



**Thermo Scientific Evolution 300  
UV-Vis Spectrophotometer**

# Precision performance for advanced analysis

Life Science • Quality Control • Pharmaceutical  
Materials Science • Biochemical

# Reliable, high-performance UV-Visible measurements

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 UV-Visible spectrophotometer is founded on the successful legacy of the Pye Unicam, Bausch & Lomb™, Phillips Scientific, and Thermo Scientific™ SPECTRONIC™ products.

Many customers today say they made their first absorbance measurement on a Thermo Scientific SPECTRONIC 20 spectrophotometer, a product introduced to the market in 1953. The Evolution 300 continues in this tradition by delivering the high level of performance, accuracy and precision you need for your UV-Vis applications.



# Double-beam optical design for reliable results

The Evolution 300 spectrophotometer 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:**

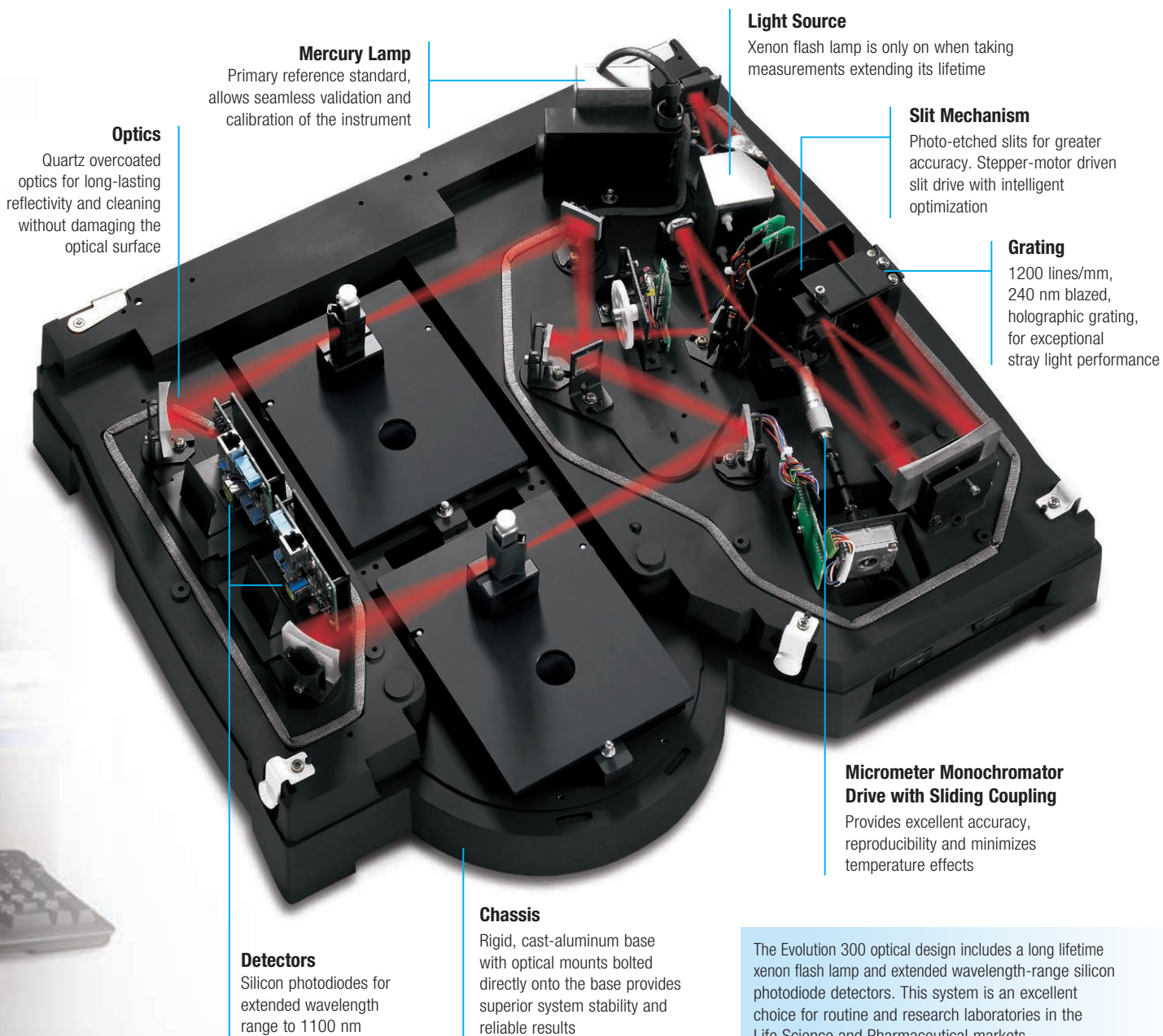
- Life Science and Biochemical
- Pharmaceutical and QC
- Material Science

