JASCO

# Spectroscopy and Chromatography Technology

*FT-IR*
*Raman*
*UV-Vis/NIR*
*Dissolution Testing*
*Circular Dichroism*
*Fluorescence*
*Polarimetry*
*HPLC, RHPLC & UHPLC*
*SFC/SFE*

**Superior Performance**
**Superior Innovation**
**Superior Reliability**

# The JASCO range of Analytical Instrumentation

*In 1958, to meet the need for an Infrared Spectrophotometer at the Institute of Optics (now Tsukuba University), a group of researchers developed their own instrument. This was a great success with a highly reliable unit giving excellent optical performance. This led to other research groups requesting similar instruments for their laboratories and the founding of JASCO Corporation in 1958 to meet the growing demand for optical spectroscopy instrumentation. Today, JASCO manufactures a wide range of UV-Vis/NIR, FT-IR, Fluorescence, Raman and related spectroscopic instrumentation. JASCO is also the world leader in the field of Circular Dichroism Spectropolarimeters.*

*The experience gained by JASCO in both optical design and computer technology led to the production of spectrophotometric detectors for HPLC. The move into the HPLC market continued with the production of solvent delivery systems, gradient elution devices and a complete range of detectors. JASCO now has 30 years experience in the design and development of innovative chromatography instrumentation for a wide range of applications. For over 20 years, JASCO has also responded to the growing emphasis on reducing chemical waste by offering an alternative to traditional HPLC with a full line of "green" SFC/SFE products.*



## JASCO's Global Network

*JASCO has been supplying analytical instrumentation to customers in over 45 different countries in North and South America, Europe, Asia, Africa and Oceania through a worldwide network of affiliated companies and distributors.*

*In addition, JASCO has highly skilled and well-trained local engineers to support you and maintain instrument performance.*

## Whenever, Wherever ... JASCO

JASCO

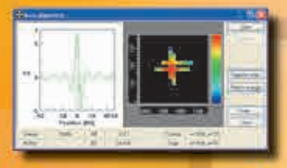
# Spectra Manager™ Suite

## *A single platform software for all JASCO spectroscopy instruments*

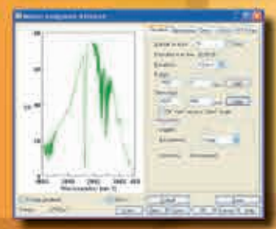
***JASCO is the first manufacturer to develop a powerful, cross-platform Wi ndows® software package for controlling a wide range of spectroscopic instrumentation. The Spectra Manager program is a comprehensive package for capturing and processing data, eliminating the need to learn multiple software packages and offering the user a time-saving benefit.***

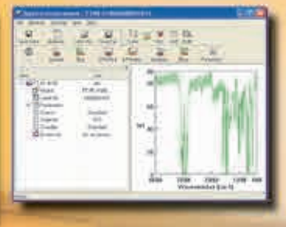
- ***Spectrum measurement***
- ***Spectral analysis***
- ***Multiple instrument control***
- ***Instrument validation***
- ***Self diagnostic routines***
- ***Publication-quality printouts***
- ***Automated macros command option***
- ***Quantitative analysis packages***

### System Control & Data Acquisition



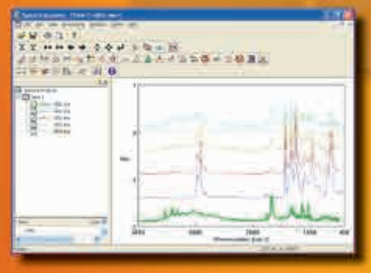
*Drivers are available to control each JASCO spectroscopy instrument. Parameter dialogs allow easy editing of pre-saved parameter files.*

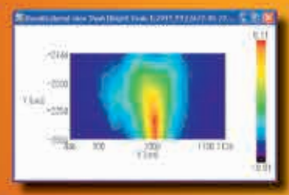


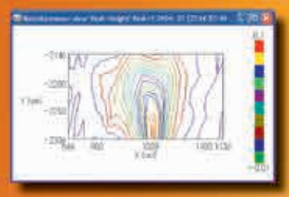


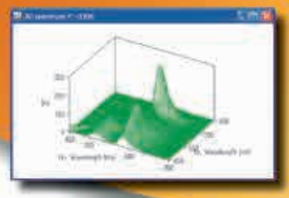
### Flexible Display Features

*User-friendly features include overlay printing in colors and patterns, autoscale mode, full control of style and font, customized tool bars, etc.*









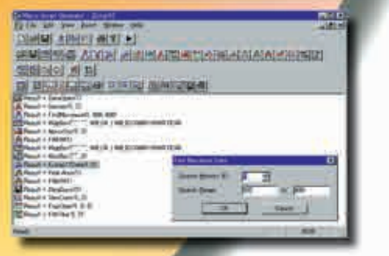
### Data Processing & Spectral Analysis

*Several types of measurement data files (UV/Vis/NIR, FTIR, Fluorescence, etc.) can be viewed in a single window, and processed using a full range of data manipulation functions. Features include arithmetic operations, derivatives, peak detection and processing, smoothing (several methods), baseline correction, etc.*



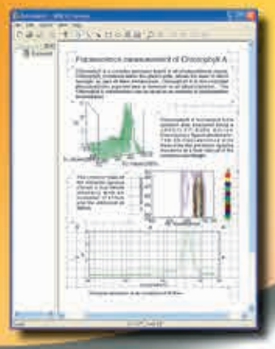
### Macro Command Option

*This software provides customized programs for a complete range of tasks including data acquisition, post-run data manipulation, report printing, etc.*



### Report Publishing

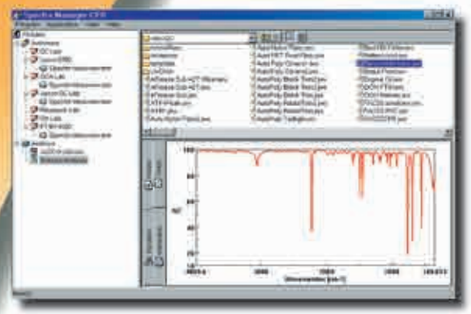
*JASCO canvas allows the user to produce hard copy layouts of data to meet their own report requirements.*



# Spectra Manager™ CFR

***Spectra Manager™ CFR provides features to support laboratories for compliance with 21 CFR Part 11. A choice of complete pull-down task menus, user-friendly icons, and easily accessible pop-up menus enables new users to manage security information, control user access, and record audit trails.***

- ***Management of security information for systems, users, data and records***
- ***Access control for secure systems by user ID and password***
- ***Audit trail function with time-stamp for tracking records***
- ***Three levels of electronic signatures for record integrity***



### Easy-to-use

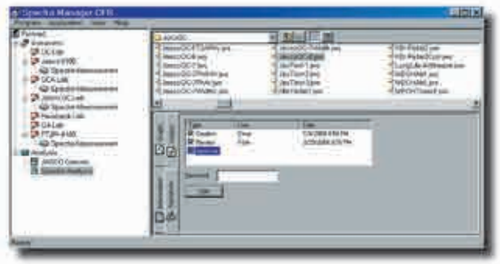
*Startup window lists available resources, such as instruments, measurement and application programs. User access requires a Username and Password, assigned by the Workgroup Manager.*

