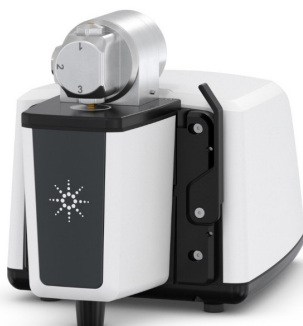


Agilent Cary 635 FTIR Spectrometer



Built small. Packed with performance.

The Agilent Cary 635 FTIR spectrometer sets a new standard for compact, high-performance FTIR analysis. Designed with an innovative, integrated architecture, this lightweight benchtop instrument delivers exceptional speed, sensitivity, and operational efficiency—making it an ideal solution for both routine laboratory workflows and advanced research applications. Combining robust engineering with outstanding analytical capabilities, the Cary 635 FTIR is the preferred choice for laboratories seeking efficiency, reliability, and adaptability in FTIR spectroscopy.

A modular system inspired by real-world applications

The Cary 635 FTIR spectrometer is designed with a modular format centered on the powerful Cary 635 FTIR engine. This engine contains essential optical components—including the interferometer, laser, light source, and detector—and can be equipped with either zinc selenite (ZnSe) or potassium bromide (KBr) optics. Unlike many other systems that only use ZnSe-coated components, the Cary 635 FTIR ZnSe engine features optical components made entirely from ZnSe, resulting in a system that is sturdier and better protected against moisture.

The Cary 635 FTIR sampling modules easily attach to the front of the engine (Figure 1). With permanently aligned optics, the sampling interfaces swap out seamlessly and merge with the optical-mechanical system, offering excellent performance, simplicity, and flexibility that empowers users to achieve accurate, reliable results quickly and easily.

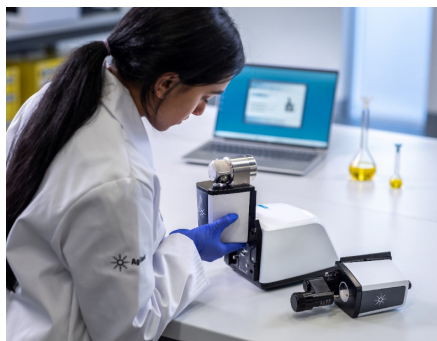
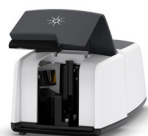


Figure 1. Sampling modules easily attach to the front of the Agilent Cary 635 FTIR engine.

Configure your Cary 635 FTIR solution

Transmission module

Agilent **transmission module** accepting standard KBr pellets, liquid and gas cells, and other sampling devices



Transmission module



ATR modules

ATR modules

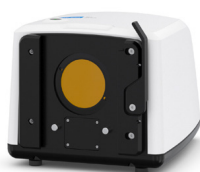
Agilent **attenuated total reflectance (ATR) modules** for handling a wide range of solids, pastes, gels, rubbers, and liquids



Multireflection ZnSe ATR module



10-deg specular reflectance module



Cary 635 FTIR engine



DialPath modules



45-deg specular reflectance module



Diffuse reflectance module



TumblIR modules

Specular reflectance

Agilent **specular reflectance modules** for measuring samples designed to reflect light, such as optics, mirrors, and glass

Diffuse reflectance module

Agilent **diffuse reflectance module** for materials that scatter infrared light, such as powdered samples

DialPath modules

Innovative Agilent **TumblIR** and Agilent **DialPath modules** for rapid transmission analysis of liquids

Meaningful simplicity at its core

Instruments that are intuitive to use provide more reliable results by reducing the chance of human error. The unique Agilent DialPath sampling module eliminates the need for cumbersome traditional flow cells or demountable liquid cells in transmission measurements. A small drop of a liquid sample is placed between two horizontally positioned sample windows. The distance between the two windows defines the optical pathlength. With this innovative sampling technique, liquid samples can be analyzed in three easy steps (Figure 2).

Three easy steps to analysis with DialPath



Figure 2. Three easy steps to analyzing liquid samples with the Agilent Cary 635 FTIR.

