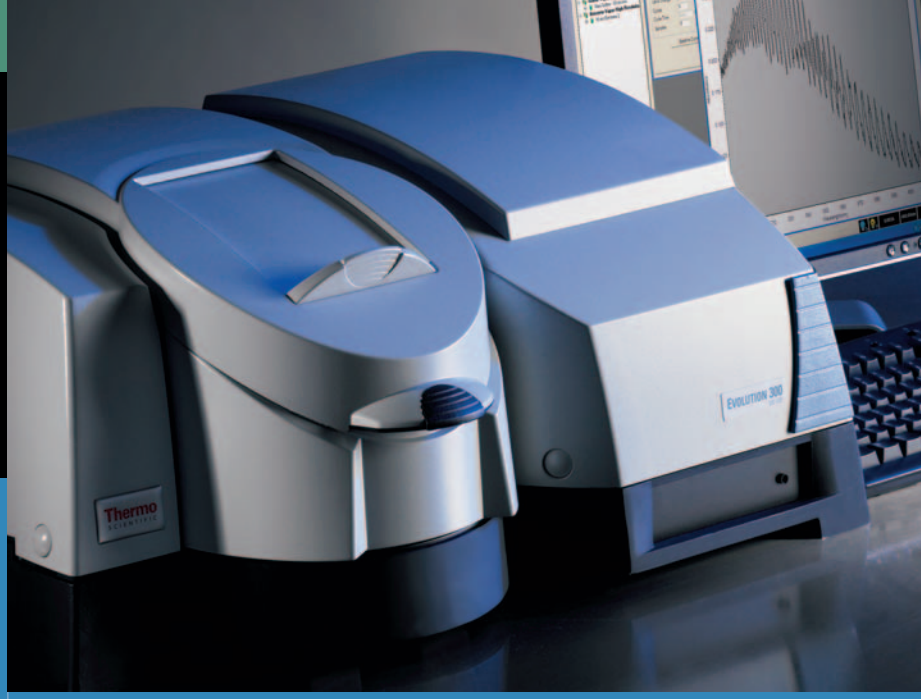
Thermo Scientific Evolution 300 and Evolution 600 UV-Vis Spectrophotometers



Life Science

Material Science

Pharmaceutical

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Reliable, High-Performance UV-Visible Spectrophotometers

For over 60 years, customers in world-renowned research institutions, highly regulated QC laboratories and teaching institutions have relied on Thermo Scientific UV-Visible (UV-Vis) spectrophotometers. The Thermo Scientific Evolution 300/600 UV-Visible spectrophotometer series is founded on the successful legacy of the Pye-Unicam, Bausch & Lomb, Philips Scientific, and Spectronic products. Many customers today say they made their first absorbance measurement on a Thermo Scientific SPECTRONIC 20 spectrophotometer, a product on the market since 1953. The Evolution™ 300/600 series continues in this tradition by delivering the solid, high-performance you need for your UV-Vis applications.

Thermo Scientific UV-Vis Spectrophotometer Product Lines

SPECTRONIC™ 15/20/20D+, SPECTRONIC Educator™, and Thermo Scientific GENESYS 20

- Basic teaching
- Easy sample and data handling

GENESYS™ 10S Series

- Routine quantitative analysis and common bio assays
- Easy-to-use accessories

Thermo Scientific Helios, Evolution 60S, and Evolution 160

- Routine quantitative analysis and bio assays
- More advanced accessories and software

Evolution 300/600 Series

- Wide range of accessories
- Advanced quantitative analysis and bio assays
- Extensive software offerings
- Tablet dissolution
- Material science

The PU8800, designed by Pye-Unicam in the 1980's, was one of the industry-leading research instruments of its time.

The Evolution 300/600 spectrophotometer series incorporates a high-performance optical design, versatile Thermo Scientific VISION software packages, and the highest quality accessories for the most demanding applications. The systems offer a multitude of advantages for a wide variety of applications including:

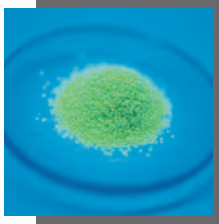
- **Life Science Biochemical**
- **Pharmaceutical and QC**
- **Material Science**

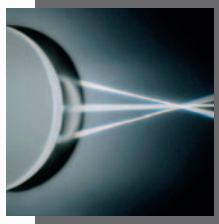
Innovative Smart Accessories™ offer ease of use and increased productivity by providing:

- **Snap-and-go installation**
- **Seamless software integration**
- **Serial number tracking for the regulated environment**

System configuration choices offer the ultimate in flexibility for your laboratory. Choose from:

- **Stand-alone Local Control version**
- **PC Control version**
- **Combination of both**





High-Performance Optical Design for Reliable Results

Maintaining high performance is the ongoing legacy you can count on with the Thermo Scientific Evolution 300/600 spectrophotometer series.

