

# UV/VIS Spectrophotometers



## Excellence UV/VIS Spectrophotometers

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UV5

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UV7

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UV5Bio

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UV5Nano

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## FastTrack™ UV/VIS Spectroscopy

Speed up Your Measurements

METTLER TOLEDO

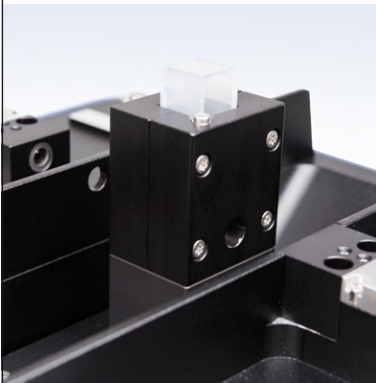


# FastTrack™ UV/VIS Technology

## Superior Performance by Design

**FastTrack UV/VIS technology integrates robust, state-of-the-art components into a unique spectroscopic system design. Thus, fast reliable measurements with high traceable accuracy are possible on a compact footprint. FastTrack UV/VIS technology and One Click™ operation comprise the basis for sustainable, trustworthy performance for the fast and simple operation of the UV/VIS Excellence line.**

### Measurements within seconds



FastTrack UV/VIS technology comprises modern fiber optics in combination with array detection and a Xenon flash lamp. A full spectrum scan is performed within just 1 second. Stable lamp intensity conditions significantly increase throughput, as multiple reference measurements are not needed during sample series.

### Excellent robustness



Thanks to the FastTrack UV/VIS technology, there are no moving parts in the instrument, and thus it reduces the risk of misalignment. This not only contributes to accuracy, not also brings a low requirement of maintenance.

### Clean up your lab bench



UV/VIS Excellence spectrophotometers have a strikingly small footprint. They can be operated as standalone without the use of a connected PC, thus saving ample benchtop space. FastTrack UV/VIS technology allows for an extremely compact layout of the optical components without compromising performance.

