

Agilent Cary 8454 Spectrophotometer

ULTIMATE IN PERFORMANCE, RELIABILITY AND COMPLIANCE

The Measure of Confidence



Agilent Technologies

PROVEN DIODE ARRAY TECHNOLOGY

Agilent Technologies is your premier resource and partner for molecular spectroscopy. The world-renowned Cary product line, encompassing FTIR, UV-Vis-NIR, and Fluorescence, offers you a comprehensive range of molecular spectroscopy solutions.

The leader in diode array technology

Agilent Technologies continues its leadership in diode array technology with the Agilent Cary 8454 UV-Vis spectrophotometer. The Cary 8454 provides the performance you expect from an Agilent diode array with the analysis benefits of Agilent's UV-Visible ChemStation software.

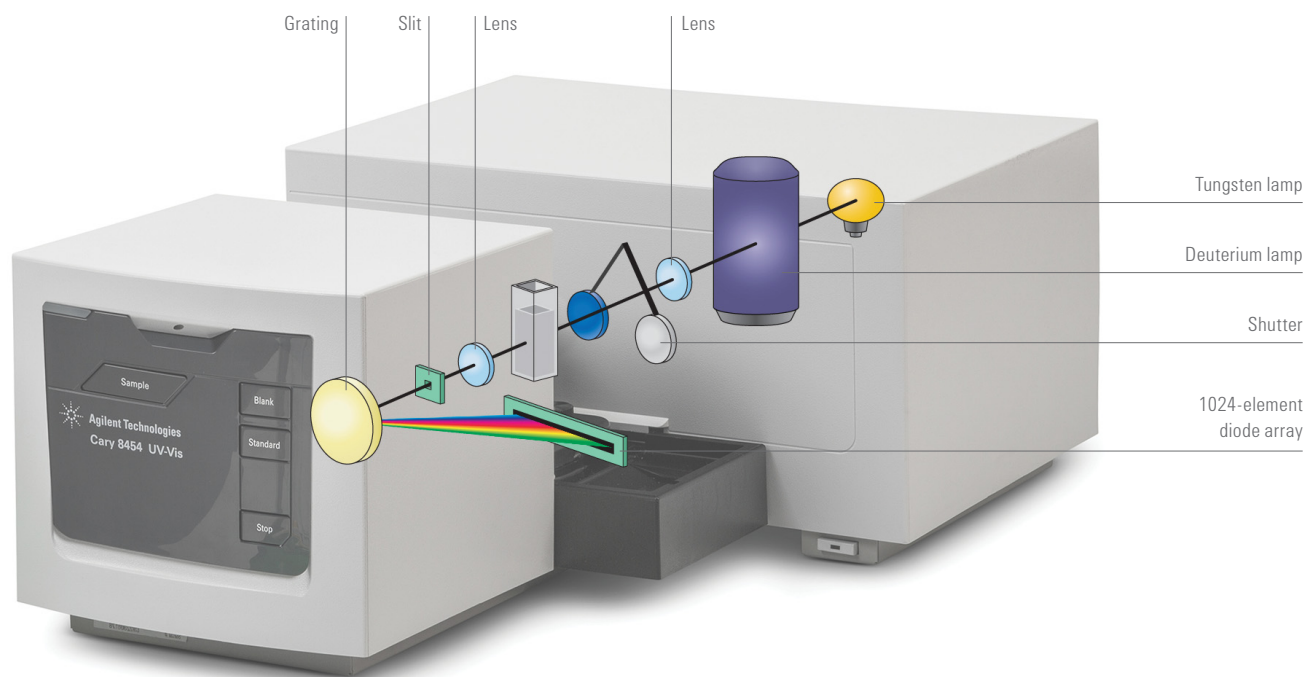
- **Fast reliable performance** — acquire a complete spectrum in as little as 0.1 seconds and obtain accurate and repeatable results across the entire UV-Vis spectrum, every time.
- **Proven compliance solutions** — Agilent diode array spectrophotometers have served the pharmaceutical industry for decades and can offer a complete suite of services to assist with validation needs. Single workstation 21 CFR Part 11 software is available, and UV-Visible ChemStation when integrated with OpenLAB ECM, also offers a network solution that helps meet the requirements of 21 CFR Part 11. OpenLAB ECM provides a secure storage solution for all laboratory data, and combines seamlessly with other Agilent equipment in your laboratory.