### Access Rights Control

*System access levels for Administrator, Power User, Limited User and User are defined.*

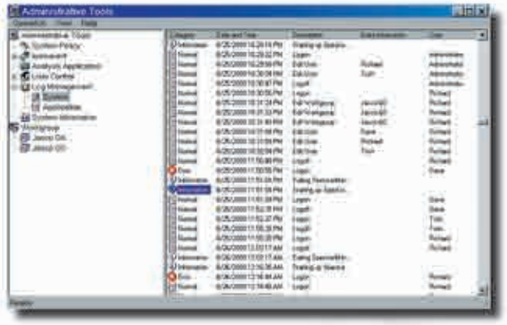

### Electronic Signatures

*Three levels of electronic signatures, Creation, Review and Approval. Electronic signatures are applied to spectral data files, Canvas templates or documents, instrument parameters and analysis methods.*



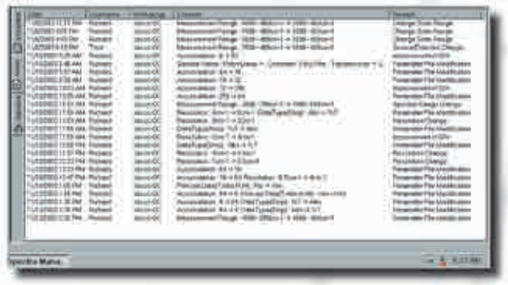
### Audit Trail for System and Applications

*The system and application history are automatically recorded.*




### Audit Trail for Data Files and Parameters

*Audit trails are assigned to every data file, recording data manipulations on the spectral data. Audit trails are also applied to instrument parameters, Canvas templates and Method files.*



# Fourier Transform Infrared Spectrometers

## FT/IR-4000 Series

***The JASCO FT/IR-4600 and FT/IR-4700 were designed to provide operational features and sensitivity levels found only in more expensive instruments. Innovative technology results in an exceptionally high signal-to-noise ratio. Both models offer excellent operational flexibility and can be easily upgraded to meet new requirements. Expandable capabilities include microanalysis using an FT-IR microscope, IR imaging, and a second detector. The JASCO Quick Start System enables users of all experience levels to measure samples and perform data processing functions quickly and easily with a simple push of a button.***

### FT/IR-4600

- *Compact size and economical*
- *S/N ratio: 25,000:1*
- *Maximum resolution: 0.7 $cm^{-1}$*
- *Applicable to FT-IR microscopy and IR imaging*
- *Auto-alignment*
- *Purgeable optics*

### FT/IR-4700

- *S/N ratio: 35,000:1*
- *Maximum resolution: 0.4 $cm^{-1}$*
- *Excellent sensitivity*
- *for varied and complex applications*
- *Measurement of liquid, solid and*
- *gaseous samples*

### A full range of sampling accessories

- *IQ Accessory Recognition*
- *Standard purge capability*
- *Use of any commercially available accessory*

**DR PRO410-M**
*Diffuse Reflectance Accessory*

**ATR PRO ONE**
*Single Reflection ATR Accessory*

**RAS PRO410-H**
*Grazing Angle Reflection Accessory*

## FT/IR-6000 Series

***The JASCO FT/IR-6000 Series offers the highest level of performance in the industry with excellent signal-to-noise specifications. Designed for a wide range of research and development applications, each model is capable of measuring from the Near IR (25,000 $cm^{-1}$) through the Far IR (10 $cm^{-1}$) using interchangeable beamsplitters and computer controlled sources and detectors. The FT/IR-6800 is equipped with gold optical surfaces for FT-Raman analysis and rapid scan capability as standard. Step scan, high resolution, and full vacuum options are available for all models.***

### FT/IR-6600

- *S/N ratio: 45,000:1*
- *Maximum resolution: 0.4 $cm^{-1}$*
- *Capable of measuring from the Near IR (25,000 $cm^{-1}$) through Far IR (10 $cm^{-1}$)*
- *Step scan, full-vacuum option*
- *Applicable to FT-IR microscopy, IR imaging and Dynamic Imaging*
- *Auto-alignment*
- *Purgeable optics as standard*

### FT/IR-6700

- *S/N ratio: 47,000:1*
- *Maximum resolution: 0.25 $cm^{-1}$*

### FT/IR-6800

- *S/N ratio: 55,000:1*
- *Maximum resolution: 0.07 $cm^{-1}$*
- *Au-coated mirrors for higher throughput*
- *FT-Raman option*

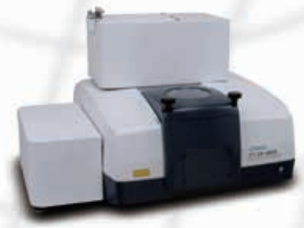
### FT-Raman System

*The JASCO RFT-6000 FT-Raman accessory is designed for quick, non-destructive FT-Raman analysis of virtually any sample and can be added to any JASCO FT/IR-6000 Series instrument.*

***FT/IR-6800 with RFT-6000 FT-Raman Accessory***

### Automatic broadband measurement under vacuum conditions

*Combining the automatic beam splitter exchange unit and the automatic window switching unit/ automatic gate valve unit, a broadband spectral range measurement of a sample can be provided without breaking the instrument vacuum conditions.*



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# FT-IR Microscope Systems

## IRT-5000/7000 FT-IR Microscope

***The IRT-5000/7000 FT-IR Microscope can be easily interfaced with either the FT/IR-4000 or FT/IR-6000 spectrometers, which offers the most advanced microscopy and imaging systems in the market. JASCO can provide the "IQ Mapping" function, which allows multi-point, line, area and ATR mapping experiments without moving the sample stage. In addition to standard transmission and reflection measurements, optional ATR and grazing angle reflection objectives expands the capability of the microscope system.***

### IRT-5100

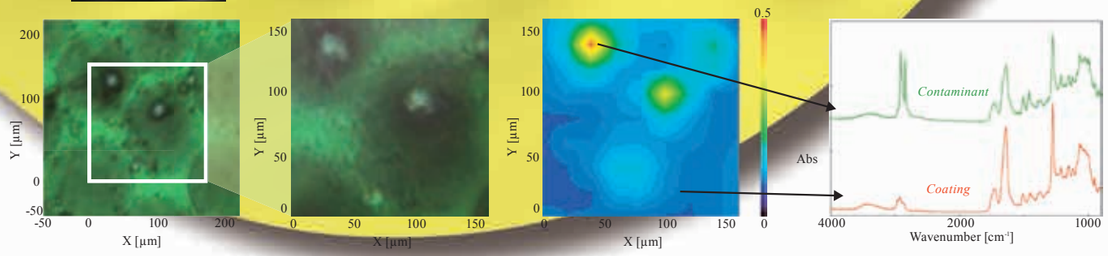
- *DLATGS detector with no need for liquid nitrogen cooling (Standard)*
- *Dual detector capability*
- *Variety of measurement modes (Transmission, Reflection, ATR, Grazing Angle Reflection)*
- *Multiple objective capabilities*
- *Optional automatic sample stage*