Evolution 300 Optics

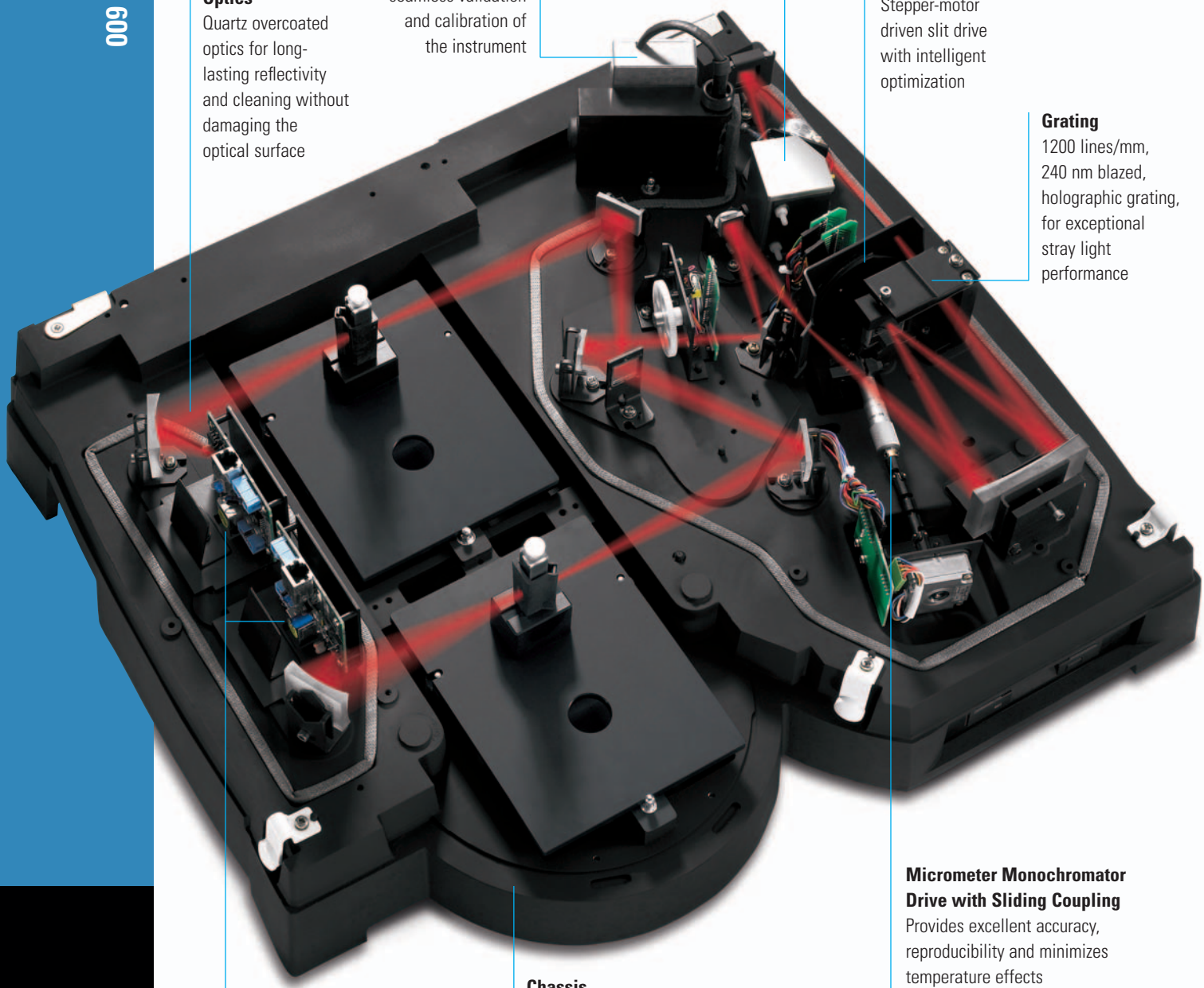
Light Source
Xenon flash lamp is only on when taking measurements extending its lifetime

Mercury Lamp
Primary reference standard, allows seamless validation and calibration of the instrument

Slit Mechanism
Photo-etched slits for greater accuracy. Stepper-motor driven slit drive with intelligent optimization

Optics
Quartz overcoated optics for long-lasting reflectivity and cleaning without damaging the optical surface

Grating
1200 lines/mm, 240 nm blazed, holographic grating, for exceptional stray light performance



Micrometer Monochromator Drive with Sliding Coupling
Provides excellent accuracy, reproducibility and minimizes temperature effects

Detectors
Silicon photodiodes for extended wavelength range to 1100 nm

Chassis
Rigid, cast-aluminum base with optical mounts bolted directly onto the base provides superior system stability and reliable results

The Evolution 300 optical design includes a long lifetime xenon flash lamp and extended wavelength-range silicon photodiode detectors. This system is an excellent choice for routine and research laboratories in the Life Science and Pharmaceutical markets.