Simple and intuitive analysis

The intuitive, easy-to-use design of the Cary 635 FTIR spectrometer is matched by the Agilent MicroLab software. Instant sample interface recognition, step-by-step guidance using instructive pictures, and color-coded result presentation allow for consistent and accurate sample measurements.

Three simple steps using MicroLab software and the Cary 635 FTIR make performing an analysis straightforward while reducing training needs (Figure 3).

Performance with confidence

An instrument must produce accurate and repeatable results day in and day out. The Cary 635 FTIR provides the sensitivity to produce both quantitative and qualitative results quickly, and the reliability to withstand rigorous handling in the lab.

A large 25 mm optical aperture and short internal optical path in the interferometer deliver performance levels typically associated with much larger lab FTIR systems.

Designed to provide years of reliable performance, the Cary 635 FTIR ensures consistent results with minimal maintenance. The Cary 635 FTIR optical components originated from Agilent mobile FTIR instruments built to withstand harsh environments. In production, the Cary 635 FTIR unit passed a 1-meter drop test.

Agilent Cary 635 FTIR spectrometers meet the performance specifications of global pharmacopoeias such as the European, US, Indian, Chinese, and Japanese Pharmacopoeias. Each instrument is manufactured according to a quality system certified to ISO 9001.



1 Start the analysis

2 Follow picture-driven software guidance

3 Instantly receive color-coded, actionable results

Figure 3. Agilent MicroLab software makes the Agilent Cary 635 FTIR easy to use.

Instrument

Type	Portable benchtop Fourier Transform Infrared (FTIR) spectrometer
Instrument Body	Glass-fiber-reinforced polyamide for durability and structural strength
Optical System (Engine)	The Cary 635 FTIR features two different engines that differ in the material used for the beam splitter. The choice of material influences both the performance of the instrument and its functionality under varying environmental conditions. Zinc selenide (ZnSe) for high-humidity environments ZnSe is inert to moisture, which allows instrument operation even in humid environments. The Cary 635 FTIR engine with ZnSe optics offers a spectral range suitable for most FTIR applications. All relevant optical components are made from high-grade ZnSe to minimize reflections, improve accuracy, and enhance robustness in humid environments compared to ZnSe-coated optics. Spectral range: 5,100 to 600 cm^{-1} Potassium bromide (KBr) with antimoisture coating KBr is susceptible to moisture and therefore requires operation and storage in a humidity-controlled environment. The Cary 635 FTIR engine with KBr optics offers a broader spectral range for specific applications. Spectral range: 7,000 to 350 cm^{-1}
Sampling Modules	The Cary 635 FTIR is a fully interchangeable, modular system. The permanently aligned sampling modules: – Connect easily to the front of the Cary 635 FTIR engine in seconds – Are automatically recognized by the Agilent MicroLab software using radio frequency identification (RFID) – Are engineered specifically for use with the Cary 635 FTIR engine, ensuring high-level performance across applications All sampling modules are compatible with the Cary 635 FTIR engine for both KBr and ZnSe optics. Transmission module A traditional FTIR sample interface. The Transmission module includes a 2 × 3 inch card slide mount holder designed to accommodate various samples, sampling devices, holders, and accessories. Spectral range: dependent on Cary 635 FTIR engine Single-Reflection ATR Modules with monolithic crystals ATR is the most widely used FTIR sampling method, allowing for quick and easy measurement of nearly all sample types. The type of crystal material used determines the pathlength of light traveling into the sample. For the Cary 635 FTIR, the following crystal materials are available: – Diamond (Di) Spectral range: 6,300 to 350 cm^{-1} using Cary 635 FTIR engine with KBr optics; 5,100 to 600 cm^{-1} using Cary 635 FTIR engine with ZnSe optics – Zinc selenide (ZnSe) Spectral range: 5,100 to 600 cm^{-1} – Germanium (Ge) Spectral range: 5,100 to 600 cm^{-1} DialPath Module (30 to 1,000 μm) The unique DialPath module is ideal for fixed-pathlength transmission measurements of liquids without the need for conventional infrared flow or demountable cells, overcoming the challenges associated with these cells. Spectral range: 5,100 to 600 cm^{-1} Tumbler Module (100 to 1,000 μm) Uses the same technology as the DialPath modules. This module is the best solution when only one fixed pathlength is needed. Spectral range: 5,100 to 600 cm^{-1} Multireflection ATR Module with ZnSe crystal Compared to single-reflection ATR modules, this module uses a longer crystal to allow multiple reflections of the light beam. With its increased pathlength, the multireflection ZnSe ATR module delivers unsurpassed sensitivity to measure lower-concentration components. Spectral range: 5,100 to 600 cm^{-1} Diffuse Reflectance Module Enables the acquisition of quantitative and qualitative information from powdered or solid samples. Spectral range: 5,100 to 600 cm^{-1} 45-degree Specular Reflectance Module Generally used for at-angle spectral reflectance measurements of samples designed to reflect light across the IR spectral range. Spectral range: dependent on Cary 635 FTIR engine 10-degree Specular Reflectance Module Used for IR measurements of near-normal reflectance of solid samples. Spectral range: dependent on Cary 635 FTIR engine

