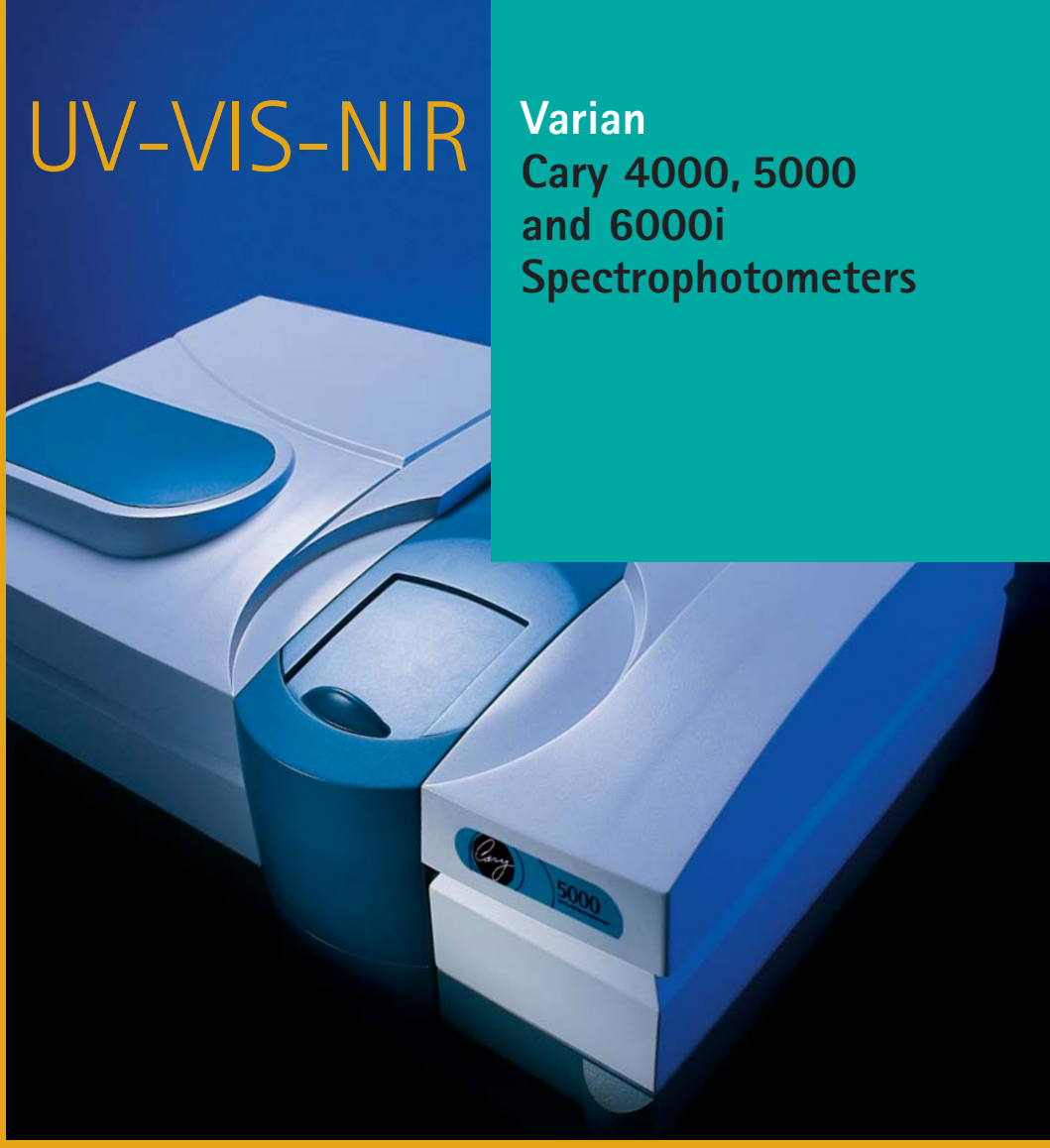
UV-VIS-NIR

Varian
Cary 4000, 5000 and 6000i Spectrophotometers



VARIAN

Varian's Cary® range of UV-Vis-NIR spectrophotometers has been synonymous with excellence and high performance for over 50 years.

The Cary range has become the standard for researchers wanting to extend the boundaries of spectrophotometric measurement techniques.

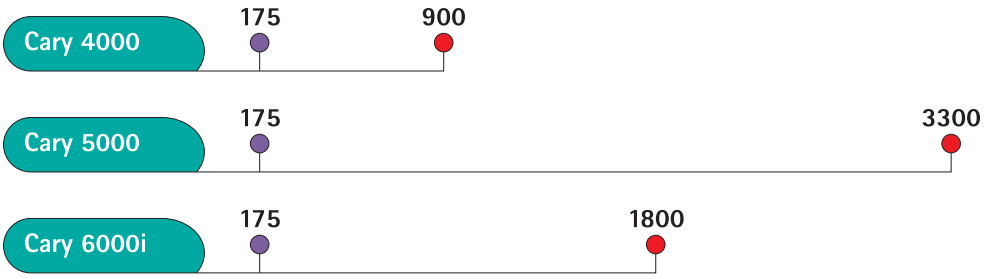
The range is equally at home in routine laboratories where reliability and ease-of-use are vital. In fact, no matter what your measurement challenge, Varian's Cary product range has a solution for you.