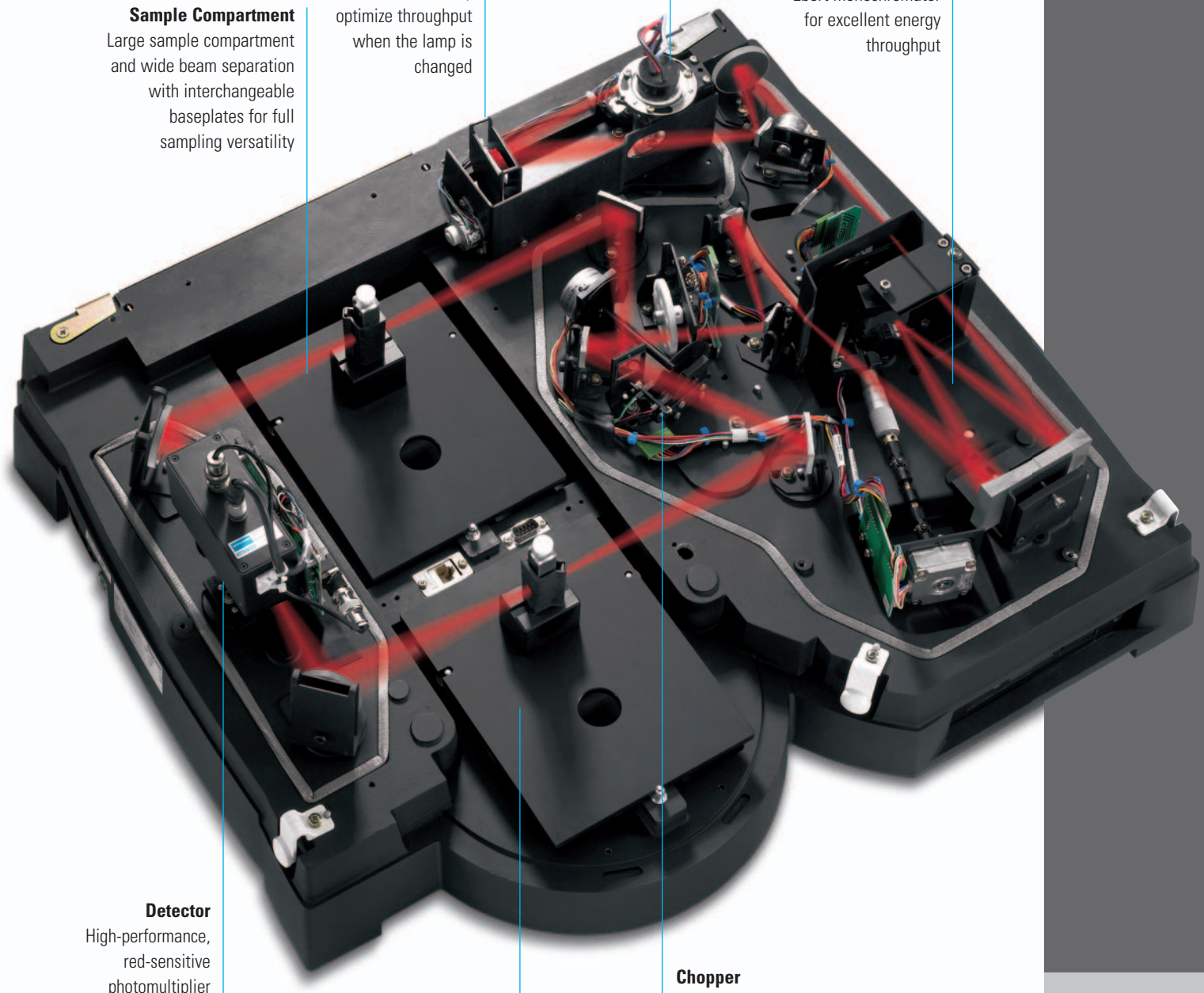
Evolution 600 Optics

Light Sources
Deuterium and Halogen lamps for added stability when measuring minute absorbance changes

Source Optics
Auto-aligning source optics automatically optimize throughput when the lamp is changed

Monochromator
Both models feature research grade, Ebert monochromator for excellent energy throughput

Sample Compartment
Large sample compartment and wide beam separation with interchangeable baseplates for full sampling versatility



Detector
High-performance, red-sensitive photomultiplier (PMT) detector for demanding samples

Smart Sampling
Plug-in, instrument-controlled accessories for ease of use and reliability

Chopper
Four-segment chopper running at 33 Hz eliminates possible oscillation conflicts with global mains AC power frequencies of 60 or 50 Hz

The optical design of the Evolution 600 includes deuterium and tungsten sources and a high-performance photomultiplier detector. These features provide enhanced high-level performance for the Material Science market and general research applications.

Operational Flexibility to Fit Your Lab Needs

The Evolution 300/600 series offers the flexibility to choose a configuration suited to your needs: Local Control, PC software control, or Local Control with PC software control. Each of these configurations offers various levels of operational flexibility to fit the individual or multi-user laboratory environment.

The large, color display and tactile keypad make the Evolution Local Control system convenient and easy-to-use.

Local Control

The Local Control configuration offers complete instrument control, comprehensive method and data file manipulation, and saves valuable bench space. It can also be password protected preventing unwanted access from outside your laboratory. For presentation purposes, the Local Control screen display can be viewed on an external monitor or projection system using the DVI output.

Local and PC Control

The Local Control with PC software control configuration gives you the freedom to choose the configuration that matches your experimental needs. For example, use Local Control to make a quick absorption measurement to determine the purity of a DNA sample. You do not need to wait for the PC to boot and the software to load. Later, to run a kinetics experiment based on a method stored on a network drive, simply open VISION™ software, and switch the instrument to PC control. This configuration is ideal for labs with a variety of experimental needs.

PC Control

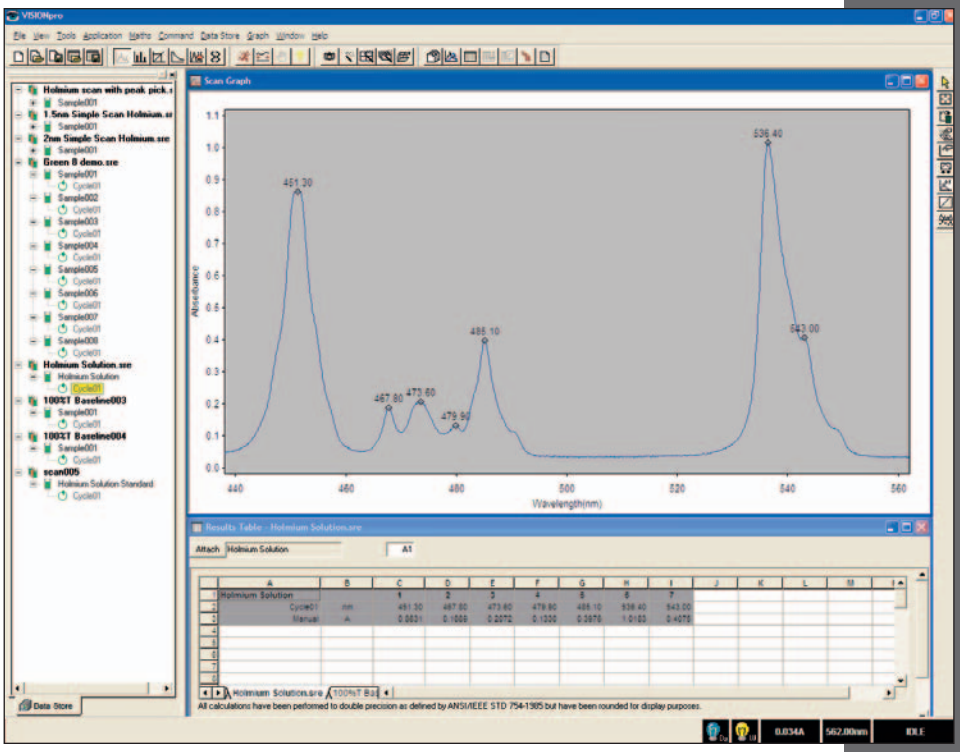
The PC Control configuration allows users to collect data and distribute it to third-party applications for advanced processing and archival. In multi-user environments, Local Control with PC software control gives you the ultimate flexibility.

