VWR™
Supplier Partnerships for Customer Solutions

The new LaChrom Elite® Generation

vwr.com

A masterpiece of modern technology

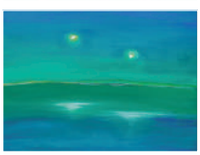
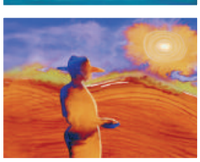
ELITE LaChrom

Precise and reliable
Hitachi technology
for your analysis

LaChrom Elite®

The new generation



A masterpiece of modern technology designed with virtuosity like a work of art

The new generation LaChrom Elite® system from VWR-Hitachi is a robust, versatile and well designed HPLC instrument line with excellent precision and sensitivity as well as minimum sample carry-over. Designed for ease of use, all operational and maintenance parts are accessible from the front.

Together with the comprehensive and FDA compliant chromatography data system EZChrom Elite® it offers a high degree of capability in data processing and chromatography system control (1).

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From micro to standard HPLC

LaChrom Elite® provides optimal performance in all flow rate ranges from 50 µl/min to 10 ml/min with 1, 2, 3, 4 and 4.6 mm i.d. columns as well as for high-speed chromatography using Chromolith® columns.

Fast chromatography

The flow rate range 1-10 ml/min is ideal for fast chromatography using 3 or 4.6 mm i.d. Chromolith® columns. Using such columns the speed of analysis can be increased by a factor of 3-10 compared with separations using conventional particulate columns, saving time and money in routine analysis. Their low back-pressure means less risk of leaks and much longer lifetime of system components, increasing up-time and reliability while reducing cost of analysis.

Superior column temperature control for reliable results

In addition to the proven L-2300 Oven, the new generation LaChrom Elite® system offers the high performance column thermostat L-2350 with excellent temperature homogeneity and an extended temperature range. It accommodates 4 columns up to 50 cm in length or 8 columns up to 25 cm. The increased temperature range to 85 °C adds more versatility for high temperature applications. It can also be equipped with one or two valves for column switching, sample preparation by pre-column switching and other applications.

Unique detector sensitivity

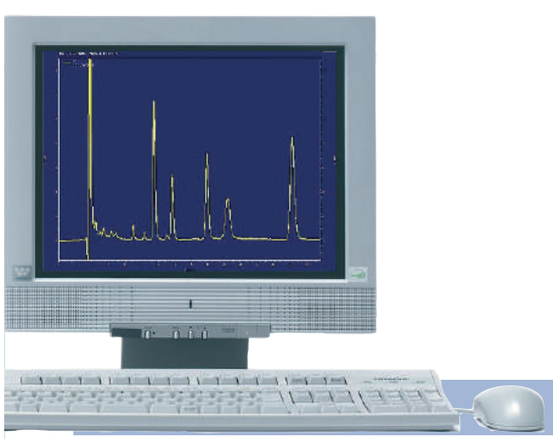
The new generation LaChrom Elite® system extends its detector family by two new instruments offering unique sensitivity. The new L-2455 Diode Array Detector with an advanced reference wavelength function has extremely high sensitivity specifications, comparable to those of a very good UV detector. It can also be used as a multi-wavelength detector. The new L-2485 Fluorescence Detector shows superb sensitivity, which allows analyses at the lowest trace levels.

LC-MS

The LaChrom Elite® system can be easily combined with the esquire™ and HCT™ series ion trap or micrOTOF® series MS systems of Bruker Daltonics, which offer exciting possibilities in mass detection, structural elucidation and substance identification in research and routine analysis.

Fast automated method development

LaChrom Elite® combined with the powerful ChromSword® Auto software performs completely automatic, unattended HPLC method development and optimisation within hours. The target is optimum resolution with minimum analysis time so even existing methods can be optimised and analysis time further reduced. In this way substantial time and cost savings can be achieved.



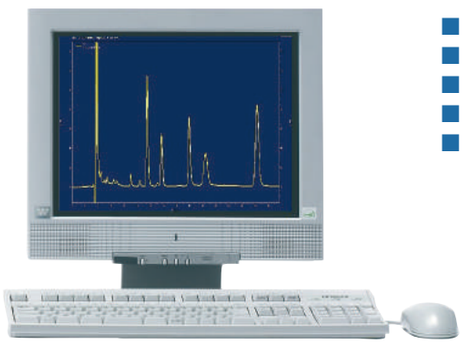
(1) Users opinion on the performance of VWR-Hitachi systems is documented in SDI Marketing Analyses and Perspectives:
High Performance Liquid Chromatography (September 2003).
«VWR/Hitachi has the highest overall vendor score and is well above the average score.»
VWR/Hitachi HPLC systems received the top scores for quality, price/performance ratio, innovation and application support.

LaChrom Elite®

System Configurations and Applications

Isocratic system with manual injection

This inexpensive HPLC system is used mainly for simple isocratic methods in routine analysis and for teaching.

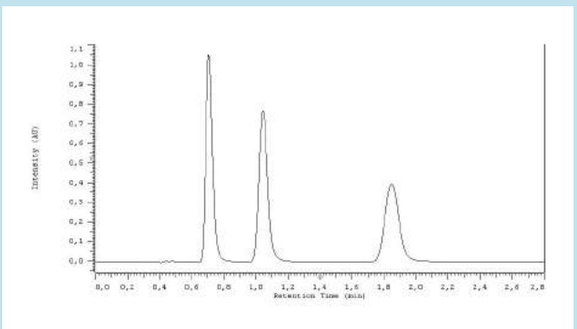


The system consists of:

- L-2130 Pump
- Manual injector
- One of the LaChrom Elite® detectors
- USB board
- PC with EZChrom Elite® chromatography data system

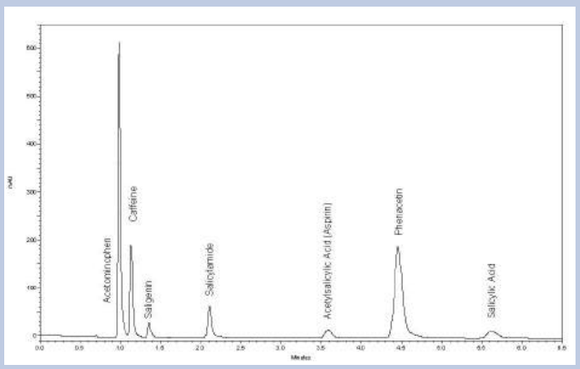
Fast isocratic separation of methyl, ethyl and propyl paraben

Column:	Chromolith® Speed Rod RP-18e 50 x 4.6 mm
Eluent:	methanol / water 60/40 (v/v)
Flow rate:	2 ml/min
Wavelength:	250 nm

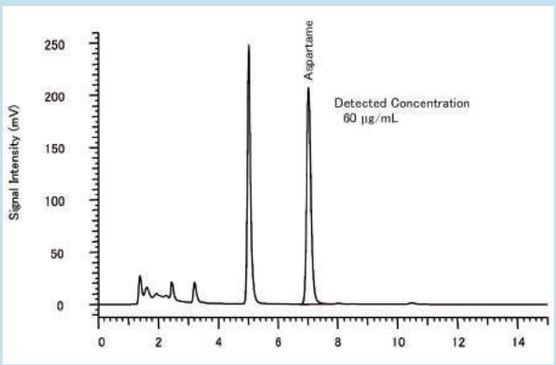


Fast isocratic HPLC analysis of an analgesic drug

Column:	Chromolith® Performance 100 x 4.6 mm
Eluent:	acetonitrile / 0.03 M phosphoric acid
Flow rate:	2 ml/min
Wavelength:	254 nm
Temperature:	30°C