The new generation Cary series
Now, Varian introduces the latest breakthrough in UV-Vis-NIR: the new generation Cary series. Comprising the Cary 4000, 5000 and 6000i instruments, this research grade series sets new standards for UV-Vis-NIR performance. With unsurpassed photometric accuracy and a wide range of flexible accessories, the new Cary series satisfies all your measurement needs and is the only choice for researchers who need to stay at the forefront of their field.

Cary 4000
Offering the ultimate in UV-Vis photometric performance from 175-900 nm, the Cary 4000 sets the industry standard for research and reference spectrophotometers.

Cary 5000
With innovative PbSmart™ technology, the Cary 5000 extends the unparalleled Cary performance into the NIR to 3300 nm.

Cary 6000i
Having provided the world's first UV-Vis NIR spectrophotometer with InGaAs detection, the Cary 6000i represents the second generation of this technology. No other instrument can match the NIR performance of the Cary 6000i.



The wavelength ranges of the Varian Cary 4000, 5000 and 6000i instruments.


VARIAN
Cary
5000

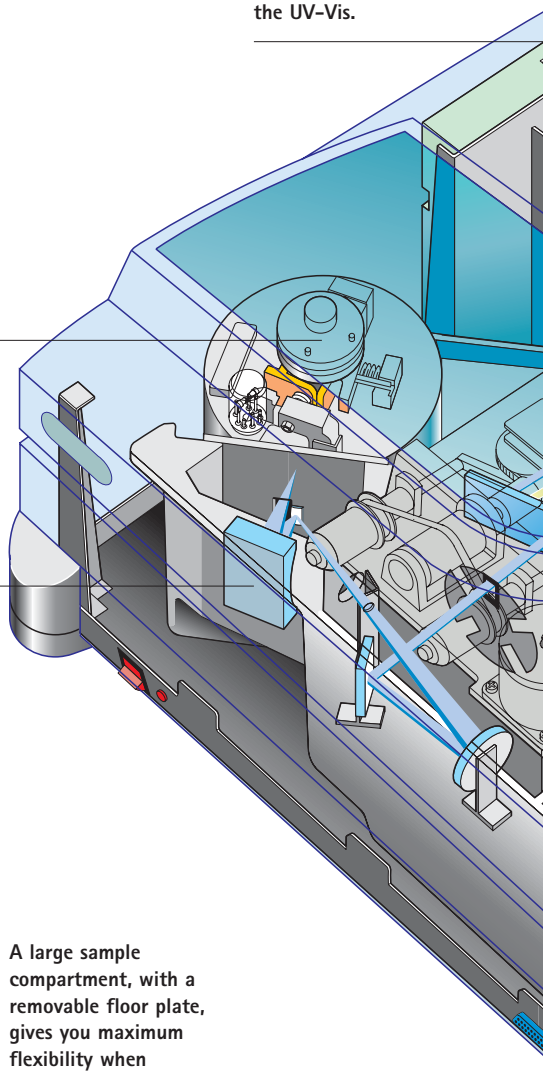
What's inside?

The new generation Cary series features the Optical Isolation System, which provides all the optical stability of an independently mounted, research grade optical bench. Vibrational noise is reduced, as the optics casting is mounted on an isolated system which floats independently of the spectrophotometer cover and sample compartment. The system has also been insulated from vibrational effects, so you can be sure that your laboratory environment won't affect your instrument's performance.

The Cary 4000/5000/6000i instruments also feature the unique LockDown™ mechanism that ensures you can mount accessories in the sample compartment quickly, easily and reproducibly. With the Cary LockDown mechanism, you'll spend less time on setup and more time on analysis.

The slits can be fixed in the NIR as well as the UV-Vis.