### IRT-5200

- *IQ Mapping*
- *Mid-band MCT detector (Standard)*
- *Dual detector capability*
- *Variety of measurement modes (Transmission, Reflection, ATR, Grazing Angle Reflection)*
- *Multiple objective capabilities*
- *Field upgrade to IR Imaging System using a linerar array detector*

### ATR Mapping

*The "Clear-View" ATR objectives enable a simultaneous sample view even during ATR data collection after the ATR crystal element contacts the sample. IQ Mapping coupled with a "Clear-View" ATR objective allows ATR mapping and ATR Imaging of any sample in contact with the ATR objective without moving the sample stage or ATR objective, while observing the entire area of the sample that is in contact with the crystal element. This function provides high-speed and cross-contaminant free measurements of a small sampling area.*




*Sample image brefore contact of crystal* — *Sample image after contact of crystal* — *Chemical image*

### IRT-7100

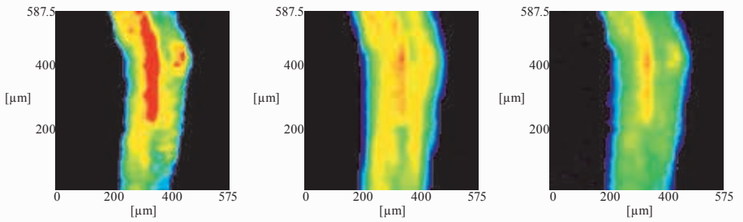
- *Mid-band MCT detector (Standard)*
- *Fully automated sample stage with auto focus function as standard*
- *IQ Mapping*
- *Dual detector capability*
- *Field upgrade to IR Imaging System using a linear array detector*

### IRT-7200

- *Mid-band MCT detector and Linear Array detector (Standard)*
- *Full IR Imaging function*
- *IQ Mapping*
- *Wide area mapping and multi-ATR imaging*
- *Dynamic Imaging with FT-IR step-scan option*

### Transmittance measurement of multi-layer film

*Measurement area: 600 × 600 µm*
*Number of measurement points: 48 × 48*
*Spatial resolution: 12.5 × 12.5 µm*
*Resolution: 16 cm-1*
*Accumulations: 16*
*Collection time: Approx. 4 minutes*




*Compact, in-compartment microscope*

**Irtron µ**

*The Irtron offers unprecedented convenience and ease of use, compatible with the FT/IR-4000/6000 Series.*

*Precision Cutting from 10-200 µm*

### SliceMaster

*SliceMaster is a compact, easy to use instrument that can create thin sections by cutting film-type samples.*

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# Raman Spectrometers

## NRS-4100 & NRS-5000/7000


***In Raman spectrometry, sample preparation is generally considered to be much easier than for infrared spectroscopy and unlike FTIR microscopy, Raman offers greatly improved spatial resolution. As a result, the use of Raman spectrometry is rapidly spreading as the analytical technique of choice for materials analysis. JASCO has developed entry model NRS-4100 & reseach-grade model NRS-5000/7000 to make Raman spectroscopy accessible not only to experienced spectroscopists, but also to first-time users.***

## NRS-4100

*•Maximum Resolution: 2 cm-1/ 0.7 cm-1 (optional)*
*•Laser wavelength range: UV - NIR*
*•Wavenumber range: 100 to 8000 cm-1*

### Powerful 'UserAssist' control

*The 'UserAssist' guide aids the user in setting up the NRS-4100 for sample measurement; a simple sequence takes you through setup and optimization of measurement parameters with helpful advice and tips, such as a warning if you have the laser intensity set too high. When each of the parameters has been set, the NRS-4100 automatically selects the laser and matching notch filter, the grating for the appropriate resolution, focuses on the sample and then the sample measurement is performed.*

**Real-time 'User-Assist'**

**Guides you through set-up and sample measurement**

**Choose the Sample area to be measured**

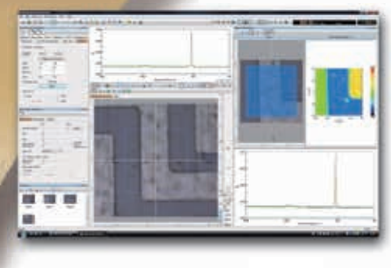
**select the Laser and filter**

**Slider bar to set the laser attenuation**

**Set the Grating**

**Wavelength range**

**And 'Execute'**




## NRS-5000 Series

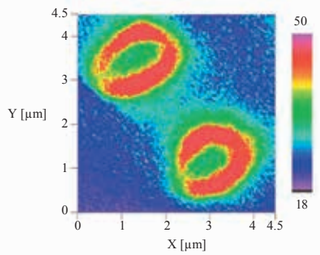
*•Maximum Resolution: 1 cm-1/ 0.4 cm-1 (optional)*
*•Laser wavelength range: UV - NIR*
*•Wavenumber range:*
*50 to 8000 cm-1 (NRS-5100)*
*10 to 8000 cm-1 (NRS-5200)*

## NRS-7000 Series

*•Maximum Resolution: 0.7 cm-1/ 0.3 cm-1 (optional)*
*•Laser wavelength range: UV - NIR*
*•Wavenumber range:*
*50 to 8000 cm-1 (NRS-7100)*
*5 to 8000 cm-1 (NRS-7200)*

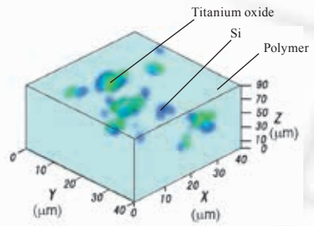
## SPRIntS High Speed Imaging System

*SPRIntS imaging is a laser scanning function which supports high speed measurements by scanning the laser excitation beam using individual scan mirrors (VertiScan) to irradiate the sample while collecting data from a high-speed CCD detector at a minimum of every 5 milliseconds. The VertiScan function also supports a 3-D imaging function by utilizing the Z-autostage and the confocal capability of the instrument system. The VertiScan system is unlike other laser scanning functions because the sample is illuminated with a vertical laser beam every time to retain measurement confocality and obtain a high quality, undistorted Raman image.*




Raman Imaging

*The matrix area surrounding a 1.5 µm diameter hole formed on a Si wafer was measured using a 40 nm stepping function. The 1.5 µm feature could be easily observed in the Raman image.*




3-D Imaging

*The VertiScan function acquires depth imaging data from a sample using the confocal capability of the Raman spectrometer and creates a 3-D image from the Raman intensity data.*

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# Versatile System

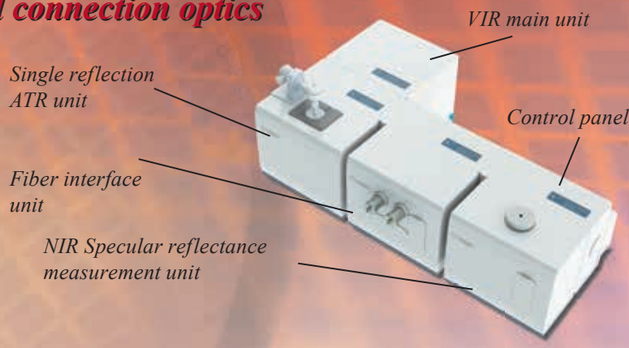
***JASCO can provide the versatile system such as VIR-100/200/300 and RMP-500, which are designed to be used for field applications with high performance and excellent reliability. In addition, the modular design allows to configure any dedicated systems with maximum flexibility, with ugrading capability in the fields to meet very wide range of analytical applications even for use in the laboratory as well as field applications.***