- **Seamless upgrade** — with the largest install base of diode array UV-Vis instruments in the market, we have ensured transitioning to a Cary 8454 will be seamless and transparent. Agilent support tools simplify the transition from existing Agilent 845x systems, ensuring you will be running your existing SOPs in minutes.

QUALITY AND PERFORMANCE BY DESIGN

The innovative design of the Cary 8454 results in a high performance, robust and reliable spectrophotometer that maximizes up-time and lowers cost of ownership.



Superior optical design

The Cary 8454 uses a very efficient optical system that allows all light to go through the sample for excellent throughput and sensitivity. Light of all wavelengths falls on the array and is measured simultaneously for instantaneous spectral acquisition.

Open sample area

The optical design means the instrument is not sensitive to ambient room light and allows for an open sampling area. This provides ease of access for improved sample handling and sample presentation with the Cary 8454.

Fastest data collection

The Cary 8454 gives reliable, repeatable spectroscopy results across the entire UV-Vis spectrum in as little as 0.1 sec. Save time by not waiting for your result!

No moving parts

With no moving parts that affect the sample measurement, and a compact and rigid optical bench, the Cary 8454 is exceptionally rugged and reliable and requires virtually no maintenance.

ACCURATE AND RELIABLE RESULTS

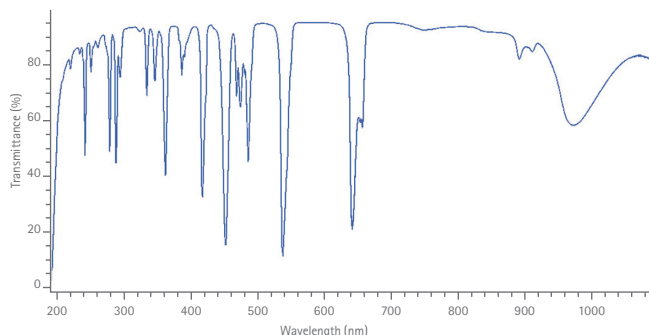
With over 30 years of experience and leadership in diode array technology, you can be assured of the reliable performance of the Cary 8454.

The power of Agilent diode array technology

The Cary 8454 spectrophotometer uses a photodiode array (PDA) for simultaneous measurement of the complete ultra-violet to visible light spectrum in as little as 0.1 seconds.

Discover the advantages of the Cary 8454:

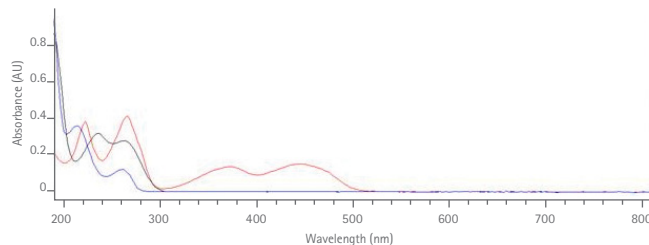
- Fast spectral acquisition allows for:
 - complete identification and purity of the sample
 - trouble shooting of “out of specification” test results in a regulated environment
 - validation and re-validation of methods
 - multi-wavelength applications such as analyzing complex kinetic experiments
 - multi-component analysis of mixtures
- Exceptional ruggedness and reliability resulting in maximum uptime and low cost of ownership. The Cary 8454 diode array has no moving parts that affect the measurement
- Accurate and repeatable results inherent to Agilent diode arrays, ensuring a smooth transition path for regulatory methods and SOPs
- An open sample area for convenient sample handling.