**Innovative Smart Accessories™ deliver 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



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

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

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

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

**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.

# Operational flexibility to fit your lab needs

The Evolution 300 offers the flexibility to choose a configuration suited to your needs: Local Control, PC software control, or both. 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.

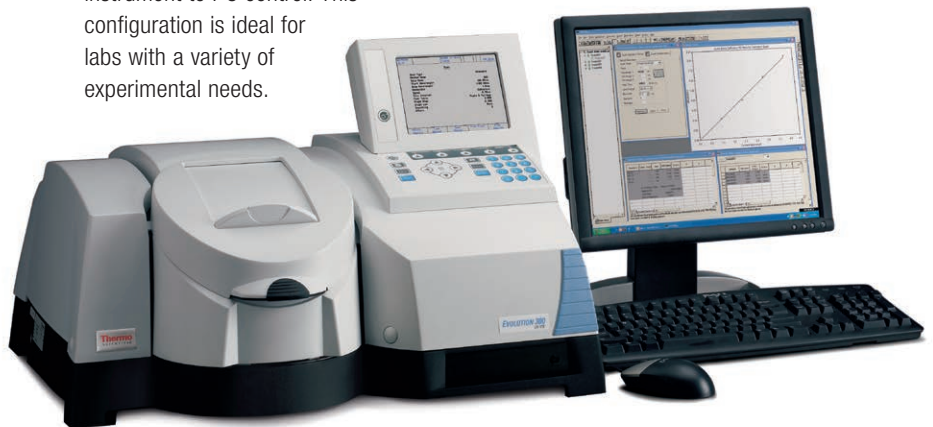
## Local and PC Control

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 for quick walk up measurements in a multi-user lab. 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 Software Control configuration uses the powerful VISION suite of software to control the Evolution 300 instrument. 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.

The PC Control configuration also allows users to collect data and distribute it to third-party applications for advanced processing and archiving.



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SmartStart Menu			
CHLPYLL .SCN	Cholorphyll Scan		
Mg-PPM .FXD	Mg Assay		
CU-PPM .QNT	Copper ppm		
TOTAL-CL .QNT	Total Chloride		
CHLPHYL .QNT	Chlorophyll		
NH3-PPM .QNT	Ammonia		
Instrument Hours 637			
Main Menu			Remote

## SmartStart

Increase productivity with Thermo Scientific™ SmartStart™ feature in the local control. SmartStart lets you place your laboratory's most used methods and applications on the first menu screen displayed after switching on the instrument. With no requirement to navigate menus and reduced training requirements, the Evolution 300 Local Control fits perfectly in busy labs where users don't have to be experts.

