for the analysis of illegal substances and potentially hazardous compounds. The identity of an unknown liquid or solid substance can be determined in less than one minute with little or no sample preparation required, making identification of unknown substances rapid and easy to use.

[\(click to access application example, "Identification of illicit drugs and hazardous compounds with the Agilent 4500a FTIR Spectrometer" by A. Rein\).](#)

The Portable FTIR Forensics Analyzer Package has been created to address the ever growing need of portability, flexibility and ease of use within the Forensics community. Either a 4500a or 5500a can be selected whether the end user desires full portability (4500a) or simply wants a workhorse, dedicated instrument like the 5500a to use every day in a lab.

The 4500a Portable FTIR system with single reflection diamond ATR sampling device is designed for use in some of the most demanding environments. The diamond ATR sampling interface requires little or no sample preparation and is chemically resistant to virtually all compounds that will be measured. Included with the 4500a is a PDA device, which runs Agilent's MicroLab Mobile software, eliminating the need for a PC at the point of analysis.



Portable FTIR Forensic Analyzer:

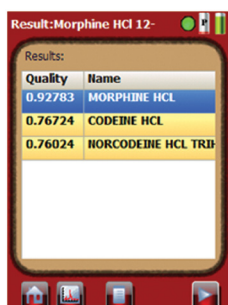
- ✓ Fully portable with accurate results in real time
- ✓ Comprehensive Forensic ATR database with over 13,000 spectra
- ✓ Little to no sample preparation is required
- ✓ Diamond ATR sample interface is chemically resistant to virtually all compounds



Agilent Technologies

The Agilent 4500a Portable Forensic Analyzer Purposed for Field Use

In addition to class leading performance and ruggedness, what makes the Agilent's Portable FTIR Package stand out is the addition of a comprehensive library. The ATR Forensics Library for Agilent Mobile FTIR contains 13,137 spectra specifically selected for the forensics market containing materials categorized as bio-chemicals, forensics, white powders, hazardous and toxic chemicals, HPV chemicals, food additives and explosives. This creates one of the most comprehensive forensic FTIR databases. The library is configured for



the PDA at 8cm^{-1} resolution to facilitate speed of identification at the site of measurement, since rapid measurement for quick decision making is necessary when screening materials and identifying probable cause. This package also includes a second high resolution version of the library (4cm^{-1})

which can be used on a Laptop or Desktop PC for higher accuracy and further analysis of samples in the lab.


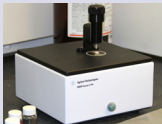
Product Highlights:

- Small and lightweight - made for field use.
- Highly accurate mid-IR analysis
- No sample preparation
- Internal 4 hour battery
- USB connection to any computer, if necessary
- Integrated sampling interface
- Water-resistant for inclement weather conditions

System Specifications:

- Size: 22 x 29 x 19 cm (8.5 x 11.5 x 7.5 in)
- Weight: 6.8 kg (15 lb)
- Operating ranges: 0 to 50 °C (32 to 122 °F)
- Power: Internal battery (4 h), 100/120/240 V AC, 50/60 Hz
- Spectral range: 4000–650 cm^{-1}
- Resolution: 4–32 cm^{-1}
- Controller: Mobile device with MicroLab Mobile software
- Software: Agilent MicroLab PC
- Warmup time: 10 min > Response time: 2 min

Choice of 4500a FTIR Single Reflection ATR system or 5500a FTIR Single Reflection ATR system:

Part# G8172A	Title and Description
Option #101:	4500a FTIR Single Reflection Portable FTIR Spectrometer with a single (1) reflection diamond ATR sample interface. Socket Somo 655 PDA, power cables, power supply, hardware and software manuals, MicroLab PC and MicroLab Mobile.
	
Part# G8172A	Title and Description
Option #102:	5500a FTIR Single Reflection Compact FTIR Spectrometer with a single (1) reflection diamond ATR sample interface. Power cables, power supply, hardware and software manuals, and MicroLab PC software CD.
	

