

# Time for New Demands SPECORD® PLUS

UV/Vis Spectrophotometry



## SPECORD® PLUS Series

Among the more than 150,000 photometers installed worldwide from Jena, the SPECORD® is a classic. The latest generation of the SPECORD® spectrophotometer, the double-beam photometer SPECORD® PLUS, set a new course to the future!

### SPECORD® PLUS – flexible and efficient

- Comprehensive accessory range
- Quickly ready for measurement
- Easy handling
- Intelligent software
- 10-year long-term warranty\* for optical components

### SPECORD® 50 PLUS

Double-beam spectrophotometer with Split-Beam Technology – ideal for qualitative and quantitative routine photometric applications

### SPECORD® 200 PLUS

Double-beam spectrophotometer with fixed spectral bandwidth – simultaneous measurement of sample and reference signal

### SPECORD® 210 PLUS

Double-beam spectrophotometer with 5 variable spectral bandwidths – ideal for measuring solutions and solids requiring high optical resolution

### SPECORD® 250 PLUS

Double-beam spectrophotometer with 5 variable spectral bandwidths and double monochromator – for optimal reduction of stray light, ideal for samples with particularly high absorption



\* according to our warranty conditions: [www.analytik-jena.com](http://www.analytik-jena.com)

# SPECORD® PLUS

Time for New Demands



## SPECORD® – Sets the Highest Standards

Whether routine analysis or special application in chemistry, pharmacy, medicine, food control, environment, life science or others – with SPECORD® PLUS you are well equipped to fulfill all requirements.



### **Precision**

The SPECORD® PLUS offers highest precision and reliability of measurement results.

### **Flexibility**

An extensive range of accessories guarantees flexibility and efficiency for all routine- or special applications.

### **User-friendliness**

The generously sized sample chamber and easily accessible long-life radiation sources are a benchmark for functionality and instrument design.

### **Intelligence**

The modular software package ASpect UV is the basis for the intelligent control of the SPECORD® PLUS family and allows the user to work intuitively and precisely.

### **Durability**

Analytik Jena is the only manufacturer worldwide that offers a long-term warranty of 10 years for the optical components of the device.

### **Design**

The intelligent design of the SPECORD® PLUS impresses with ergonomics and optimal use of space, fast operational readiness, high effectiveness and easy handling.

## SPECORD® – Assures Highest Quality

Quartz coated optical components with high-quality encapsulation guarantee highest quality, maximum performance and extreme durability. A 10-year long-term warranty for the optical components emphasizes this promise.

### Simply convincing:

- Monochromator with imaging holographic grating for stray light reduction
- Minimized number of movable components for high reliability, notably improved signal-to-noise ratio and best energy throughput
- Aspheric optics for optimized, highly precise imaging
- Innovative Cooled Double Detection (CDD) technology – two temperature controlled detectors for outstanding long-term stability
- Pre-adjusted and voltage stabilized radiation sources
- Double-beam mode for highest precision
- Internal holmium oxide filter for wavelength calibration and for optimized wavelength accuracy and reproducibility
- Variable spectral resolution for optimal sensitivity
- Dedicated cell position directly in front of the detector area for measuring turbid samples
- Long lamp lifetime



# SPECORD® – Maximum User-friendliness Guaranteed

Plug and play – short warm-up phase, automatic accessory recognition, an intuitive software navigation and a comprehensive collection of methods make your work enjoyable.

## More features you will love:

- Large, easily accessible sample compartment
- Easy use of different cell types
- Easy lamp replacement
- Modular and multilingual software concept
- Self Check System (SCS)

## Intuitive, user-oriented and easy to use

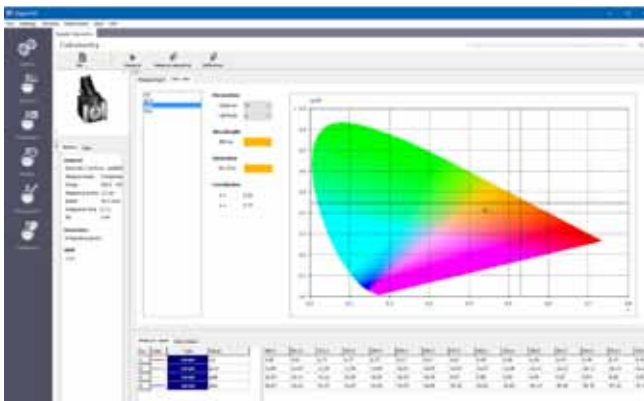
The generously sized sample compartment is ideal for quick, easily repeatable addition of reagents and the fast exchange of samples and accessories. The light sources are pre-aligned, readily accessible and easy to exchange. The integrated device check indicates when a lamp replacement is necessary. Switching between the deuterium and halogen lamp can easily be preprogrammed by the user. Both lamps can be switched on or off easily via the software menu.