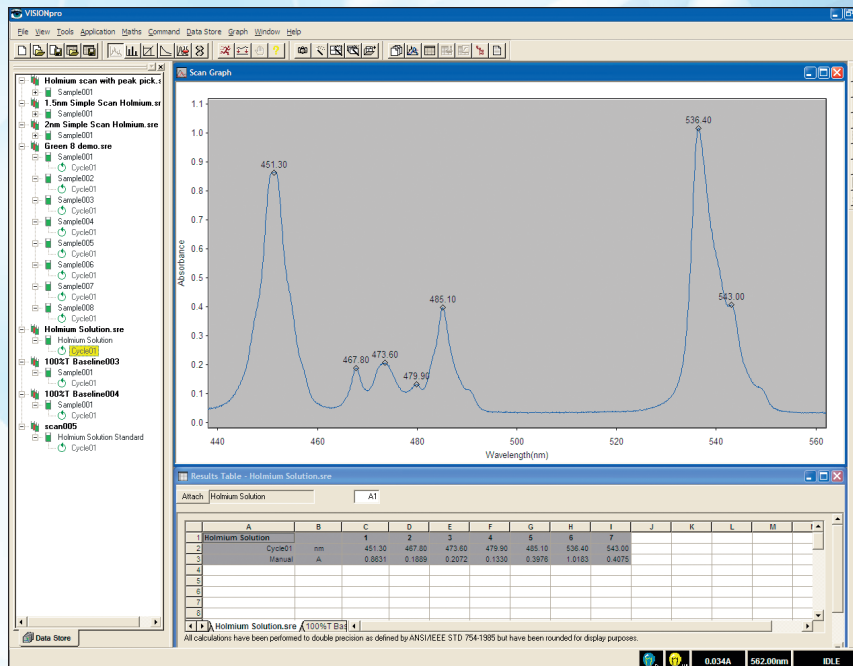


## VISION Software Suite

### VISION<sup>pro</sup>

Thermo Scientific™ VISION<sup>pro</sup>™ software is a flexible instrument control and data manipulation package designed for the general research and QC laboratory. It features:

- Advanced scanning functionality for sample identification and method development
- Single and multiple fixed wavelength measurements complete with advanced reference wavelength correction
- Comprehensive quantitative analysis with UV<sup>calc</sup>, an advanced results calculator tool for real-time data processing
- Powerful multicomponent analysis package offering simultaneous concentration analysis of multiple components
- Spreadsheet functionality in UV<sup>calc</sup> automatically performs user-programmed calculations and provides complete flexibility to format your final results



The standard VISION<sup>pro</sup> software offers advanced scanning, multiple fixed wavelength measurements, and multi-wavelength measurements with customized UV<sup>calc</sup>. Quantitative analysis and multicomponent analysis applications are also included.

### VISION<sup>life</sup>

Thermo Scientific™ VISION<sup>life</sup>™ is an optional module that integrates with either Thermo Scientific™ VISION<sup>pro</sup>™ or VISION<sup>security</sup>™. VISION<sup>life</sup> adds:

- A sophisticated kinetics application supporting serial, parallel, and triggered rate modes
- Advanced kinetics analysis software with modeling for pre-defined enzyme behavior models ranging from basic Michaelis-Menten treatments to binding models such as Hill plots, Lineweaver-Burke and Eadie-Hofstee
- A DNA melting application that works with the Smart Peltier Thermostatted Single Cell Holder to deliver advanced control of the heating/cooling cycles and save valuable time in your DNA denaturation/renaturation assays
- A wide range of T<sub>m</sub> calculation methods which can also be extended using UV<sup>calc</sup>

### VISION<sup>security</sup>

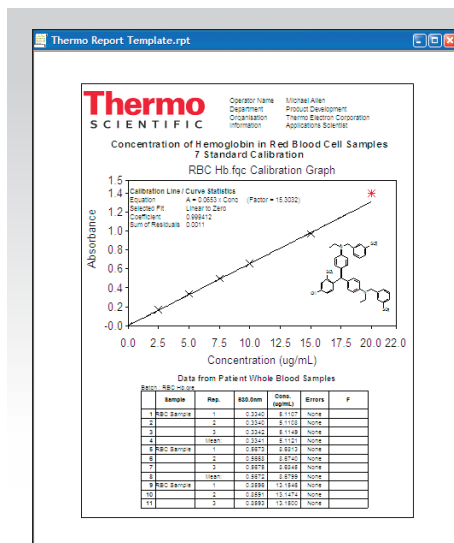
For laboratories requiring 21 CFR Part 11 compliance, Thermo Scientific VISION<sup>security</sup> sets the standard for UV-Vis instrumentation. With all the features of VISION<sup>pro</sup> plus the capability to achieve 21 CFR Part 11 compliance for electronic records, VISION<sup>security</sup> offers:

- Multiple levels of access control for method and data security
- Audit trails and electronic signatures for records compliance
- Comprehensive integration into the Microsoft Windows® operating system for a solution that can be implemented on a single PC or enterprise-wide from a server location