The PC Software Control configuration uses the powerful VISION suite of software to control the Evolution 300/600 instruments. This software allows you to collect, store, recall, and analyze your data, using one convenient program. From QC quantitative analysis measurements to complex enzymatic assays, the right VISION software package is available for your application.

VISION Software Suite

The Thermo Scientific VISION*pro* is a flexible software package designed for the general research and QC laboratory. When used with VISION*pro*™, the Thermo Scientific VISION*life* software package adds the ability to monitor and calculate reaction kinetics and to perform DNA melting experiments. For those laboratories requiring 21 CFR Part 11 compliance, Thermo Scientific VISION*security* sets the standard for UV-Vis instrumentation.

Additional application software packages for the Evolution 300/600 UV-Vis series include: Thermo Scientific VISION*lite* ColorCalc for color measurements and EnzLab for Enzymatic Food Analysis.



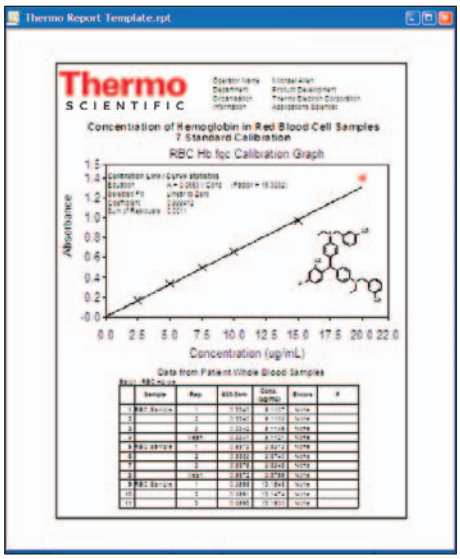
The standard VISIONpro software offers advanced scanning, multiple fixed wavelength measurements, and multi-wavelength measurements with customized UVcalc. Quantitative analysis and multicomponent analysis applications are also included.

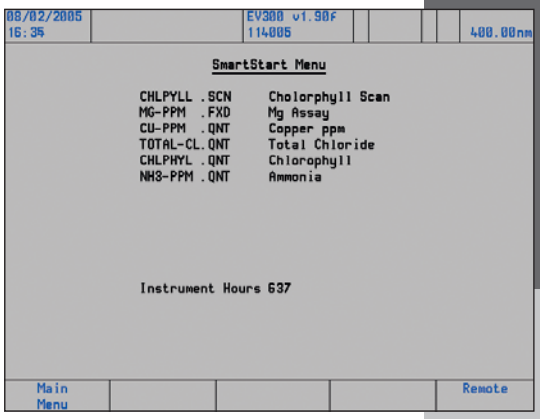
VISION Software Application Comparison Chart

Software	Scanning	Fixed Abs/%T	Quant	Multicomponent	Rate	DNA
VISION*pro*	✔	✔	✔	✔		
VISION*pro* + VISION*life*™	✔	✔	✔	✔	✔	✔
VISION*security*™	✔	✔	✔	✔		
VISION*security* + VISION*life*	✔	✔	✔	✔	✔	✔

Customized Reporting

The Evolution advanced Report Composer in VISIONpro, VISIONlife and VISIONsecurity software allows you to precisely configure the format of reports. These templates can be linked to an application method and used to automatically produce reports in your customized format.





Thermo Scientific SmartStart

SmartStart™ allows each user to set up the SmartStart menu with the applications they use most often. This increases the throughput of every user by eliminating the need to navigate menus and by decreasing the amount of time required to train users. Load the SmartStart menu with any application, including your stored methods, and watch the productivity of your lab increase.

Comprehensive Solutions for Life Science Biochemical Applications

The Evolution 300/600 series is the natural fit for any multi-user, life-science research laboratory. From users performing fast or routine assays, such as Nucleic Acid tests, to users performing more advanced studies, such as Michaelis-Menton kinetics or Thermal Denaturation/Renaturation assays, these instruments offer a configuration ideal for your laboratory.

Nucleic Acid Tests

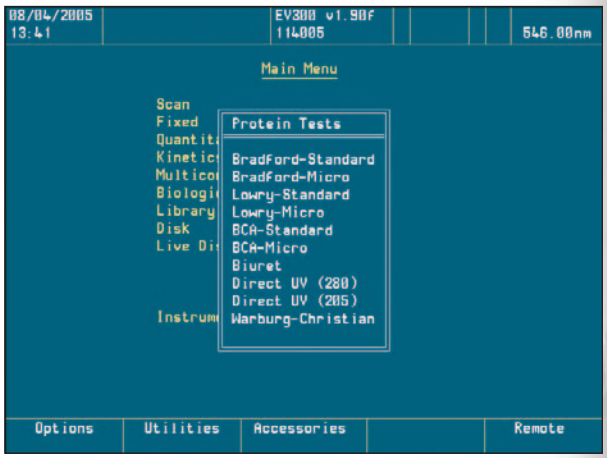
The Evolution series provides all the necessary tests for determining DNA purity in the presence of protein or phenol. DNA/RNA concentrations can be determined by simple ratios or by wavelength scanning. The wavelength scanning option allows the added flexibility of checking for potential contaminants.

