# JASCO

## Spectroscopy and Chromatography Technology

*FT-IR*
*Raman*
*UV-Vis/NIR*
*Dissolution Testing*
*Circular Dichroism*
*Fluorescence*
*Polarimetry*
*X-LC*
*HPLC*
*SFE/SFC*

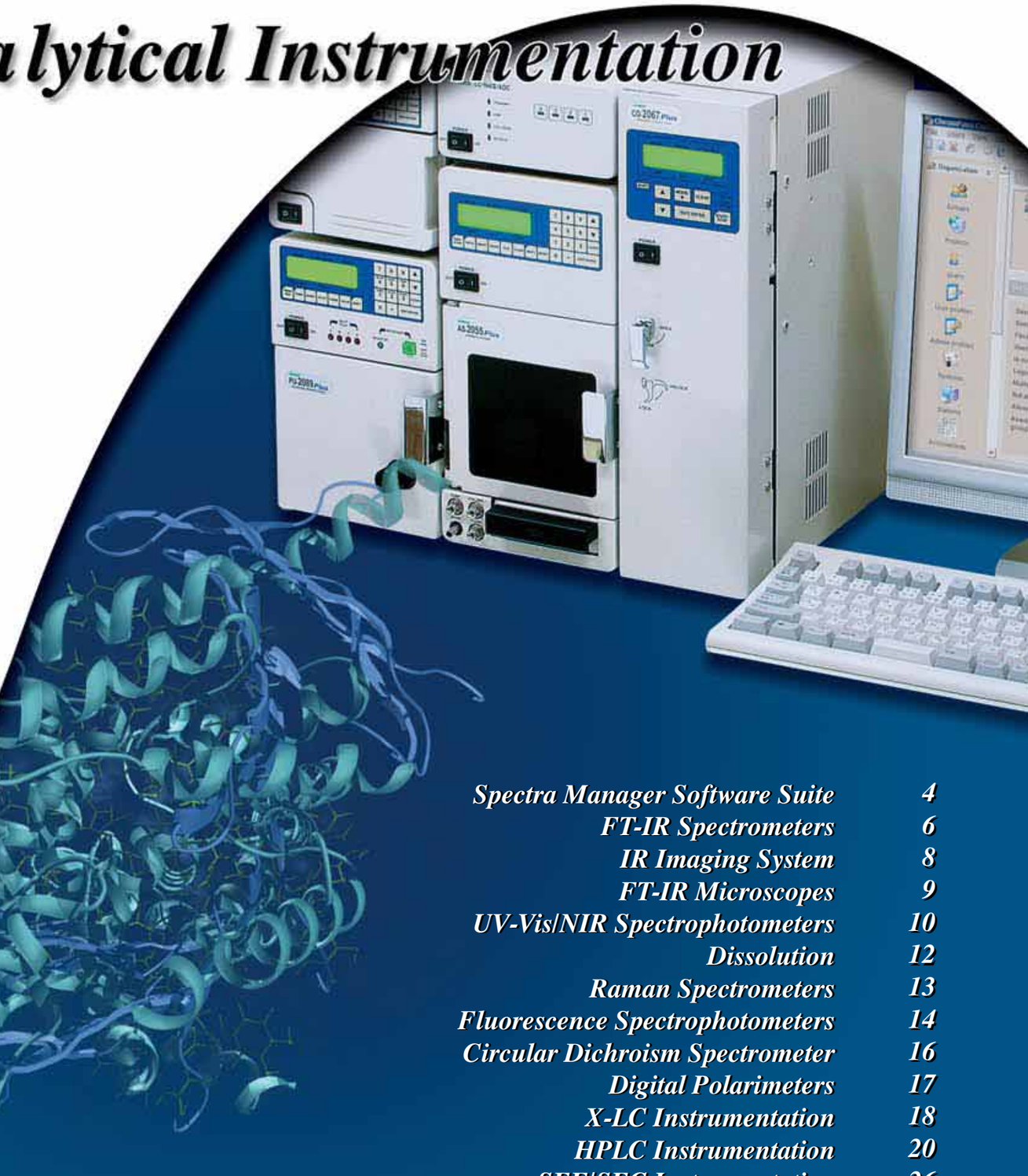
**Superior Performance**
**Superior Innovation**
**Superior Reliability**

# 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. The X-LC® (extreme pressure liquid chromatography) provides researchers with a powerful new tool to achieve efficiency and speed. 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.*

*A worldwide network of JASCO companies supports the full range of analytical instrumentation in educational, industrial, quality control and research laboratories.*



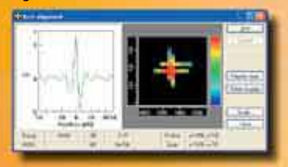
# Spectra Manager™ Suite

## A single platform software for all JASCO spectroscopy instruments

***JASCO is the first manufacturer to develop a powerful, cross-platform Windows® 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***

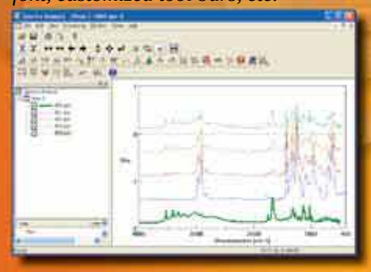
### System Control & Data Acquisition

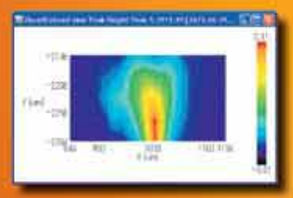


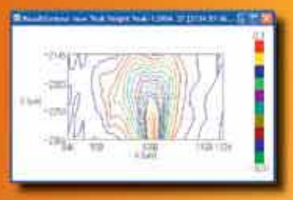
*Drivers are available to control each JASCO spectroscopy instrument. Parameter dialogs allow easy editing of pre-saved parameter files.*