### VISION<sup>lite</sup> ColorCalc

Thermo Scientific™ VISION<sup>lite</sup>™ ColorCalc software offers a simplified stand-alone interface that delivers calculated color parameters quickly and easily. In applications ranging from lighting gels to waste-water, VISION<sup>lite</sup> ColorCalc calculates the color values you need including:

- Tristimulus XYZ
- Chromaticity
- CIE L\*a\*b\*
- Whiteness and Yellowness indices
- APHA/Hazen/Pt-Co
- Gardner
- Iodine
- Many other methods and scales



### Customized Reporting

The Report Composer in the VISION software suite offers complete freedom to configure your reports. Choose to include:

- Methods information
- Spectrum or Rate plots
- Tabular data
- Microsoft® Word files
- Microsoft Excel® spreadsheets
- Custom graphics such as your institutional logo

Link a report template to an application method and reports are automatically produced in your customized format.

# Comprehensive solutions for life science biochemical applications

The Evolution 300 is the natural fit for any multi-user life-science research laboratory. Whether your users perform fast or routine assays, such as Nucleic Acid tests or more advanced studies, such as Michaelis-Menten kinetics or Thermal Denaturation/Renaturation assays, this instrument offers a configuration ideal for your laboratory.

## Nucleic Acid Tests

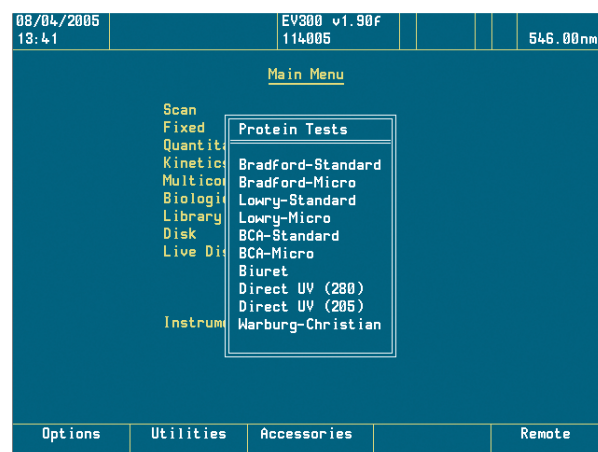
All the standard tests for determining DNA purity in the presence of protein or phenol are included. DNA/RNA concentrations can be determined by simple ratios or by wavelength scanning. The wavelength scanning option allows the added flexibility of checking for potential contaminants.

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

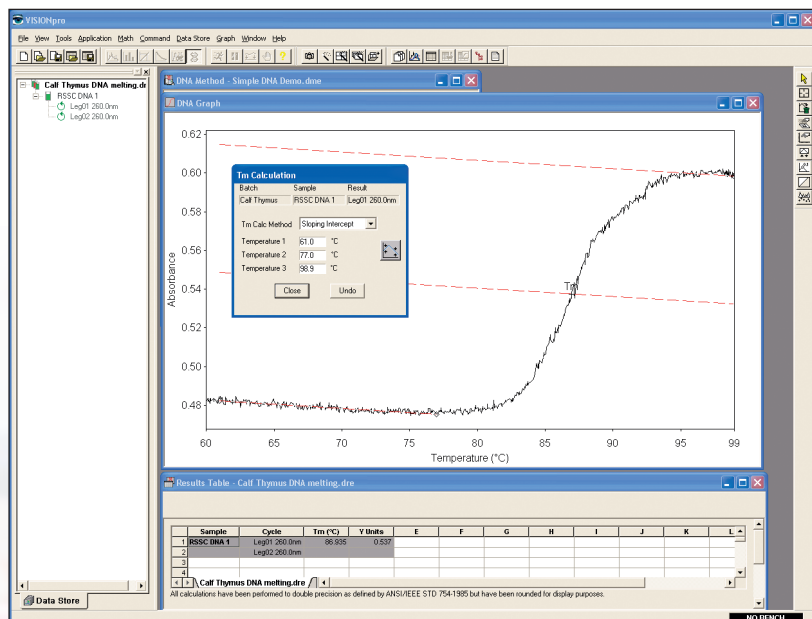
The Oligo (Calc Factor) function allows you to enter a specific oligonucleotide sequence and from a subsequent absorbance measurement the system calculates the %GC content, MW of the oligo, molar (pmol/ $\mu$ L) concentration of the sample and an estimate of the  $T_m$  value.