Various quantization methods are available to determine the concentration of purified double-stranded and single-stranded DNA and RNA. Based on user-entered factors, the Evolution instrument measures the absorbance of the DNA or RNA and calculates the appropriate concentration.

The Oligo (Calc Factor) function allows you to enter a specific oligonucleotide sequence and from a subsequent absorbance measurement, the system calculates the %GC content, MW of the oligo, molar (pmol/ul) concentration of the sample and an estimate of the T_m value.

Protein Concentration

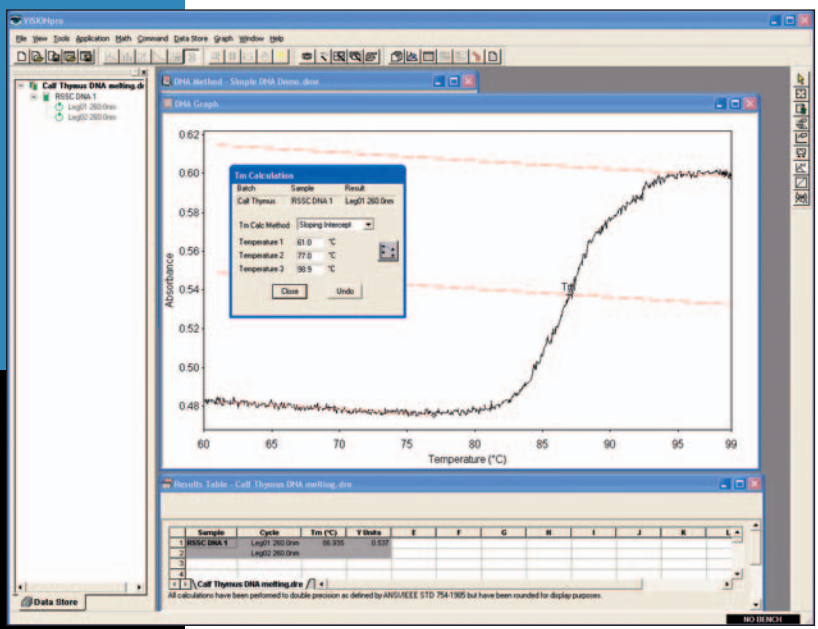
If your research involves the determination of protein concentration assays, the Evolution Local Control systems provide the standard protein assays at the push of a button.



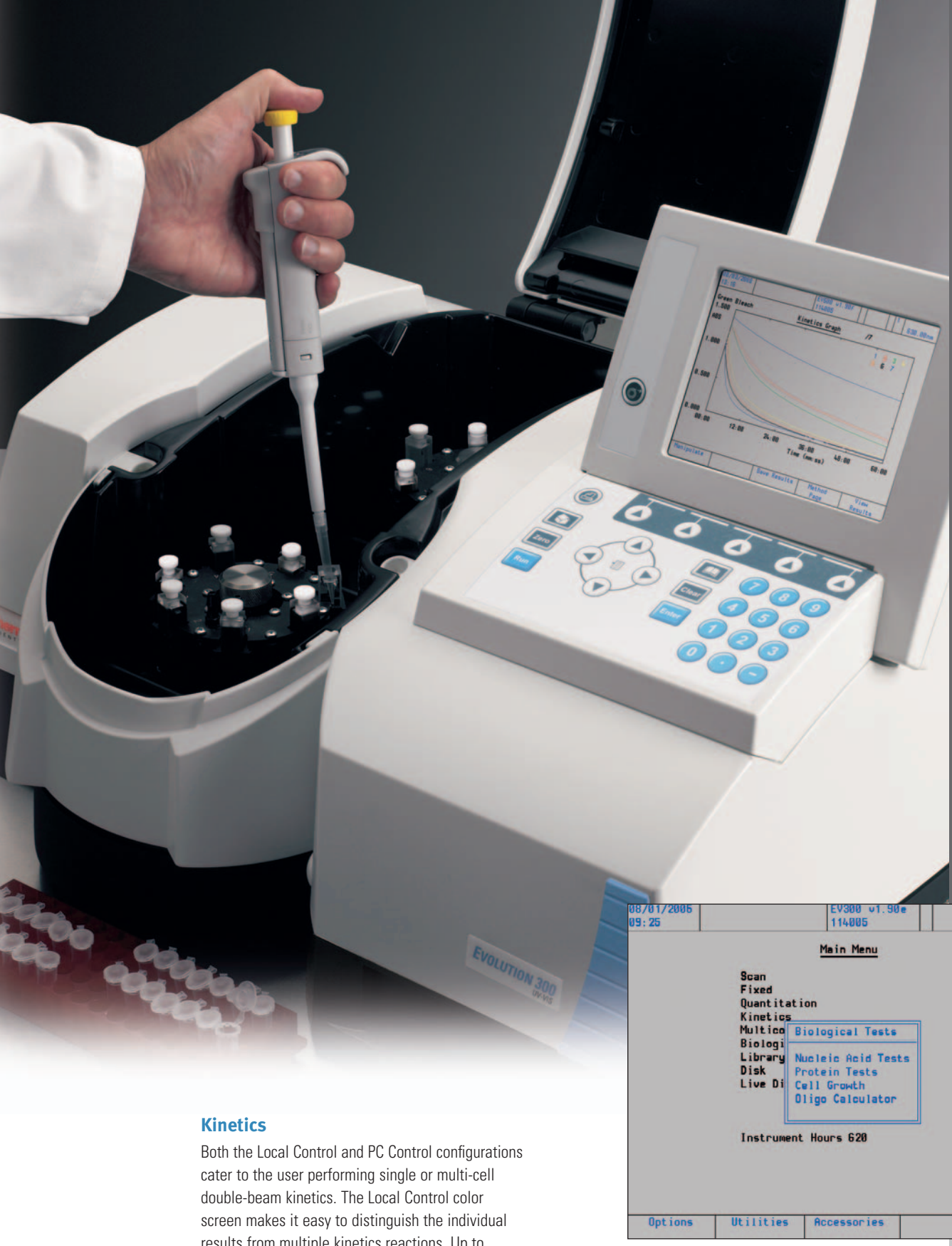
All of the major, industry-standard protein concentration assays at your fingertips.

