

X-LC[®]

Ultra High Pressure Liquid Chromatography

Save time

Reduce cost

Achieve higher sensitivity

Gain higher resolution



*Technology to achieve the
maximum in speed and efficiency*

Jasco

A Reputation for Quality

www.jascoinc.com

X-LC[®] Ultra High Pressure Liquid Chromatography (UHPLC)

Achieving maximum speed and efficiency by utilizing shorter columns packed with smaller particles



FLEXIBLE
Capable of UHPLC
and conventional HPLC

MODULAR
Configure each
system to meet
individual requirements

X-LC/MS

The X-LC provides a powerful and flexible platform for UHPLC front-end separations. Configuration options include binary high-pressure gradient and ternary high-pressure gradient formats. Combine this system with standard or high-throughput autosampler options, automated column selection valves and a wide variety of optical detectors and X-LC meets the demands of a variety of analytical requirements. X-LC can also be controlled directly by a variety of MS software packages eliminating the need to run multiple software platforms, providing a powerful solution for UHPLC/MS users everywhere.

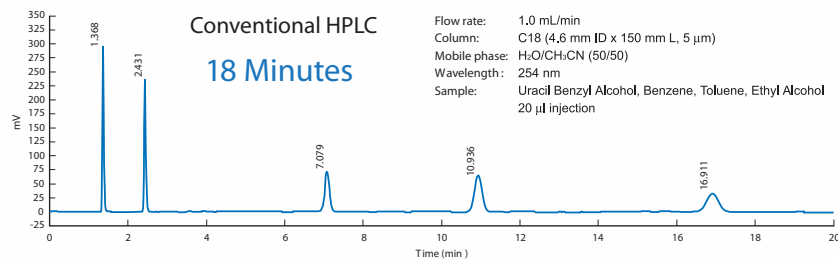
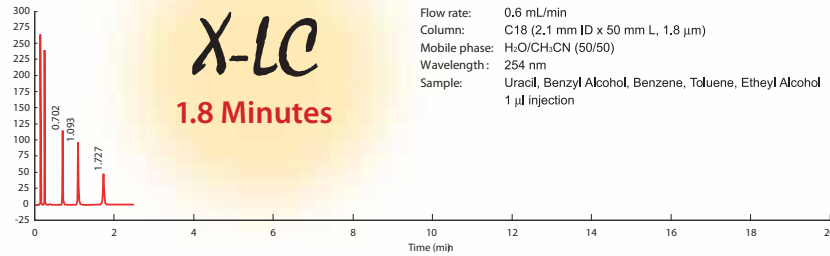
The future of liquid chromatography is here!

JASCO's X-LC provides researchers with a powerful tool to take advantage of newly available small particle size packed columns providing efficiency, resolution, and speed that was previously not possible in a commercial HPLC. All of this while retaining the ability to run traditional HPLC methods. The X-LC series of components is designed to operate at pressures approaching 15,000 psi for either gradient or isocratic separations.



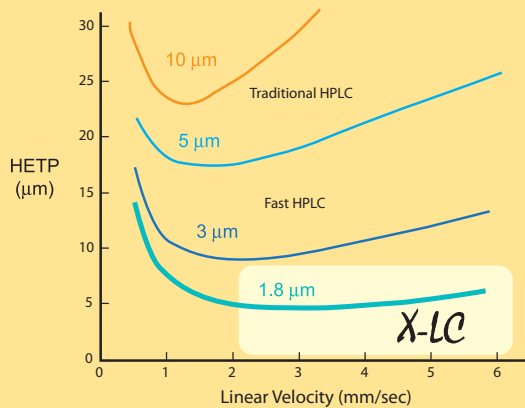
Xtreme Speed

The X-LC provides chromatographers with a system capable of reducing analysis times up to 10 × as compared to conventional HPLC.



Xtreme Efficiency

The X-LC series provides efficiency far beyond conventional HPLC by utilizing columns packed with small particles less than 2 μm.