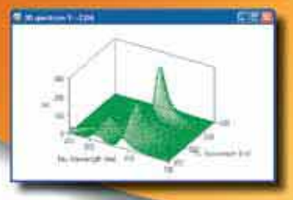
### Flexible Display Features

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



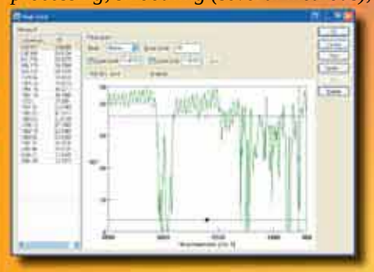






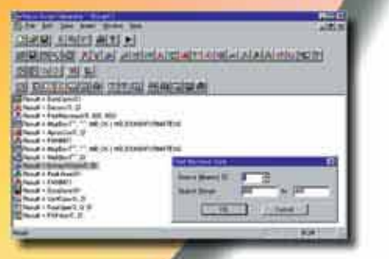
### Data Processing & Spectral Analysis

*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.*



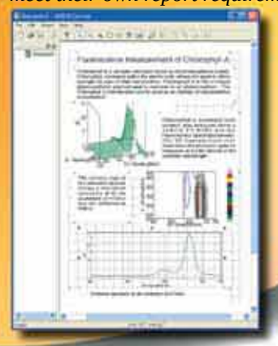
### Macro Command Option

*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.*

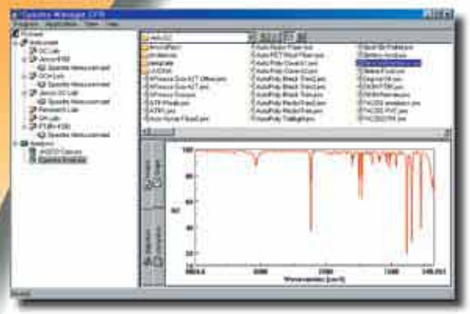




# Spectra Manager™ CFR

***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

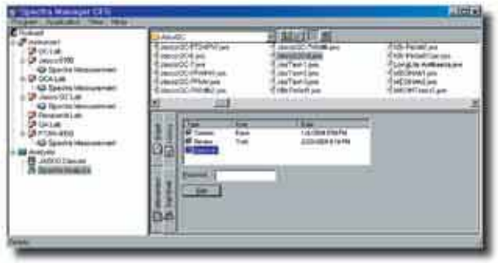
*Startup window lists available resources, such as instruments, measurement and application programs. User access requires a Username and Password, assigned by the Workgroup Manager.*

### Access Rights Control

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

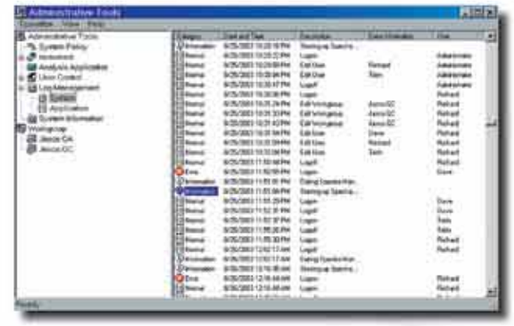

### Electronic Signatures

*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-4100 and FT/IR-4200 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-4100

- Compact size and economical
- S/N ratio: 22,000:1
- Maximum resolution: 0.9 $cm^{-1}$
- Applicable to FT-IR microscopy and IR imaging
- Auto-alignment
- Purgeable optics

### FT/IR-4200

- S/N ratio: 30,000:1
- Maximum resolution: 0.5 $cm^{-1}$
- Excellent sensitivity for varied and complex applications
- Measurement of liquid, solid and gaseous samples

### A full range of sampling accessories

- IQ Accessory Recognition (option)
- Standard purge capability
- Use of any commercially available accessory

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

**ATR PRO450-S**
*Single Reflection ATR Accessory*

**ATR PRO470-H**
*Diamond ATR Crystal with Extreme High Pressure Contact*

**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 (15000 $cm^{-1}$) through the Far IR (20 $cm^{-1}$) using interchangeable beamsplitters and computer controlled sources and detectors. The FT/IR-6300 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-6100

- S/N ratio: 42,000:1
- Maximum resolution: 0.5 $cm^{-1}$
- Capable of measuring from the Near IR (15,000 $cm^{-1}$) through Far IR (20 $cm^{-1}$)
- Step scan, full-vacuum option
- Applicable to FT-IR microscopy, IR imaging and Dynamic Imaging
- Auto-alignment
- Purgeable optics as standard

### FT/IR-6200

- S/N ratio: 45,000:1
- Maximum resolution: 0.25 $cm^{-1}$

### FT/IR-6300

- S/N ratio: 50,000:1
- Maximum resolution: 0.07 $cm^{-1}$
- Au-coated mirrors for higher throughput
- FT-Raman option

### Fully evacuable model

*A durable, pressure resistant casing for the interferometer allows an inexpensive upgrade to an evacuable interferometer or fully evacuable system including sample and detector chambers.*

### 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-6300 with RFT-6000 FT-Raman Accessory***

# IR Imaging System

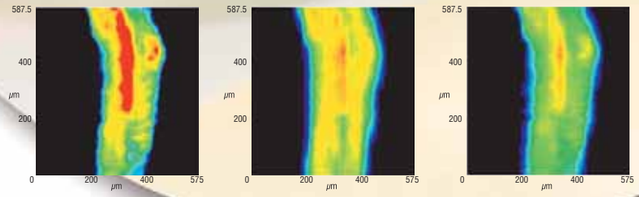
## IRT-7000 Multi-channel IR Microscope

***The IRT-7000 Multi-channel Infrared Microscope can be easily interfaced with either the FT/IR-4000 or FT/IR-6000 spectrometer offering an IR Imaging system. The system allows IR Imaging of a specific spatial area with extremely high spatial resolution and excellent sensitivity in a short time. The combination of the FT/IR-6000 and Step scan option offers an advanced capability for dynamic imaging.***

- *Wavenumber range 7800-750 $cm^{-1}$ (10000-1900 $cm^{-1}$ optional)*
- *Linear array MCT*
- *1.6 sec collection time for 100 × 100 μm, 6.25 μm/pixel*
- *4 cassegrain objectives with options for user-interchangeable objectives*
- *2 Detectors - options for user-interchangeable detectors*
- *IQ Monitoring*
- *IQ Mapping*
- *Intuitive, graphical user interface software for spectral measurement and analysis*