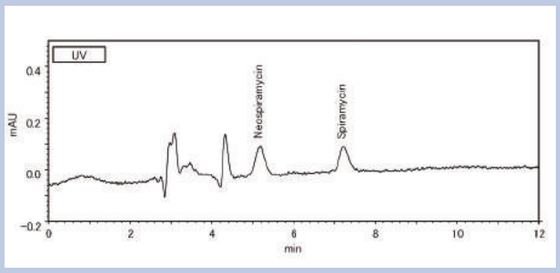


System configurations and applications



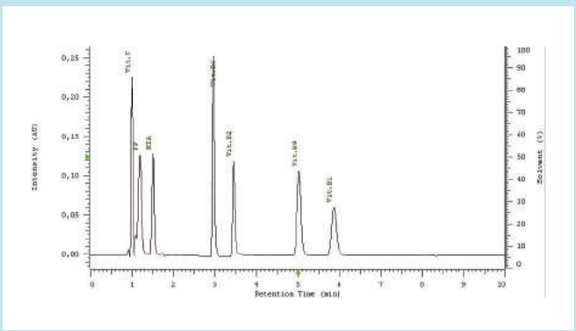
Isocratic analysis of aspartame in diet coke

Column:	Inertsil® ODS-3 150 x 2.1 mm
Eluent:	acetonitrile / buffer
Flow rate:	0.2 ml/min
Wavelength:	210 nm
Temperature:	40°C



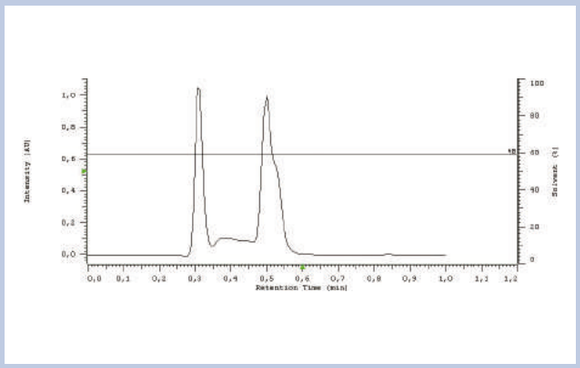
Isocratic analysis of spiramycin antibiotic in food

Column:	Inertsil® ODS-3 150 x 4.6 mm
Eluent:	acetonitrile / buffer
Flow rate:	0.5 ml/min
Wavelength:	235 nm
Temperature:	40°C



Isocratic analysis of 7 water soluble vitamins

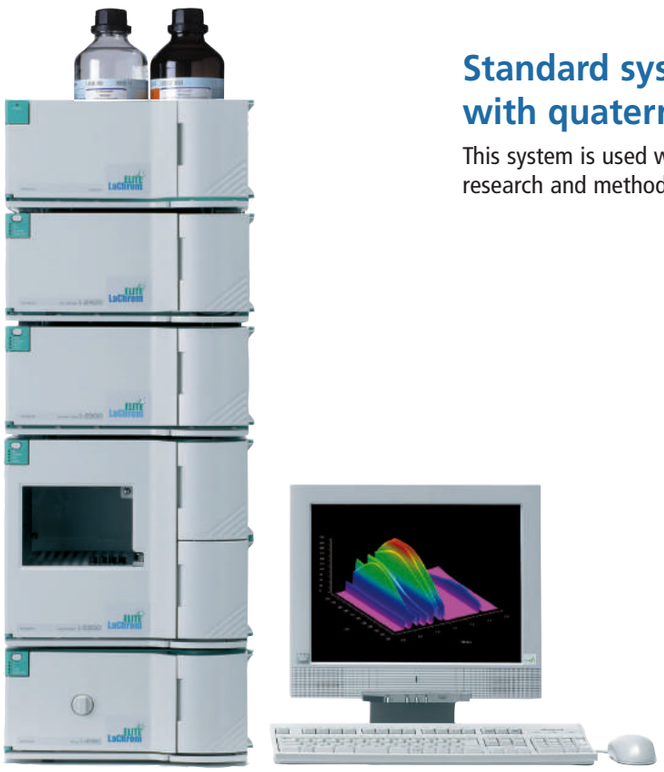
Column:	Chromolith® Performance RP-18e, 100 x 4.6 mm
Eluent:	acetonitrile / buffer
Flow rate:	5 ml/min
Wavelength:	280 nm
Temperature:	room



Derivates of nicotine acids

Column:	Chromolith® SpeedRod RP-18e, 50 x 4.6
Eluent:	acetonitrile / buffer
Flow rate:	3 ml/min

LaChrom Elite®



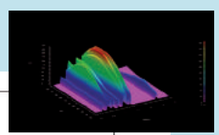
Standard system with quaternary low-pressure gradient

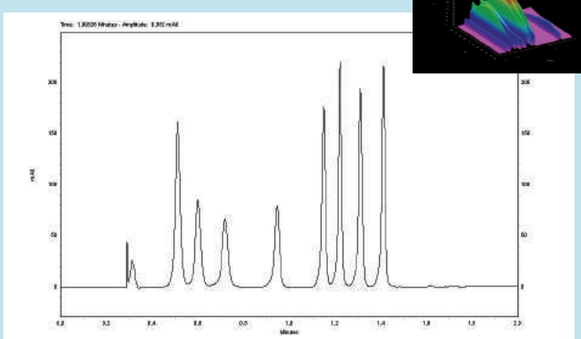
This system is used widely in routine analysis and quality control as well as in research and method development.

The system consists of:

- L-2130 Pump equipped with low-pressure gradient accessory and in-line degasser
- L-2200 Autosampler (with or without sample cooling)
- L-2300 or L-2350 Column Oven
- One of the LaChrom Elite® detectors or AID for other detectors
- Organiser
- USB board
- PC with EZChrom Elite® chromatography data system

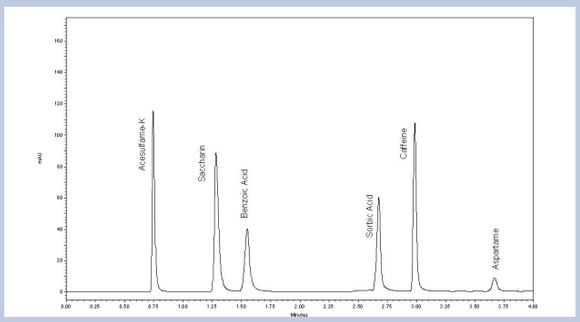
8 Sulfonamides: 3 D plot of DAD data





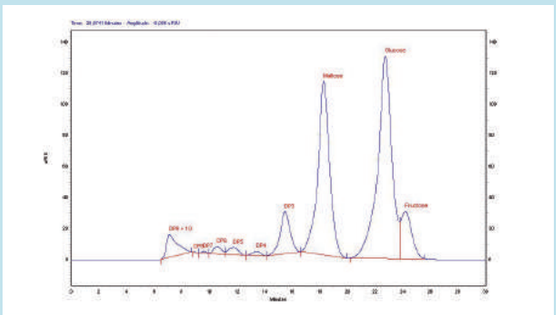
Fast HPLC separation of 8 sulfonamides after optimisation with ChromSword® Auto

Column:	Chromolith® Performance RP-18e 100 x 3 mm
Eluent:	water / acetonitrile (+ 0.1%TFA) gradient
Flow rate:	2 ml/min
Detector:	L-2455 DAD



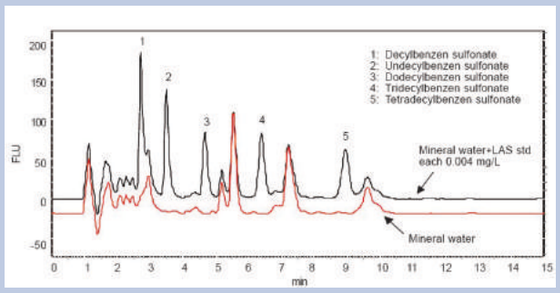
Fast HPLC analysis of sweeteners in diet drink