## VIR-100/200/300 Versatile FT-IR

***The VIR series FT-IR spectrometers are designed with flexibility in mind, providing various configurations for the laboratory, the field and customized applications. The most suitable system can be configured by selecting specific accessories matched to the desired applications, additional accessories added as needs change.***

### Combination with External connection optics

*The external connection optics allows the user to install up to three different attachments in one system, selecting the most appropriate application accessory by simply switching the PC controlled optical configuration.*




## RMP-500 Versatile Raman Spectrometers

*The RMP-500 series dispersive Raman spectrometer compromises a field rugged (portable optical bench) with compact monochromator, internal laser and CCD detector.*

*The system uses a variety of fiber probes coupled to different measuring devices such as hand-held probes, sample chambers and sample stages to make it possible to meet a wide variety of applications in many different fields.*

*The RMP-500 has already been customized for a range of special applications for use by laboratories, manufacturing and law enforcement.*

# Film-Thickness Measurement System

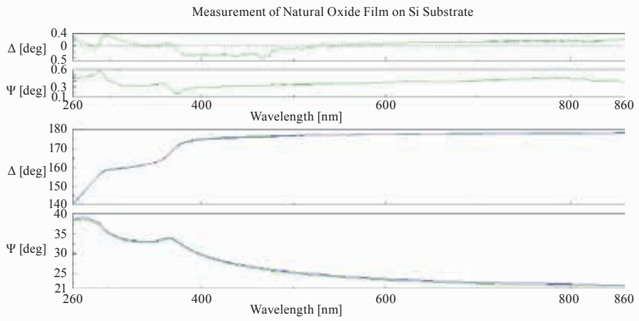
***Optical methods for thickness measurement are applicable to various research and development of materials such as novel coatings of dielectrics and semiconductor. The primary advantage of these methods is to provide non-destructive and non-contact measurement, as well as wide measurement range from sub-nanometer to micrometer. JASCO can provide the most suitable method for measurement and analysis depending on thickness of film, number of multiple layers and substrate materials.***

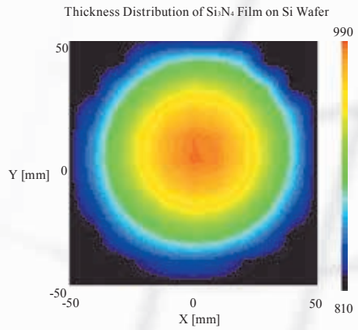
## UTS-2000 Film-Thickness Measurement System

*The UTS-2000 is a dedicated Film Thickness Measurement System. Simplified operation system of the UTS-2000 enables various conditions for measurement, mapping, and the film thickness calculations to be configured as preset recipes and managed in a recipe table. Measurement of film thickness is initiated by simply selecting a required method from the recipe table and clicking the Measure button.*

## M-220 & M-550 Ellipsometer

*Ellipsometry is an optical measurement technique used to characterize film properties based on a change in polarization as light interacts with layered materials. JASCO's ellipsometer employs a proprietary polarization modulation technique (a PEM dual lock-in system) utilizing a photoelastic modulator, instead of the rotational drive mechanism of conventional ellipsometers. The PEM dual lock-in system provides a stable measurement with additional capabilities including high-speed data sampling and wavelength scanning.*

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# UV-Vis/NIR Spectrophotometers

## V-700 Series


***With more than forty years of experience in the design of spectrophotometers, JASCO offers a complete range of UV-Vis/NIR instruments. The V-700 series consists of five distinct models designed to meet a wide range of application requirements. From an innovative optical layout to a simple comprehensive instrument control and data analysis software interface, the V-700 series does not compromise on accuracy, performance or reliability.***

### V-730
#### General-purpose UV-Vis

- *Double-beam spectrophotometer with single monochromator*
- *Silicon photodiode detectors*
- *Range 190 to 1100 nm*
- *Fixed bandpass of 1.0 nm*
- *High-speed scanning up to 8,000 nm/min*
- *IQ Accessory and IQ Start provide simplicity and ease of use*
- *USP, EP and JP compliant instrument validation software*

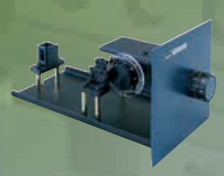
### V-730Bio
#### Life Science package

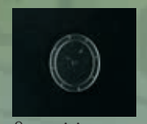
- *Applicable to micro volume samples*
- *Dedicated biological application programs*
  - *Protein/nucleic acid measurement*
  - *Temperature ramping/DNA melting analysis*
  - *Kinetics measurement and analysis*
- *4 basic measurement modes*
  - *Wavelength scanning*
  - *Quantitative analysis - including six different calibrations*
  - *Time course measurement for reaction kinetics*
  - *Fixed wavelength measurement*

### Over 50 sampling accessories for gas, liquid and solid samples

***TCH-703***

*8-position turret micro cell holder*



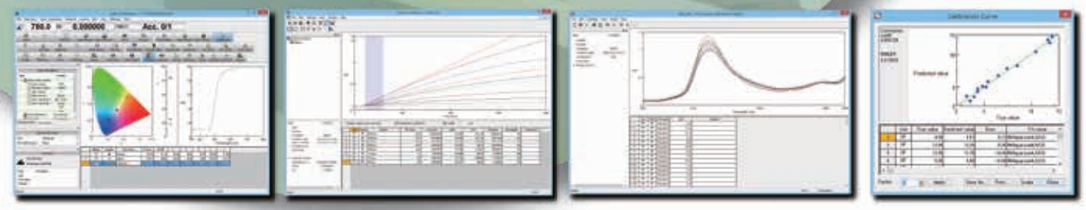


*8-position turret micro cell holder*

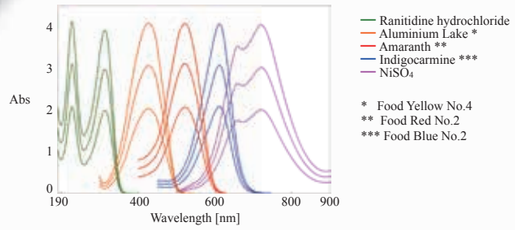
***µWashMaster***

*Cleaning tool for micro cells/cuvettes*

### Over 20 dedicated software programs to support specific analysis applications



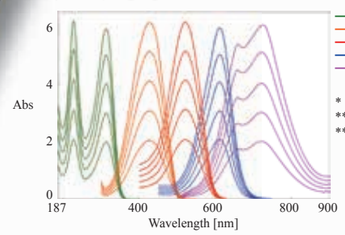
### V-750
#### High resolution UV-Vis



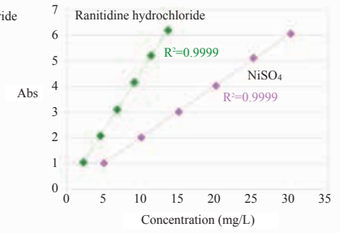

Spectra of Various Solutions

- *Linearity up to 4 absorbance*
- *Range 190 to 900 nm*
- *Variable bandpass to 0.1 nm*