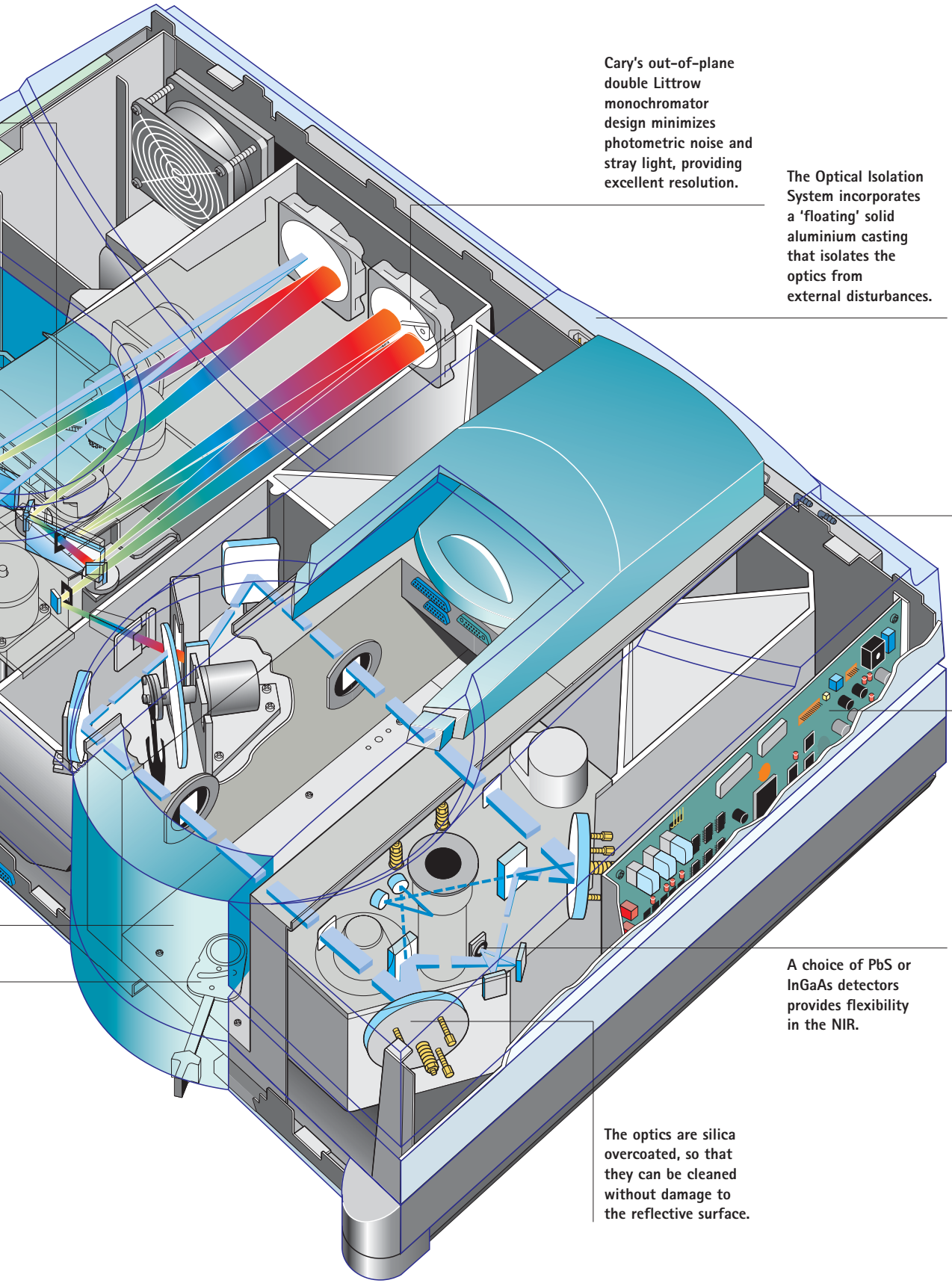
With 'Plug-and-Go'™ lamp management, lamps are now easily replaced and pre-aligned, requiring no adjustment. The lamp management electronics ensures that a wider range of lamp designs can be accommodated.



Schwarzchild coupling optics ensure the maximum level of light throughput. This produces more accurate measurements at low transmission levels.

A large sample compartment, with a removable floor plate, gives you maximum flexibility when mounting samples.

The unique precision LockDown mechanism allows you to position your accessories quickly and reproducibly in the sample compartment.



Cary's out-of-plane double Littrow monochromator design minimizes photometric noise and stray light, providing excellent resolution.

The Optical Isolation System incorporates a 'floating' solid aluminium casting that isolates the optics from external disturbances.

The monochromator and sample compartments have separate nitrogen purging capabilities, allowing the sample compartment to be purged at a higher rate than the instrument.

The extended dynamic range of the Cary instruments is a result of its advanced electronics design. With reference beam attenuation, the instruments can typically measure absorbances beyond 8.

A choice of PbS or InGaAs detectors provides flexibility in the NIR.

The optics are silica overcoated, so that they can be cleaned without damage to the reflective surface.

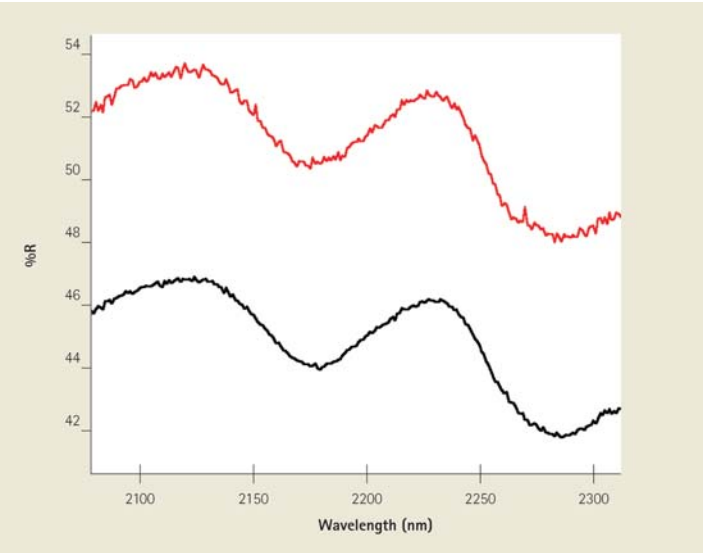
Unparalleled performance

The new generation Cary range begins with the Cary 4000. This instrument sets the standard for photometric noise, range and linearity, providing excellent resolution across the UV-Visible spectrum from 175-900 nm. Featuring Varian's new Optical Isolation System, the Cary 4000 provides advances in noise and stray light reduction, making it ideal for the most challenging research applications or as your own primary reference UV-Vis spectrophotometer.