Column:	Chromolith® Performance RP-18e 100 x 4.6 mm
Eluent:	buffer / acetonitrile gradient
Flow rate:	4 ml/min
Wavelength:	220 nm
Temperature:	30 °C



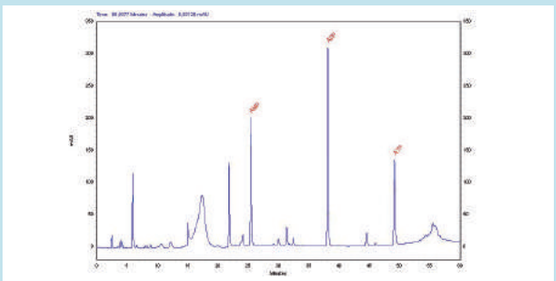
Analysis of sugars in corn syrup with RI detection

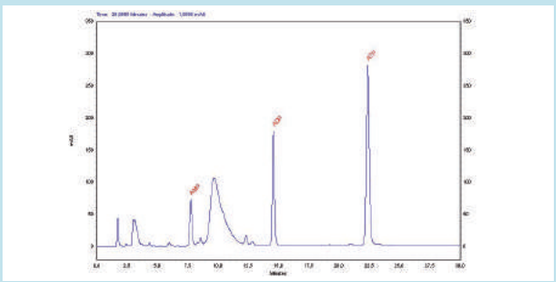
Column:	Varian MetaCarb™ 300 x 7.8 mm
Eluent:	water
Flow Rate:	0.4 ml/min
Detector:	L-2490 RI Detector
Temperature:	85°C



Analysis of anionic surfactants in mineral water with fluorescence detection

Column:	InertSil ODS-3 (5 µm) 150 x 4.6 mm
Eluent:	acetonitrile/ 0.1 M $NaClO_4$, isocratic
Flow Rate:	1 ml/min
Detector:	L-2485 Fluorescence Detector



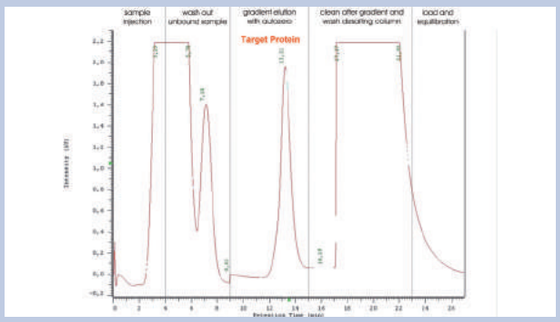


Analysis of AMP, ADP and ATP in aquatic invertebrates for monitoring surface water quality

Column:	Synergi™ 4 µ Hydro-RP 80A, 250 x 4.6 mm
Eluent:	acetonitrile/ buffer gradient
Flow Rate:	1 ml/min
Detection:	L-2455 DAD, 260 nm
Temperature:	40°C

above : original method,

below : method after optimisation with ChromSword® Auto, analysis time was reduced from 60 min to 30 min



LaChrom® and LaChrom Elite® systems in fermentation control: on-line monitoring of the target protein expression
(Courtesy of Prof. R. Luttmann, Hamburg University of Applied Sciences).

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Standard system with binary high-pressure gradient

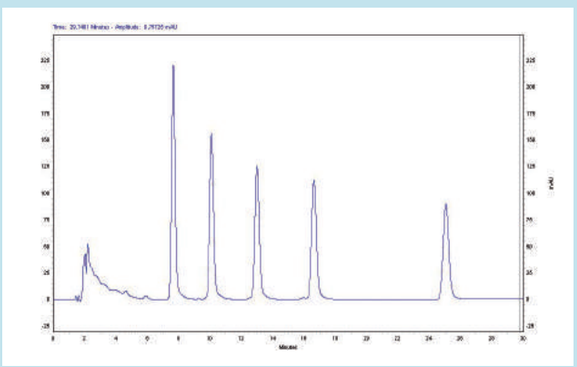
This system can be used in the same application fields as the low-pressure gradient system where binary gradients are required. It is particularly recommended for semi-micro and micro applications with 1 mm i.d. columns and low flow rates.

The HPLC system consists of:

- 2x L-2130 Pump + high-pressure gradient accessory (+ semi-micro upgrade kit for micro applications)
- L-2200 Autosampler (with or without sample cooling)
- L-2300 or L-2350 Column Oven
- One of the LaChrom Elite® detectors or another detector connected via the Analog Input Device (AID)
- Organiser
- USB board
- PC with EZChrom Elite® chromatography data system

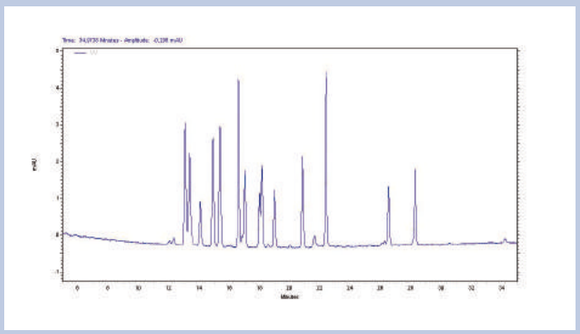
High performance micro HPLC using a 1 mm i.d. column:
Analysis of homologous precursors of liquid crystals
(courtesy of Merck KGaA)

Column:	Purospher® STAR RP-18e 3 µm, 150 x 1 mm
Eluent:	water/acetonitrile
Flow rate:	50 µl/min
Injection volume:	0.5 µl
Wavelength:	254 nm



Semi-micro HPLC using a 2 mm i.d. column:
Analysis of a pharmaceutical sample

Column:	Superspher 100 RP-18e 4 µm, 125 x 2 mm
Eluent:	water/acetonitrile (+ formic acid) gradient
Flow rate:	50 µl/min
Injection volume:	5 µl
Wavelength:	310 nm



HPLC method development system

LaChrom Elite® combined with the powerful ChromSword® Auto software performs completely automatic HPLC method development and optimisation.
Two system configurations for automated method development are recommended:

Standard method development system

Using this system rapid and fine optimisation can be performed with up to 3 columns of different selectivity
and up to 3 organic modifiers using the channels of the low-pressure gradient pump.

The HPLC system consists of:

- L-2130 Pump equipped with low-pressure gradient accessory and in-line degasser
- L-2200 Autosampler (with or without sample cooling)
- L-2300 or L-2350 Column Oven (optionally equipped with column switching valve)
- One of the LaChrom Elite® detectors (UV, UV-Vis, DAD, Fl)
- Organiser
- USB board
- PC with EZChrom Elite® chromatography data system and
- ChromSword® Auto software

Professional method development system

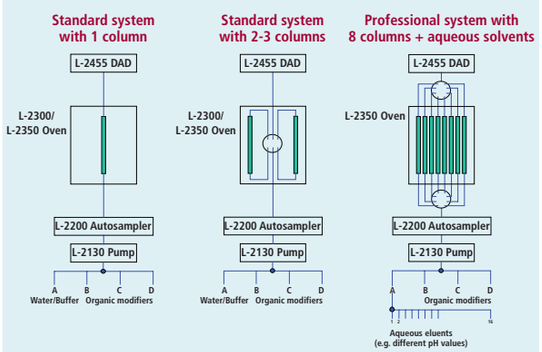
For professional HPLC method development the ChromSword® Auto rapid screening and fine optimisation modes can be applied together with column and solvent switching procedures to evaluate a variety of column/solvent combinations automatically.
The rapid optimisation mode is used for fast screening of different columns with different selectivities and a variety of solvents (e.g. with different pH values), to quickly find a suitable separation system. The best candidate is then used for fine optimisation.