Choice of ATR Forensics Library for Agilent Mobile FTIR or ATR Aldrich Spectral Database:

Options	Title and Description
Option #201:	ATR Forensics Library - Agilent Mobile FTIR 13,137 spectra including bio-chemicals, forensics drugs, white powders, hazardous and toxic chemicals, high production volume chemicals, food additives and explosives for one of the most comprehensive databases to be used for forensics applications.
Option #202:	ATR Aldrich Spectral Database 18,513 ATR-FTIR spectra of compounds from the Aldrich collection of the Sigma-Aldrich Company.

* Laptop PC is available as part of the package under G8172AA



Agilent Molecular Spectroscopy Portable FTIR Solutions

Datasheet

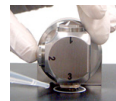


5500 Series FTIR Spectrometer

Robust Performance in a Compact Design

The Agilent 5500 Series FTIR Spectrometers are designed for one purpose – to provide you with great results rapidly and reliably – day after day. The combination of great performing optics, innovative sampling interfaces and intuitive software provides information on liquid and solid samples faster and easier than ever before.

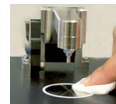
Features and Benefits



- **5500 Dialpath:** Provides the longer pathlength capabilities of transmission spectroscopy in a format that is as easy to use as ATR.



- **5500t:** Ease of use: quickly analyze a sample by placing a single drop of the liquid on the surface of the 5500t analyzer, and then rotate a second window into position to sandwich the sample.



- **5500a:** One, three or five reflection diamond ATRs are available, depending on the application. Single reflection diamond ATR available for solids and liquids identification. Multi-reflection ZnSe ATR available for liquid analysis.



AGILENT 4100 EXOSCAN FTIR

Take your samples to the lab for FTIR analysis, or take the analyzer to your samples. Either way, achieve superb, non-destructive analysis of your solid and liquid samples.

With the 4100 ExoScan FTIR, you can:

- Enjoy the convenience of a portable, handheld, battery-operated FTIR analyzer.
- Carry your analyzer with ease — it weighs a mere 3.2 kg, including data system and batteries.
- Achieve performance equal to or better than conventional laboratory FTIR spectrometers. A highly rugged, miniature interferometer with large diameter optics and very fast, short internal optical path makes this possible.
- Interchange sample interfaces to handle varying analytical challenges.
- Easily upload and download your data and methods between the PDA-based control panel and your laptop, using wireless connectivity.
- Continuously analyze for more than 3 hours, thanks to the powerful, onboard, rechargeable lithium ion battery.
- Tailor software access to each user so they can perform only those commands appropriate to their job function.
- Use the 4100 ExoScan in a lab, just like a benchtop FTIR, by mounting it on the docking station.



ANALYSIS OF: COMPOSITES, COATINGS, PAINTS, POLYMERS, LIQUIDS, SOLIDS & GELS

Unlimited applications

With the 4100 ExoScan FTIR, you are not limited to analyzing only samples that can be brought to the lab:

- Measure incoming raw materials and finished products onsite.
- Measure samples that are too large, inconvenient or valuable to move into the lab.

By taking the 4100 ExoScan to the sample, anything is possible.



Use the 4100 ExoScan FTIR to determine if:

- A metal surface is properly cleaned in preparation for a manufacturing process such as painting or coating.
- A surface is properly prepared for a bonding process.
- The correct coating has been applied to a surface and that the thickness of that coating is accurate and precise.
- A surface has the expected homogeneity.
- Anodization and alodining processes have been correctly carried out.
- Spots, streaks, stains, or blemishes on a surface are of concern.
- High value composite material has been damaged by heat, UV, or chemical exposure.
- Polymers and composites are properly cured.
- Incoming raw materials and outgoing finished products meet specifications.
- 'First article' vendor-supplied material meets specifications.
- Solids, liquids, gels and pastes meet specifications.