## 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.**



**With no external circulating water required, an Evolution 300 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.**

## Thermal Denaturation/Renaturation

Whether your research examines short or long DNA or RNA sequences, duplexes or triplexes, an Evolution 300 with 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.



## 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-Menten  $K_m$  and  $V_{max}$  parameters using methods such as Lineweaver-Burke and Eadie-Hofstee.

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

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<u>Main Menu</u>			
Scan			
Fixed			
Quantitation			
Kinetics			
Multica	Biological Tests		
Biologi			
Library	Nucleic Acid Tests		
Disk	Protein Tests		
Live Di	Cell Growth		
	Oligo Calculator		
Instrument Hours 620			
Options	Utilities	Accessories	Remote

# 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<sup>pro</sup> 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<sup>pro</sup>, is ideal.

## UVcalc 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 UVcalc function beneficial. UVcalc 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.

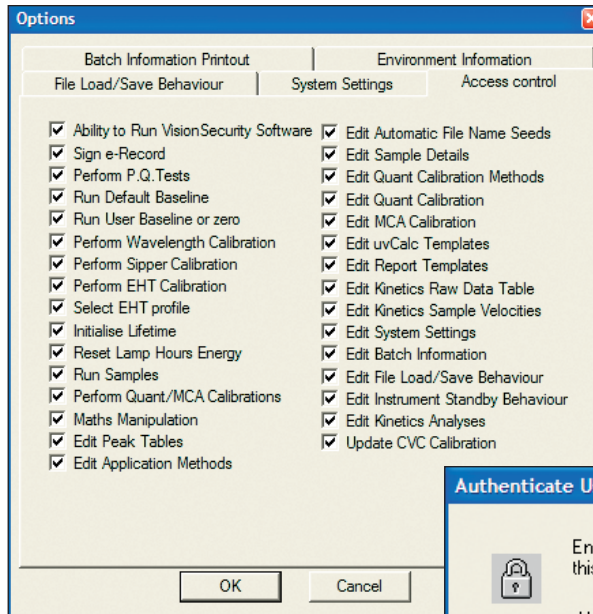
VISIONsecurity software provides all the tools necessary to help your laboratory achieve 21 CFR Part 11 compliance.

Whether compliance requires a manually inserted, traceable standard or fully automated intelligent verification, the Thermo Scientific proprietary Smart Calibration and Validation Carousels (CVC) traceable to NIST<sup>1</sup> or NPL<sup>2</sup> standards fully automate testing for:

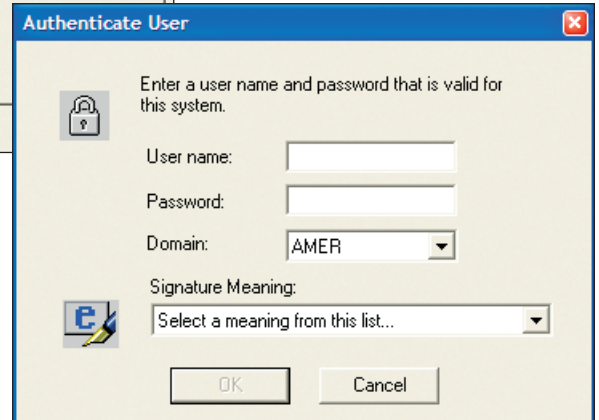
- Wavelength accuracy/repeatability
- Photometric accuracy/repeatability
- Stray light
- Photometric noise
- Photometric stability
- Baseline flatness
- Resolution