### 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*




*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.*



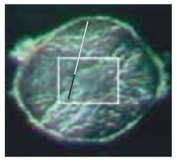
# FT-IR Microscope Systems

## IRT-5000 FT-IR Microscope

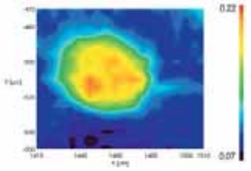
***The IRT-5000 is a fully upgradeable FT-IR microscope system capable of spatial resolution of six microns with excellent signal to noise ratio. The standard "IQ Mapping" function allows multi-point, line, area and ATR mapping experiments without moving the sample stage. In addition to standard transmission and reflection measurements, optional ATR and grazing angle reflection objectives expands the capability of the microscope system. Starting with the basic microscope, the system can be fully upgraded to include imaging capabilities as well as user-exchangeable detectors and cassegrain objectives.***

- *Dual detector capability*
- *Multiple objectives - options for user-exchangeable objectives*
- *Automatic aperture control*
- *Optional XYZ sample stage for ATR mapping*
- *Advanced software for mapping and multi-point analysis*
- *IQ Monitoring*
- *IQ Mapping*
- *Intuitive, graphical user interface software for spectral measurement and analysis*

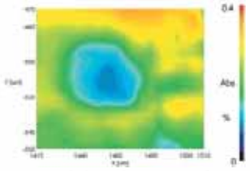
### Mapping analysis of hair cross section



*Measurement area*




*Peak height of Amide I*




*Peak height ratio of lipid and protein*

*Compact, in-compartment microscope*

**Irtronμ**

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

JASCO

# UV-Vis/NIR Spectrophotometers

## V-600 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-600 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-600 series does not compromise on accuracy, performance or reliability.***

### V-630 *General-purpose UV-Vis*

- *Double-beam spectrophotometer with single monochromator*
- *Silicon photodiode detectors*
- *Range 190 to 1100 nm*
- *Fixed bandpass of 1.5 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-630Bio *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*

***iRM-700***
*Intelligent remote module*

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

***TCH-703***
*8-position turret micro cell holder*

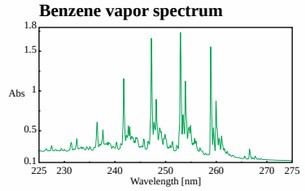
**4 µL 8-position turret micro cell**

***µWash***
*Cleaning tool for micro cells/cuvettes*

### V-650 *High resolution UV-Vis*

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

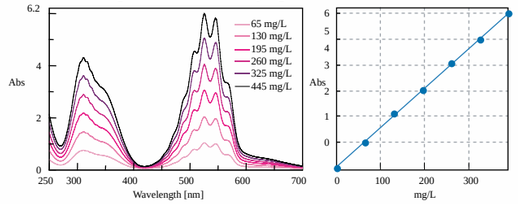
**Benzene vapor spectrum**




### V-660 *Exceptional stray light rejection*

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

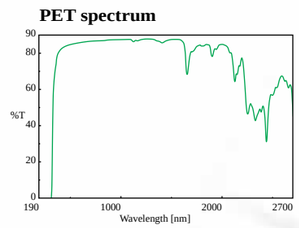
**$KMnO_4$ spectra and linearity up to 6 absorbance**



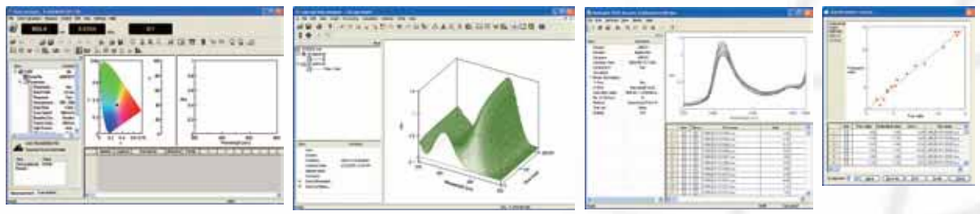

### V-670 *Expansion into the NIR region*

- *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)*

**PET spectrum**

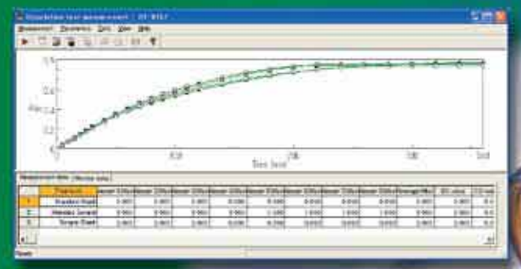



## *Over 20 dedicated software programs to support specific analysis applications*



# 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-Center™ 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.*

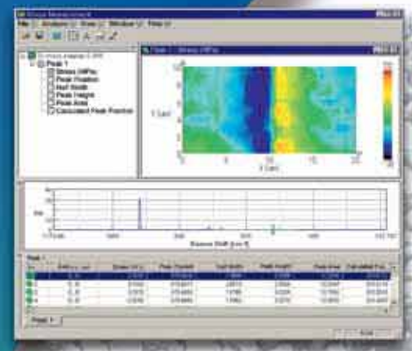
### New

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



# Raman Spectrometers

## NRS-3000 Series



***The NRS-3000 Series of bench top, singly dispersive micro-Raman spectrometers are based on JASCO's proven technology emphasizing sensitivity, reliability, and ease of operation from a PC-controlled optical system. The laser(s), enclosed microscope, software-switched optics and unique aberration-corrected polychromator with CCD detector provide an integrated package that is compact enough to fit on a laboratory bench.***