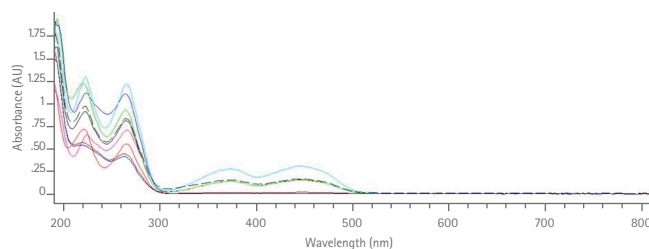
Superior wavelength reproducibility

To determine wavelength accuracy and reproducibility, a NIST-traceable solution of holmium oxide is measured ten times and this graph shows the ten overlaid spectra. The Cary 8454 diode array has excellent wavelength reproducibility as there are no moving parts that affect measurement. The fixed optical design means you can rely on your results – every time.

Multi-component analysis



Standard spectra of B vitamins – B1, B2 and B3.



UV-Vis spectra of multivitamin mixtures

The spectra of the pure vitamins were used to determine the vitamin concentration in the mixtures using multi component analysis– without separation or purification steps!

SOLUTIONS FOR CHEMICAL ANALYSIS

From research to method development, satisfy the diverse needs of chemical laboratories

Whether in an industrial QA/QC environment, or a research laboratory in a university, the Cary 8454 provides the software and hardware solutions to simplify your workflow, increase productivity and provide you with accurate answers...fast.

- Perform time-based measurements – the Cary 8454 collects an entire spectrum in as little as 0.1 seconds!
- Increase productivity with the Agilent sipper and XY autosampler
- Obtain answers quickly using built-in analysis software
- Study complex systems using multi-component software

Save time and improve productivity with the Cary 8454 – no more waiting for results as the Cary 8454 acquires a full spectrum while the UV-Visible ChemStation displays results instantaneously.

Tools for Data Analysis

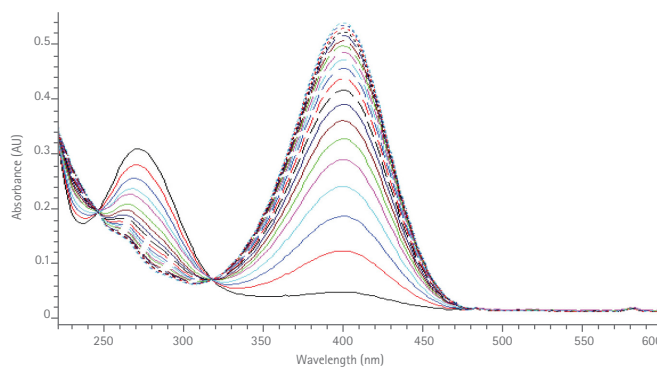
The UV-Visible ChemStation software provides unprecedented capability for data analysis:

- Method development tools to ensure the best parameters are used – evaluation of standards, compare calibrations and optimize analysis wavelength
- Mathematical functions including multi-component analysis (MCA) – a real alternative for time consuming and expensive separations
- Flexibility for single or multi-wavelength analysis.



Setting up a multi-wavelength analysis is as easy as 1, 2, 3

- 1 Select the task you want**
Fixed Wavelengths
Spectrum/Peaks
Ratio/Equation
Quantification
- 2 Enter the parameters**
Fixed Wavelength(s) Parameters
Wavelength: 300 340 380 420 460 500 540 580 600 nm
Background correction: none
 Export for sample information
Data type: Display spectrum
Absorbance
From: 300 nm To: 600 nm
OK Cancel
- 3 Do the measurement**
Sample



Multi-wavelength analysis made easy

The Cary 8454 UV-Vis is ideal for kinetics applications where speed is vital, and using UV-Visible ChemStation, it is easy to open existing data and reanalyze the data at any wavelength. Whether for kinetics analysis or for determining concentration, the capability to work with the full spectrum provides great analytical value.