Thermal Denaturation/Renaturation

Whether your research examines short or long DNA or RNA sequences, duplexes or triplexes, the Evolution VISION*life* Thermal Denaturation/Renaturation system will meet all of your experimental needs. The system provides all the tools necessary to control complex heating and cooling profiles with user defined hold times and ramp rates down to 0.1 °C/min. Multiple built-in fitting algorithms are available to calculate the T_m value from all types of melting curves.



With no external circulating water required, the Evolution spectrophotometer with the Smart Peltier accessory can reach a maximum temperature of 110 °C. This extended range provides added flexibility for making accurate T_m measurements on very long oligonucleotides.



All of the routine biological assays, including a built-in Oligo calculator, are accessible in only two keystrokes.

Kinetics

Both the Local Control and PC Control configurations cater to the user performing single or multi-cell double-beam kinetics. The Local Control color screen makes it easy to distinguish the individual results from multiple kinetics reactions. Up to seven active reference cuvettes can be used in a seven-sample/seven-reference configuration. For laboratories performing more complex assays, such as inhibitor studies, VISION*life* software provides calculations for the Michaelis-Menton K_m and V_{max} parameters using methods such as Lineweaver-Burke and Eadie-Hoftsee.

Complete Tools for Pharmaceutical and QC Analysis

Quantitative Analysis Made Simple

The Evolution Quant application is available in both the Local Control and PC Control configurations. For very quick and simple quant analysis in a routine QC laboratory, the Local Control configuration with built-in, soft-key menu operation is an excellent choice. In a regulated environment, the Evolution series provides the tools to achieve 21 CFR Part 11 compliance.

The Quant application can use the data from up to 50 standards (3 replicates each) to analyze 999 samples (3 replicates each). VISION*pro* software provides automated weight and volume correction eliminating additional time-consuming calculations. If your laboratory is performing analysis on mixtures, then the multicomponent analysis application, standard with VISION*pro*, is ideal.

UV*calc* for Automated User Calculations

If your analyses routinely demand automated calculations on experimental data, you will find the easy-to-use spreadsheet format of the UV*calc* function beneficial. UV*calc* allows you to enter and store the calculation formulas as you develop data acquisition methods. When the method is recalled, both the data acquisition and the calculations are performed automatically, saving valuable time.

Remote Fiber Optics Measurements

A remote fiber optic probe allows the user to perform absorption measurements inside almost any vessel. A simple rinse between each measurement makes sample carryover nonexistent. Increase sample throughput by taking light to any sample container instead of wasting time bringing the sample to the instrument in a cuvette or test tube.

Comprehensive Solutions for Regulatory Compliance

The US FDA Regulation 21 CFR Part 11 describes the criteria under which the FDA will consider electronic records equivalent to paper records and electronic signatures equivalent to handwritten signatures. This regulation applies to all GxP manufacturers and industries that are FDA-regulated.

VISION*security* software provides all the tools necessary to help your laboratory achieve 21 CFR Part 11 compliance.

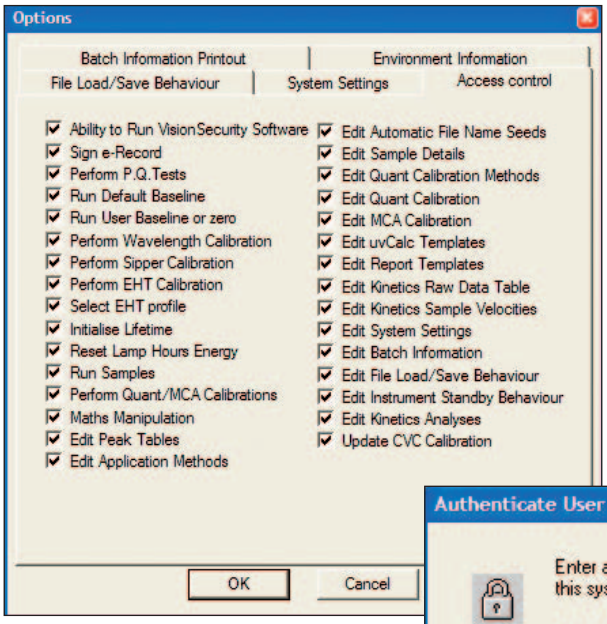
With continually changing requirements to keep your Evolution spectrophotometer up to regulatory standards, no supplier in the industry can provide a more comprehensive selection of calibration and verification tools.

Whether compliance requires a manually inserted, traceable standard or fully automated intelligent verification, the Thermo Scientific proprietary Smart Calibration Validation Carousel (CVC) traceable to NIST[1] or NPL[2] standards fully automates testing for:

- Wavelength accuracy
- Photometric accuracy
- Stray light
- Photometric noise
- Photometric stability
- Baseline flatness

To obtain the best possible accuracy across the entire wavelength range each instrument is factory calibrated at multiple wavelengths from the ultraviolet to the near-IR region using a mercury lamp. An optional mercury lamp accessory is available and user installable.