### NRS-3100

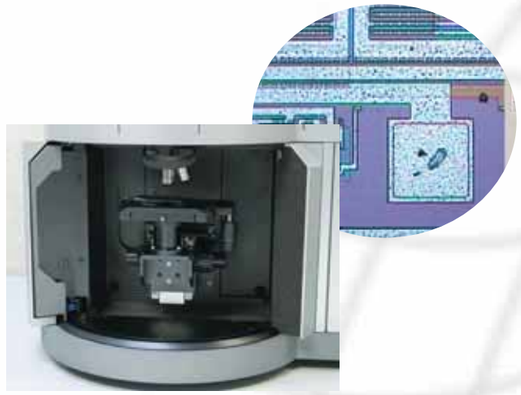
- *Resolution 1 $cm^{-1}$*
- *Laser wavelength range: Visible - NIR*
- *Wavenumber range: 50 to 8000 $cm^{-1}$*

### NRS-3200

- *Resolution 1 $cm^{-1}$ (0.4 $cm^{-1}$ optional)*
- *Laser wavelength range: UV - NIR*
- *Wavenumber range: 50 to 8000 $cm^{-1}$*
- *Raman imaging optional*

### NRS-3300

- *Resolution 1 $cm^{-1}$ (0.4 $cm^{-1}$ optional)*
- *Laser wavelength range: UV - NIR*
- *Wavenumber range: 50 to 8000 $cm^{-1}$ (10 to 8000 $cm^{-1}$ with low wavenumber attachment)*
- *Ultimate flexibility providing a range of different configurations*



***120° motorized sample chamber door***
*Complete operator safety is maintained by the fully enclosed automated sample chamber door which provides a 120° opening to allow full microscope access.*

JASCO

# Fluorescence Spectrophotometers

## FP-6000 Series

***The FP-6000 series meets the demands of both research and routine analysis by combining a highly sensitive and flexible optical system with the 32-bit Windows based Spectra Manager™ software platform. The FP-6000 series is equipped with an easily accessible sample compartment. This compartment allows for a range of prealigned optional sampling accessories to meet many specific application requirements. Microcell holder, 4 or 8 position cell holders, and attachments for stopped-flow, titration and anisotropy measurements are available.***

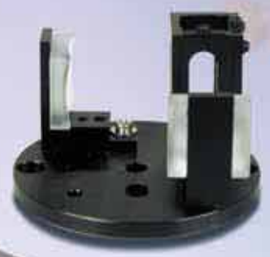

### FP-6200

*A versatile unit for routine and research applications*

- *Range 220 to 730 nm*
- *High quality optical system with excellent S/N specifications*
- *GLP/GMP compliant*
- *Optional extended working range, 200 to 900 nm*
- *Full PC control with Spectra Manager™ software package*

### FHM-440

*Cell holder for high sensitivity measurements*



### FDA-430

*Solid sample holder*

### ETC-272/273

*Peltier thermostatted single cell holder with stirrer*




### FP-6300

*Mid-range instrument*

- *Range 220 to 750 nm (900 nm with optional PM tube)*
- *S/N ratio > 550:1 for Raman band of water*

### FP-6500/6600

*Research level unit for stopped-flow, kinetics, titration and anisotropy measurements.*

- *Range 220 - 750 nm (200 - 850 nm option) for FP-6500*
- *Extended range 220 - 1010 nm with FP-6600*
- *Accuracy 1.5 nm*
- *Spectral bandwidth: 1, 3, 5, 10 and 20 nm on both excitation and emission monochromators*
- *Variable scan speed and selectable response time*
- *S/N ratio > 800:1 for Raman band of water (FP-6500)*
- *GLP/GMP compliant*
- *Spectra Manager™ software package for PC control*
- *Thermostatted single cell holder as standard*


### SFA-452/453/454

*Stopped-flow accessory*

### ATS-443

*Automatic titration accessory*

### APH-103

*Peltier thermostated depolarization accessory*

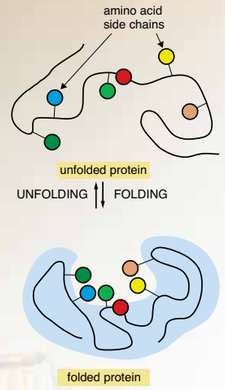
JASCO

# Circular Dichroism

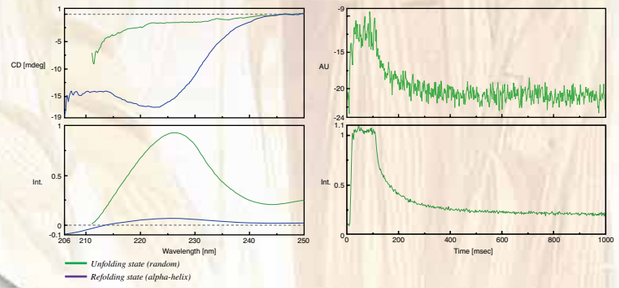
## J-815 Spectrometer

***The J-815 Circular Dichroism (CD) spectrometer offers the best far-UV performance combined with a range of flexible accessories to meet any required application. With 40 years of CD innovation, JASCO is the world leader in Chiro-optical spectroscopy.***

- *Compact benchtop design*
- *Air cooled 150W Xenon lamp*
- *Highest Signal:Noise ratio*
- *Range of precise temperature control accessories*
- *Automated titration and stopped-flow accessories*
- *Spectra Manager™ II software for control and data analysis*
- *Spectra Manager CFR option for 21 CFR 11 compliance*
- *Fluorescence emission monochromator/detector (option)*
- *High throughput sampling accessories*




## Refolding measurement of Cytochrome




*Cytochrome C in its unfolded state, denatured in the presence of guanidine hydrochloride, is refolded by dilution of the guanidine hydrochloride with a sodium phosphate buffer. This refolding process, which is completed in around 300 msec, is monitored by simultaneous CD/Fluorescence measurement with stopped flow dilution.*