SOLUTIONS FOR PHARMACEUTICAL ANALYSIS

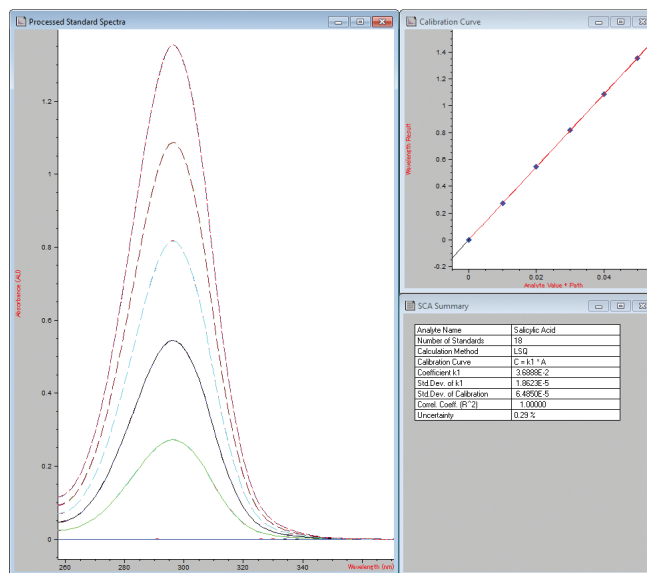
Leading the way in pharmaceutical analysis

Agilent diode array spectrophotometers have served the pharmaceutical industry for decades. Leveraging Agilent's strong presence in the pharmaceutical market through its liquid chromatography solutions, the diode array UV-Vis has been the instrument of choice in which hundreds of methods and SOPs have been established.

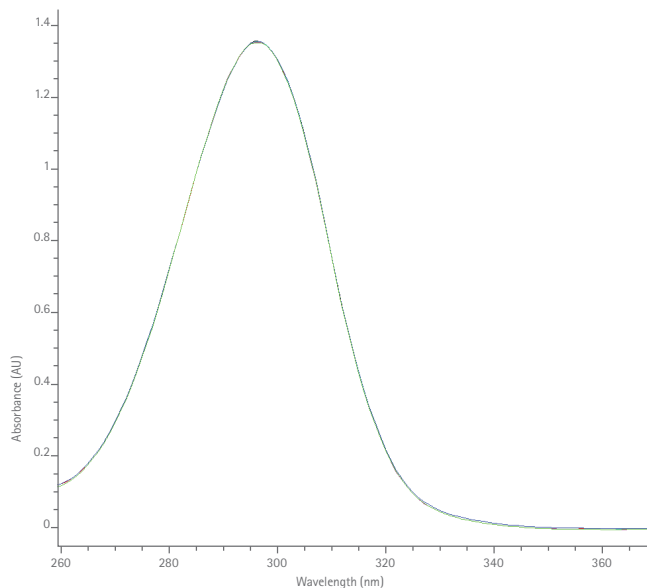
The Cary 8454 continues the tradition of providing the ideal platform for you to either upgrade or expand.

- Developed by the leader in diode array technology, the Agilent Cary 8454 provides 100% compatibility with the 8453 and its predecessors, resulting in a smooth and seamless transition to a new platform
- From software tools such as electronic signatures and data security to help meet 21 CFR Part 11 requirements, and hardware that meets all requirements of the European and United States Pharmacopeia, the Cary 8454 system assists you to achieve regulatory compliance
- With no moving parts to affect data acquisition, the Cary 8454 is the most rugged and reliable UV-Vis on the market, providing low ongoing cost of ownership and maximum up-time.

Smooth and seamless method transfer – have the result in minutes!



UV-Visible ChemStation showing triplicate salicylic acid standards, and calibration at 297 nm, collected on the Cary 8454 using a method generated on an 8453 UV-Vis.



Overlay of triplicate spectra collected on the Cary 8454 UV-Vis and the 8453 of 0.05 mg/mL salicylic acid.