In addition to the standard method development system the HPLC system consists of:

- External solvent switching valve with up to 16 channels
- External column switching valve for up to 8 columns

Automatic Method Development with ChromSword® Auto

Suitable HPLC system configurations



LaChrom Elite®

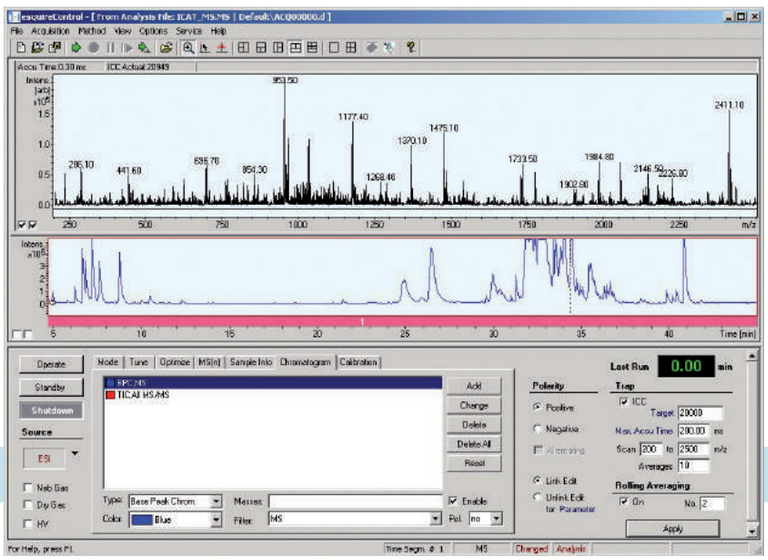
LC-MS system

For LC-MS analysis the LaChrom Elite® system can be easily combined with the renowned esquire™ and HCT™ series ion trap or micrOTOF™ series MS systems from Bruker Daltonics offering exciting possibilities in mass detection, structural elucidation and substance identification in research and routine analysis. In combination with the Bruker MS systems the LaChrom Elite® system is controlled by the powerful Bruker Daltonics Compass®/HyStar® LC-MS software.

Bruker Daltonics LC-MS Systems for combination with LaChrom Elite®:

- esquire™ 6000
- HCT™
- HCTultra™
- HCTultra PTM Discovery System™
- micrOTOF™
- micrOTOF-Q™

Screen of esquire™ control software with mass spectrum, chromatogram and MS system control panel

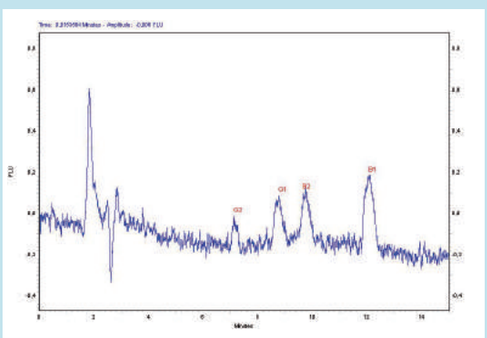


Systems with post-column derivatisation

For analytes which are difficult to detect in their native form, post-column derivatisation reactions can be applied to convert them into detectable compounds. A wide range of post-column derivatisation reactions is available.

System for detection of aflatoxins using a Coring cell and fluorescence detector

The Coring cell electrochemically generates bromine from the bromide dissolved in the eluent. The bromine converts the aflatoxins into fluorescent compounds.
The system consists of a standard LaChrom Elite® low-pressure gradient system with L-2300 Column Oven, Coring cell and L-2485 Fluorescence Detector.

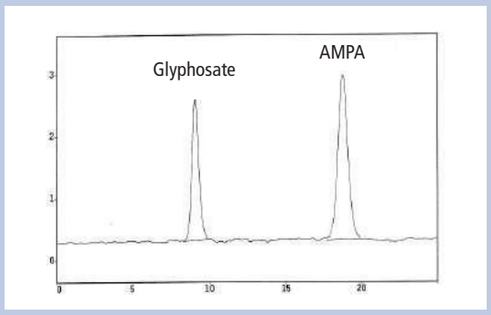


Analysis of aflatoxins with Coring cell and fluorescence detector:

Detection limit:	10 pg/ml for B1 and G1 and 2.5 pg/ml for B2 and G2
Column:	Purospher® Star RP-18e (5 µm) 150 x 4.6
Eluent:	acetonitrile / methanol / water +KBr+HNO_3
Flow Rate:	1 ml/min
Detection:	L-2485 Fluorescence Detector
Temperature:	40°C

System with additional reagent pump and reaction unit

For a large variety of analytical methods with post-column-reaction detection the LaChrom Elite® system can be equipped with an additional reagent pump, reaction coil and oven. As a professional solution a post-column reaction unit as e.g. the Pinnacle® system can be used. This system can be used for following applications:



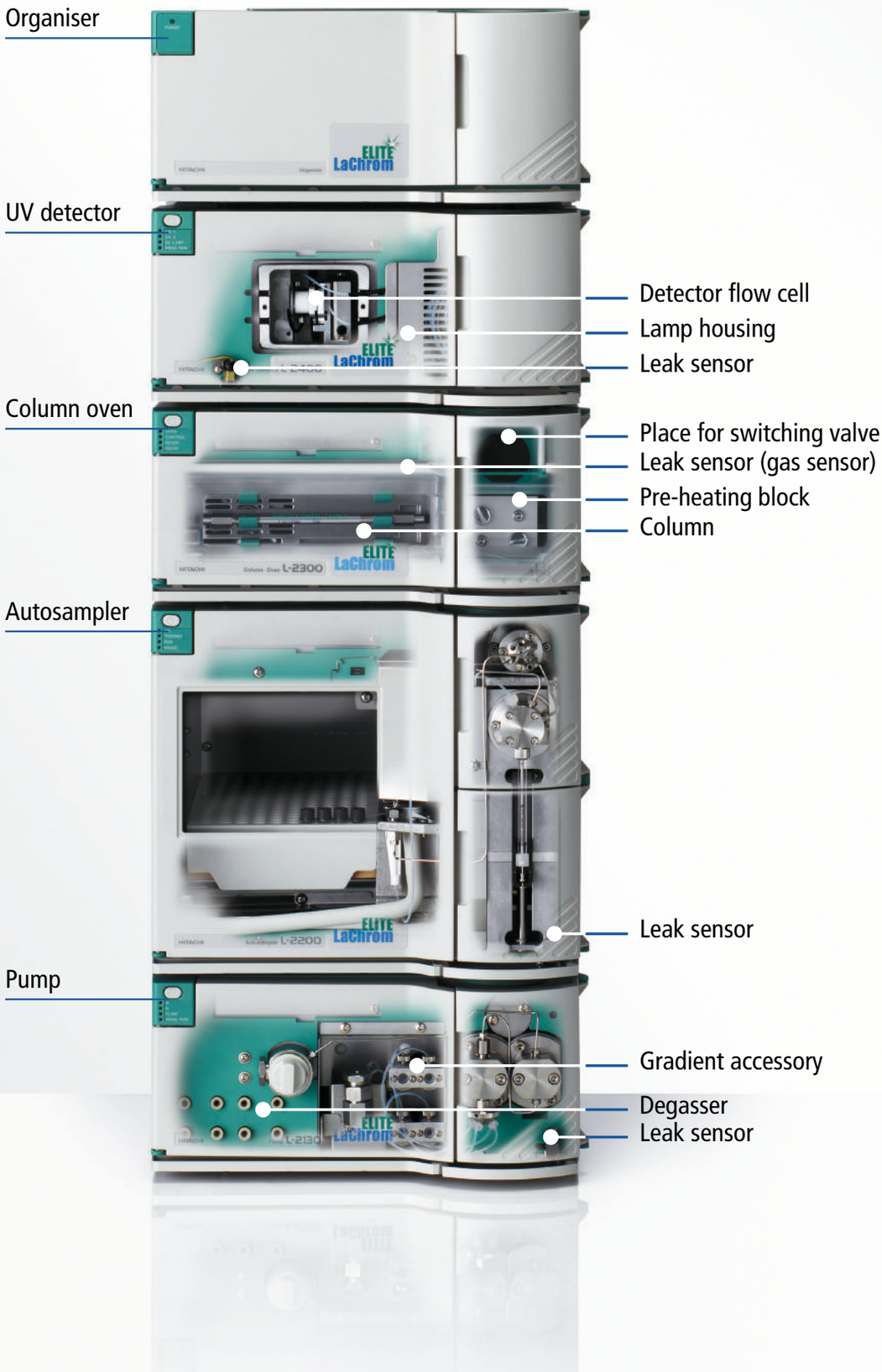
Glyphosate analysis using the LaChrom Elite® system combined with the Pinnacle® system.