# 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: iRM-800 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*

### PTC-203
*Peltier cell holder*

### SHP-201P / SHP-201
*Peltier sipper / Water thermostatted sipper*

# Ultra High Performance Liquid Chromatography

## Achieve the absolute maximum in speed and efficiency

# X-LC®

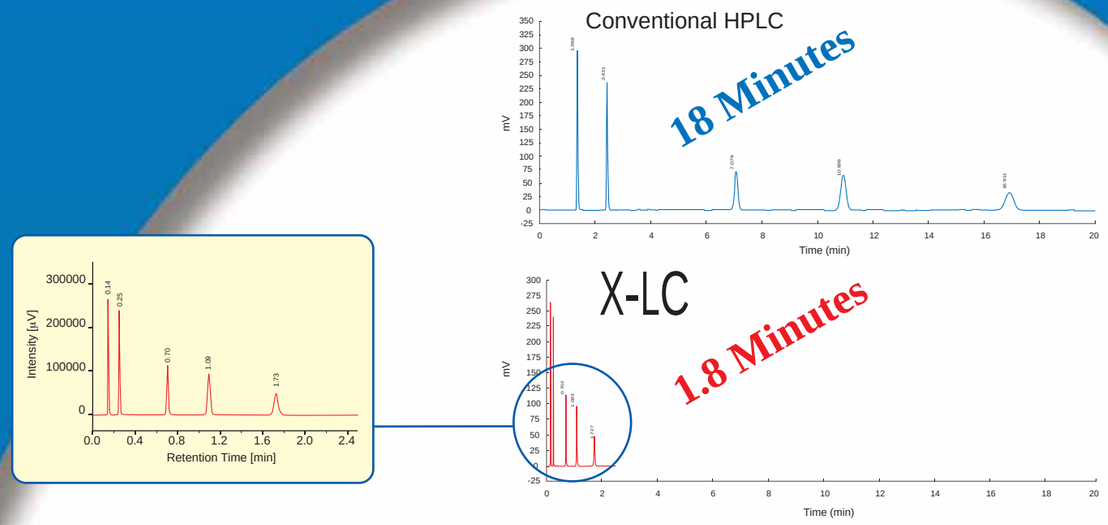
***The JASCO UHPLC (X-LC®) series is an extreme high pressure liquid chromatography system that is designed to operate at pressures approaching 15,000 psi for either gradient or isocratic separations. X-LC provides researchers with a powerful tool to use small particle columns while providing efficiency and speed that was previously not possible in a commercial HPLC. All of this while retaining the ability to run traditional HPLC methods. JASCO X-LC systems can be used with most commercial MS detectors. Direct control is available with Analyst® and Xcalibur™ software packages.***

### X-LC 3120FP
**Fluorescence Detector**

*The X-LC 3120FP Fluorescence detector, the industry's most sensitive detector, has an excellent signal-to-noise ratio with proven stability, with a wide wavelength range (220-700 nm) for both excitation and emission. Advanced optics, holographic concave diffraction gratings, and non-spherical mirrors are cleverly incorporated in a compact package resulting in extremely efficient and reliable fluorescence detection.*

### X-LC 3159AS
**Intelligent Autosampler**

*The X-LC 3159AS autosampler is a fully automatic sample injection system with a minimum injection interval of 30 seconds to enable greater productivity and the highest possible level of precision. Sampling flexibility is unparalleled with up to 768 well positions (two 384-well microplates) as an option for laboratory automation and combinatorial chemistry. Also available is a micro-vial rack (224 vials) or the standard rack (120 vials) for 2 mL vials.*




### X-LC 3185PU/3080PU
**Solvent Delivery Pump**

*The X-LC 3185PU/3080PU solvent delivery unit is designed to operate at pressures approaching 15,000 psi for either gradient or isocratic elution modes. The SSQD (Slow Suction, Quick Delivery) pumping system was designed to provide durable, accurate and pulse-free operation. Flow range 1 µL/min to 2 mL/min (3185PU), 1 µL/min to 5 mL/min (3080PU).*

### X-LC 3070/3075UV
**UV/Vis Detectors**

*To ensure the most sensitive and stable X-LC detection, these models utilize a Czerny-Turner monochromator covering a wide wavelength range from 190 to 900 nm with deuterium and halogen lamps (X-LC 3070UV) and from 190 to 600 nm with a single deuterium lamp (X-LC 3075UV). The excellent optical characteristics and program capabilities of the X-LC 3070/3075UV are combined in one compact package, making the X-LC 3070/3075UV the optimal tool for X-LC UV/Vis detection. To efficiently detect the much narrower peaks that are obtained using X-LC, the X-LC 3070/3075UV detectors are capable of data acquisitions at frequencies up to 100 data points per second.*

### X-LC 3195CD
**Circular Dichroism Detector (CD)**

**The only CD detector for UHPLC!**

*The X-LC 3195CD detector uses the same technology applied in conventional CD spectropolarimeters. This detector enables highly sensitive and selective analysis of chiral compounds. It can simultaneously determine both CD and UV absorption of the sample in the same cell and determines optical isomer separation and purity. To meet X-LC requirements, the 3195CD features a high-speed sampling rate of 50 data points/sec. for both CD and UV signals. Its specially designed flow cell minimizes peak broadening.*

### X-LC 3110MD
**Photo Diode Array Detector (PDA)**

*The X-LC 3110MD PDA detector offers maximum sensitivity with ultra high-speed data acquisition and processing. Designed specifically for use in ultra high-speed separations arising from UHPLC applications, the X-LC 3110MD is on the cutting edge of PDA detector development. Display functions such as 3-D chromatograms, contour plotting, peak purity, multi-wavelength chromatograms and spectral search are all supported.*

JASCO

# High Performance Liquid Chromatography

## LC-2000Plus Series

***A versatile series of components offering unique flexibility to build isocratic and high/low pressure gradient systems for routine and specialized applications.***

- *Compact design*
- *Modular components offering PC system or direct keypad control*
- *Micro, analytical and preparative solvent delivery systems*
- *Wide range of detectors*
- *50, 100 and 120 position autosamplers*
- *Solvent switching, mixing and degassing*
- *Column switching and temperature control*
- *32 bit software package for control and full data analysis*