The Cary 5000 combines unparalleled Cary performance with Varian's innovative PbSmart technology, extending the wavelength range into the NIR to 3300 nm. PbSmart optimizes the performance of the PbS NIR detector in real time, providing noise and linearity performance never before achieved using this detector technology.

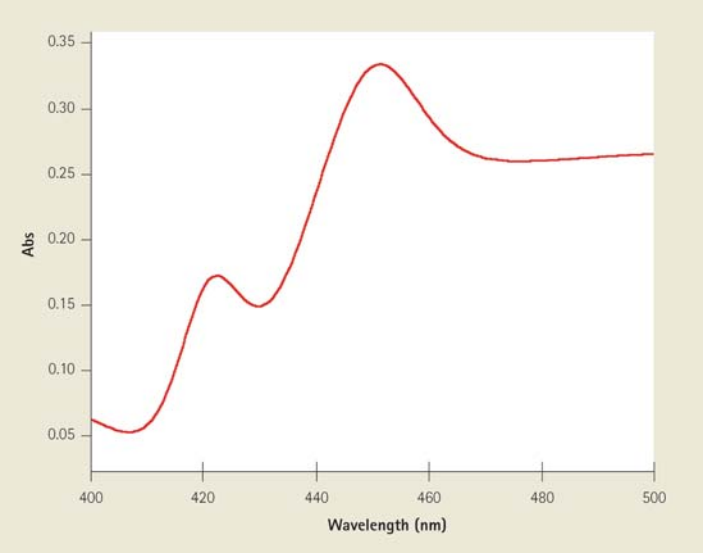
The Cary 5000 can be used to achieve significant performance breakthroughs across a range of applications—from quantifying out-of-band blocking characteristics of band pass filters or measuring the high transmission of next generation fibre optic materials to QC applications for testing of raw materials or finished pharmaceutical products.

Demonstrating signal-to-noise (S:N) scanning mode, this scan shows the excellent precision obtained at both high and low transmission values for this reference filter. Shown here is the same sample measured with (bottom) and without (top) S:N scanning mode.



Signal-to-noise (S:N) mode is a unique scanning mode available only on the Cary instruments. It allows you to control the level of precision you want across the whole scan. This saves time because the system will scan quickly in areas of high energy throughput and slow down in areas where the energy throughput is less. In addition, S:N mode provides the same precision throughout the lifetime of the instrument, no matter what its age. This makes S:N scanning ideal for standards and reference laboratories and laboratories conforming to strict regulatory protocols.

Even at a background absorbance of over 4.5, small changes in highly turbid samples such as Cytochrome P450 can be measured.



Cary Praying Mantis Diffuse Reflectance Accessory

Cary Automated Double Aperture Accessory

Cary Variable Angle Specular Reflectance Accessory

Cary Rear Beam Attenuators

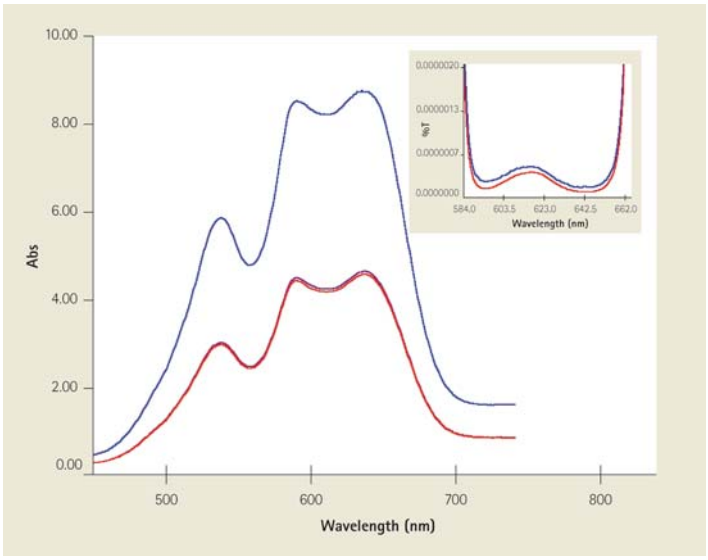
Cary Specular Reflectance Accessory

The widest photometric range

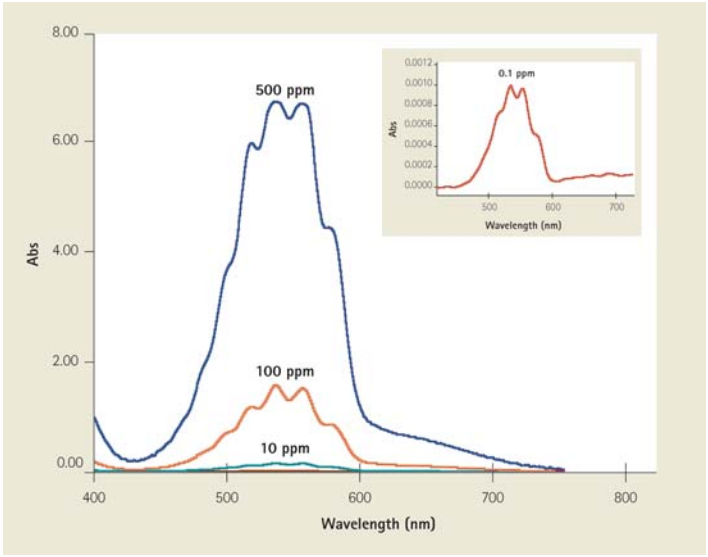
When you need to push the limits of photometric measurement, only Varian's new generation Cary spectrophotometers can break the performance barriers.
The Cary series has the widest photometric range available, across the broadest wavelength range. The instruments can measure absorbances exceeding 6 from the UV-Vis to the NIR. This means you can avoid time consuming sample and standard dilutions, and you can confidently measure the most challenging of samples. Whether you want to collect kinetics data *in situ* without dilution, or measure turbid, highly scattering biological samples without using integrating spheres, you can with a Cary instrument. And Cary's wide photometric range makes light work of the highest optical density filters and the lowest reflectance AR lenses.