## Light Source

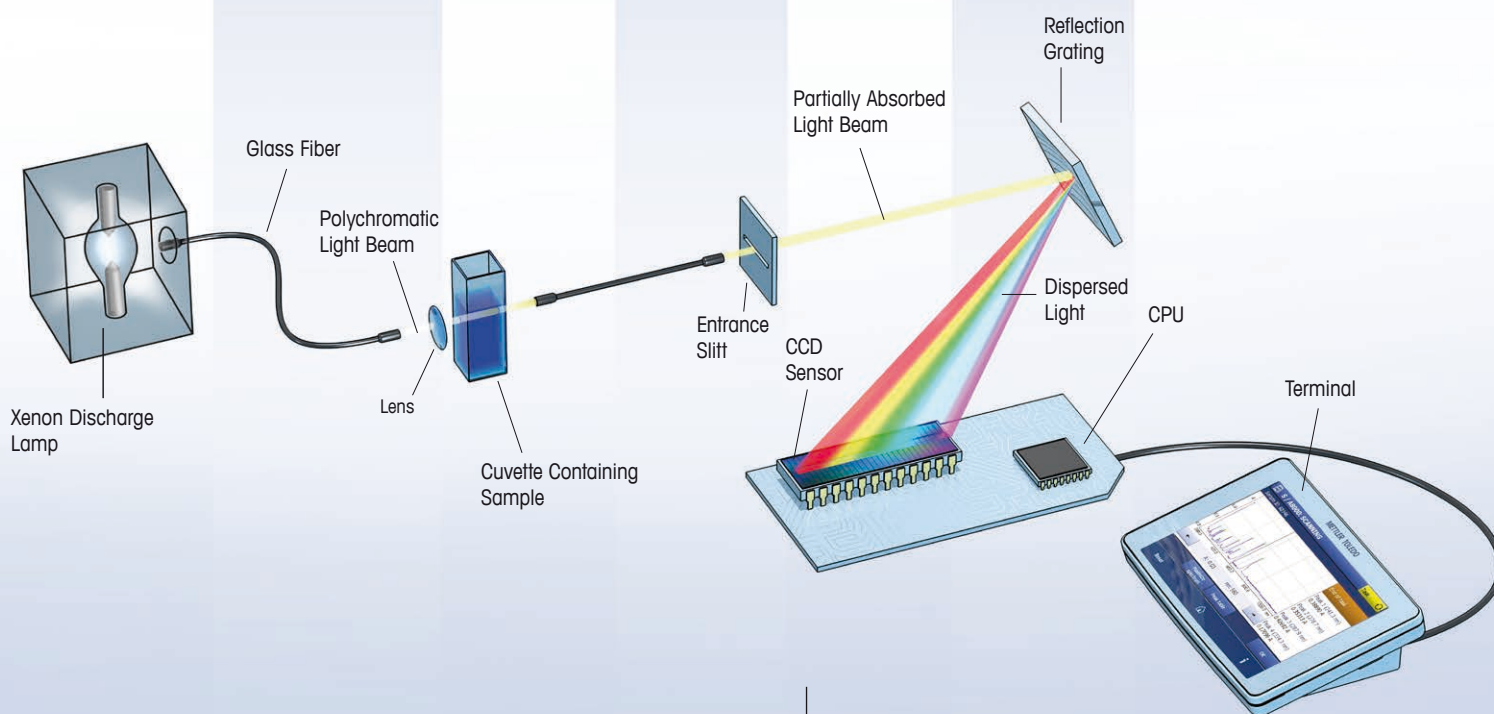
## Light Guidance

## Sample

## Detector

## Dispersing Light

## Computing and Display



### Compact modularity



Tailor the instrument to your needs with smart accessories and automation devices geared to meet individual application demands. The easily accessible open sample area makes cuvette handling fast and easy without impacting on the compact layout of the instrument.

### FastTrack UV/VIS Technology Bring the light on the fast track

- Pulsed Xenon flash lamp and CCD array detection for full spectrum scan within 1 second.
- State-of-the-art, long-life Xenon lamp for stable, and repeatable measurement conditions.
- Excellent signal to noise ratio thanks to optimal light guidance and yield through quartz glass fibers
- Always ready for measurement, no warm up time needed.

# Speed up Your Measurements

## Optimize Your Spectroscopic Workflow

The UV/VIS Excellence instruments optimize spectroscopic workflows effectively as the instruments are always ready for use. Fast measurements can be reliably run by automatic, pre-verified workflow routines and accessories can further automate applications efficiently. The PC Software LabX<sup>®</sup> fosters fast spectral data management and seamless integration into a METTLER TOLEDO based instrument network.

### An instrument at the ready



FastTrack UV/VIS technology guarantees that the instrument is ready at all times. No warm up time is needed for the Xenon flash lamp to reach stability, which speeds up measuring time. As the lamp is only used for real measurements, its lifetime is greatly increased.

### Ready-to-use applications



Spectrum scans, fixed wavelength absorption measurements, quantification with calibration curves or kinetic analyses are ready to use as direct measurements: Simply enter parameters, define the preferred workflow, store as a shortcut, and start the measurement with One Click.

### Increase workflow efficiency with automation



Sample loading is easily automated with the FillPalMini to pump samples safely into the flow cell. It can also be used for sample recovery and cuvette cleaning. Multiple samples are efficiently analyzed using the Plug & Play CuvetteChanger, including the measurement of sample series.



### **Manage your spectral data quickly and securely**

LabX UV/VIS PC software expands the instrument with a sophisticated graphical editor for spectra evaluation. Data analysis and management are simplified in one FDA 21 CFR part 11/EU annex 11 compliant software package. To optimize and secure your workflow even better, let the task scheduler organize your measurements.