Applications with Post-Column Derivatisation using the Pinnacle System

- Carbamate Pesticides
- Glyphosate Herbicide
- Paraquat/Diquat
- Mycotoxins as e.g. Ochratoxin A
- Aminoglycoside Antibiotics
- Polyether Antibiotics
- Sulfonamides
- Streptomycin
- Amino Acids
- Biogenic Amines
- Bromate
- Formaldehyde
- Guanidines
- Hexosamines
- Paralytic Shellfish Toxins
- Polyphosphates / Phosphonates
- Chromium VI
- Vitamins B1, B6,
- and other applications

LaChrom Elite®

System characteristics



Small footprint, modern design

The LaChrom Elite® system has a compact, uniform, modular design.
All accessory parts such as the degasser, gradient accessories, autosampler cooling unit and switching valves are mounted inside the modules, ensuring that everything is incorporated within its small footprint.

Front access for easy operation and maintenance

Whether you want to change the column in the column oven, exchange pump seals or remove the detector lamp for maintenance, all parts are easily accessible from the front of the system. In addition, the complete eluent flow path from the pump to the detector is arranged at the front of the system for easy observation, modification and maintenance.

Safety and reliability

To ensure the safety of all laboratory personnel and the consistency of results, all LaChrom Elite® modules are equipped with leak sensors and error handling procedures. Solvent bottles are stored securely in the LaChrom Elite® Organiser which also contains the central low voltage power supply for the system, keeping mains cables to a minimum.

Full system control by EZChrom Elite®

Instrument keypads are not necessary since the LaChrom Elite® system and modules are fully controlled by the EZChrom Elite® data handling software (but can be fitted for stand-alone operation). All module parameters are entered via the instrument setup screen. The system conditions are displayed in the status window.

System communication and digital data transfer

The high performance E-Line communication system together with rapid data transfer via a USB interface ensure reliable automation.

GXP functions

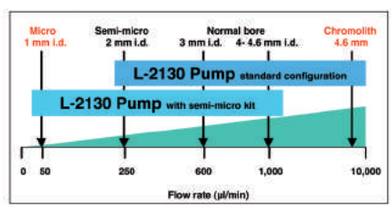
All LaChrom Elite® modules contain a maintenance log, which records the use of replacement parts. They also have in-built diagnostics, which allow the operational conditions of the system to be monitored. All photometric detectors are equipped with an additional mercury lamp for automated wavelength calibration. When used in conjunction with the EZChrom Elite® software, the complete range of GXP-related functions and 21CFR Part 11 compliance is achieved e.g. detector lamp energy and wavelength accuracy checks, audit trails, automatic documentation of the instrument parameters etc.

LaChrom Elite®

Modules to build a system

The L-2130 Pump for precise HPLC solvent delivery

Innovative electronic control technologies developed by Hitachi enable outstanding accuracy and precision of solvent delivery resulting in extremely stable analyte retention times. The L-2130 Pump in its standard configuration is applicable to semi-micro and normal bore up to 4.6 mm i.d. Chromolith® column applications covering a flow rate range from 1 ml/min up to 10 ml/min.
By upgrading with a semi-micro kit the system is perfectly suited for use with micro up to normal bore HPLC columns covering a flow range from 1 µl/min up to 2.5 ml/min.
The pump can be used either in isocratic mode or, after fitting with the appropriate optional gradient accessory, in low-pressure or high-pressure gradient mode.
An optional solvent degasser can be installed in the pump housing.
In combination with the L-2200 Autosampler, the automatic pump plunger wash function becomes available.
The L-2130 Pump can be integrated in the LaChrom Elite® system and controlled with EZChrom Elite® software or used as a stand-alone module with the optional keypad.



Specifications

	Pump L-2130	With Semi-Micro Kit
Flow rate range	0.001 - 10 ml/min	0.001 - 2.5 ml/min
Max. pressure	400 bar (- 5 ml/min) 200 bar (-10 ml/min)	400 bar
Flow precision	0.075 % RSD or 0.02 min SD (at 1 ml/min)	0.075 % RSD or 0.02 min SD (at 0.2 ml/min)
Low-pressure Gradient		
Recommended flow rate range	0.2 – 8 ml/min	0.1 – 1.0 ml/min
Number of solvents	4	4
Composition accuracy	± 1%	± 1%
Composition precision	≤ 0.2 %RSD (at 1 ml/min)	≤ 0.2 %RSD (at 0.2 ml/min)
High-pressure Gradient		
Recommended flow rate range	0.2 – 8 ml/min	0.05 – 2 ml/min
Number of solvents	2 or 8	2 or 8
Composition accuracy	± 1%	± 1%
Composition precision	≤ 0.15 %RSD (at 1 ml/min)	≤ 0.15 %RSD (at 0.2 ml/min)
Safety	Leak sensor, error handling	
FDA/GXP functions	Maintenance logbook: - Solvent delivery since last seal exchange - No. of abnormal pressure pulsations during analysis, With EZChrom Elite® software: - Pressure profile - Documentation of instrument serial no. and configuration - Comprehensive audit trails and logbooks	
Power requirements	24 V DC, 50 W, either from organiser or using a separate optional power supply	
Dimensions	340 (W) x 400 (D) x 150 (H) mm	

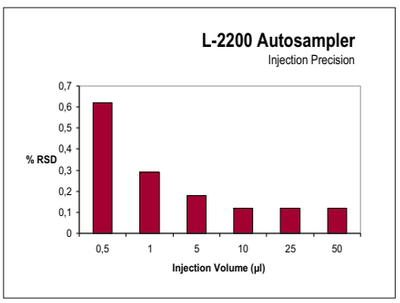
Accessories:
- Low-pressure gradient accessory
- High-pressure gradient accessory
- Degasser
- Different mixers
- Pump seal washing kit for semi-micro kit
- Semi-micro upgrade kit
- UI pad kit
- Power supply: 50 W AC Adaptor
- USB Interface board + cable

The L-2200 Autosampler for perfect HPLC sample management

The outstanding precision, carry-over and linearity specifications of the L-2200 substantially increase the quality and significance of analytical results. The amazing versatility of the L-2200 Autosampler allows the instrument to be easily adapted to specific HPLC applications.
For different injection volumes (0.1 µl up to 4.5 ml), sample cooling, alternative racks, vials or septa requirements, or adaptation for particular sample or eluent properties, a set of parameters and accessories is available for proper optimisation. A large sample capacity combined with a small injection time allows fast chromatography applications in automated routine analysis. The L-2200 Autosampler can be integrated in the LaChrom Elite® system and controlled with EZChrom Elite® software or used as a stand-alone module with the optional keypad.