### V-760
#### Exceptional stray light rejection




Spectra of Liquid Samples Measured in the UV-Visible Range

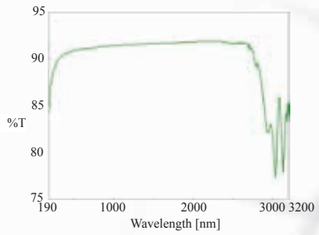



Calibration Curves of Ranitidine Hydrochloride and $NiSO_4$

- *Double monochromator*
- *Low stray light below 0.00008%*
- *Linearity up to 6 absorbance*
- *Range 187 to 900 nm*
- *Variable bandpass to 0.1 nm*

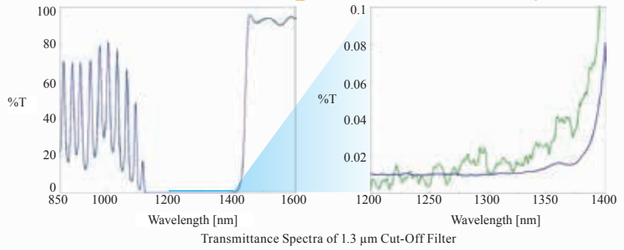
### V-770
#### Expansion into the NIR region

- *Unique single monochromator system*
- *Photomultiplier tube detector for UV-Vis region*
- *Peltier cooled PbS detector for NIR operation*
- *Range 190 to 2700 nm (3200 nm option)*
- *Variable bandpass to 0.1 nm (UV-Vis)*




Transmittance Spectrum of Crystalline Quartz Sample

### V-780
#### Exceptional sensitivity and resolution in the NIR region



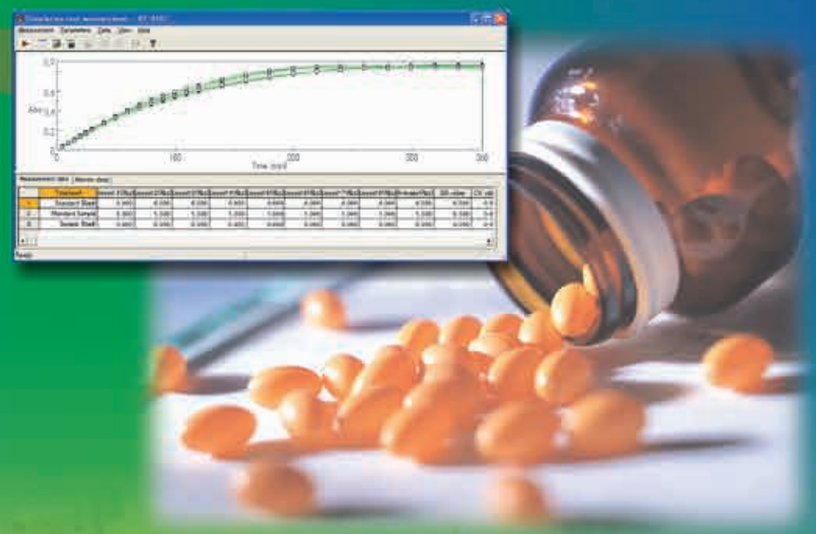

Transmittance Spectra of 1.3 µm Cut-Off Filter

- *Unique single monochromator system*
- *Photomultiplier tube detector for UV-Vis region*
- *Peltier cooled InGaAs detector for NIR operation*
- *Range 190 to 1600 nm*
- *Variable bandpass to 0.1 nm (UV-Vis)*

JASCO

# Dissolution Tester

## DT-810



***The DT-810 Dissolution Tester is fully automated and designed for flexibility to provide dissolution testing of up to 8 samples with either the paddle method (standard) or the rotating basket method (option). The unique circular design provides uniform water temperature while utilizing a round heating element. The Direct-CenterTM automatic centering mechanism provides hands-free positioning of the dissolution vessels and drive shafts for accurate dissolution tests with high reproducibility.***

### Flow System

*This system integrates the DT-810 with an 8 position flow-cell accessory and a UV-Vis spectrophotometer. A peristaltic pump continuously circulates sample solution between the 8 dissolution vessels and the flow cell accessory.*

### Fraction System

*This system integrates a fraction collector and the pumping unit for off-line testing. As many as 12 sets of samples with a volume of 20 mL or less can be collected from each dissolution vessel at pre-set intervals.*

### Fraction Flow System

*This system combines the fraction collector and a flow cell installed in a UV-Vis spectrophotometer. Samples from the dissolution vessels are collected in test tubes and sample aliquots are analyzed by the UV-Vis .*

### Automated Filtration System

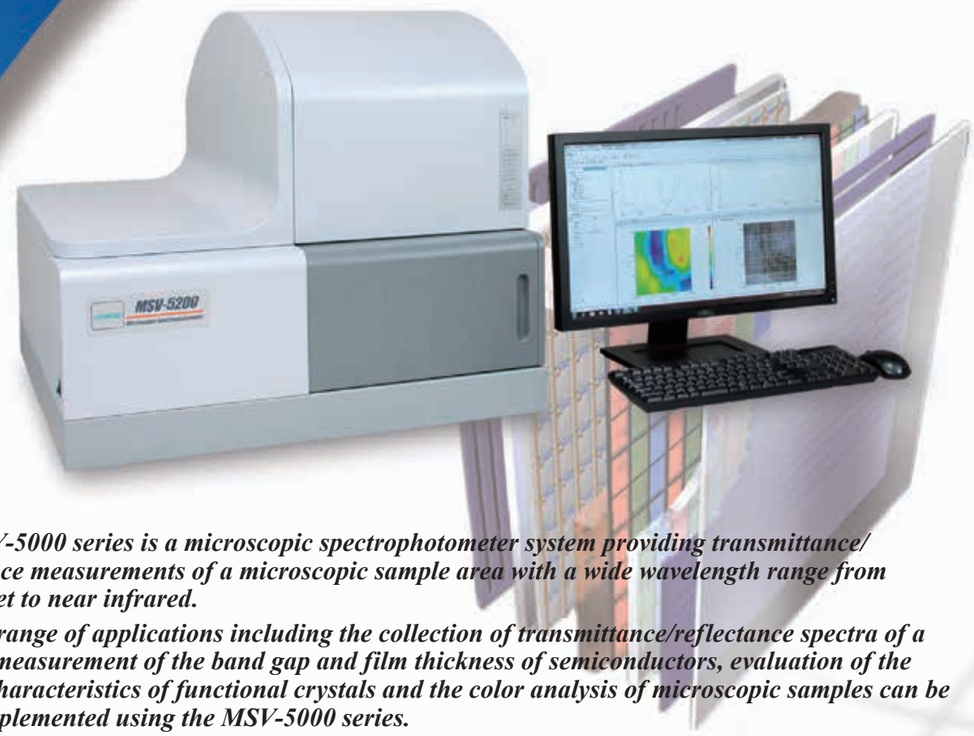
*This system includes an 8-position syringe pump and an automated filter changer to provide automatic filtration of sample solutions from all 8 vessels. After each sampling, filters are automatically exchanged.*

### Amber Bath and Vessel (option)

*Now available as option with amber bath and vessel lids for light sensitive formulations.*