# As Easy as It Gets

## Simple One Click™ Operation

**UV/VIS Excellence instruments include One Click, an easy and intuitive way to run tasks right from the terminal. A large, seven inch high-resolution terminal provides clear color representation of spectra and results at a glance. The user is always securely guided through step-by-step instructions. UV/VIS spectroscopy has never been so quick to learn and easy to use.**

### Configuration and shortcuts made easy



One Click UV/VIS Spectroscopy – the home screen shortcuts allow you to start such tasks as direct measurements or manual operations with just One Click. Irrespective of which submenu you are in, one keystroke takes you directly back to the home screen. With this intuitive interface, even customizing shortcuts is easy.

### Optimized routines and unparalleled user guidance



The task icon and comments on the touchscreen inform you about the status of your measurements. Efficient operation is secured as each keystroke in the various menus provides you with requisite information. The uncluttered home screen only displays information relevant to your daily work.

### Simple operation mode selection



Work according to your preferences. Use either a simple direct measurement or choose from pre-defined METTLER TOLEDO methods for an immediate start. In both cases, the well-defined method editor allows easy integration of automation functions and user-defined calculations to fit advanced application workflows.



### **Flexible dual-mode operation**

LabX UV/VIS PC software allows you the option to work at the instrument's terminal or at a PC. The PC does not need to be close to the instrument if bench space is limited. The network ensures all results are securely stored in the LabX database regardless of where the analysis was started.

# Trust Your Results

## Ensure and Maintain High Performance

**UV/VIS Excellence instruments are made to last. FastTrack UV/VIS technology ensures exceptional ruggedness and optical performance while precision can be verified with traceable, certified reference substances. The correct installation, usage and maintenance of the instrument are supported by the unique Good UV/VIS Practice (GUVP™) services, giving you peace of mind in your daily tasks and confidence in your results.**

### Keeping track of accuracy, automatically



The fully automatic modules CertiRef™ and LinSet™ allow to test the performance of the instrument in compliance with Pharmacopeia (USP or Ph.Eur.). Certified reference materials traceable to NIST primary standards are used and a report documents all results. Performance verification has never been so easy, efficient and secure.

### High performance, low maintenance



Exceptional ruggedness and reliability, thanks to the lack of moving parts in the optical section, long-lasting Xenon flash lamp and state-of-the-art optical fibers. Their flexible connectivity to printers, PC, storage devices and barcode scanners, make UV/VIS Excellence instruments a sound, sustainable investment for the future.

### Secure measurement quality



GUVP provides comprehensive services that include: installation, operational qualification, performance qualification recommendation, defined maintenance qualification with calibration, and LabX software validation. GUVP covers the entire life cycle of the instrument, improving quality while reducing risks and costs.





**Ready at the start**

Each UV/VIS Excellence instrument is shipped ready for immediate use. Fast-Track technology allows for an impressively simple layout of the optical system and does not require any adjustment during installation. Simply power up the system and measure!

# OneDrop UV/VIS Spectroscopy

## Minimize Sample, Maximize Performance

### Save precious sample and avoid errors



Micro-volume UV/VIS measurement is the method of choice when measuring either small sample amounts or high absorption samples. Only 1  $\mu\text{L}$  of sample is required for reliable measurements. The pure sample is pipetted on the measuring surface and the arm is locked automatically to a precisely defined pathlength. Measurement errors are avoided, as the sample does not need to be diluted.

### Measure wide concentration ranges fast

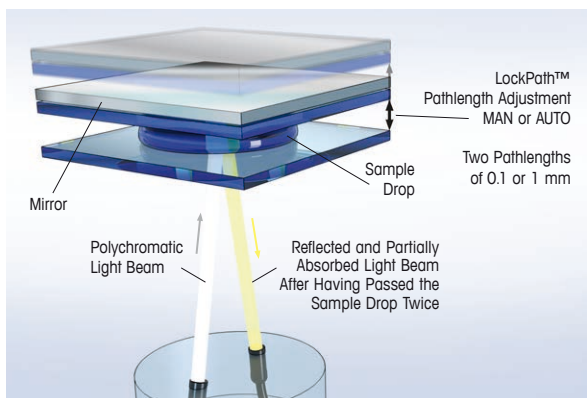


LockPath enables the measurement of wide concentration ranges from 6 to 15,000  $\text{ng}/\mu\text{L}$  of dsDNA without further dilutions within 2 seconds per pathlength. The most suitable pathlength can be automatically locked. The arm design prevents the sample from drying out during measurement, significantly increasing repeatability.