Specifications

Principle	Direct injection method
Injection precision	< 0.3 % RSD, typical: 0.1% RSD
Carry-over	< 0.01%
Linearity	Correlation coefficient $R^2 \geq 0.999$
Sample capacity	200 vials (1.5 ml) or 3 x 384 well micro titre plates
Injection volume	0.1 µl – 90 µl injection with standard 100 µl syringe, up to 4.5 ml with optional syringe kits
Special functions	- PASS: Pump Autosampler Synchronisation - Pump plunger wash function
Safety	Leak sensor, vial detection function
FDA/GXP functions	Maintenance logbook: - seal and valve usage, - seal exchange dates With EZChrom Elite® software - Documentation of instrument serial no. and configuration - Comprehensive audit trails and logbooks
Power requirements	24 V DC, 50 W, either from organiser or using a separate optional power supply
Dimensions	340 (W) x 400 (D) x 300 (H) mm



Accessories:
- L-2200 Autosampler with sample cooling unit
- Different sample racks e.g. for 3 micro titre plates etc.
- Different injection syringe kits
- System adaptation kits for micro- and high flow rate applications
- UI pad kit
- Power supply: 50 W AC Adaptor
- USB Interface board + cable

LaChrom Elite®

LaChrom Elite® Column Ovens for better analytical results

Improved reproducibility and peak shape can be achieved with the L-2300 and L-2350 Column Ovens. The combined Peltier thermostatic block / fan principle provides superior temperature stability and uniformity throughout the column compartment resulting in maximum retention time reproducibility while ensuring rapid temperature equilibration. An eluent pre-heating section allows the length of pre-heated capillary to be adapted according to the flow rate used. This minimises temperature gradients inside the column and improves the peak shapes obtained. For Chromolith® column applications at elevated flow rates this is especially important. An optional column switching valve can be mounted in the oven for automated column switching procedures. During analysis, both oven and ambient temperature profiles can be monitored and documented. System communication ensures that sample injections are made only when the set oven temperature has been reached thereby eliminating inconsistent results caused by rising temperatures. Both ovens can be integrated in the LaChrom Elite® system and controlled with EZChrom Elite® software or used as stand-alone modules with the optional keypad.

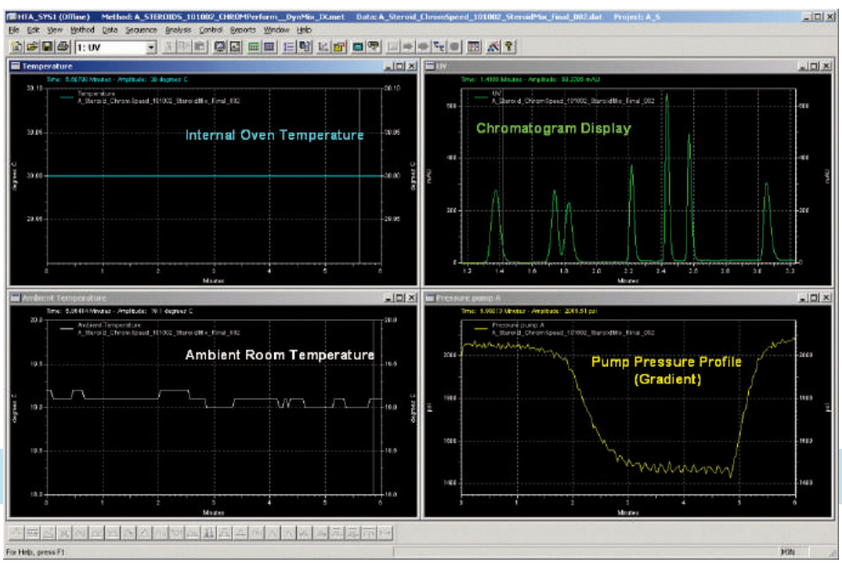
L-2300 Column Oven

Up to three columns can be easily mounted and accessed from the front. The transparent door of the thermostatted column compartment allows columns and flow path to be observed without having to interrupt temperature control.

L-2350 Column Oven

This oven accommodates 4 columns up to 50 cm in length or 8 columns of up to 23 cm. For sample preparation procedures or multi-dimensional chromatography it can be equipped with a second switching valve. Another special feature of the L-2350 Column Oven is the facility to program temperature gradients.

	L-2300	L-2350
Temperature range	Ambient minus 15°C up to 65°C	Ambient minus 15°C up to 85°C
Capacity	3 columns ≤ 250 mm	4 columns ≤ 500 mm or 8 columns ≤ 250 mm
Temperature accuracy	± 1°C	
Temperature stability	± 0.1°C	
Safety	- Adjustable leak sensor (gas sensor) - Overheat protection - Door sensor - Error handling	
FDA/GXP functions	- Halt sample injection until temperature equilibration is finished - Maintenance logbook for optional column selection valve (seal exchange date, no. of switching cycles) With EZChrom Elite® software: - Oven temperature profile during analysis - Ambient temperature profile during analysis - Documentation of instrument serial no. and configuration - Comprehensive audit trails and logbooks	
Power requirements	100-240 V (50 or 60 Hz), 200 Watt	100-240 V (50 or 60 Hz), 300 Watt
Dimensions	340 (W) x 400 (D) x 150 (H) mm	210 (W) x 360 (D) x 615 (H) mm

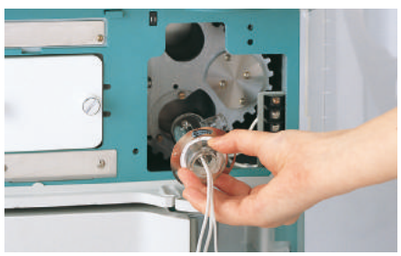


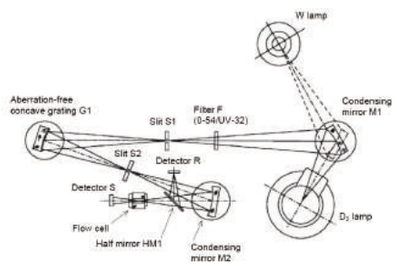
Accessories:
- UI pad kit
- 3-column selection valve
- 6-port 2-position switching valve
- 10-port 2-position switching valve
- USB Interface board + cable

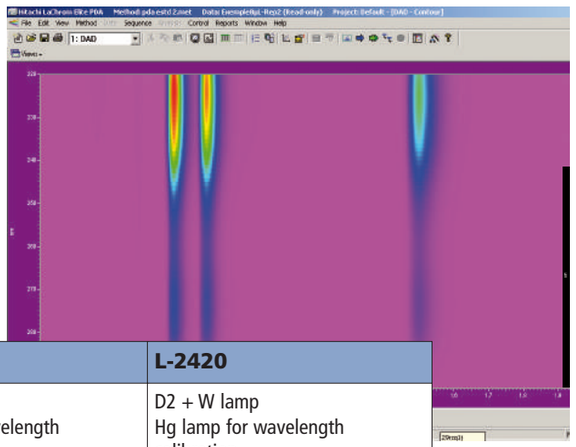
LaChrom Elite®

The L-2400 UV and L-2420 UV-Vis Detectors with outstanding sensitivity

Both detectors are designed for maximum sensitivity even at the fastest response times by utilising the double beam photometric detection principle combined with a grating monochromator. To improve light intensity and detection sensitivity in the visible range, the L-2420 UV-Visible Detector contains a tungsten lamp as well as a deuterium lamp. Detection wavelength is time-programmable for optimum detection sensitivity at the absorbance maximum of each analyte. For automatic wavelength calibration the detectors are equipped with a mercury lamp. Using the different spectral lines of the deuterium and mercury lamps, wavelength calibration can be performed over the whole spectral range of the detectors. In contrast to calibration filters (e.g. Holmium oxide filters), which have to be recalibrated periodically, the spectral lines of the lamps act as a stable primary reference standard, with no need for recalibration. All lamps and the flow cell are accessible from the front for easy maintenance. The detectors can be integrated in the LaChrom Elite® system and controlled with EZChrom Elite® software or used as stand-alone modules with the optional keypad.