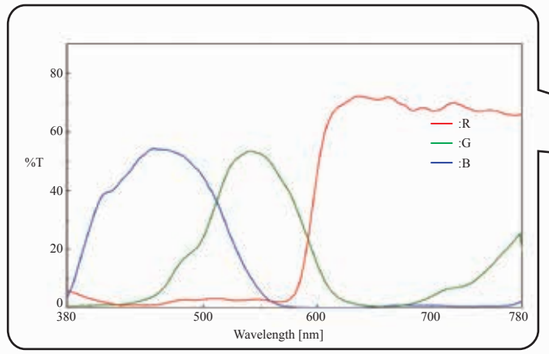
# UV-Vis/NIR Microscopic Spectrophotometer

## MSV-5000 Series

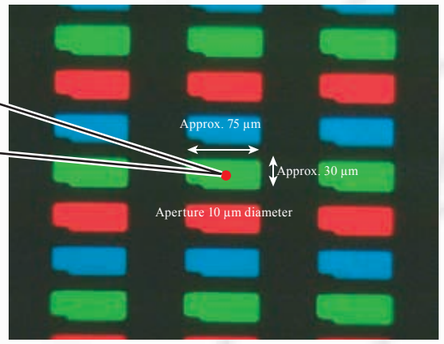



***The MSV-5000 series is a microscopic spectrophotometer system providing transmittance/reflectance measurements of a microscopic sample area with a wide wavelength range from ultraviolet to near infrared.***

***A broad range of applications including the collection of transmittance/reflectance spectra of a sample, measurement of the band gap and film thickness of semiconductors, evaluation of the optical characteristics of functional crystals and the color analysis of microscopic samples can be easily implemented using the MSV-5000 series.***




Transmittance spectra of color filters for an LCD panel




Microscopic image of an LCD panel

A circular 10 µm aperture was applied for each subpixel of red, green and blue (R, G, B).

JASCO

# Spectrofluorometers

## FP-8000 Series

***Equipped with the latest innovative technology, the JASCO FP-8000 series was designed to obtain fluorescence spectra with the highest sensitivity, the fastest scan speeds and excellent analysis-oriented functionality. To meet the demands of research and development applications, a wide array of accessories are available for integration with the FP-8000 instruments and supported by the user-friendly Spectra Manager™ II software platform. The various instruments of the FP-8000 series, covering a wide range of applications, offers the best solution for all your needs, from advanced materials analysis to biological research requirements.***


*•Highest sensitivity (>5000:1 (RMS), FP-8500)*
*•Fastest scan speed in the world.*
*•Wide dynamic range (> 6.5 orders of magnitude, FP-8500)*
*•Standard Auto-Gain and Auto-SCS*
*•Automatic higher-order diffraction cut filter*
*•Rapid 3D spectra measurement*
*•Phosphorescent lifetime measurements up to 1 msec*


### FP-8200

*For general use, especially for routine fluorescence analysis.*
*•Wavelength range on both Ex and Em*
*200 - 750 nm / Option: 200 - 900 nm*
*•Wide dynamic range; greater than 6 orders of magnitude*
*•Automatic higher-order diffraction cut filter (option)*
*•Select from iRM or Spectra Manager PC control*

### FP-8300

*Versatile model, specifically designed for bio-applications, such as stopped flow, fluorescence anisotropy and auto-titration applications.*
*•Wavelength range on both Ex and Em*
*200 - 750 nm / Option: 200 - 900 nm*
*•Wide dynamic range greater than 6 orders of magnitude*
*•High sensitivity (>2800:1 (RMS), band width 5 nm)*

### FP-8500

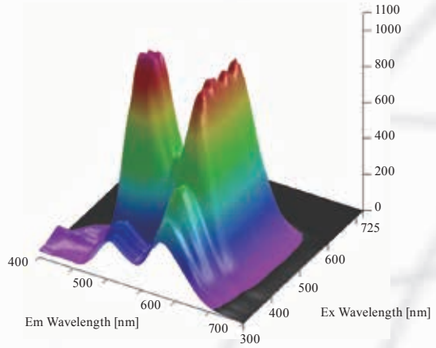
*Research model with the highest performance in the world. Optimized for the analysis of solid samples and advanced materials.*
*•Wavelength range on both Ex and Em*
*200 - 750 nm / Option: 200 - 850 nm*
*•Wide dynamic range greater than 6.5 orders of magnitude*
*•Highest sensitivity in the world (>5000:1 (RMS), band width 5 nm)*
*Fastest spectral scanning available (60,000 nm/min)*

### FP-8600

*NIR model for evaluation of new materials such as carbon nano-tube, NIR fluorescent dyes, up-conversion fluorescent glasses, etc.*
*•Wavelength range*
*Ex: 200 - 850 nm, Em: 200 - 1010 nm*
*•Fast spectral scanning (Ex: 60,000 nm/min, Em: 120,000 nm/min)*

### Rapid 3D Spectra Measurement

*3D spectra measurement is available for all models of the FP-8000 series. The fastest scan speed of 60,000 nm/min for the FP-8500/8600 offers 3D spectral measurement in the shortest time available for any instrument in this class. The analysis software offers a variety of processing methods to easily display the relevant data characteristics.*




3D spectra measurement of fluorescent orange color plate

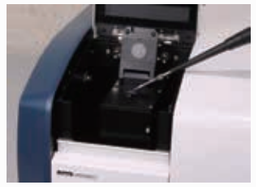
## *A variety of accessories for temperature control and specific application requirements*

*A wide variety of accessories and control/analysis programs are designed to integrate analysis methods for various samples and application requirements ranging from biochemical/bioscience to materials research and beyond.*

*•Thermostatted cell holders for single or multiple samples*
*•Stopped flow accessory*
*•Automatic titration accessory*
*•Microplate reader*
*•Auto-sampler and sipper*
*•Polarizer for fluorescence anisotropy*
*•One-drop measurement unit*
*•Liquid nitrogen cooling unit*
*•Cryostat holder*
*•Film holder*
*•Integrating sphere*
*•High temperature powder cell unit*

### SAF-850

*One-drop measurement unit*

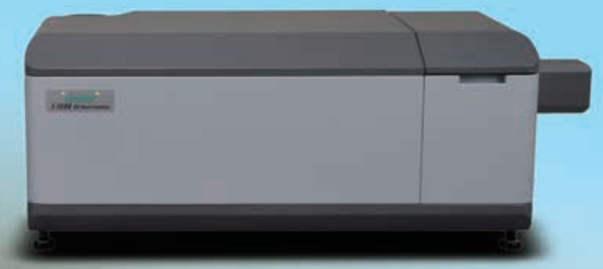


*The SAF-850 (FP-8200) or SAF-851 (FP-8300/8500/8600) One-drop measurement unit is a dedicated module for rapid measurements of micro-volume samples. Simply place a droplet of sample on the disk cell to obtain a measurement of the sample.*