1. National Institute of Standards and Technology, USA
2. National Physical Laboratory, UK

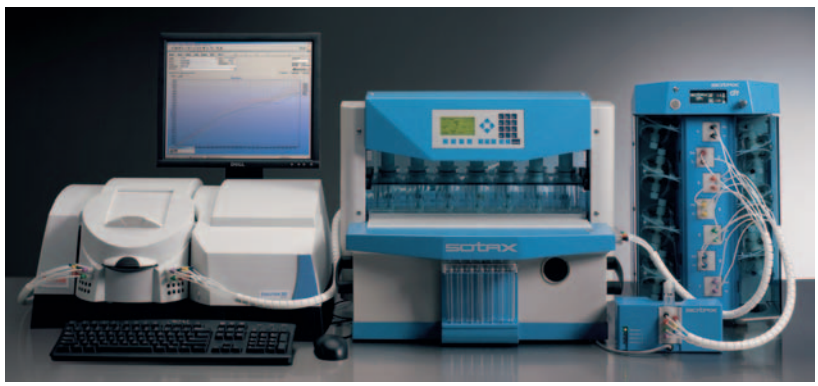


VISIONsecurity not only has all of the acquisition, analysis, and reporting capabilities found in the VISIONpro software, but also has the tools necessary to control individual or group access to the instrument, data, and records. User authentication at start-up allows event audit trails, electronic signatures, and prevents use while the operator is away.

By replacing paper-based archival storage with electronic data storage and data transfer, the proper use of VISIONsecurity software with your Thermo Scientific spectrophotometer will help you pass FDA audits while reducing costs and increasing security.

Tablet Dissolution

An important application where compliance issues are critical is in the testing of solid dosage forms. Thermo Fisher Scientific and SOTAX have entered into a relationship to provide semi-automated and fully automated Tablet Dissolution testing systems supporting Apparatus I, II, IV, V and VI. The system combination provides a complete and seamless solution for any dissolution laboratory.



Evolution 300 with the SOTAX Apparatus IV flow-through system offers a unique solution for a variety of Tablet Dissolution assays

High-performance Measurements for Material Science

The Evolution 300/600 UV-Vis spectrophotometers offer a variety of accessories designed to meet your solid sample testing needs. With the horizontal mounting of our Diffuse Reflectance Accessory (DRA) or the highly optimized Diffuse Transmittance Accessory, a new world of materials science measurements is available with the Evolution spectrophotometers. Whatever your routine high-performance measurements require, we have a variety of sample handling accessories catering to your needs.

Long Path Diffuse Transmittance Accessory

The Diffuse Transmittance Accessory (DTA) provides the capability to mount a variety of samples in front of an integrating sphere designed for high performance and compliance with regulatory standards. At only 2.9%, the port fraction complies with both AATCC method 183:2004 for measuring Ultraviolet Protection Factor (UPF) of fabrics and ASTM method D1003:2007 for measuring haze in plastics and glasses.

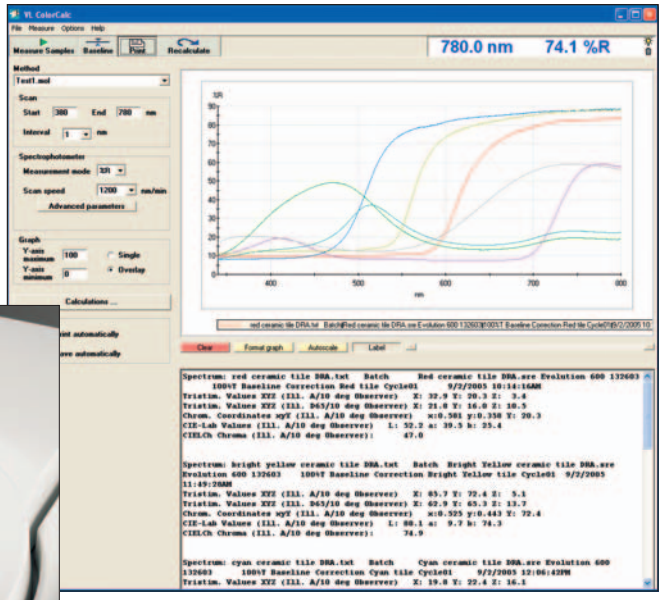
The optional fabric holder with included UG11 filter makes fabric measurements easy, and the magnetic steel baseplate with threaded holes on a 1 inch grid supports magnetic or screw-down laser table fittings to position almost any optical sample.

Diffuse Reflectance Accessory

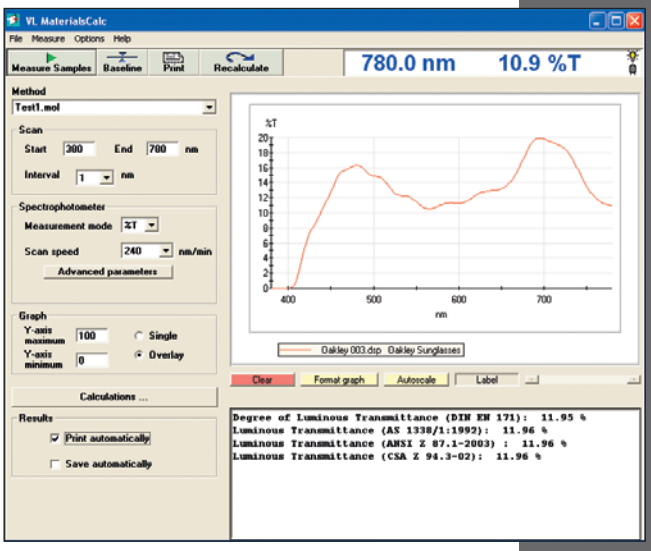
The Diffuse Reflectance accessory opens the door to measuring many samples that were almost impossible to measure in the past. This accessory offers a horizontal mounting reflectance port to conveniently measure both delicate and large samples. The double beam Spectralon® integrating sphere ensures the highest possible energy throughput and accuracy. A transmittance port is included for diffuse transmittance measurement of solid or turbid liquid materials. The integrating sphere is fully CIE compliant for performing color measurements.