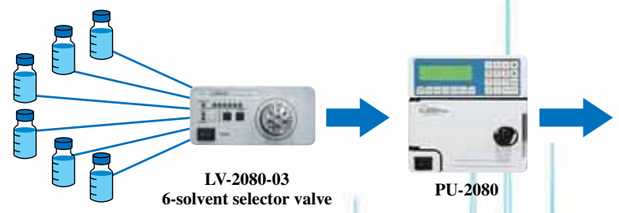

# Solvent Delivery Systems

*Wide range of solvent delivery systems for isocratic, binary, ternary and quaternary gradient applications*

## PU-2080 Analytical

- *Flow range of 1 µl/minute to 10 ml/minute*
- *Flow precision ±0.1%*
- *Versatile time programming for high and low pressure gradient elution, flow rate, solvent selection, etc.*
- *Bioinert version, PU-2080i, for applications such as biological separations, without metallic material contact*

***Solvent switching system***



**LV-2080-03**
**6-solvent selector valve**

**PU-2080**

## PU-2085 Semi-micro

- *Gradient flow rates from 1 µl to 4 ml/minute*
- *Ideal for 1-2 mm columns and LC-MS applications*
- *requiring low flow rate gradient elution*

## PU-2086 Semi-preparative

- *Flow rate up to 20 ml/minute*
- *Flow precision ±0.2%*

## PU-2087 Preparative

- *Flow rate up to 50 ml/minute*
- *Flow precision ±1%*

## PU-2089 Quaternary

- *Low pressure gradient pump with built-in 4 line degasser and mixing modue*
- *Flow rate 1 µl to 10 ml/minute settable in 1 µl steps*
- *Flow accuracy ±1%*
- *Stepwise, linear and exponential gradient mixing*

# High Performance Liquid Chromatography

## LC-2000Plus Series

## Wide Range of Detectors


### UV-2070/2075 UV/Visible

- *Range 190-900 nm (UV-2070), 190-600 nm (UV-2075)*
- *Versatile programming with 10 program files*
- *Storage of 10 spectra and baselines*
- *'On the fly' scanning capability*
- *Excellent baseline stability*
- *Lamp-off timer to extend lamp life*

### UV-2077 Multi-wavelength

- *Simultaneous monitoring of 4 different wavelengths*
- *Range 200-600 nm with 1 nm intervals*
- *Low noise, stable baseline*
- *Spectral acquisition without interrupting chromatography*

### MD-2010/2015 Diode Array

- *Range 195-650 nm (MD-2010), 200-900 nm (MD-2015)*
- *3D chromatograms*
- *Contour plots*
- *UV/Vis spectra*
- *6 wavelength chromatograms*
- *Ratio chromatogram*
- *Spectral library and search facility*

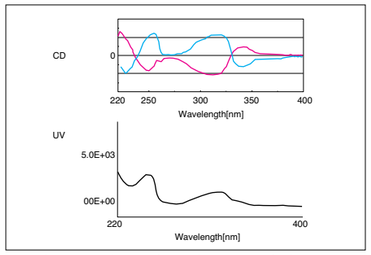
*Stand alone units offer*

- *Chromatograms at 3 different wavelengths*
- *Ratio chromatogram for peak purity*
- *50 spectra storage memory*
- *10 program files with up to 64 steps for time programming*

### FP-2020 Fluorescence

- *Excitation and emission range of 220-700 nm (to 900 nm with optional PMT)*
- *Time programming of wavelength, response range and spectral scan providing peak measurement at optimum excitation and emission wavelengths*
- *Rapid scan for spectral acquisition of excitation and emission spectra without interrupting chromatographic elution*

**✻ JASCO HPLC components can be interfaced with most commercial MS systems. Direct control is available with Analyst® and Xcalibur® software packages.**




*Simultaneous CD and UV detection of Flavanone*

### CD-2095 Circular Dichroism

*JASCO has developed the world's first Circular Dichroism based detector for Chiral Chromatography. Until recently, optical rotation detectors have been used exclusively for enantiomer detection. The new CD-2095 offers increased sensitivity and additional peak purity information.*

- *Simultaneous CD, UV and g factor signals*
- *Ratio of CD and UV signals, the g factor, gives direct determination of optical isomer separation and purity*
- *Spectral scanning with Spectra Manager™*
- *Up to 100 greater sensitivity than ORD*
- *High pressure cell for SFC*

### OR-2090 Chiral

- *Low noise and drift*
- *Hg/Xe lamp to cover wavelength range from UV to visible*
- *Patented flow cell for low dispersion*
- *Artifact free design*

### RI-2031 Refractive Index

- *Semi-preparative flow rate to 50 ml/min*
- *Low noise, stable baseline*
- *Automatic time programming*
- *Temperature stabilization from 10˚C above ambient to 45˚C*

### CL-2027 Chemiluminescence

- *Detection of ultra-trace amounts*
- *Unique flow cell design for high sensitivity*
- *Time programming for detection of multiple peaks*
- *Temperature stabilization from 10˚C above ambient to 60˚C*

# High Performance Liquid Chromatography

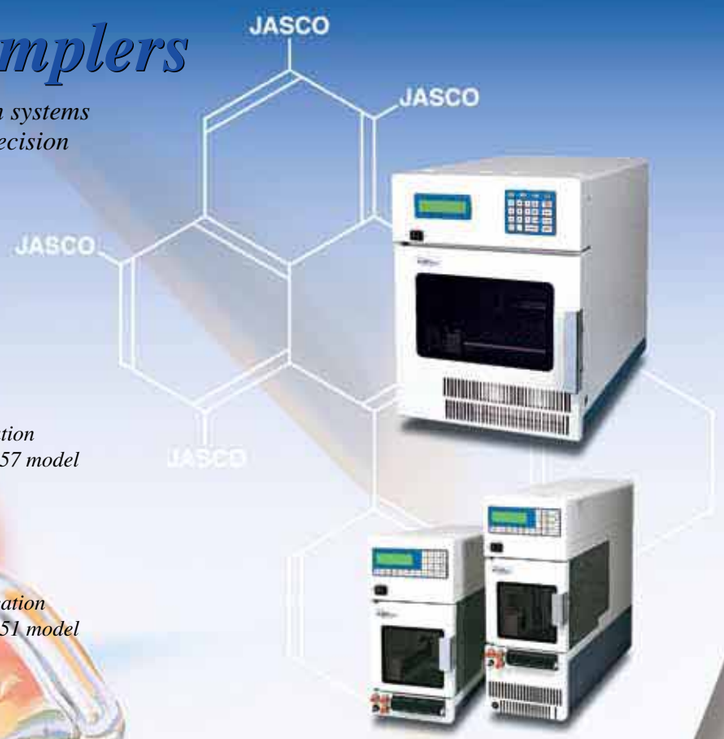
## LC-2000Plus Series

## Versatile Autosamplers

*Fully automatic, intelligent sample injection systems for increased productivity and analytical precision*