Transfer methods from the 8453 quickly and with confidence. Run the same experiment on the Cary 8454 UV-Vis spectrophotometer in minutes and achieve accurate, reproducible data for sample measurements to produce results to keep your laboratory running.

GOOD LABORATORY PRACTICE

No. 1 for compliance solutions

Agilent plays a leading role in defining the Good Laboratory Practice (GLP) related responsibilities of analytical manufacturers and users. Agilent incorporates features in its products that enable you to comply with GLP regulations quickly, reliably, and productively.

Agilent offers a comprehensive portfolio of service plans and regulatory compliance services to help achieve validation of the 8454 UV-Vis system and its components to ensure the highest levels of reliability and performance.

Standards kits

OQ/PV is made even easier using an Agilent standards kit, which meets the needs of both the United States and European Pharmacopoeias. The kit includes standard solutions in snap-open glass ampoules which are inexpensive, easy-to-use, and traceable. The standards let you check for photometric accuracy, wavelength accuracy, stray light and resolution.

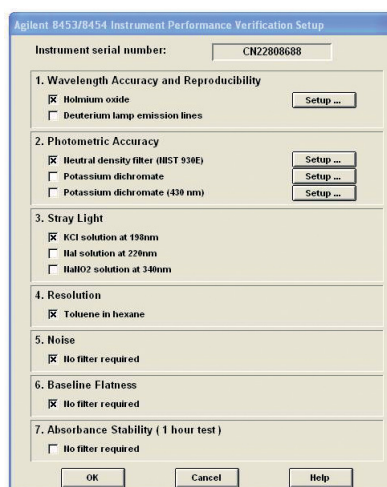
21 CFR Part 11

The Agilent UV-Visible ChemStation software can be configured to support the requirements for electronic records and signatures for a closed system as defined in FDA 21 CFR Part 11. Tools and products for system installation and operational qualification also complete this solution. Key features include:

- Workstation or Network versions available
- Access control defined by administrator
- Method and data integrity
- Data security
- Audit trail
- Electronic Signatures.



Agilent standards kit for UV-Vis instrument operational qualification (OQ) and optional OQ hardware kit save time and support OQ procedures.



All you need for Installation or Operational Qualification (IQ, OQ) is provided for both the spectrophotometer and system software. Test methods are supported by the software to save time. IQ and OQ can be performed by the user or are available as services from Agilent.

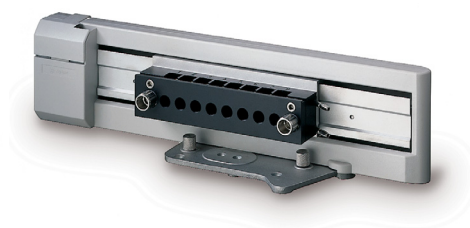
ACCESSORIES

The Agilent Cary 8454 diode array UV-Vis provides excellent sampling capabilities for liquid analysis. Coupled with Agilent's market-leading diode array technology, samples are analyzed in seconds with the highest degree of accuracy, ensuring that your UV-Vis can expand and meet your productivity needs.

Cell holders



Peltier thermostatted cell holder



Cell holders

- **Standard cell holder:** Ensure quick and precise cell positioning for each measurement. Supplied as standard.
- **Thermostattable cell holder:** When connected to a water recirculating bath, ensures constant sample temperature for temperature sensitive analyses. Magnetic stirring available as an option.
- **Peltier Thermostattable cell holder:** Use the peltier for precise temperature control (10–70 °C). Includes magnetic stirring.
- **Long pathlength cell holder:** Holds rectangular and cylindrical cells with pathlengths up to 100 mm.

Multicell transport

The multicell transport provides a significant increase in productivity when you need to do simple, repetitive measurements on a small number of samples, or when you want to follow changes in several samples (for example, enzyme kinetic studies).

Key features include:

- Software controlled
- Eight cell positions
- Water-thermostattable using external water bath (5–90 °C)
- Less than 1 second to move between adjacent cells
- Magnetic stirring.