JASCO

# Circular Dichroism

## J-1000 Series



### *J-1500*

*High performance CD spectrometer for versatile measurements*

### *J-1100*

*Compact CD spectrometer for routine measurements*

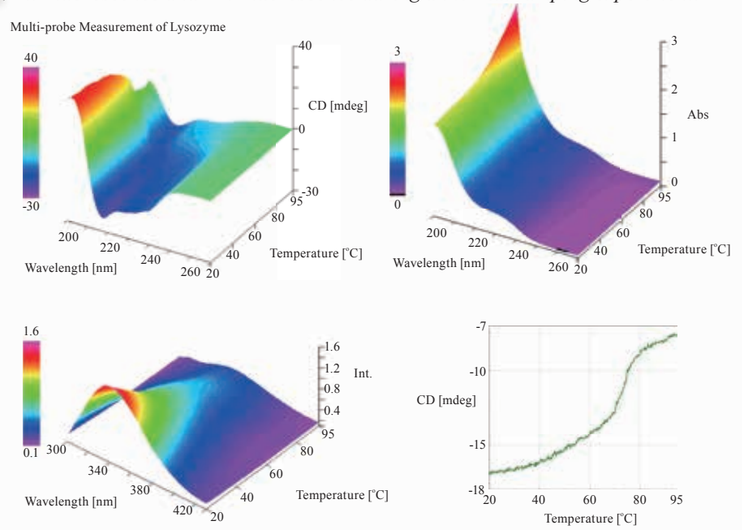
***Chiroptical spectroscopy has become one of most important techniques for the characterization of biomolecules, determination of absolute configuration and stereochemical analysis. Since launching the Model AP-1, our first spectropolarimeter in 1961, JASCO has designed and built the finest in chiroptical instrumentation. Based on JASCO's experience in CD instrumentation over a half century, JASCO proudly introduces the J-1000 Series Circular Dichroism (CD) Spectrometers providing both unparalleled optical performance and versatile flexibility.***

- *Wide spectral range from vacuum UV to Near-IR (up to 1600 nm, only J-1500)*
- *Standard built-in mercury lamp and optional traceable standard sample for system validation*
- *High-efficiency purge capability enabling to enhanced vacuum UV measurement*
- *Extremely low stray light and high S/N ratio providing wide dynamic range*
- *High speed scanning (J-1500: 10000 nm/min, J-1100: 5000 nm/min)*
- *Simultaneous Multi-probe measurements (SMP) with acquisition of up to four data channels*
- *Flexible design allowing field upgrades for different measurement modes and accessories as applications evolve*
- *Spectra Manager II or Spectra Manager CFR (For FDA regulated labs): 64 bit innovative, cross-platform Spectroscopy Software Suite for data acquisition, analysis and presentation including several methods of secondary structure calculation*

## *Simultaneous Multi-Probe Measurement (SMP)*

*The latest Quad Lock-in Amplifier allows the simultaneous acquisition of up to four data channels including CD, Absorbance, Linear Dichroism (LD), Fluorescence, Fluorescence detected CD (FDCD), Fluorescence detected LD (FDLD) and Fluorescence Anisotropy. The following figure shows the multi-probe measurement of Lysozyme showing the simultaneous acquisition of CD, Abs, Ex Fluorescence and Em Fluorescence during a thermal ramping experiment.*

*PTC-517 Peltier cell holder with emission optical unit and PML-534 high sensitvity FDCD detector*



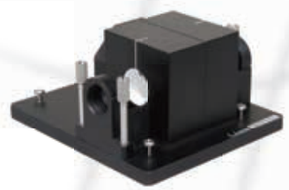

## *Broad Range of Measurement Options*

*Designed as a "Chiroptical Spectroscopy Workbench" the J-1500 offers a wide range of accessories to allow it to be adapted to any application requirements. Temperature ramping, protein folding, enzyme kinetics, DNA/RNA interactions, natural organic chemistry, biochemistry, macromolecules and rapid scanning experiments are all possible. The J-1100 offers the basic cell holders for general CD/LD/Abs and Temperature control measurements.*

- *Peltier cell holders, single and six-position cell changers*
- *Micro sampling disk and Capillary jacket for measurement down to a few microliters*
- *Near-infrared extended detection to 1600 nm*
- *Highly-accurate ORD attachments*
- *High-sensitivity, artifact-free FDCD attachments*
- *Total Fluorescence and 90° light scattering*
- *Fluorescence Excitation/Emission scanning*
- *Fluorescence Anisotropy, Fluorescence Polarization*
- *Permanent and electro-magnets for Magnetic Circular Dichroism (MCD)*
- *Automatic titration system*
- *2, 3 and 4-syringe stopped-flow systems*
- *High-throughput Automated CD system*
- *LD flow Couette cell holder*
- *Pressure-resistant high temperature measurement unit*
- *Solid sampling Diffuse Reflectance/Transmittance CD measurement units*
- *Liquid N2 Cryostat*
- *Double-beam UV measurement unit*

*PTC-510*
*Peltier thermostatted Cylindrical/ Rectangular Cell Holder*

*MPTC-513*
*Peltier Thermostatted 6-position Turret Rectangular Cell Changer*



*DRCD-574*
*Powder CD Measurement Unit*

JASCO

# Vibrational Circular Dichroism

## VFT-4000 & FVS-6000

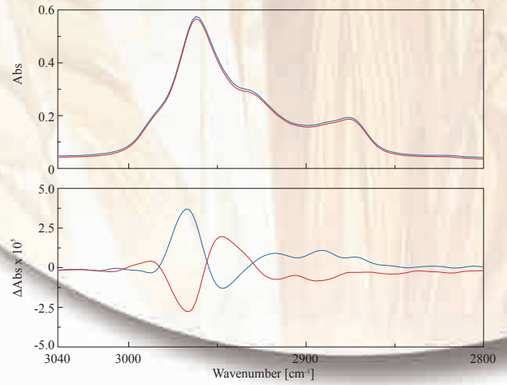
***To determine the molecular conformation of chiral molecules, analysis of the molecular frame and orientation of the various functional groups is essential. With otically active molecules, information about the chiral structure is readily revealed utilising vibrational circular dichroism (VCD) spectra compared to ordinary infrared absorption data. Since the CD signals in the infrared region are one or more orders of magnitude lower than ECD signals in the UV-Vis region, the VCD spectrometer needs high sensitivity and high stability. JASCO has developed VFT-4000 VCD Attachment for FT/IR-4000/6000 Series and FVS-6000 VCD Spectrometer, which enables to obtain high quality VCD spectrum from a weak signal of peaks.***

### VFT-4000

*The VFT-4000 combined with the FT/IR-4000/6000 allows you to perform both FT-IR and VCD measurements on one system. In FT-IR measurement mode, information for protein secondary structure analysis can be obtained, while in the VCD measurement mode, very useful information of optical activities and tertiary structure identification of molecules can be obtained. This system can be applied widely for the field of structural analysis of various optically active substances.*

### FVS-6000

*The FVS-6000 is the VCD spectrometer of choice for highly sensitive VCD measurements. The FVS-6000 not only allows you to easily obtain fingerprint VCD spectra, but also has several unique features such as a measurement range extension option of 4000 ~ 750 cm-1, which offers complete characterization of chiral molecular structures.*




VCD and IR Spectra of camphor

### Narrow band mode

*The narrow band mode allows measurements of small peaks at targeted absorption bands with high sensitivity by using optional band filters.*