Software – Standard	MicroLab software In part, what makes the Cary 635 FTIR unique is the software that accompanies it. To make using the MicroLab software as easy as possible, the software suite includes four individual applications specifically designed for the task at hand: MicroLab PC Method-driven software for collecting and analyzing data using predefined methods – Highly visual interface with step-by-step guidance using instructive pictures and an intuitive software design – Color-coded result display (red, yellow, green) based on method-defined thresholds, making interpretation simple – Component reporting feature that allows textual reporting based on method-defined quantitative results – Supports predefined and customized report templates MicroLab Lite Software for offline review, analysis, and reporting of FTIR data MicroLab Quant Easy and intuitive software for the development and verification of quantification models – Direct feedback showing how any model adjustments influence model quality visualization – Evaluation of quantification models with cross or independent sample validation – Seamless data integration for easy use of IR spectra and quantification models across MicroLab applications MicroLab OQ Automated operational qualification (OQ) software that can be used to routinely verify instrument performance – Intuitive, pictorial interface that guides users through the qualification process – Ability to conduct a series of tests that validate all aspects of instrument performance against Agilent specifications
Optional Data Compliance Software	MicroLab Pharma software Agilent MicroLab Pharma software provides features that support data integrity compliance as required by regulations, including: – Log-on security – User management and permissions – Data security to ensure the authenticity and integrity of records – Electronic signature capability – Audit trail capability and system log information – Validation of system performance – Reporting capabilities These features provide the tools needed for compliance with data integrity regulations while retaining the versatile, easy-to-use nature of the standard MicroLab software package for FTIR spectroscopy. This optional software is ideal for GMP environments.
Optional Software Package	MicroLab Expert software The optional Agilent MicroLab Expert software is ideal when more advanced data processing, visualization, and analysis tools are required, balancing ease of operation with sophisticated data handling. Features of MicroLab Expert software include: – Instrument control of Agilent FTIR spectrometers and seamless transfer of data and methods between the MicroLab software suite and MicroLab Expert – 2D and 3D data visualization tools – IR interpretation and functional group analysis – Advanced data evaluation and mathematics – Optional Chemometrics and Prediction module featuring a calibration model wizard that guides the creation and editing of quantitative calibration models; models can be deployed and integrated into the easy-to-use MicroLab software – Optional Reaction Monitoring module for reaction monitoring, trend analysis, and process analysis, featuring a simple reaction wizard that allows the quick-and-easy setup of new reaction runs
Included Spectral Libraries	A set of libraries is automatically installed as part of the standard MicroLab software installation process: – Agilent Elastomer O-ring and Seal Handheld ATR Library – Agilent Polymer Handheld ATR Library – ATR Demo Library 10K Spectral Library Collection The Agilent 10K Spectral Library Collection contains approximately 10,000 spectra organized into eight separate spectral libraries: – Introductory Library – 300 spectra of common and typical compounds – Gas Library – 80 spectra of common gases – Pharmaceutical Library – 2,423 spectra of common European over-the-counter and prescription drugs – Gas Phase Library – 3,287 vapor phase spectra – Paint Library – 1,975 spectra of automobile paints – Drug Library – 1,650 spectra of drugs and drug-related compounds – Minerals Library – 52 spectra of minerals and geological samples – Polymer Library – 199 spectra of common polymers
Optional Spectral Libraries	Optionally, the following FTIR-ATR starter libraries are available: – FTIR Starter Library: Polymers Contains more than <i>10,000 ATR-FTIR spectra</i> specifically curated for polymer-related industries – FTIR Starter Library: Pharmaceuticals Contains more than <i>10,000 ATR-FTIR spectra</i> of pharmaceutical, biochemical, and food-related substances – FTIR Starter Library: Forensics Contains more than <i>10,000 ATR-FTIR spectra</i> tailored to forensic and hazardous material analysis Additionally, Agilent offers a large selection of over 80 ready-to-use, application-specific FTIR libraries.