Linearity
The quality of your results is only as good as the linearity performance of your spectrophotometer. Whether you're making solution measurements at the limit of detection, measuring highly absorbing chemical process streams or discerning the smallest difference in optical thickness, the superb photometric linearity of the Cary range guarantees the validity of your results.

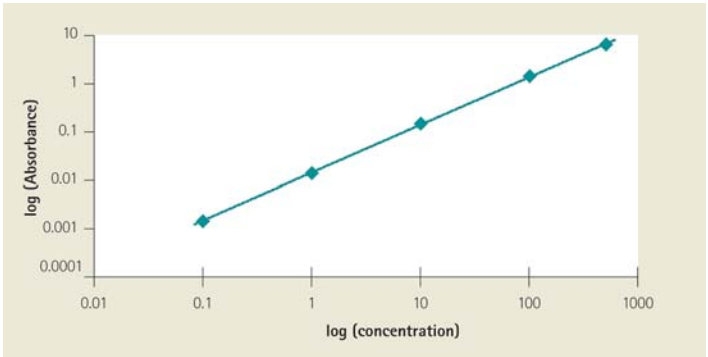
The Diffuse Reflectance Accessory is ideal for measuring a wide range of solid and liquid samples.



The addition of two blue filters shows the superior photometric range and linearity of the Cary instruments in the UV-Vis. The insert compares the spectral addition of the filters to their combined measurement, a difference of less than 8 x 10^{-8} %T.



The quantitative analysis of aqueous potassium permanganate further demonstrates the excellent photometric accuracy and range of the Cary instruments. Measurement at 555 nm permits analysis from 0.1–500 ppm without dilution. The plot of Absorbance vs Concentration (shown below) highlights the wide dynamic range and inherent linearity (r^2 = 0.999) of the Cary spectrophotometers.

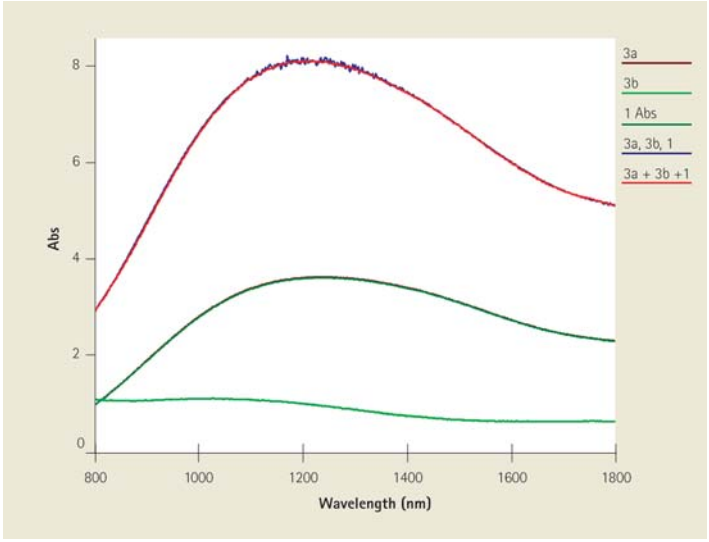


Advanced NIR performance for advanced photonics

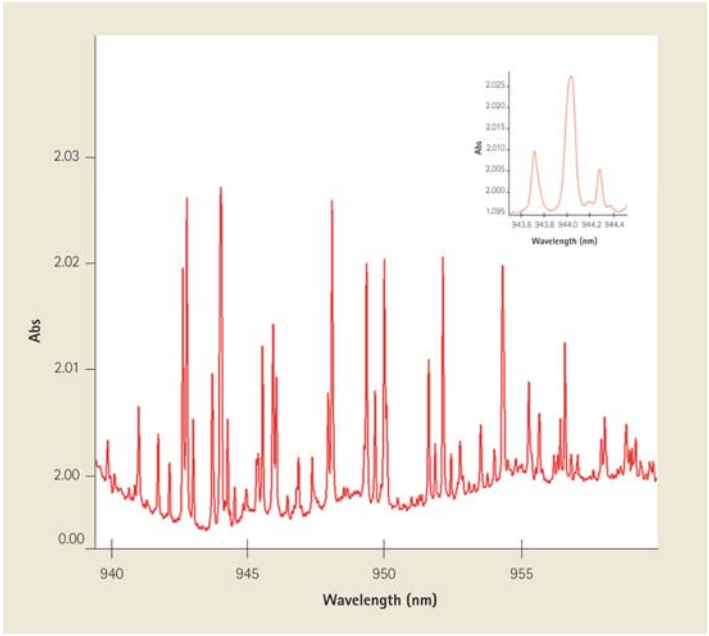
With an operating range from 175-1800 nm, the Cary 6000i is the instrument of choice for users needing to keep abreast of rapidly developing photonics and communications technologies—both now and in the future. Varian pioneered the world's first double beam UV-Vis-NIR spectrophotometer with InGaAs detection to take advantage of the dramatically reduced noise and improved sensitivity the detector provides in the NIR. The Cary 6000i represents the second generation of this technology and is the world's most advanced UV-Vis-NIR spectrophotometer with InGaAs detection.