# Digital Polarimeter

## P-2000


***The P-2000 is designed as a customizable, multi-option polarimeter for a range of applications and budgetary requirements. The instrument system can also be field upgraded as application requirements change. By selecting the most suitable combination of optical elements, the instrument provides a wide range of analytical wavelengths from UV-Vis to NIR.***

- *Two graphical user interfaces: intelligent Remote Module and Spectra Manager™ II*
- *Up to two light sources can be installed. Available light sources: WI, Na and Hg*
- *IQ accessory recognition*
- *Automatic recognition of light sources and filters*
- *High response speed of 6°/sec*
- *Wide dynamic detection range of up to ±90°*
- *Minimum readable angle as low as 0.0001°*
- *Instrument performance validation (standard)*
- *CFR compliant option*

### RSC-200

*Cylindrical cell holder*

### SHP-263P / SHP-263

*Peltier sipper / Water thermostatted sipper*

### PTC-262

*Peltier cell holder*

JASCO

# High Performance Liquid Chromatography

## LC-4000 Series


***The LC-4000 Series is the latest in a long history of innovative HPLC systems developed by JASCO reaching all the way back to the start of commercial HPLC in the early 1970s.***

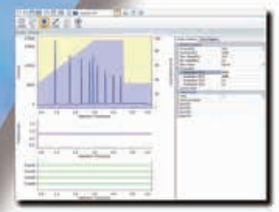
***The concept of the integrated LC-4000 series HPLC provides key separation platforms at 50 MPa, 70 MPa and 130 MPa which correspond to conventional HPLC, the increasingly popular Rapid Analysis (RHPLC) and sub 2 µm UHPLC, respectively.***

***Each platform is supplied with a dedicated pump and autosampler matched to the operating pressure and all three platforms share common detectors optimized for high-speed 100 Hz acquisition and the narrow peak shapes common to both RHPLC and UHPLC.***

## Chromatography Data System

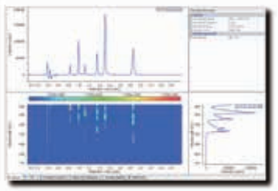
## ChromNAV

*ChromNAV 2.0 is a universal CDS which can be used with any type of separation - HPLC, UHPLC, RHPLC, prep-HPLC, analytical SFC and prep-SFC. ChromNAV can also satisfiy the demands of dedicated analysis and multi-purpose systems.*



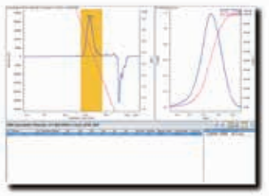
### System Control and Data Acquisition

*ChromNAV can control up to four systems simultaneously. The LC-NetII/ADC is the hardware interface between your PC and the system components. Up to four channels of analog data can be acquired by each LC-NetII/ADC.*



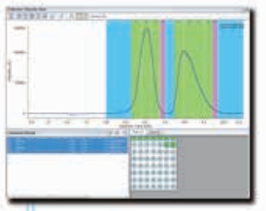
### Powerful Data Analysis Functions

*ChromNAV includes all standard chromatography calculations, such as reliable peak integration and identification, powerful and easy quantification, a quick user-defined reporting format and versatile data conversion for data export. Peak calculation results can be sent to Microsoft® Excel automatically.*



### PDA Detector Control and Data Analysis

*PDA data analysis is a standard feature in ChromNAV. Some useful tools for manipulating spectra, such as peak purity calculation, spectrum search, etc., are fully supported. Installed as part of the ChromNAV software package, JASCO's Spectra Manager softwear is provided to perform advanced spectral analysis.*



### On-flow Spectra Using Spectra Manager™

*A powerful cross-platform software package, Spectra Manager is standard for rapid spectral scanning using UV, 4 ch-UV, Fluorescence and Cicular Dichroism detectors and data processing functions.*

### Optional Applications

*JASCO can provide the following optional packages.*

- *GPC molecular weight dispersion*
- *Molecular weight dispersion of low molecular weight heparin*
- *FUMI theory (Function of Mutual Information) for theoretical precision analysis*

## ChromNAV CFR

### Users and Privileges

*User privileges can be set at different security levels.*

### Electronic Signature

*Three types of electronic signatures (Created, Reviewed, and Approved) are available. The customer cannot modify any approved data or methods.*

### Audit Trails

*The Audit Trail function records and archives all operations including any file modifications.*

JASCO

# High Performance Liquid Chromatography

## LC-4000 Series

## System Configurations

### Conventional HPLC and RHPLC Analytical Systems up to 70 MPa

*The LC-4000 Series 70 MPa system has been designed to future-proof your HPLC requirements. The LC-4000 70 MPa system can be used with conventional 3 and 5 µm particle size analytical columns at typical lower pressures around 10 to 20 MPa (1500 to 3000 psi) and can also be used with smaller particles such as shorter length UHPLC columns and superficially porous (SPP) or Coreshell that require slightly higher pressure solvent delivery to provide optimum linear velocity through the column.*


### UHPLC Analytical Systems at 130 MPa

*Ten years after the new segment of the HPLC market, UHPLC has found a niche for those that need to run a large number of samplers or get results quickly. Pioneering column technology is pushing the particle size even smaller. The near 20,000 psi operation of the LC-4000 130 MPa is designed to take advantage of the separation efficiency of the very small particles couple with longer and narrower columns. The LC-4000 130 MPa system incorporates many of the same features as the 70 MPa system, but with materials designed to withstand higher pressures.*

### Preparative HPLC Systems

*The LC-4000 preparative HPLC systems includes three platform options*

- *Up to 20 mL/min for columns up to 21.2 mm ID*
- *Up to 50 mL/min for columns up to 30 mm ID*
- *Up to 120 mL/min for columns up to 50 mm ID*

*Solvents can be delivered at higher flow rates and higher pressures for use with longer preparative HPLC columns that generate more back pressure and for faster and more productive preparative separations.*

## Supercritical Fluid Chromatography (SFC) System

*The effect of the chiral compounds is the key factor in the pharmaceutical industry, and in order to evaluate the enantiomer, the chiral searation is taken up as a main theme. As a solution, Supercritical Fluid Chromatography (SFC) is drawing attention from many researchers. Since the separation capacity of SFC is higher than the one of HPLC, the SFC is powerful tool for separating the chiral compounds which is hard to separate by using HPLC.*

### Analytical SFC System

*The physical characteristics exhibited by supercritical fluid include a diffusion coefficient of dissolved molecules that is a hundred times greater than it is in liquid and a viscosity that is at least one digit smaller. A SFC system, which employs such a medium as a mobile phase, can be expected to serve as a separation analysis method that can rapidly perform separation without any degradation in separation efficiency, even at fast flow rates, due to a rapid mass transfer inside the column when compared with high-speed liquid chromatography that uses liquid as the mobile phase.*

### Semi-Preparative & Preparative SFC System

*The Semi-Prep SFC and the Prep SFC system are aplied to separtion and purification with high recovery. When carbon dioxide is used as the medium, gasification will occur simply by keeping the separated and fractionated sample at an atmospheric pressure, making this one of the techniques capable of highly efficient refining with few post-processing hassles, such as elimination solvents after preparative isolation. This offers a host of advantages, including cost cuts related to the expense of purchasing solvents and discarding organic solvents among other things.*

JASCO

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For more information, please contact :

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