### Double application power and ergonomic design



The UV5Nano combines two instruments in one for micro-volume and cuvette based measurements. Once the arm is at a 90 degree position, the measurement surface can be easily accessed with a pipette from either the left or the right. The curved lid on top of the instrument allows convenient positioning of the operator's hand to securely guide the pipette tip.



### Secure accuracy with LockPath™

LockPath ensures that the available pathlengths at 0.1 and 1 mm are accurately defined. Thanks to the rugged patented design, pathlength drift is excluded. This eliminates expensive recalibration and downtime. The arm is securely locked and cannot be opened until the measurement is completed; measurement errors are minimized and result accuracy is preserved.

# Tailored to Your Needs

## Industry-Specific Applications

**UV/VIS Excellence spectrophotometers perform typical direct measurements such as fixed wavelength, spectrum scan, quantification and kinetics. In addition, pre-verified METTLER TOLEDO methods are available for applications in pharmaceutical, chemical, food and beverage, and biotechnology industries, amongst others. The instruments can be integrated into automated multi-parameter systems together with other METTLER TOLEDO analytical instruments such as titrators, density meters, and refractometers.**

### Pharmaceutical, Cosmetics



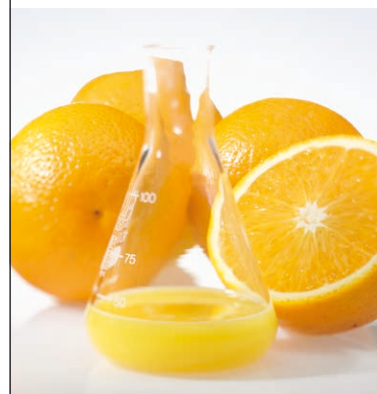
- Concentration determinations, e.g.
  - Active agent content (tablets, capsules, ointments, creams)
  - Content uniformity studies
- Identification, e.g. Alkylamines, Sulphonamides, Alkaloids, Heterocycles
- Purity by absorption, e.g. Peptides, proteins
- Kinetic studies using specified wavelengths or full spectra
  - Enzyme kinetics
  - color according to gardner and Hess-Ives

### Chemical, Environmental



- Concentration determinations, e.g.
  - Anions in water (phosphate, silicate, nitrate)
  - Metal cations
  - Surfactants
  - UV absorbing agents in paints and varnish
- Identification and spectra comparison, e.g. Pesticide residues, Chlorophyll
- Purity by absorption, e.g. Benzene in absolute ethanol
- Color according to Saybolt, Gardner, CIE L\*a\*b\*, APHA/Pt-Co/Hazen, Yellowness index

### Food & Beverage



- DOBI (Deterioration of Bleachability Index) of palm oil
- Browning index of fruit juices
- Purity of olive oil
- Beer color according to ASBC and EBC
- Enzymatic determination of carbohydrates (glucose in food)
- Color According to EBC, ASBC, CIE L\*a\*b\*



### Petrochemical



- UV absorbance of petroleum products (ASTM D2008)
- Phosphorous in gasoline (ASTM D3231)
- Duty markers in fuel
- Hydrogen sulfide in fuel oils
- UV absorbance of aromatic compounds
- Color according to Saybold, Gardner, Yellowness Index, APHA/Pt-Co/Hazen

### Life Sciences applications



- Nucleic acid analysis: concentration determination, 260/280 nm ratios (with background correction at 320 nm) for nucleic acid purity
- Protein analysis: Biuret (Modified) Lowry, Bradford, Bicinchoic acid, and Trinitrobenzene sulfonate protein quantification methods
- Kinetic tests for enzyme activity determination
- Standard cuvette or microvolume down to 1  $\mu$ L sample size

### Multiparameter solutions



- Fully automated multi-parameter measurements e.g.
  - Determination of absorbance at specific wavelength, pH, and acidity of drinking water.
  - Determination of absorbance at specific wavelength, pH, acidity, Brix (by refractive index, acid corrected) of fruit juices.