Solid Sample Holder Accessory

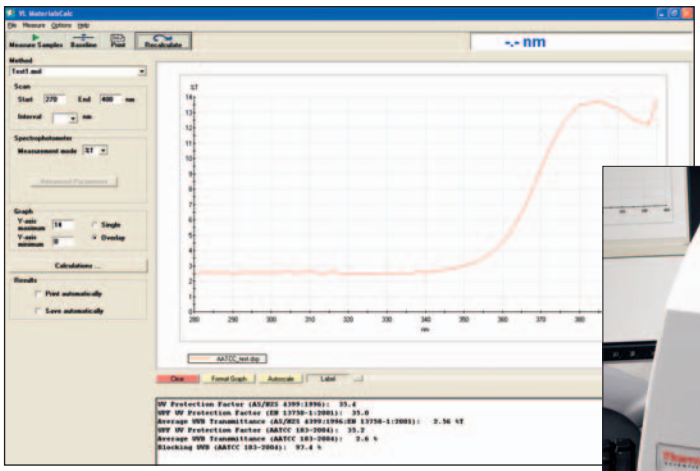
The Solid Sample Holder provides the capacity to measure a variety of solid samples in % Transmission mode. An assortment of sample holders is available for round, square and odd shaped samples. The 2" x 3" sample slides allow other measurement tools, such as specular reflectance accessories, to be used.



The horizontal sample port of the DRA provides almost unlimited sample size measurements. Using the DRA in combination with VISIONlite™ ColorCalc software provides routine solutions for CIE Color compliant measurements on solids.



VISIONlite™ MaterialsCalc software provides an array of calculations ranging from Luminous Transmittance, Haze, UV protection and UPF protection of fabrics. One of the key calculations is the luminous transmittance of sunglasses. An example of the transmittance profile of a pair of high end sunglasses is shown here along with the luminous transmittance calculation.



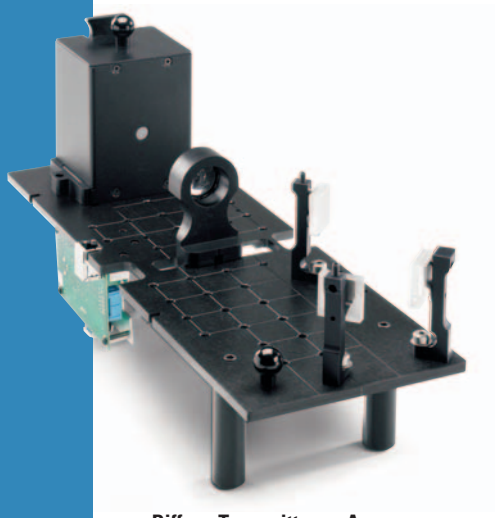
The Diffuse Transmittance Accessory together with VISIONlite MaterialsCalc software makes haze and fabric measurements simple and routine.

Smart Accessories for Enhanced Productivity

The Evolution 300/600 UV-Vis series provides Smart Accessories with auto-intelligence. Both Local Control and PC Control configurations recognize individual accessories and automatically identify the accessory's unique serial number. This saves time and enhances productivity in regulated environments. Kinematic mounts allow easy interchange and reproducible alignment each time the accessory is removed and installed.

Smart Accessories intelligently interact with software menus and local control. Simply snap the accessory in place and the appropriate software menu for that accessory will appear on the screen. All other accessory software menus are hidden eliminating possible confusion.

Grazing Angle Specular Reflectance Accessory



Diffuse Transmittance Accessory

Praying Mantis Accessory

VeeMAX Variable Angle 30° - 80° Specular Reflectance Accessory

Smart Thermostatted Rotary 7-Cell Changer

Smart 8-Cell Peltier System

Smart Peltier Thermostatted Single Cell Holder

Cylindrical Cell Holder

Adjustable Microcell Holder

Smart Calibration Validation Carousel (CVC)

RX2000 Rapid
Mix Accessory

nanoCell
Accessory

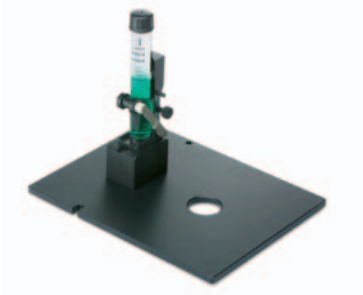
DRA-EV-600 Diffuse
Reflectance Accessory

Solid Sample Holder

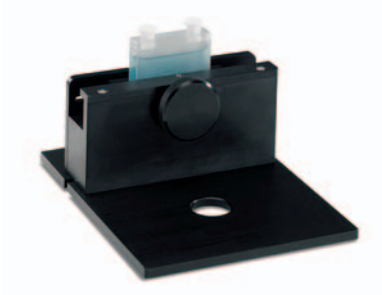
VERSA Fiber Optic Probe

Smart Sipper Accessory

8°, 15°, 20°, 30°, 45° and 60° Specular
Reflectance Accessories



Test Tube and Vial Holder



Long Pathlength Rectangular Cell Holder

Temperature Probe

Laboratory Solutions Backed by Worldwide Service and Support

Tap our expertise throughout the life of your instrument. Thermo Scientific Services extends its support throughout our worldwide network of highly trained and certified engineers who are experts in laboratory technologies and applications. Put our team of experts to work for you in a range of disciplines – from system installation, training and technical support, to complete asset management and regulatory compliance consulting. Improve your productivity and lower the cost of instrument ownership through our product support services. Maximize uptime while eliminating the uncontrollable cost of unplanned maintenance and repairs. When it's time to enhance your system, we also offer certified parts and a range of accessories and consumables suited to your application.

To learn more about our products and comprehensive service offerings, visit us at www.thermo.com.

In addition to these offices, Thermo Fisher Scientific maintains a network of representative organizations throughout the world.

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Specifications, terms and pricing are subject to change. Not all products are available in all countries. Please consult your local sales representative for details.

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