## ASpect UV software

The ASpect UV software allows for the control, monitoring, and documentation of all operations of the spectrometer and accessories. The intuitive software navigation and the intelligent operating system ensure easy operation. ASpect UV supports GLP-suitable operation including FDA 21 CFR Part 11 conformity.

## Your benefits

- Self Check System (SCS): Regular and fully automatic checks of all parameters important for instrument safety and the quality of the analyses ensure trouble-free operation.
- Optimized analysis: The software indicates necessary settings for measurements.
- Automatic accessory recognition: The software recognizes connected accessories and indicates necessary accessories.
- Method selection: The system includes a large selection of preprogrammed methods. Simply choose a method and start measuring.
- Multilingual Software: The user can select between different languages, including German, English, French, Russian, Chinese, Spanish and Japanese.
- Spectra presentation and handling: individual color selection, easy shifting, copying and overlay of spectra.



Color determination using the colorimetry module



Quantitative analysis with the photometry module

# SPECORD® – Secures Perfect Measurement Results

Comprehensive basic software and numerous specific tools provide the perfect solution for diverse applications.

## Analysis made easy

- Data handling such as addition, subtraction, peak search, smoothing, derivative, interactive wavelength selection, integration and normalization
- Quantitative analysis with statistical functions
- Formula editor for creating individual formulas
- Macro programming for individual method development for automated measurement-, evaluation- and documentation processes
- Life Science program package for the quantification of nucleic acids and proteins with numerous preprogrammed bio methods, such as DNA purity determination, Warburg Christian-, Scopes-, Kalb- and Bernlohr-Formula
- Kinetics tool for evaluating time-controlled reactions
- Tool for measuring the layer thickness of transparent coatings and foils
- Tool for color determination, such as calculating the color coordinates using the different standard illuminants, white/yellow index and color numbers
- Diverse preprogrammed methods for determining enzymatic content in food and for medical purposes
- Water analysis with preprogrammed methods
- Validation software for quality assurance of device parameters based on internal and external quality regulations (incl. Ph. Eur. and USP)
- Device check to determine the status of the photometer



## SPECORD® – Enhanced Individual Flexibility

Routine or special analysis – the extensive range of accessories and the modular software concept offer unique individuality and flexibility in operation.

### Perfect equipment

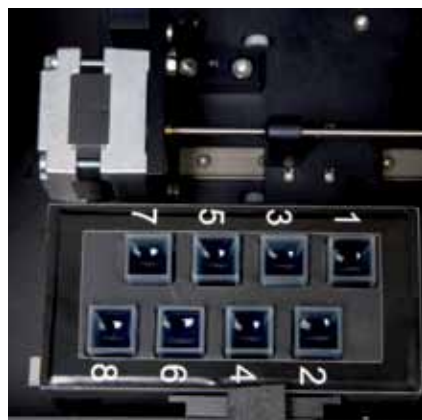
UV/Vis spectroscopy in particular requires a wide range of accessories in addition to a solid basic instrument. Whether cell holder, cell changer, flow cell systems, reflectance accessories or fiber coupling the wide range of SPECORD® accessories supports the automation of analytical processes, and the use in a broad range of routine analytical tasks as well as special applications.

SPECORD® PLUS is your ideal partner for quantitative photometry as well as applications in research and development, production, quality control and many other areas. Below is a small selection of some of the applications for the SPECORD® PLUS and its accessories.

### Chemical industry

The SPECORD® PLUS can be used in the chemical industry for example in the area of material analysis and purity control. Transmission characteristics of different materials such as glasses and foils can be examined with the holder for solid samples. The determination of the refractive index and the film thickness of these materials can be carried out using the variable angle reflectance attachment. The integrating sphere is suitable for the measurement of transmittance and diffuse reflectance of scattering solid or liquid samples as well as powder samples. With the help of the color software the determination of different color coordinates in textiles or the white/yellow index of for example surfaces of teeth can be examined.

The autosampler with up to 116 sample positions enables effective routine analysis with high sample throughput.



8-cell changer



Solid sample holder to determine transmission characteristics



Integrating sphere for transmittance and diffuse reflectance measurements





### Food and Agriculture

Reactions with time-dependent concentration changes such as enzyme kinetics, e.g. citric acid, glucose and saccharose in foods can be carried out with special accessories, such as the peltier temperature controlled 8-cell changer.

Quantitative analysis of numerous elements and compounds found in foods such as calcium, phosphate and nitrate can be carried out quickly and easily using ready-to-use test kits.