SYSTEM SPECIFICATIONS

Infrared module

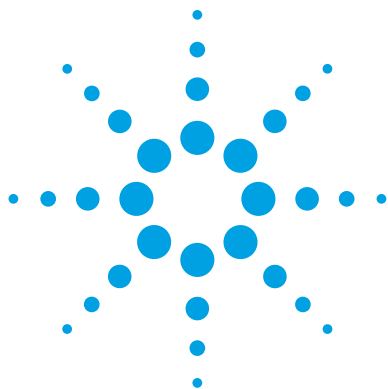
Size	17.1 × 11.9 × 22.4 cm (6.75 x 4.68 x 8.81 in) (excluding handle and sample tech.)
Weight	3.18 kg (7 lb)
Sampling technology	Interchangeable External Reflectance and Single-Reflection Diamond ATR sampling heads
Interferometer	Michelson interferometer, 4 cm ⁻¹ max. resolution
Frequency range	4000–650 cm ⁻¹
Beam splitter	ZnSe
Detector	Temperature-stabilized DTGS
Buttons	Power on/off, handle-mounted 'Tab' and 'Enter'
Power supply input:	100–250 V AC 47–63 Hz, Output: 15 V DC Battery 10.8 V 4400 mAh lithium ion rechargeable (estimated 3.2 h run time)

Handheld computer

Size	12.7 × 7.5 × 2.1 cm (5.00 x 2.94 x 0.81 in)
Weight	179 g (6.3 oz)
Processor	Intel PXA270 @ 624 MHz
Operating system	Microsoft® Windows® Mobile 5.0 Premium Edition
Memory	128 MB SDRAM, 256 MB NAND FLASH
Display	65K colors TFT LCD, 3.5 in, 240 (w) x 320 (l) pixel resolution
Touch panel	Glass analog resistive touch
Power supply input:	100–240 V AC 47–63 Hz, Output: 5 V DC battery 3.7 V 1200 mAh lithium ion rechargeable (>8 h estimated run time)
Expansion slots	CompactFlash and SDIO slots
Wireless LAN	IEEE 802.11 b/g antenna: internal
Bluetooth	v2.0 + EDR Class 2 supported

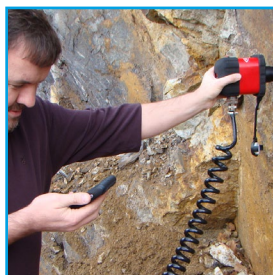
Durability

Operating temperature	0 to 50 °C (32 to 120 °F)
Storage temperature	-25 to 75 °C (-13 to 167 °F)
Humidity	95% non-condensing
Water resistance	Completely sealed spectrometer compartment
Shock	Withstands 40 G on each axis (in shipping case)
Vibration	Withstands 60 Hz for 30 min



Agilent 4200 FlexScan FTIR spectrometer

Data sheet



FTIR in the palm of your hand.

Following on from the rapid acceptance of the handheld 4100 ExoScan FTIR, the Agilent 4200 FlexScan FTIR is a handheld FTIR designed specifically for various surface analysis applications, with the flexibility to be used in the most inaccessible of locations.

The 4200 FlexScan FTIR employs the optics, electronics, power supply and sampling technology of the 4100 ExoScan FTIR and splits them into two modules — the optics module, which contains the interferometer and sampling interface, and a power module, which contains the battery and system electronics. The optics module fits comfortably in the palm of your hand. The power module can be hooked to your belt, or suspended from a shoulder strap.

The compact dimensions and light weight of the optics module means you can conquer a host of previously impossible field-based applications that demand FTIR performance equivalent to traditional benchtop lab systems.

If you need to perform FTIR analysis in out-of-reach places such as inside vessels, you can simply attach the optics module to an extendable arm. If you need more stability, mount it on a tripod. Effortlessly perform repetitive measurements, such as analyzing numerous points over a large surface area.