### AS-2059

- *120 standard 2ml vial capacity*
- *192 well positions (2  96 well microplates) for combinatorial chemistry or 224 microvials*
- *Excellent reproducibility of 0.2% RSD for 5 µl to 100 µl injection volumes*




### AS-2055/2057

- *50 position unit with high reproducibility specification*
- *Built-in Peltier cooling and heating unit for AS-2057 model*

### AS-2050/2051

- *100 position unit with high reproducibility specification*
- *Built-in Peltier cooling and heating unit for AS-2051 model*

## Column Ovens

### CO-2060/2065

- *Intelligent module*
- *Range –15˚C below ambient to 80˚C (CO-2060)*
- *Range +10˚C above ambient to 80˚C (CO-2065)*
- *Accuracy ±0.1˚C*
- *Accepts column lengths to 40 cm*

### CO-2067

- *Aluminium block design*
- *Range –15˚C below ambient to 65˚C*
- *Accommodates 2 columns up to 25 cm*

## Mixers

### Low pressure gradient mixers

### LG-2080-02

- *3 solvent mixing module*

### LG-2080-04

- *4 solvent mixing module*

### High pressure gradient mixers

### MX-2080-31

- *3 solvent mixer with 2 mixing lines*
- *Higher mixing capability for a stable baseline*

### MX-2080-32

- *3 solvent dynamic mixer with optional semi-micro and semi-prep mixers*

## Degassers and Valves

### DG-2080-53

- *In-line degasser eliminates dissolved gases from 3 solvent lines*

### DG-2080-54

- *4 line degasser*

### HV-2080-01

- *A 2-position switching valve for use in flow line switching between columns and auto-injector*

### LV-2080-03

- *A 6-solvent selector valve used with the PU-2080 HPLC pump*

## Reaction Oven

### RO-2061

- *Oven designed for use in post-column ninhydrin derivatisation and sugar analysis systems*
- *Range 10˚C above ambient to 200˚C*

JASCO

# High Performance Liquid Chromatography

## LC-2000Plus Series

## HPLC Systems


### Amino Acid Analysis

- *LC-2000Plus system dedicated to the separation of protein hydrolysate and physiological amino acids*
- *OPA (orthophthaldehyde) or Ninhydrin post-column derivatisation*


### Sugar Analysis

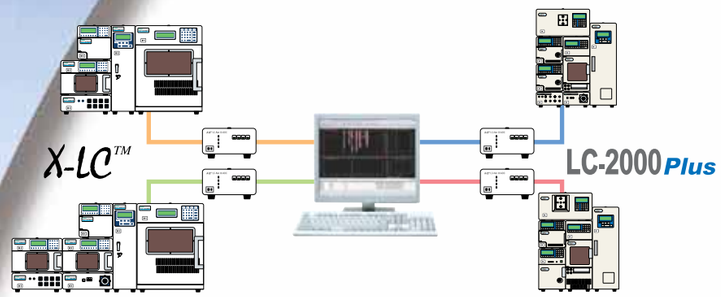
- *High sensitivity and selective detection using post-column derivatisation and fluorescence detection*
- *Analysis of reducing sugars, sugar alcohol, aminosugar and oligosaccharides*

### Carbamate Analysis

- *Routine simultaneous analysis of at least 11 carbamate types*
- *Uses OPA post-column derivatisation method*
- *Carbamates separated on Crestpak C18 column packed with silica - ODS resin*
- *Gradient elution technique with FP-2020 fluorescence detection*

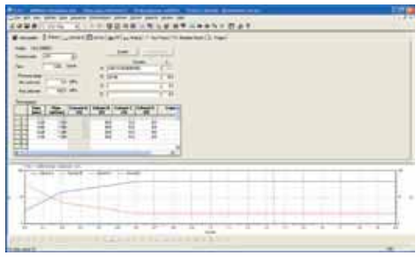
## System control and data analysis software EZChrom Elite™

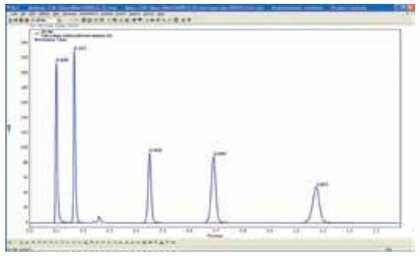
### The industry standard for client and server chromatography data systems




### Integrated Instrument Control

*JASCO's EZChrom Elite™ acquisition and control software provides a comprehensive platform to control a wide variety of system configurations. The flexibility and power of this software provides chromatographers with the ability to adjust to the experimental requirements of today's modern lab environment. The integrated software control fully supports JASCO's SFE/SFC, LC-2000Plus and cutting-edge X-LC series.*





### Full Download Sequence Run

*The latest version of JASCO's EZChrom Elite supports 'inject-ahead' sample pre-loading. This allows immediate injection of the next sample after completion of the current run. Elimination of the post-processing delay in previous versions of EZChrom Elite dramatically reduces cycle time, thereby reducing the total sequence completion time. This feature is especially beneficial when sample pretreatment, such as dilution or pre-reaction of the sample before injection, is required.*

### Comprehensive Data Analysis

*Recognized as a comprehensive software package throughout the past decade, EZChrom Elite has been developed by leading chromatographers and has been continuously refined. The result is a control and analysis software that can flexibly handle all types of chromatography data requirements and demands. These capabilities range from single-channel to diode-array and spectral scanning collection modes. Integrated GPC/SEC and system suitability functions are also available. Chromatographers can use EZChrom Elite with the confidence that they are using a powerful software package than can meet all of their current and future laboratory data processing needs.*