This plot shows the relationship between HETP (height equivalent to a theoretical plate) and linear velocity of the mobile phase. A smaller HETP value indicates higher efficiency. The optimum linear velocity, which offers the maximum column efficiency, is shown in the graph. Reducing the particle size offers lower HETP values resulting in higher column efficiency. For columns packed with 1.8 μm particles, when the linear velocity of the mobile phase is increased to two or three times its original value, the HETP value is maintained at a much lower level compared to a similar increase when using columns with larger particles. This demonstrates that the flow rate can be increased and the analysis time shortened without sacrificing the column efficiency. The use of smaller particles, however, requires increased pumping pressure. The X-LC is capable of delivering solvents at pressures up to 15,000 psi.

X-LC[®]

Ultra High Pressure Liquid Chromatography

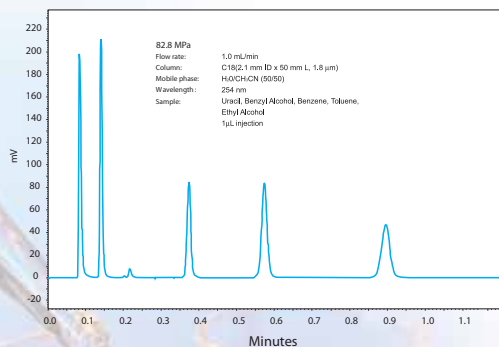


Modular Design for Flexibility

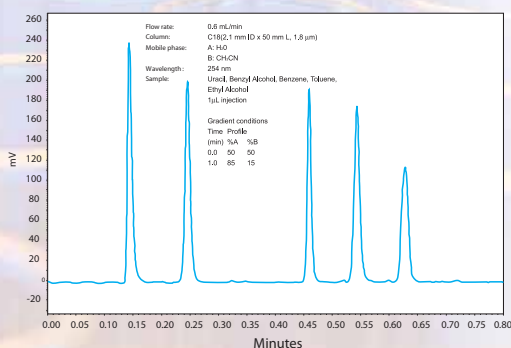
The modular nature of the individual X-LC components allows each chromatography system to be customized to fit the requirements of even the most demanding applications.

- Extremely low system volumes
- Reliable gradient performance
- Wide range of detectors

In the case of the separation of mixtures that contain compounds with a wide range of polarities, isocratic conditions may not provide an acceptable separation. To solve this problem, the composition of the mobile phase is changed during the separation. After sample introduction, the ratio of these solvents is programmed to vary either continuously or in steps, resulting in enhanced separation efficiency. JASCO's X-LC is easily configured for complete control of both isocratic and gradient methods.