Interfaces	Communication: USB 2.0 with secure nut fastener Power: AC power with secure nut fastener Reliable nut fastener connections maintain secure attachment, even in demanding or busy environments. Module recognition: RFID interface for wireless, instant identification of the attached sampling module	
Humidity and Atmospheric Vapor Protection	The Cary 635 FTIR engine enclosure is sealed and desiccated to protect the instrument from humidity and atmospheric vapor. Due to its ultra-compact form factor and modular design, the Cary 635 FTIR incorporates a short optical path, effectively minimizing the impact of atmospheric moisture. So, post-acquisition algorithms for water vapor compensation—which may introduce spectral distortion—are unnecessary.	
Detector	High-sensitivity thermoelectrically cooled deuterated triglycine sulfate (DTGS) detector - Wide spectral range with a more linear response, reducing the need for data pre-processing and segmentation when developing quantification modules - No need for cryogenic cooling	
Infrared Light Source	Kanthal-coated, wire-wound coil element in alumina-based ceramic enclosure - Parabolic reflector optimized for maximum throughput and minimum divergence - Precise temperature control and effective heat management, enabling exceptional IR emission in the ultracompact design of the Cary 635 FTIR while keeping the instrument cool enough to touch, even after hours of use - User-replaceable lamp module that reduces service costs and ensures higher instrument uptime - Intelligent IR Emitter Drive System that optimizes IR light output while minimizing energy consumption	
Interferometer	Permanently aligned 45° Michelson Flexure interferometer with 25 mm optical aperture The unique design of the interferometer—also used in Agilent out-of-lab and handheld FTIR systems—provides high stability. Compared to dynamically aligned interferometers, the permanently aligned interferometer maintains spectral resolution even with vibration, such as when the instrument is moved between measurements. In contrast to cube corner mirror-based interferometers, the Michelson Flexure interferometer is extraordinarily robust as it does not require a series of reflecting mirrors, reducing the risk of poor signal and decreased sensitivity.	
Laser	Low-powered, solid-state laser for high wavenumber accuracy and precision	
Warranty on Infrared Light Source	5 years	For Cary 635 FTIR systems purchased directly from Agilent or participating partners
Warranty on Laser Diode	10 years	
Warranty on Interferometer	10 years	

Performance

Spectral Range	5,100 to 600 cm^{-1} with ZnSe optics 7,000 to 350 cm^{-1} with KBr optics	
Spectral Resolution	Better than 2 cm^{-1}	Resolutions better than 4 cm^{-1} are generally only required for specific gas analysis applications
Signal-to-Noise	Transmission module: ZnSe optics: better than 33,000:1 KBr optics: better than 27,000:1	Di-ATR module: ZnSe optics: better than 15,000:1 KBr optics: better than 10,000:1
Wavenumber Precision	$\leq 0.005 \text{ cm}^{-1}$ at 1,028.30 cm^{-1}	Standard deviation of 10 repeated measurements; Measured with a NIST 1921 traceable standard
Wavenumber Accuracy	$\leq 0.05 \text{ cm}^{-1}$ at 1,028.30 cm^{-1}	Measured with a NIST 1921 traceable standard
Transmission Precision	$\leq 0.008\%$ T at 1,028.30 cm^{-1}	Measured with a NIST 1921 traceable standard
Ordinate Linearity	Better than 0.15% T deviation from 0.0% T	Based on ASTM 1421
Stability	Better than 0.1%	%T drift over 30 min at 1,028 cm^{-1}
Sampling Speed	145 spectra per minute at 4 cm^{-1} resolution 80 spectra per minute at 2 cm^{-1} resolution	Allows for more spectrum co-additions in a given measurement time