### GLP/GMP Features

*Chromatographers in regulated environments can utilize the comprehensive features of EZChrom Elite to address any GLP/GMP requirements. Complete audit trails and system logs document and record any changes made to the system. Highly flexible user security access levels and operational privileges are easily configured. Data file integrity and electronic signature functions allow full compliance with 21 CFR Part 11.*

JASCO

# Supercritical Fluid Chromatography

## SFC/SFE

***First discovered in 1879 supercritical fluids have been used for extraction applications since the 1950's. The 1980's saw an increase in their use as a mobile phase for analytical separations. The benefits of using supercritical fluids are their liquid-like densities offering higher solubility and increased column loading due to their low viscosity and high diffusivity, enabling faster separation and extraction. The reduction in the use of organic solvents has cost, health, and safety benefits as well as faster (cleaner) sample recovery during experimental procedures.***

***SFC applications include; chiral and achiral separations, purifications, screening and chiral chromatographic analysis.***

### Supercritical Fluid Extraction

*SFE is a technique that uses supercritical fluid as an extraction medium. Methods that employ supercritical carbon dioxide as an extraction medium have many advantages and are used in a variety of fields. Supercritical fluid extraction by means of supercritical carbon dioxide can improve efficiency, including shorter extraction times and simplified collection procedures when compared to extraction techniques that use organic solvents.*

### Analytical SFC

*JASCO has been manufacturing SFC/SFE systems for over 20 years. Our Analytical SFC system features a versatile, modular design and excellent performance. It employs a stable dynamic regulator (Back Pressure Regulator – BPR) to control the supercritical state. The unique $CO_2$ pump offers peltier electric cooling of the pump head for greater stability and eliminates inconvenient plumbing with liquid cooled heads. Optional detectors include: UV-Vis, UV-Vis multiwavelength, Photometric Diode Array and Chiral detectors. Flow cells are rated up to 30 MP (300 Bar).*

### *SFE/SFC*

- *Separation and sample preparation applications*
- *Flow rate range up to 10 mL/min*
- *Replaces normal phase chromatography for environmental analysis procedures*
- *System includes Peltier thermostatted $CO_2$ delivery pump and pressure programmable Back Pressure Regulator*
- *Chiral SFC available*

### Preparative SFC

*The heart of JASCO's Preparative SFC system is our patented back-pressure regulator, which allows control of system pressure regardless of solvent composition and flow rate. Injections can be manual or fully automated. Repetitive injections can be performed to overlay chromatographic runs. Detection choices include UV and/or CD with MS interface capability. SF-Nav process control software is designed for fully automated operation, monitoring and recording of chromatograms, temperatures and pressures.*

### *Preparative SFE/SFC*

- *Separation and purification from hundreds of milligrams to several grams with up to 30 mm I.D. columns*
- *Preparative scale $CO_2$ delivery up to 120 mL/min*
- *Fraction collection of up to 8 fractions*
- *Dedicated software for high throughput stack injection*
- *A wide range of detectors including UV-Vis, Multi-channel and CD*

# Service and Support
## Committed to Service Excellence

***JASCO offers world class service and support. Once an instrument is purchased, JASCO's commitment to you is just beginning. We offer a multitude of services and programs that will keep your equipment operating at peak performance.***

***Choose the plan that is right for you. We offer four plans to make sure we have one that fits both your budget and requirements.***

***Advantage Support*** *– the Advantage Support plan offers the ultimate coverage and includes:*

- *All parts, labor and travel costs*
- *Two Preventative Maintenance (PM) calls per year*
- *One IQ/OQ service*
- *One free customer training class at Jasco, Inc.*
- *Unlimited phone support for technical and application issues*
- *20% discount on consumable parts*

***Full Support*** *– the Full Support plan offers excellent coverage at a very reasonable cost to ensure your instrument is always in optimum running condition. This plan includes:*

- *All parts, labor and travel costs, excluding consumables*
- *Customized one or two Preventative Maintenance (PM) calls per year*
- *Discounted IQ/OQ service (performed at the same time as PM)*
- *One free customer training class at Jasco, Inc.*
- *Unlimited phone support for technical and application issues*
- *15% discount on consumable parts*

***Limited Support*** *– The Limited Support plan provides more moderate coverage, including:*

- *All parts and labor costs*
- *50% discount on travel for each call (no Preventative Maintenance)*
- *Unlimited phone support for technical and application issues*
- *10% discount on consumable parts*

***Preventative Maintenance Support***

- *One Preventative Maintenance call per year*
- *Unlimited phone support for technical and application issues*
- *5% discount on consumable parts*

*JASCO offers over 30 service centers strategically located around the busiest customer-based areas in North America to better serve our customers.*

***Maintenance Kits***
*JASCO offers maintenance kits to ensure continuous instrument function. These kits provide a cost savings over purchasing parts individually.*



# Application Training Seminars

### *Quality Training from Jasco, Inc.*

*Increasing productivity in the lab requires reliable instruments, quality support and a strong working knowledge of the instrumentation. JASCO training seminars are specifically designed to increase your knowledge of JASCO products and related applications, as well as instrument maintenance and troubleshooting procedures.*

*We offer both on-site training and regularly scheduled training seminars at our Easton, Maryland applications lab. For more information regarding pricing, times and course schedules, or regarding on-site training at your facility please contact us at 800-333-5272.*

*Our seminars include: Circular Dichroism J-Series, FT-IR Spectroscopy, Fluorescence, UV-Vis/NIR, Polarimetry, HPLC, X-LC®, and Supercritical Fluid Chromatography.*

*The hands-on aspect of JASCO's programs, combined with small class sizes, ensure that you receive the optimum learning experience.*


● Specifications are subject to change without notice.

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ISO 9001 Certified
Products described herein are designed and manufactured by ISO-9001-certified JASCO Corporation.

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