Sipper

For measurement of liquid samples, the sipper system improves productivity and eliminates errors caused by manual sample handling. Includes a peristaltic pump and quartz flow cell. Key features include:

- Software controlled
- Variable pump, delay, and return time
- Flow cell with 10 mm pathlength, 3 mm diameter, and 80 µL volume
- Constant-speed peristaltic pump with Tygon pump tubing
- Minimum sample volume of approximately 1 mL
- Typical sampling time of 20 seconds
- Ideal for use with autosampler.

ACCESSORIES AND RELATED SOLUTIONS



Autosampler

Combine an XY autosampler with a sipper system to measure large numbers of samples fully automated and unattended. Key features include:

- Software controlled
- Capacity for up to 240 samples
- Wash station for optional rinsing between samples
- 10–13 mm diameter sample tubes with maximum height of 100 mm
- Typical transit time (adjacent samples) of approximately 6 seconds (including raising and lowering probe)
- Typical time per sample of 25 seconds (including sipper operation time)
- Minimum sample volume of 2 mL.



Dissolution Testing

Connect Agilent tablet dissolution test baths to the Cary 8454 for the ultimate in dissolution testing. Agilent is the only company to provide an “Agilent-only” integrated dissolution system to ensure that you get all components from a single supplier. Key features include:

- Dedicated software controls bath operation and all calculations and reports
- Multi-component software for studying complex systems
- Allows compliance with 21 CFR part 11
- Multicell based sampling system
- Valve-based sampling system
- Multi-bath sampling for increased productivity.



Consumables for UV-Vis

Agilent’s range of UV-Vis consumables includes cuvettes, flow cells and lamps.

SOFTWARE TOOLS TO SUPPORT COMPLIANCE

OpenLAB ECM Compliance Pack for UV-Visible ChemStation

A direct 21 CFR Part 11 compliant link to OpenLAB ECM from UV-Visible ChemStation

Efficient Data Storage and Retrieval

- Centralized storage for UV-Visible ChemStation methods and results files

Security

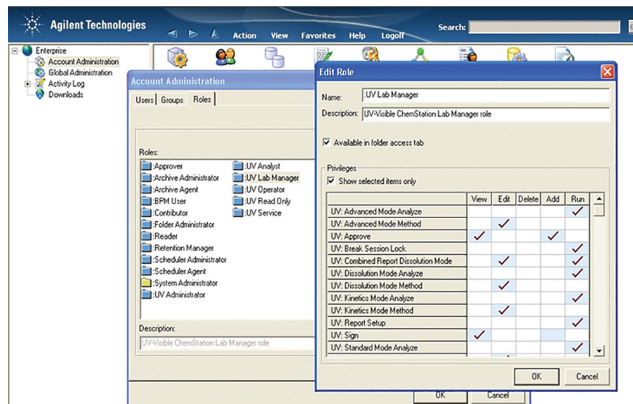
- Comprehensive data security
- Access for registered users with assigned privileges

Data integrity and traceability

- Maintain file revision and history
- Comprehensive audit trail
 - Trail of who has what item
 - Trail of when an item was uploaded
 - New central UV-Visible ChemStation enhanced audit trail

21 CFR Part 11 Compliant

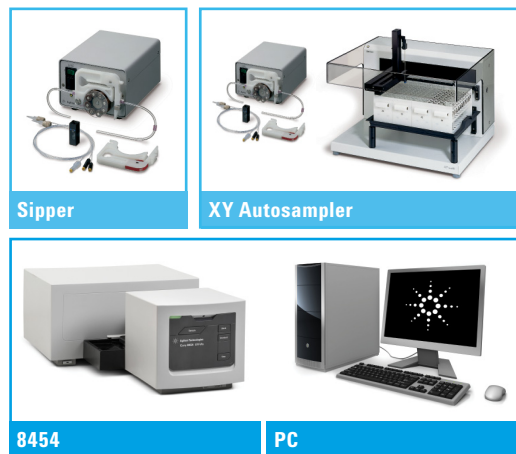
- Designed to support FDA regulations for
 - Data integrity and traceability
 - Electronic signatures
 - Archival capabilities



New UV: ChemStation privileges and profiles in OpenLAB ECM allow customized user access to UV-Visible ChemStation. Allow varying levels of method manipulation, data analysis, system access and system validation.