Ease-of-use is crucial for performing analyses in the field. With the 4200 FlexScan, simply push a button on the optics module to analyze a sample. Control the system and view data with a handheld computer.

A variety of sampling interfaces are available to meet your specific application requirements. Choose from external reflectance, grazing angle reflectance, ATR, or diffuse reflectance. With this versatility, you can analyze a range of metal, polymers, plastics, composites, in addition to most solids and granulated materials.

Product highlights

- Specifically designed for surface analysis applications
- Small and lightweight
- Highly accurate mid-IR analysis
- No sample preparation
- Ideal for onsite, in-field use
- Available with general purpose and specific methods
- Bluetooth communication to handheld computer and/or laptop data station
- Multiple sample interfaces available

Specification highlights

- Handheld weight = 1.45 kg (3.2 lb)
- Handheld size = 14 x 10.8 x 8.3 cm (5.5 x 4.25 x 3.25 in)
- Wireless data collection
- Sample interfaces
 - Diffuse Reflectance
 - External Reflectance
 - ATR
 - Grazing Angle

See back of sheet for additional details.

Agilent 4200 FlexScan FTIR spectrometer

Data sheet

Available sample interfaces

Diffuse Reflectance

- Normal incidence
- Quantitative or sample ID
- Powdered samples
- Plastics
- Rough, low-reflecting surfaces

External Reflectance

- 45°
- Specular reflectance
- Reflectance absorption
- Coating thickness
- Surface oxidation

Grazing Angle

- 82°
- Metal surfaces
- Ultra-thin coatings
- Trace contamination

ATR

- Diamond crystal
- Elastomers and sealants
- Liquids
- Sample ID

Infrared

Size	Optics module: 14 x 10.8 x 8.3 cm (5.5 x 4.25 x 3.25 in) (w/o sample interface) Electronics module: 19 x 10.2 x 6.4 cm (7.5 x 4 x 2.5 in) Cable: 1.2 m (4 ft)
Weight	Optics module: 1.45 kg (3.2 lb) Electronics module: 1.16 kg (2.55 lb) (including battery) Total: 2.86 kg (6.3 lb)
Sample interface	External Reflectance, Single-Bounce Diamond ATR, Grazing Angle, or Diffuse Reflectance
Interferometer	Michelson interferometer, 4 cm ⁻¹ max. resolution
Frequency range	4000–650 cm ⁻¹
Beam splitter	ZnSe
Detector	Temperature-stabilized DTGS
Buttons	Power on/off, trigger (enter)
Power supply	Input: 100–250 V AC 47–63 Hz, Output: 15 V DC
Battery	10.8 V 4400 mAh lithium ion rechargeable (estimated 3.2 h run time)
Communication	Bluetooth communication to handheld computer and/or laptop data station

Handheld computer

Size	12.7 × 7.5 × 2.1 cm (5.00 x 2.94 x 0.81 in)
Weight	179 g (6.3 oz)
Processor	Intel PXA270 @ 624 MHz
Operating system	Microsoft® Windows® Mobile 5.0 Premium Edition
Memory	128 MB SDRAM, 256 MB NAND FLASH
Display	65K colors TFT LCD, 3.5 in, 240 (w) x 320 (l) pixel resolution
Touch panel	Glass analog resistive touch
Power supply	Input: 100–240 V AC 47–63 Hz, Output: 5 V DC
Battery	3.7 V 1200 mAh lithium ion rechargeable (>8 h estimated run time)
Expansion slots	CompactFlash and SDIO slots
Wireless LAN	IEEE 802.11 b/g antenna: internal
Bluetooth	v2.0 + EDR Class 2 supported

Durability

Operating temperature	0 to 50 °C (32 to 120 °F)
Storage temperature	-25 to 75 °C (-13 to 167 °F)
Humidity	95% non-condensing
Water resistance	Completely sealed spectrometer compartment
Shock	Withstands 40 G on each axis (In shipping case)
Vibration	Withstands 60 Hz for 30 min

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