# Comparison Table

## UV5 – UV7 – UV5Bio – UV5Nano

The UV/VIS Excellence line encompasses three models for cuvette measurements and one dedicated micro-volume instrument for life science applications. Each of the models provides unique features that are beneficial to their respective industries.



### UV5 – easy and fast

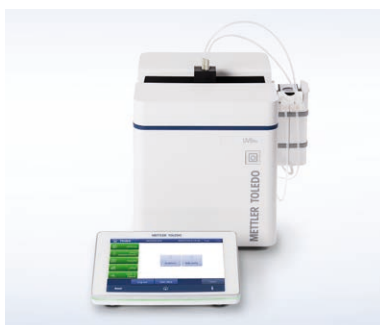
The UV5 comes ready-to-use with a 7-inch touchscreen terminal and a precision 1 cm cuvette holder. Three direct measurement types (fixed wavelength, scan, quantification) have been pre-installed. FastTrack™ technology allows full spectrum scans from 190 – 1100 nm in 1 second. It is available in two versions: UV5 includes the precision 1 cm cuvette holder and the UV5 A includes the 8-position CuvetteChanger for automated UV/VIS measurements.



### UV7 – excellence performance

The UV7 comes with four pre-defined direct measurement types and METTLER TOLEDO methods. The method editor allows specific adaptation of the spectroscopic workflow. The UV7 optical performance is tested according to the US and European Pharmacopeia concerning photometric and wavelength accuracy/repeatability, photometric linearity, stray light and resolution. To learn more, please visit the link:

► [www.mt.com/UV-VIS-Pharmacopeia](http://www.mt.com/UV-VIS-Pharmacopeia)



### UV5Bio – the Life Science Specialist

The UV5Bio is a dedicated instrument for standard cuvette measurements in life sciences. Its wide range of pre-defined direct measurement applications and METTLER TOLEDO methods are typically used in Life Sciences (biotech and biopharma), e.g. concentration determination of nucleic acids and proteins. The UV5Bio has the same specifications and delivery scope as the UV5.



### UV5Nano – the Life Science Micro-Volume Master

The UV5Nano allows micro-volume measurements with only 1 µL of sample, as well as standard cuvette applications. LockPath™ technology secures pathlength accuracy and repeatability. It comes with a wide range of pre-defined direct measurement applications and METTLER TOLEDO methods typically used in Life Sciences (biotech and biopharma), e.g. nucleic acid and protein analyses.