X-LC Isocratic Elution Method



X-LC Gradient Elution Method

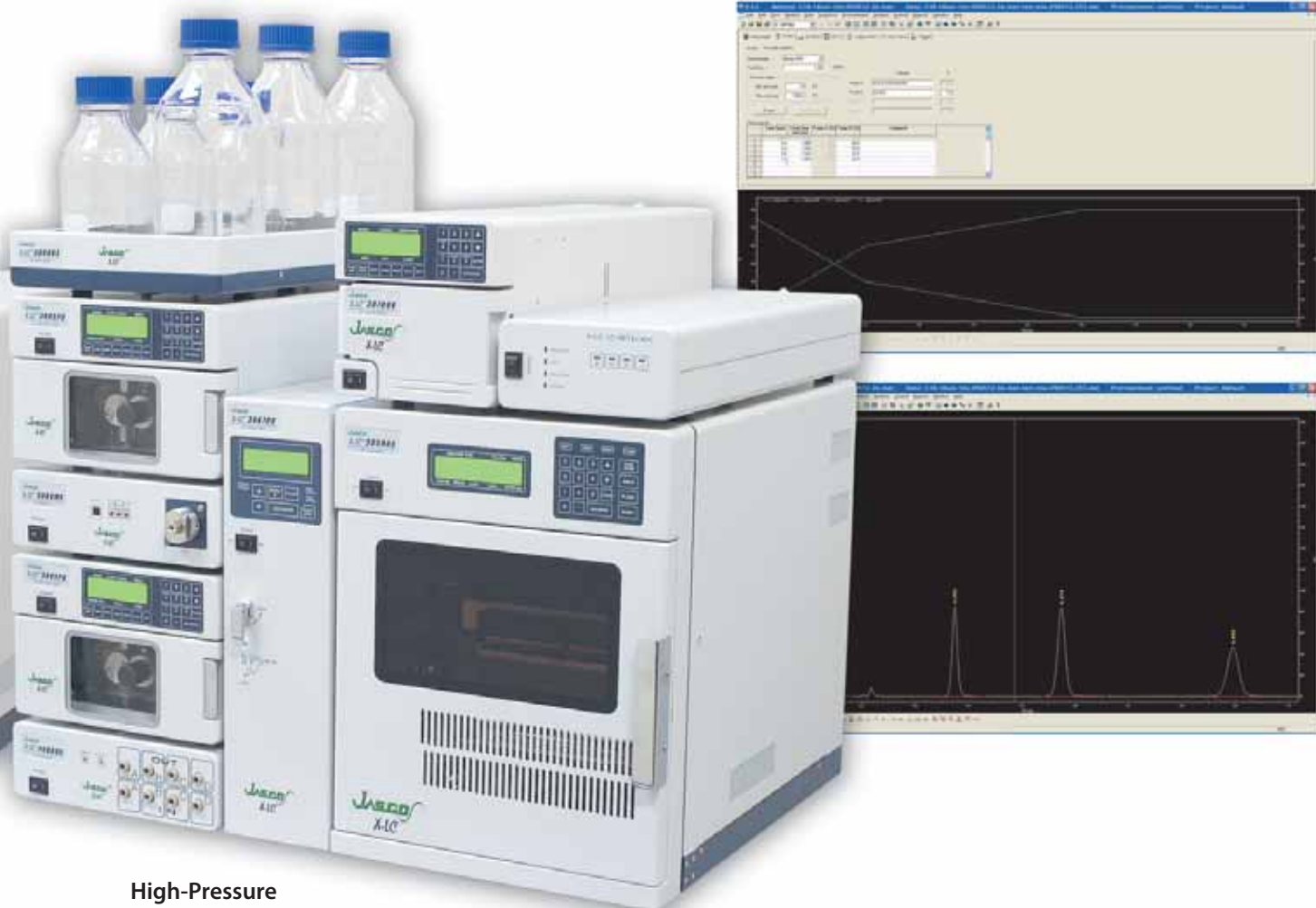


Isocratic System

Software Control using EZChrom *Elite*™

The industry standard for client and server chromatography data systems

The X-LC system components are fully controlled by EZ Chrom *Elite* software. This powerful and flexible data system provides full instrument control for every X-LC configuration. EZ Chrom *Elite* supports operation in either stand-alone or networked data station configurations. Data collected by EZ Chrom *Elite* can be analyzed and reported using a wide array of analysis and reporting functions including batch reprocessing and summary reporting. Overlay runs perform system suitability calculations and output data with a variety of report templates using the intuitive graphical interface. GLP/GMP features in EZ Chrom *Elite* ensure that X-LC results are securely controlled with a full-featured Audit Trail to track all changes. Multiple user access-level assignment and the Electronic Signature feature provide full compliance with 21 CFR 11 requirements.



High-Pressure Gradient System

X-LC®

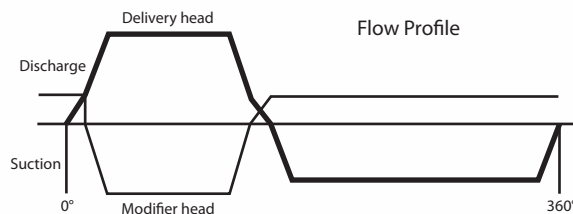
Ultra High Pressure Liquid Chromatography