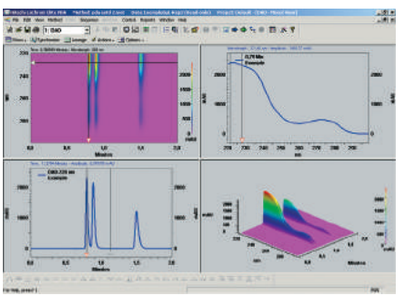


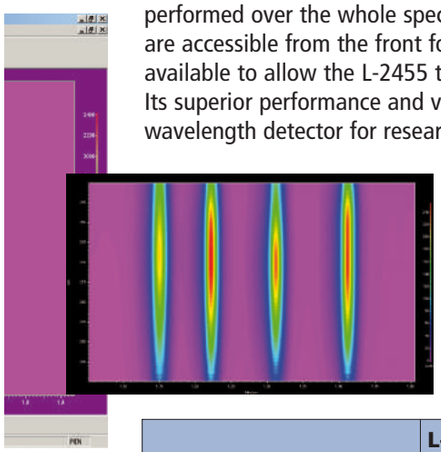
	L-2400	L-2420
Light source	D2 lamp Hg lamp for wavelength calibration	D2 + W lamp Hg lamp for wavelength calibration
Wavelength range	190 - 600 nm	190 - 900 nm
Noise	≤ ± 0.3 x 10^{-5} AU at 250 nm	≤ ± 0.3 x 10^{-5} AU at 250 nm and 600 nm
Drift	≤ ± 0.5 x 10^{-4} AU/h typical ≤ ± 0.4 x 10^{-4} AU/h at 250 nm	≤ ± 0.5 x 10^{-4} AU/h typical ≤ ± 0.4 x 10^{-4} AU/h at 250 nm and 600 nm
Slit width	6 nm	
Response time constant	0.05, 0.1, 0.5, 1, 2, 4, 8 s	
Standard cell	10 mm, 13 µl	
FDA/GXP functions	- Automatic wavelength calibration with different D2 and Hg lines - Maintenance logbook: D2, W and Hg lamp exchange date, lamp energy, total lamp-on time, no. of lamp ignitions With EZChrom Elite® software: - Documentation of instrument serial no. and configuration - Comprehensive audit trails and logbooks	
Safety	Leak sensor, error handling	
Power requirements	24 V DC, 100 W	
Dimensions	340 (W) x 400 (D) x 150 (H) mm	

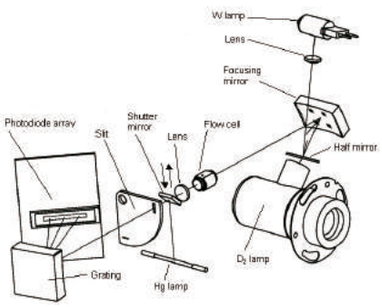
Accessories:
- USB Interface board + cable
- Analog signal output
- Different flow cells
- Cuvette holder unit
- UI pad kit
- Power supply: 100 W AC Adaptor

The L-2455 Diode Array Detector/Multi-Wavelength Detector with unique 3D sensitivity

The Diode Array Detector L-2455 sets a new performance standard in 3-D chromatography detection. Equipped with an advanced reference wavelength function it achieves extremely high sensitivity specifications, which are comparable to those of a very good UV detector. In addition, the exceptionally low baseline drift makes signal detection insensitive to variations in ambient conditions and leads to optimum peak integration. Designed as a single beam photometric detector with grating monochromator, the L-2455 is equipped with a 1024 bit diode array element to supply highest spectral resolution over the complete wavelength range. The detector contains both a deuterium and a tungsten lamp to ensure maximum sensitivity even in the visible range. Selectable optical slit width and electronic diode bunching allows spectral resolution and sensitivity to be optimised as required for each specific analysis. The resulting output is handled using the EZChrom Elite® chromatography data system which offers a wide range of 3-dimensional chromatograms and spectra processing functions e.g. peak identification by spectra and peak purity assessment. Equipped as standard with a mercury lamp, automatic wavelength calibration can be performed over the whole spectral range of the detector. All lamps and the flow cell are accessible from the front for easy maintenance. An alternative software licence is available to allow the L-2455 to be operated as a multi-wavelength detector as well. Its superior performance and versatility make the L-2455 a perfect diode array or multi wavelength detector for research and routine analysis.







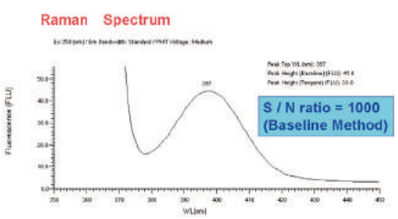
	L-2455 DAD / Multi-Wavelength Detector
Light source	D2 + W lamp Hg lamp for wavelength calibration
Wavelength range	190 - 900 nm
Noise	≤ ± 0.25 x 10^{-5} AU at 250 nm and 600 nm
Drift	≤ ± 0.25 x 10^{-3} AU/h at 250 nm and 600 nm
Slit width	1 nm, 4 nm
Response time constant	0.05, 0.1, 0.5, 1.0, 2.0 s
Standard cell	10 mm, 13 µl
FDA/GXP functions	- Automatic wavelength calibration with different D2 and Hg lines - Maintenance logbook: D2, W and Hg lamp exchange date, lamp energy, total lamp-on time, no. of lamp ignitions With EZChrom Elite® software: - Documentation of instrument serial no. and configuration - Comprehensive audit trails and logbooks
Safety	Leak sensor, error handling
Power requirements	24 V DC, 100 W
Dimensions	340 (W) x 400 (D) x 150 (H) mm

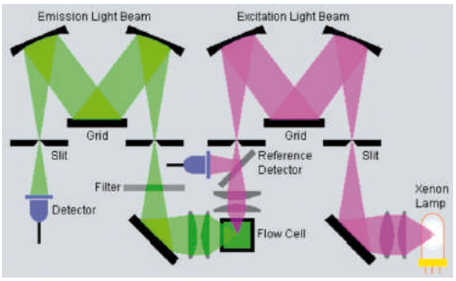
Accessories:
- USB Interface board + cable
- Analog signal output
- Different flow cells
- Cuvette holder unit
- Power supply: 100 W AC Adaptor

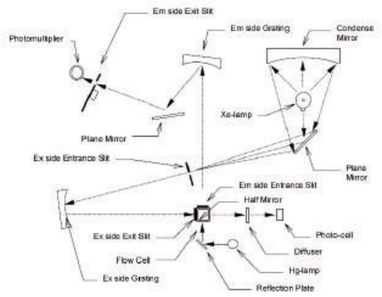
LaChrom Elite®

The L-2485 Fluorescence Detector
Unique sensitivity for trace level detection

The innovative optical system of the L-2485 significantly reduces loss of light and provides superior signal to noise level even at the fastest response times. Additional features and functions, e.g. the variable slit width, allow detection sensitivity to be further optimised. For compound identification or optimisation of the detection wavelengths, a spectrum scan function enables acquisition and storage of excitation and emission spectra. The L-2485 is equipped with a mercury lamp for automatic wavelength check and calibration. For convenient maintenance all exchangeable parts, such as lamps and flow cell, are easily accessible from the front of the instruments. The L-2485 Fluorescence Detector can be integrated in the LaChrom Elite® system and controlled with EZChrom Elite® software or as a stand-alone module with the optional keypad. Its versatility and utmost sensitivity make the L-2485 the perfect detector for fluorescent analytes both in research and routine analysis.