# Feature comparison UV/VIS Excellence Line

	Feature / Parameters	UV5	UV7	UV5Bio	UV5Nano
<b>Optical performance</b>	Wavelength range [nm]	190–1100	190–1100	190–1100	190–1100
	Resolution (toluene in hexane)	>1.5	>1.9	>1.5	>1.7
	Wavelength accuracy (measured with NIST2034 holmium oxide) [nm]	±0.9	±0.5	±0.9	±0.9
	Wavelength repeatability (measured with NIST2034 holmium oxide) [nm]	<0.15	<0.08	<0.15	–
	Photometric accuracy (measured with NIST935 potassium dichromate) [A]	±0.005 (≤1A)	±0.005 (≤1A)	±0.005 (≤1A)	±0.006 (≤1A)
	Photometric accuracy (measured with NIST930/1930 neutral density filter) [A]	±0.005 (≤1A)	±0.005 (≤1A)	±0.005 (≤1A)	–
	Photometric repeatability (measured with NIST935 potassium dichromate) [A]	<0.002	<0.002	<0.002	<0.003
	Photometric repeatability (measured with NIST930/1930 neutral density filter) [A]	<0.003	<0.003	<0.003	–
	Stray light at 198 nm (measured with KCl)	>2.0A (<1.0% T)	>2.3A (<0.5% T)	>2.0A (<1.0% T)	>1.7A (<2.0% T)
	Stray light at 220 nm (measured with KI)	>3.5A or <0.03% T	>3.7A or <0.02% T	>3.5A or <0.03% T	>3.5A or <0.03% T
	Stray light at 340 nm (measured with NaNO <sub>2</sub> )	>3.7A or <0.02% T	>3.7A or <0.02% T	>3.7A or <0.02% T	>3.7A (<0.02% T)
	Noise [A]	<0.002	<0.002	<0.002	<0.003
	Baseline flatness [A]	<0.002	<0.002	<0.002	<0.003
	Tested according to USP and Ph. Eur.	no	yes	no	no
Minimal scan time full range [s]	1	1	1	1	
<b>One Click™ UV/VIS spectroscopy</b>	Shortcuts per user	24	24	24	24
<b>Temperature control</b>	CuveT thermostating unit	•	•	•	–
<b>Automation</b>	Peristaltic pump FillPalMini and SPR200	•	•	•	•
	CuvetteChanger	•	•	•	–
	InMotion Sample Changer	•	•	•	•
	CertiRef™ automatic performance verification	•	•	•	–
	LinSet™ automatic linearity verification	–	•	–	–
<b>Applications &amp; Methods</b>	Direct measurements	3	4	5	5
	Pre-defined METTLER TOLEDO methods	–	21	22	21
	Method editor	•	•	•	•
	Max. number of methods	50	100	50	50
	Support of the following color maps: CIE L*a*b*, CIE Luv, Tristimulus (X,Y,Z), Chromaticity (x,y), Lab according to Hunter	•	•	•	•
	Support of the following color numbers: ASBC, EBC, Gardner, Hess-Ives, APHA/Pt-Co/Hazen, Saybolt, Yellowness Index	•	•	•	•
<b>Results</b>	Number of results stored in instrument	20	100	50	50
	Result storage on USB stick	•	•	•	•
	Result transfer via TCP on remote PC	•	•	•	•
<b>PC software</b>	LabX® UV/VIS software	•	•	•	•
<b>Languages</b>	English/German/French/Spanish/Italian/Portuguese/Russian/Chinese/Japanese	•	•	•	•
<b>Connectivity</b>	USB devices (memory stick for result storage, bar code reader, printer)	•	•	•	•
	Interfaces: Ethernet (PC, network printer), RS232-C	•	•	•	•
<b>Terminal</b>	7" QVGA Color TFT 800 x 480 resolution touch sensitive screen	•	•	•	•
<b>Instrument dimensions</b>	Width x depth x height (without terminal) [mm]	208 x 255 x 228			208x255x217
	Weight incl. terminal [kg]	6.4			7.2

The data above apply to hardware version 2 and firmware 3.0.1 or later.

# Accessories

## Software



### LabX® UV/VIS PC Software

Full instrument control, FDA 21 CFR part 11/EU annex 11 compliance and system integration.

## Printer



USB-P25, -P56, -P58 compact printer and HP and EPSON protocol network printer.

## Performance verification



### CertiRef™ and LinSet™ modules

Automated performance verification module with certified standards, compliant with Ph. Eur. and USP.

## Cuvettes & cuvette holder



**Cuvettes:** 1 cm, 5 cm pathlength optical and quartz glass, 700 µL micro cell quartz glass, 440 µL flow cell quartz glass.

**Holders:** 1 cm, long pathlength, solid sample, tube.

## Automation



**CuvetteChanger:** Up to 8 cuvettes, thermostatable.

**FillPalMini:** Peristaltic pump, to be used with flow cell cuvette.

**InMotion:** For automatic sampling.

## Data input, user identification



Hand-held bar code reader (USB), Biometric instrument login with LogStraight™ fingerprint reader.

[www.mt.com/UV-VIS](http://www.mt.com/UV-VIS)

For more information

### METTLER TOLEDO Group

Analytical Division

Local contact: [www.mt.com/contacts](http://www.mt.com/contacts)

Subject to technical changes

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Marketing UV/VIS / MarCom Analytical



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