### Water and waste water analysis

The sipper system can be used for the automated quantitative analysis of numerous elements such as iron, copper and zinc.

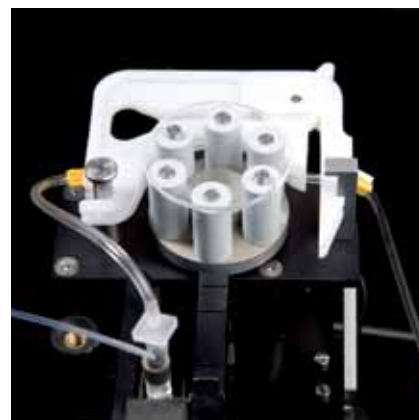
With the help of a measuring probe, less degradable organic compounds can be analyzed directly in the sample. The chemical oxygen demand (COD), ammonium, cyanide or elements such as lead, cadmium, nickel and aluminum in water samples can be detected quickly and easily using ready-to-use test kits and the round cell holder. The dedicated position for turbid samples of the SPECORD® PLUS allows reliable measurements of highly scattering samples, such as turbid waste water.



Ready-to-use test kits for water analysis



Position for turbid samples for measuring highly scattering samples



Sipper system for routine quantitative analysis

# SPECORD® – Equipped with Numerous Accessories

## Medicine and Life Science

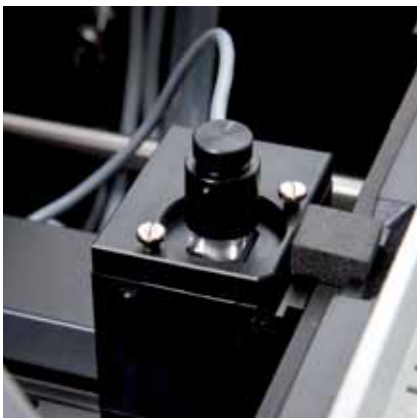
With the adjustable cell holder and the ultra-micro cell, the precise determination of concentrations can also be carried out with small sample volumes, such as DNA purity determination. By means of the peltier temperature controlled cell holder, the DNA melting point determination can be performed with very high temperature accuracy.

The peltier temperature controlled accessories allow analysis in a temperature range of -5 to 105 °C and with an accuracy of  $\pm 0.1$  °C. This feature enables applications that demand high temperature accuracy, such as precise protein analysis and examination of photochemical reactions.

## Pharmacy

The SPECORD® PLUS can also be used for the purity control of raw materials or active ingredient screening. With SPECORD® PLUS Dissolution, online UV/Vis measurements of automatic test series are possible.

The possibility to implement two 8-cell changers enables a high number of flow-through cells can be integrated in the process.



The peltier temperature controlled cell holder guarantees high temperature accuracies; the temperature is measured directly in the cell.



The SPECORD® PLUS Dissolution can be used to examine the release of active ingredients in tablets during the dissolution process.



Adjustable cell holder with ultra-micro cell for precise quantitative analysis of extremely small sample volumes

## SPECORD® – Compliance with Relevant Standards Guaranteed

Comprehensive quality assurance is a primary consideration in today's analysis software development. According to GLP, all analytical data must be accessible and documented with accuracy guaranteed

Compliance with these requirements can be assured through a variety of measures for the fully automatic monitoring of the precision and accuracy of measurement results.

### FDA 21 CFR Part 11

Conformity to FDA 21 CFR Part 11 is often a must for modern analysis software. The functions integrated in ASpect UV ensure data security as well as the reliability, transparency and traceability of all actions through-out the measurement procedure. All processes are presented in easily comprehensible terms and with a clear layout. A comprehensive user management, electronic signatures and the Audit Trail satisfy the requirements of FDA 21 CFR Part 11. The ASpect UV has the necessary functions and tools to support an efficient and FDA 21 CFR Part 11 compliant work flow.

### Validation of device parameters

To check all important device parameters of your SPECORD® PLUS in compliance with internal or external quality standards, such as Ph.Eur., USP, TGA and ASTM and to ensure correct and accurate results, the ASpect UV UV/Vis software offers a special Validation module.

### Installation and Operation Qualification

Installation Qualification (IQ) and Operation Qualification (OQ) are an integral part of quality assurance. IQ includes the correct and proper installation of the main unit and peripherals and the corresponding documentation (certificate). The OQ ensures that the spectrophotometer has been certified to satisfy the performance specifications guaranteed by Analytik Jena. Validation tests are conducted with certified photometric standards, to ensure that measurement results conform to the highest standards of reliability, accuracy and precision.



#### Headquarters

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