Dimensions

Engines

	Weight		Height		Depth		Width	
	kg	lbs	cm	in	cm	in	cm	in
Cary 635 FTIR KBr Engine	2.9	6.4	14.0	5.5	21.6	8.5	15.7	6.2
Cary 635 FTIR ZnSe Engine	2.9	6.4	14.0	5.5	21.6	8.5	15.7	6.2

Sampling Modules

When attached to the Cary 635 FTIR engine, including moving parts:

	Weight		Height		Depth		Width	
	kg	lbs	cm	in	cm	in	cm	in
Transmission Module	1.7	3.7	13.3	5.25	13.2	5.2	17.8	7.0
Di ATR Module	1.1	2.4	22.8	9.0	8.2	3.25	7.6	3.0
DialPath Module	1.3	2.8	18.0	7.0	8.2	3.25	7.6	3.0
TumbIR Module	1.3	2.8	22.8	9.0	8.2	3.25	9.5	3.75
Ge ATR Module	1.1	2.4	22.8	9.0	8.2	3.25	7.6	3.0
ZnSe ATR Module	1.1	2.4	22.8	9.0	8.2	3.25	7.6	3.0
Multireflection ZnSe ATR Module	0.7	1.5	13.3	5.25	8.2	3.25	7.6	3.0
Diffuse Reflectance Module	0.6	1.3	10.1	4.0	4.8	1.9	7.4	2.9
10° Specular Reflectance Module	0.7	1.5	14.0	5.5	8.2	3.25	7.4	2.9

For mounting in the Transmission Module:

	Weight		Height		Depth		Width	
	kg	lbs	cm	in	cm	in	cm	in
45° Specular Reflectance Module	0.3	0.6	4.7	1.85	5.0	2.0	7.0	2.75
Gas Cell	0.5	1.1	5.0	2.0	5.0	2.0	5.7	2.25

Electrical requirements

Line Voltage and Frequency	Mains supply: 100 to 240 V AC, 0.93 A, frequency 50 to 60 Hz
Maximum Power Consumption	For engine: 240 VA (60 W)

Recommended environmental conditions

	Cary 635 FTIR Engine Option	Operational/Powered	Storage/Not Powered
Humidity Range (%)	KBr	15 to 40%, noncondensing	15 to 40%, noncondensing
	ZnSe	15 to 80%, noncondensing	15 to 40%, noncondensing
Temperature Range	KBr	5 to 45 °C (–32 to 113 °F)	–30 to 60 °C (–22 to 140 °F)
	ZnSe		
Altitude	KBr	Up to 2,000 m	N/A
	ZnSe		

Installation requirements

System installation

For details of installation requirements, refer to the [Agilent Cary 635 FTIR Site Preparation Checklist](#), publication number SD-MA000358.

Service options

Agilent is renowned for providing expert applications and service support. A global network of factory-trained specialists is ready to provide support for hardware, software, or applications wherever you are located.

Services include:

- Preventive maintenance to deliver consistent operation and minimize downtime
- Troubleshooting, maintenance, and repair
- Software support services
- Comprehensive warranty extension and service contracts, including peripherals
- Classroom training and onsite training delivered by experts

Customer support policy

Warranty

Twelve (12) months, though this may vary according to location.

Agilent service guarantee

If we cannot fix an instrument covered by an Agilent CrossLab service plan during the guaranteed support window, our escalation process will resolve the issue up to, and including, replacing your instrument free.* No other manufacturer or service provider offers this level of commitment to keeping your lab running at maximum productivity.

***Conditions apply.**

Agilent value promise

We guarantee you at least 10 years of instrument use from your date of purchase, or we will credit you with the residual value of the system toward an equivalent model.

Further details

For further information, please consult your Agilent office or supplier, or our website at www.agilent.com.

www.agilent.com

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