Cary 8454 spectroscopy system with UV-Vis ChemStation software

Sampling Systems



Add-on software modules

Security Pack OR OpenLAB ECM Compliance Pack for 21 CFR Part 11		
Advanced	Dissolution Dissolution testing Multibath dissolution testing Combined report	Biochemical Analysis Kinetics Thermal denaturation
General Purpose Standard tasks Verification and diagnostics		

Agilent Molecular Spectroscopy Innovations

1947 First commercial recording UV-Vis, the Cary 11 UV-Vis	1954 Release of the Cary 14 UV-Vis-NIR	1969 First rapid scanning fourier transform infrared spectrometer, the FTS-14	1977 Release of the Cary 219 UV-Vis	1979 First commercial diode array spectrophotometer, the 8450A	1983 Launch of HP 1090 LC systems featuring Diode Array and Low Dispersion Technology	1989 Release of the acclaimed Cary 1 and 3 UV-Vis	1995 Launch of the 8453, the first small-footprint, full-featured diode array
1997 Cary 50 released to coincide with 50th anniversary of Cary 11	1999 Cary Eclipse Fluorescence Spectrophotometer released	2002 Cary 4000/5000/6000i research grade UV-Vis-NIR series released	2008 Agilent releases the Cary 620 FTIR Imaging Microscopy Series	2011 Agilent offers out-of-lab FTIR solutions. Agilent releases the Cary 60 UV-Vis	2011 Compact, versatile Cary 630 FTIR introduced	2013 Launch of the Cary 7000 Universal Measurement-Spectrophotometer (UMS)	2014 Launch of Cary 8454 UV-Vis. Next Generation of Handheld FTIR introduced

Solutions for routine and QA/QC applications

Agilent's has a range of molecular spectroscopy instruments for routine and QA/QC applications:



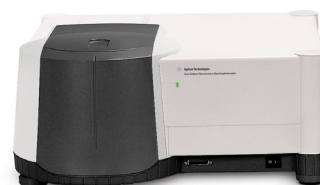
Cary 60 UV-Vis

The market leader in xenon flashlamp technology measures micro volume liquids or is ideal for remote sampling with fiber optics.



Cary 630 FTIR

The smallest bench top FTIR packs the biggest punch with superior performance, unique sampling capabilities and intuitive software.



Cary Eclipse Fluorescence

The only fluorescence instrument to have room-light immunity, the Cary Eclipse is flexible for measurements from kinetics to solid samples.

Our catalog of new applications is ever growing.

To learn about the latest, contact your local Agilent Representative or visit us at:

www.agilent.com

Find out how Agilent's Molecular Spectroscopy Solutions can deliver the performance, accuracy and flexibility you need. Learn more:

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For more information

For full details of the Agilent Cary range of molecular spectroscopy products, ask for a brochure or visit our web site at www.agilent.com/chem/molecularspec

Trust Agilent to keep your lab running — at peak productivity

Agilent's Advantage Service protects your investment in Agilent instruments and connects you with our global network of experienced professionals who can help you get the highest performance from every system in your lab. Count on us for the services you need at every stage of your instrument's lifecycle — from installation and upgrade to operation, maintenance and repair.

For customers who require full system validation, Agilent offers complete qualification services (Installation and Operational Qualification) for all Cary 8454 UV-Vis and UV-Vis-NIR hardware, software and accessories.



And if ever your Agilent instrument requires service while covered by an Agilent service agreement, we guarantee repair or we will replace your instrument for free. No other manufacturer or service provider offers this level of commitment.

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