The InGaAs detector provides superior signal-to-noise performance compared to conventional lead sulfide detectors. This results in improved detection limits and increased scan rates, giving you cleaner spectra with better resolution in less time.

The unmatched NIR capabilities of the Cary 6000i are further enhanced by the Cary Optical Isolation system and Peltier detector cooling. Like the Cary 4000 in the UV-Vis region, the 6000i can be used as a primary reference spectrophotometer in the NIR, providing absolute accuracy measurements without the need for reference to expensive external calibration standards.



The addition of three filters shows the superior photometric range and linearity of the Varian Cary instruments in the NIR. The actual and predicted measurements show excellent correlation across the entire NIR wavelength range measured.



Using the Cary 6000i, a high resolution NIR scan of water vapor clearly resolves absorption bands around 940 nm which are barely visible on standard spectrophotometers. The fine resolution delivered by the Cary 6000i is made possible through the use of a dedicated 600 lines/mm NIR diffraction grating in combination with InGaAs NIR detection.

The External DRA (150 mm integrating sphere) is ideal for reflectance or transmission measurements of large and physically challenging samples. Multiple sample mounting options are available.

Varian's technology advances don't stop at the spectrophotometer. The superior InGaAs and PbSmart NIR detection systems also power Varian's comprehensive range of integrating sphere accessories. Available in two diameters (150 mm or 110 mm) and three model types, you can swap from PbS to InGaAs to solve the most challenging diffuse reflectance measurements.

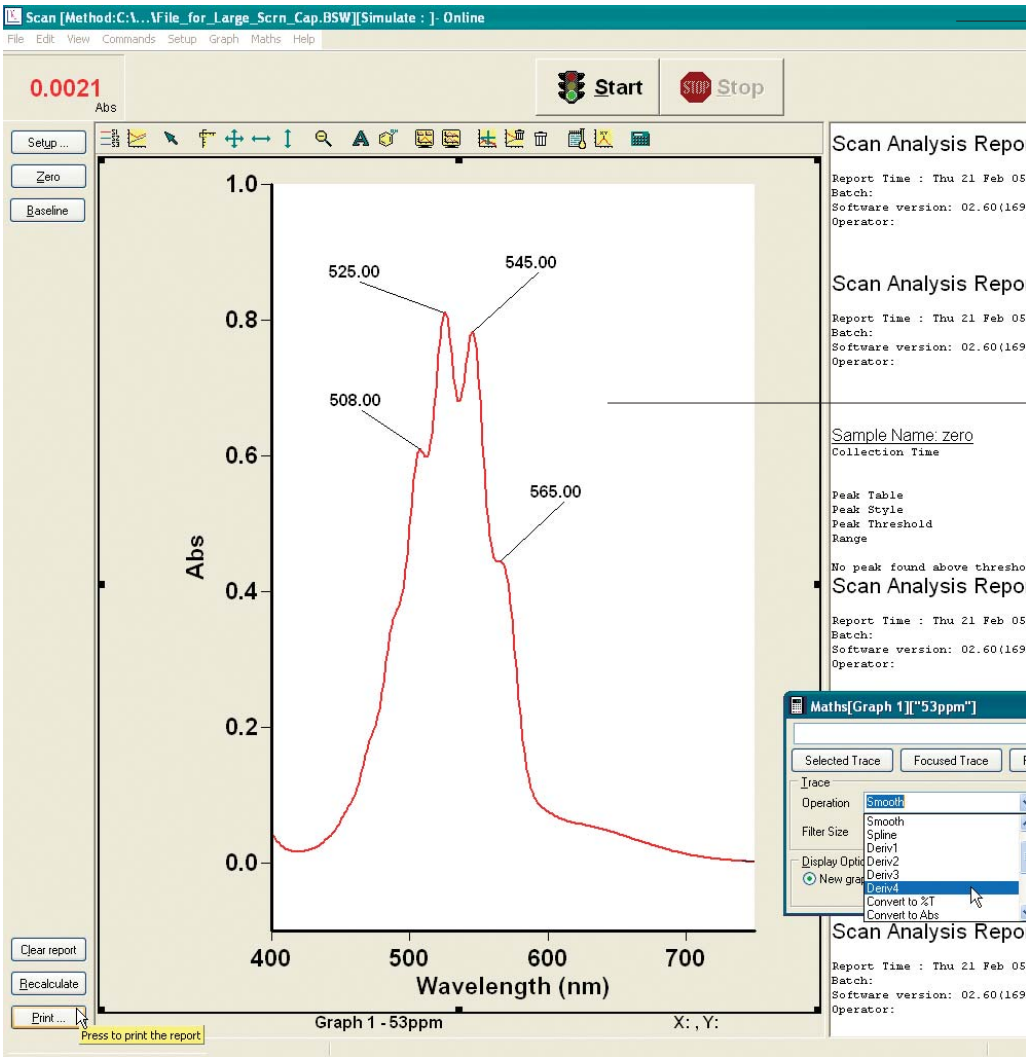
Varian, Inc. DRAs offer a unique range of features , so there's always a model to suit your needs. (Model number indicates the wavelength limit in nanometers.):