X-LC 3185PU Pumps

Pulse-free solvent pumps delivery operate at pressures approaching 15,000 psi

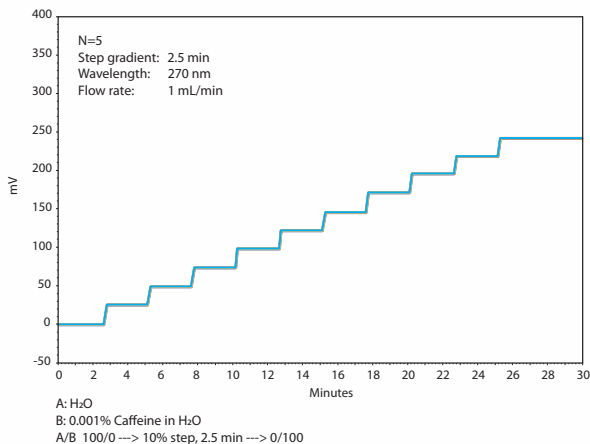
The X-LC 3185PU solvent delivery unit is designed to operate at pressures approaching 15,000 psi for either gradient or isocratic elution modes. The SSQD (Slow Suction, Quick Delivery) pumping system provides durable, accurate and pulse-free operation. This simple design utilizes only two plungers and two check valves for optimum reliability and ease of maintenance. Versatile programming capabilities allow the use of sophisticated time-based programs for isocratic, binary or ternary gradient elutions.

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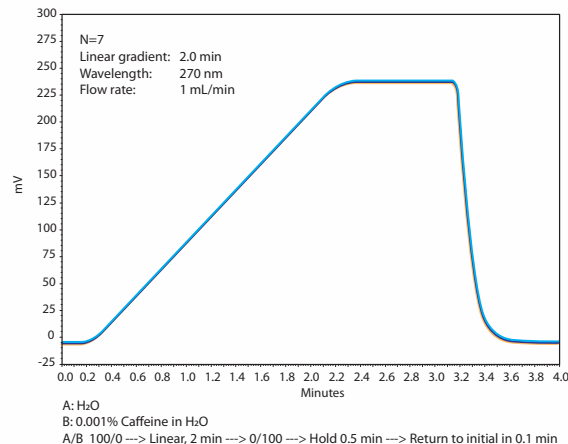


SSQD profile giving pulse-free flow

10% Step Gradient



100% Linear Gradient



Overlays of several gradient profiles with either step or gradient programs demonstrating excellent reproducibility.



High-Pressure Instrumentation *X-LC* Support Modules



X-LC 3180-32MX

Dynamic Mixer

The X-LC 3180-32MX three-solvent dynamic mixer provides efficient mixing of solvents for binary and ternary gradient work at pressures approaching 15,000 psi.

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X-LC 3080DG

Degasser

The X-LC 3080DG four-line degasser eliminates dissolved gases in up to four mobile phase inlet lines.

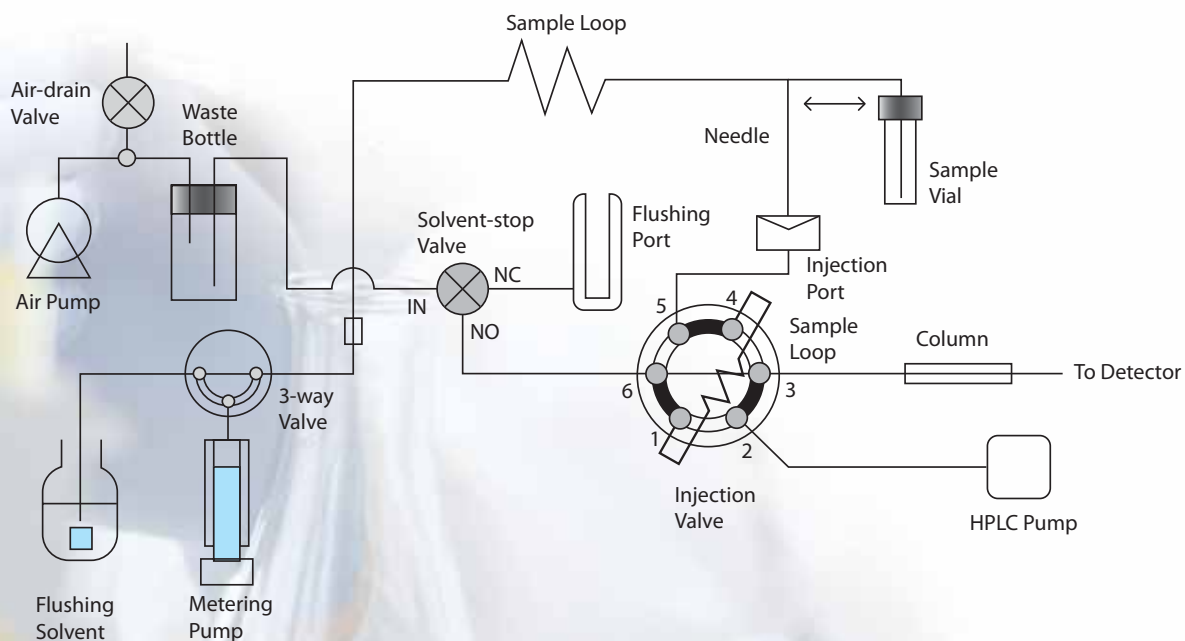
X-LC[®]