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.**

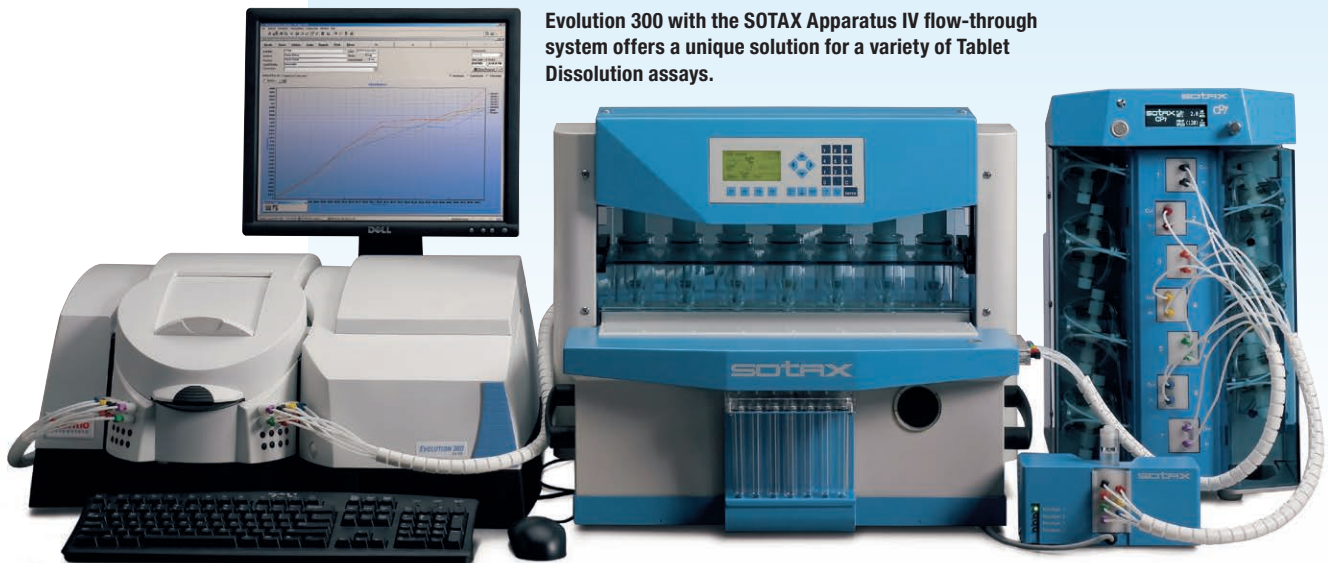


**With continually changing requirements to keep your Evolution spectrophotometer up to regulatory standards, no supplier in the industry can provide a more comprehensive selection of calibration and verification tools.**

## Tablet Dissolution

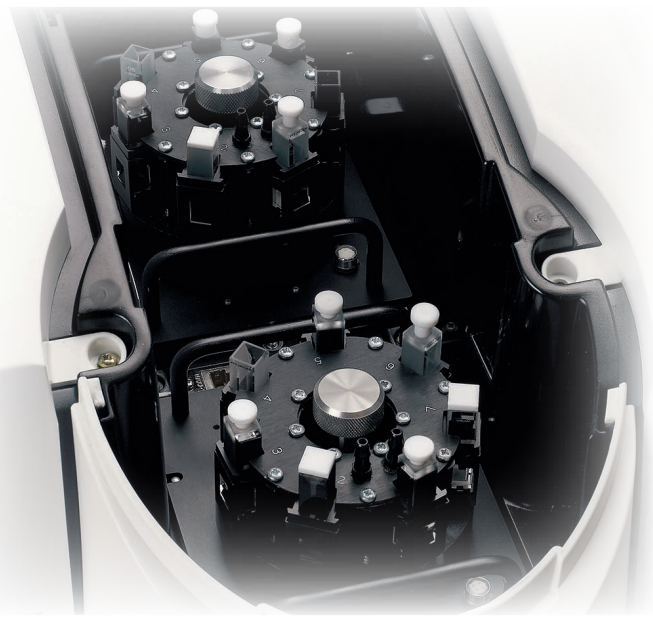
An important application where compliance issues are critical is in the testing of solid dosage forms. Thermo Fisher Scientific and SOTAX provide semi-automated and fully automated Tablet UV-Visible Dissolution testing systems. The system combination provides a complete and seamless solution for any dissolution laboratory.

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



# Smart Accessories for enhanced productivity

The Evolution 300 UV-Vis supports Smart Accessories with auto-intelligence. All configurations allow hot-swapping of powered accessories and automatically recognize and initialize each accessory upon installation. Snap the accessory in place and the appropriate software menu for that accessory appears on the screen. All other accessory software menus are hidden, eliminating possible confusion.