- **Internal/External DRA-900** – Offering exceptionally low photometric noise, a wide photometric range and good linearity.
- **Internal/External DRA-1800** – The world's only PMT/InGaAs DRA, providing superior signal to noise performance for improved detection limits and increased scan rates. Get cleaner spectra with better resolution more quickly.
- **Internal/External DRA-2500** – Extending the Cary 5000's PbSmart NIR detector management, the DRA PbS NIR detector is peltier cooled and optimized in real time, offering exceptional performance.

New Cary WinUV software ensures that Varian's widely acclaimed UV-Vis-NIR software is now even more powerful and easier to use. The modular design of the Cary WinUV software means that it can be tailored to suit your analytical requirements—whether it's a materials science application using basic concentration measurements or life science applications requiring advanced enzyme kinetics or thermal control.

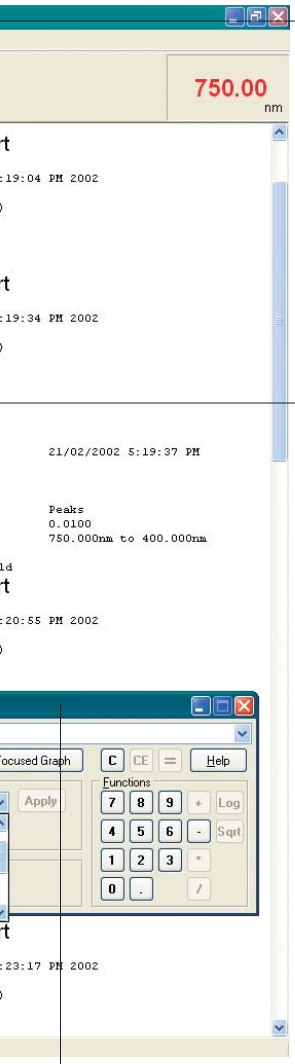
But it doesn't stop there. Cary WinUV is completely customizable using the powerful built-in Applications Development Language (ADL). ADL gives you the capability to modify the WinUV software to meet your most specific applications ensuring that no matter what analytical challenges the future holds, you will have the capability to meet them.

With standard software packages designed to meet most application needs and the power and flexibility of ADL, the Cary WinUV software is sure to meet all your requirements.



21 CFR Part 11 compatibility
Optional 21 CFR Part 11 and GLP (Good Laboratory Practice) compatibility is ideal for users in the pharmaceutical industry or anyone requiring regulatory compliance.

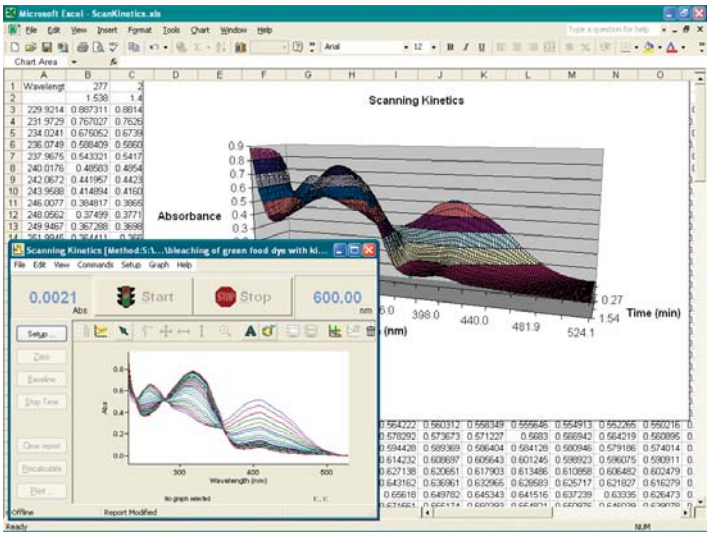
In addition, the unique Validate application enables immediate certification of your instrument against factory, BP/EP, USP (British/European, U.S. Pharmacopoeia) specifications.



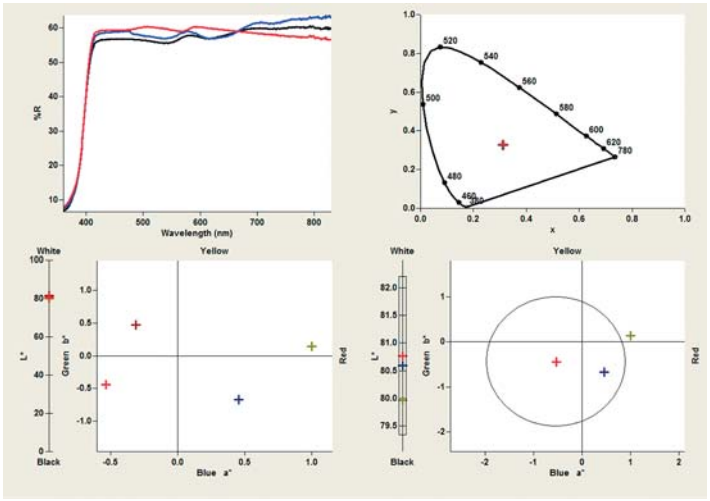
Choose your operating system
Cary WinUV software is compatible with both Microsoft® Windows® XP and Windows 2000.