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X-LC 3159AS Intelligent Autosampler

Fully automatic intelligent sample handling with extremely low carry-over and reduced cycle time

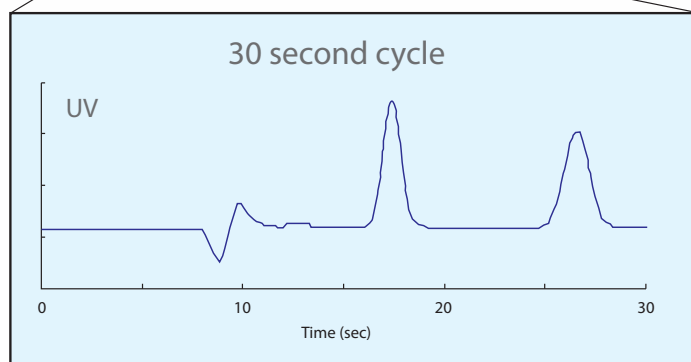
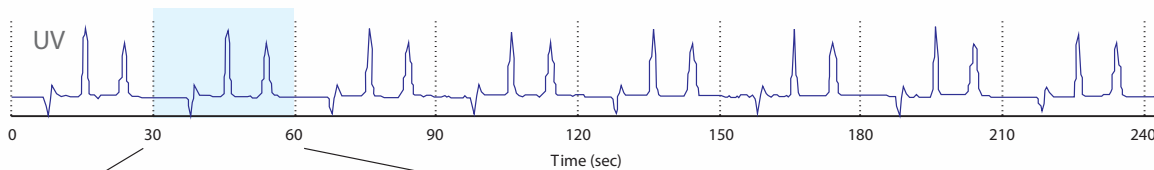
The X-LC 3159AS autosampler is a fully automatic sample injection system with a minimum injection interval of 30 seconds. It enables greater productivity and the highest possible level of precision. Sampling flexibility with up to 768 well positions (two 384-well microplates) is an option for laboratory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





Xtreme Sample Throughput

The X-LC series Autosampler (3159AS) is JASCO's fastest autosampler specifically designed for maximum throughput and productivity. The 3159AS allows faster method development of multiple samples compared with conventional HPLC. These chromatograms show the results of repetitive injections with a short injection cycle. The minimum injection interval is only 30 seconds.



X-LC 3067CO Column Oven

Column thermostating to ensure reproducibility

The X-LC 3067CO is a compact column heater/cooler employing an aluminium block design. Its temperature control range is from -15°C below ambient temperature to 65°C using Peltier elements.



X-LC[®] Wide Range of Detectors

Ultra High Pressure Liquid Chromatography

Productivity, Confidence, and Efficiency

JASCO offers an ever-growing range of X-LC and HPLC detectors offering maximum sensitivity and operating stability, which includes the world's only circular dichroism based detector for chiral detections, and the most sensitive scanning fluorescence detector on the market today.