Smart Thermostatted Rotary 7-Cell Changer



Smart Sipper Accessory



Smart Peltier Thermostatted Single Cell Holder



Smart Thermostatted Linear 8-Cell Changer



8-Cell Peltier System



Temperature Probe

Temperature probe for Smart Accessories – monitor the temperature inside the cuvette from within VISION software



Thermostatted Single Cuvette Holder



Single Cell Peltier System



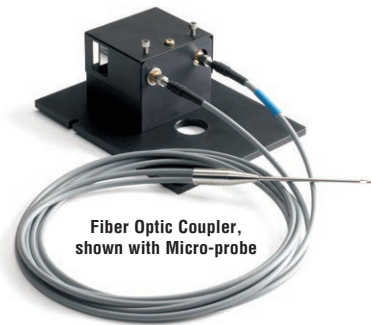
RX2000 Rapid Mix Accessory



Smart Calibration Validation Carousel (CVC)

# Kinematic mounts preserve alignment

Kinematic mounts allow easy interchange of accessories and ensure reproducible alignment each time the fiber-coupler or reflectance accessories, such as the Praying Mantis, are removed and re-installed.



Fiber Optic Coupler, shown with Micro-probe



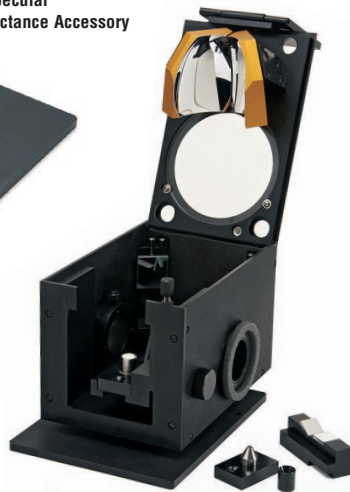
VeeMAX Variable Angle 30°–80° Specular Reflectance Accessory



8° Specular Reflectance Accessory



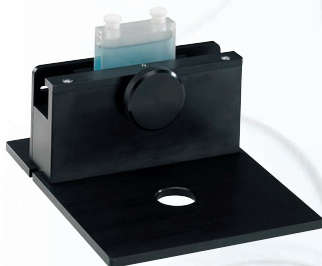
15°, 20°, 30°, 45°, and 60° Specular Reflectance Accessories



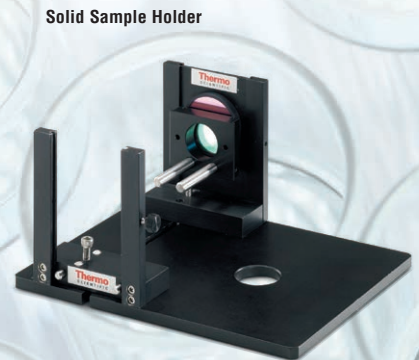
Praying Mantis Accessory



Test Tube and Vial Holder

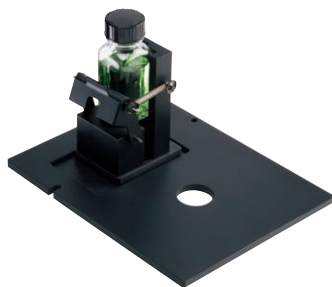


Long Pathlength Rectangular Cell Holder



Solid Sample Holder

The Solid Sample Slide Holder positions accessories supplied on standard 2-inch × 3-inch slides. Shown with a Universal Sample Holder and optional second slide holder.



1 Inch Square Vial Holder



Combination Cuvette and Test Tube Holder



Adjustable Microcell Holder

# Laboratory Solutions Backed by Worldwide Service and Support

Tap into our expertise throughout the life of your instrument. Thermo Fisher Scientific offers professional support through our worldwide network of highly trained and certified engineers. In many nations, Unity™ Lab Services, part of Thermo Fisher Scientific, offers direct support. Elsewhere, our partner companies' engineers receive the same factory training as our Unity engineers and stand ready to provide you with the same high level of service and support.

Put our experts to work for you to provide the services you need from system installation and training to technical support. Ask your Thermo Scientific sales representative about available product support services designed to keep your instrument in peak operating condition.



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