Enhanced graphics features
The graphics control module has automatic peak labeling, zoom, free and tracking cursor, multiple ordinate and abscissa formats, smart copy/paste and overlay modes, making spectral interpretation and presentation for publications a breeze.

Advanced spectrum calculator
Use the spectrum calculator to apply mathematical operations, including addition, subtraction, division, multiplication, log and square root functions, to spectra. The calculator also features mean, normalization, smoothing, up to fourth order derivatives, integration and the Kubelka-Munk correction algorithm.



Enhanced file transfer and report export capabilities give Cary WinUV greater connectivity than any other UV-Vis-NIR software. The Auto Convert function allows you to convert your data files automatically for use in another program. You can also elect to store your data files in formats that can be directly imported into a spreadsheet.



The optional Color Calculation software is compatible with the international color commission (CIE) and ASTM standards, and is ideal for users in the pharmaceutical, textile, automotive, paint or graphic arts industries.

Cary WinUV's extensive online help includes step-by-step videos of hardware setup and routine maintenance procedures ensuring you can get up and running quickly.

The Cary series has been designed for flexibility and versatility. Whether your application is optics, powders, fabrics, gases, liquids, films or coatings, there is a Cary accessory to meet your needs. Our fibre optic technologies take measurements beyond the sample compartment, ensuring you can perform a full range of measurements from advanced specular and diffuse reflectance measurements to simple solution transmittance and absorbance.

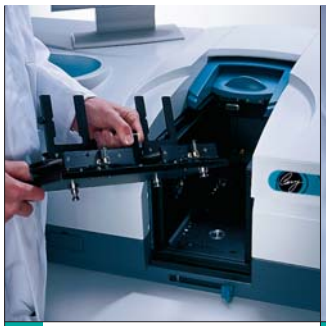
If you have the application, we have the solution. You can count on Varian's Cary spectrophotometers to meet all your needs today and tomorrow.

Lock it down and walk away
Throw down your tools! The new generation Cary series features the unique precision LockDown mechanism that allows you to position your accessories in your spectrophotometer quickly and reproducibly. With just a flick of the wrist, the Cary LockDown system permits quick mounting, release and changeover of accessories so you can spend more time on analysis and less time setting up. The Cary LockDown system means you can confidently mount any accessory in the instrument, in exactly the same place time-after-time – eliminating tools and time-consuming alignment procedures.

Plug-and-Go
The Cary's Plug-and-Go lamp management feature makes lamp replacement easy, as lamps are pre-aligned and don't require any adjustments. And, it's more flexible with the ability to accommodate a wider range of lamp designs to match your application needs. A mercury lamp module for wavelength accuracy validation is supplied with all high-end Cary spectrophotometers, allowing you to verify wavelength accuracy in one simple step.

Safety
Although Varian's products are designed to be safe and to comply with all applicable regulatory requirements, it is important to be familiar with the hazards associated with these products. For full details, refer to www.varianinc.com

CE The Cary Series is certified to comply with the requirements of the EMC and LV directives of the European Union.



1 **Insert accessory into the sample compartment**

2 **Position accessory over mounting holes**

3 **Flick the switch to lock the accessory down**

Varian's vast array of hardware solutions ensures you can handle the widest variety of sample sizes–from the smallest etalon to uncut sheet glass, from micro-flowcells to long path gas cells. The huge Cary sample compartment accommodates most sample sizes, while the removable sample compartment floor means even more flexibility is provided.

The new generation Cary series are part of Varian's range of Cary molecular spectrophotometers, which also includes the Cary 50, 100 and 300 UV-Vis spectrophotometers and the Cary Eclipse fluorescence spectrometer.

With xenon flash lamp technology, plug-and-identify electronics and feature-packed, intuitive software, the Cary Eclipse instrument embodies the Cary name. When combined with the optional solid sample holder, the Cary Eclipse can be used for a variety of materials science applications—from measuring optical components for unwanted fluorescence to measuring specialty chemicals such as optical brighteners.

For the measurement of large samples such as optical filters, the Cary Eclipse can be used in conjunction with Varian's fibre optic system (as shown above). The Cary Eclipse fibre optic system takes the light to the sample, enabling the fluorescence spectra of large, heavy and oddly shaped objects such as rocks, gems and other minerals to be measured.

For further information on Varian's range of Cary 50, 100, 300 UV-Vis or Cary Eclipse fluorescence spectrophotometers, ask your Varian sales representative for a brochure, or visit our website at www.varianinc.com.

To keep your Cary instruments running smoothly, Varian also offers a wide range of the highest quality consumable supplies, including cuvettes, reference materials and lamps.

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Pharmaceutical
Food and Beverage
Metals and Mining
Petroleum and Petrochemical

Varian, Inc. is committed to a process of continuous improvement which demands that we understand and then meet or exceed the needs and expectations of our customers—both inside and outside the company—in everything we do.

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