X-LC 3120FP Fluorescence Detector

The most sensitive fluorescence detector available

The X-LC 3120FP fluorescence detector is the industry's most sensitive detector and has an excellent signal-to-noise ratio with proven stability and 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 3177UV Multi-Wavelength Detector

Adding additional capabilities

The X-LC 3177UV has a unique design separating it from conventional UV detectors, incorporating a 36-element photo-diode array. The 3177UV offers maximum sensitivity and selectivity to allow simultaneous monitoring of chromatograms at four different wavelengths or three wavelengths and a ratio of two others.



X-LC 3195CD Circular Dichroism Detector

The only CD detector for UHPLC

The X-LC 3195CD Circular Dichroism Chiral Detector is an innovative CD (Circular Dichroism) detector for X-LC, using the same technology applied in conventional CD spectropolarimeters. The 3195CD enables highly sensitive and selective detections 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, and its specially designed flow cell minimizes peak broadening.





X-LC 3170/3175 UV/Vis Detectors

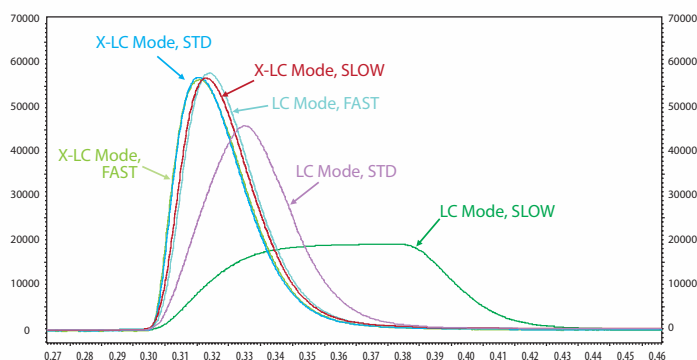
The highest data rate to achieve accurate results

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 3170UV) and from 190 to 600 nm with a single deuterium lamp (X-LC 3175UV). The excellent optical characteristics and program capabilities of the X-LC 3170/3175UV are combined in one compact package, making the X-LC 3170/3175UV 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 UV detectors are capable of data acquisitions at frequencies up to 100 data points per second.

Xtreme Sensitivity

An extremely low dispersion cell and a fast response enable detection of sharp and narrow peaks eluted in a few seconds with excellent accuracy and reproducibility.

Time Constant vs. Peak Shape



The X-LC 3170/3175UV detectors' extremely fast time constant capability provides precise peak shapes with minimized noise. Three modes, FAST, STD and SLOW are available to match peak width. The graph shows that very narrow peaks can be precisely recorded using the FAST mode, while peaks recorded using a slow time constant (as typical in conventional HPLC) show tailing and are right-shifted.



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

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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.



X-LC[®] Ultra High Pressure Liquid Chromatography



A Reputation for Quality



JASCO INCORPORATED (U.S.A.)

8649 Commerce Drive · Easton, Maryland 21601-9903, U.S.A
Tel: +1-800-333-5272 · Tel: +1-410-822-1220 · Fax: +1-410-822-7526 · Internet: www.jascoinc.com
Argentina, Brazil, Canada, Chile, Colombia, Costa Rica, Mexico, Paraguay, Peru, Puerto Rico, Uruguay

JASCO INTERNATIONAL CO., LTD.

4-21 · Sennin-cho 2-chome · Hachioji, Tokyo 193-0835, Japan
Tel: +81-426-66-1322 · Fax: +81-426-65-6512 · Internet: www.jascoint.co.jp/english/index.html
Australia, China, Hong Kong, India, Indonesia, Iran, Korea, Malaysia, New Zealand, Pakistan, Philippines, Russia, Singapore, South Africa, Taiwan, Thailand

JASCO EUROPE s.r.l. (ITALY)

Via Confalonieri 25 · 23894 Cremella (Lc), Italy
Tel: +39-039-956439 · Fax: +39-039-958642 · www.jasco-europe.com
JASCO Deutschland: www.jasco.de · JASCO UK: www.jasco.co.uk · JASCO France: www.jascofrance.fr
JASCO Benelux: www.jasco.nl · JASCO Spain: www.jasco-spain.com · JASCO Scandinavia: www.jascoscandinavia.se
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