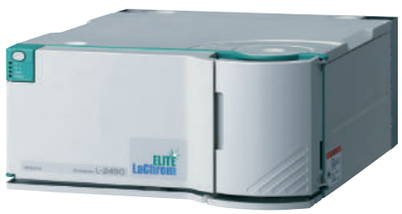




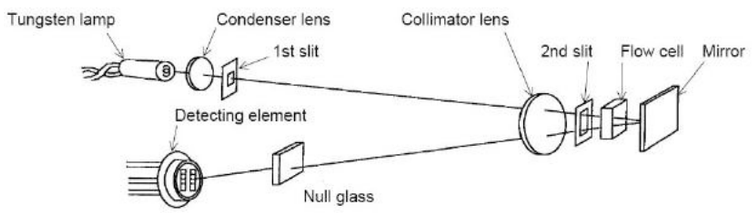
	L-2485 Fluorescence Detector
Light Source	Long life xenon lamp (150 W), mercury lamp for wavelength check and calibration
Wavelength range	Excitation: 200 – 850 nm, Emission: 250 – 900 nm (at > 731 nm the photomultiplier must be changed)
Spectral bandwidth	Excitation: 15 nm, Emission: 15 nm, 30 nm selectable
Sensitivity	S/N for Raman peak of water: ≤ 900 (baseline method, emission bandwidth 30 nm)
Response time constant	0.05, 0.1, 0.5, 1, 2, 4, 8 s
Time program	Programmable items: - Excitation wavelength - Emission wavelength - Baseline processing (auto zero, hold) - Photo multiplier gain
Standard flow cell	12 µl
FDA/GXP functions	- Automatic wavelength accuracy check and calibration with different mercury lines - Maintenance logbook: xenon, mercury lamp exchange date, lamp energy, total lamp-on time, number of lamp ignitions With EZChrom Elite® software: - Documentation of instrument serial number - Comprehensive audit trails and logbooks
Safety	Leak sensor, error handling
Power requirements	100-240 V (50 or 60 Hz), 260 Watt
Dimensions	340 (W) x 400 (D) x 300 (H) mm

Accessories:
- USB interface board
- Analog signal output
- Photo multiplier tube for > 731 nm
- UI pad kit

The L-2490 Refractive Index Detector
High sensitivity and rapid stabilisation



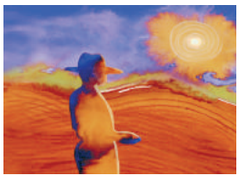
The LaChrom Elite® refractive index detector L-2490 is the ideal instrument for analytes lacking chromophores. The innovative design of the optical cell and effective temperature control result in an extremely stable baseline. In addition, a wide range of cell temperatures can be selected to achieve a close match to the column temperature or the ambient temperature. This leads to an enhanced signal to noise ratio, e.g. for carbohydrate analysis. Due to cell pre-heating and optimised temperature control, the equilibration time has been reduced to only 30 minutes, which maximises laboratory productivity. The L-2490 RI Detector can be integrated in the LaChrom Elite® system and controlled with EZChrom Elite® software or used as a stand-alone module.



	L-2490 Refractive Index Detector
Light Source	Tungsten lamp
Refractive Index range	1.0 to 1.75
Linear range	≥ 600 µRIU
Noise	≤ 2.5 nRIU (water in cell)
Drift	≤ 0.2 µRIU/h or less (water 1ml/min)
Flow rate range	0.2 to 3.0 ml/min
Maximum flow rate	10 ml/min (water)
Temperature control range	OFF, 30° to 50°C
Response time constant	0.1, 0.25, 0.5,1, 1.5, 2, 3, 6 s
Flow cell	8 µl, max. pressure 0.49 bar
Safety	Overheat protection, leak sensor
Power requirements	100-240 V (50 or 60 Hz), 150 W
Dimensions	340 (W) x (400 (D) x 150 (H) mm

The Organiser
Safe solvent location and central power supply

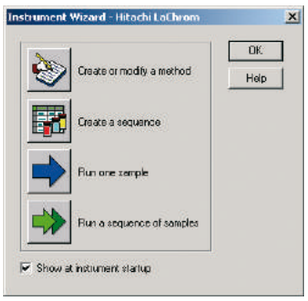
With the LaChrom Elite® organiser the solvent bottles are stored safely in a leak-proof metal container. Tube ducts integrated in the LaChrom Elite® system lead the solvent reservoir tubing to the solvent degasser mounted in the pump module. The organiser also contains the central power supply for the system, providing the 24 V power for the pumps, autosampler and detectors. This reduces the number of high voltage power cables required and therefore increases both the safety and reliability of the system.

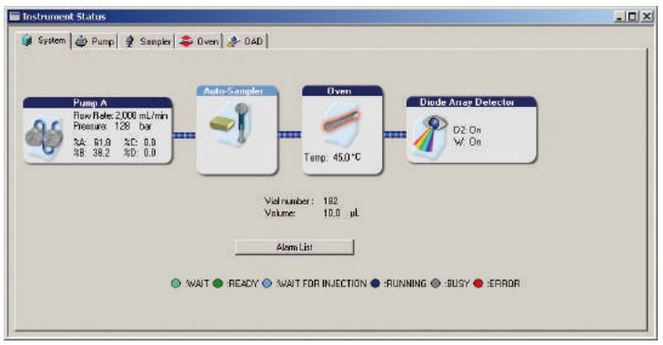


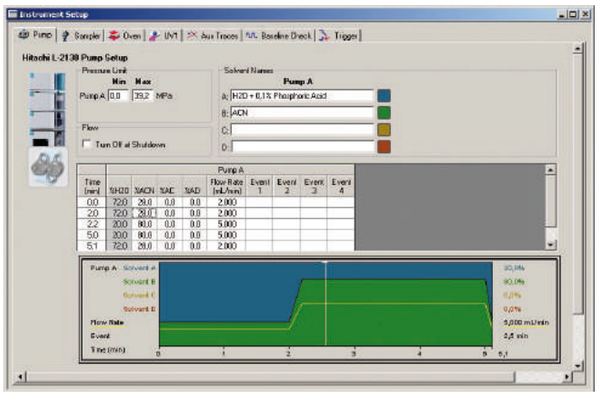
EZChrom Elite® Software

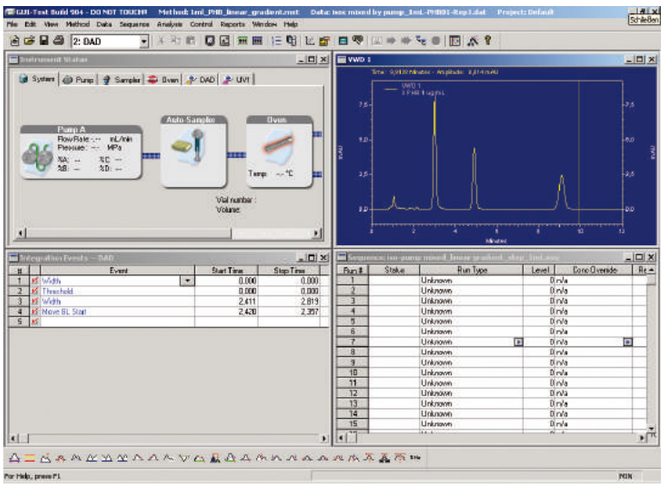
A uniform and scalable Software Solution

- Ease-of-use
- Instrument control
- Data processing
- Regulatory compliance
- Network scalability



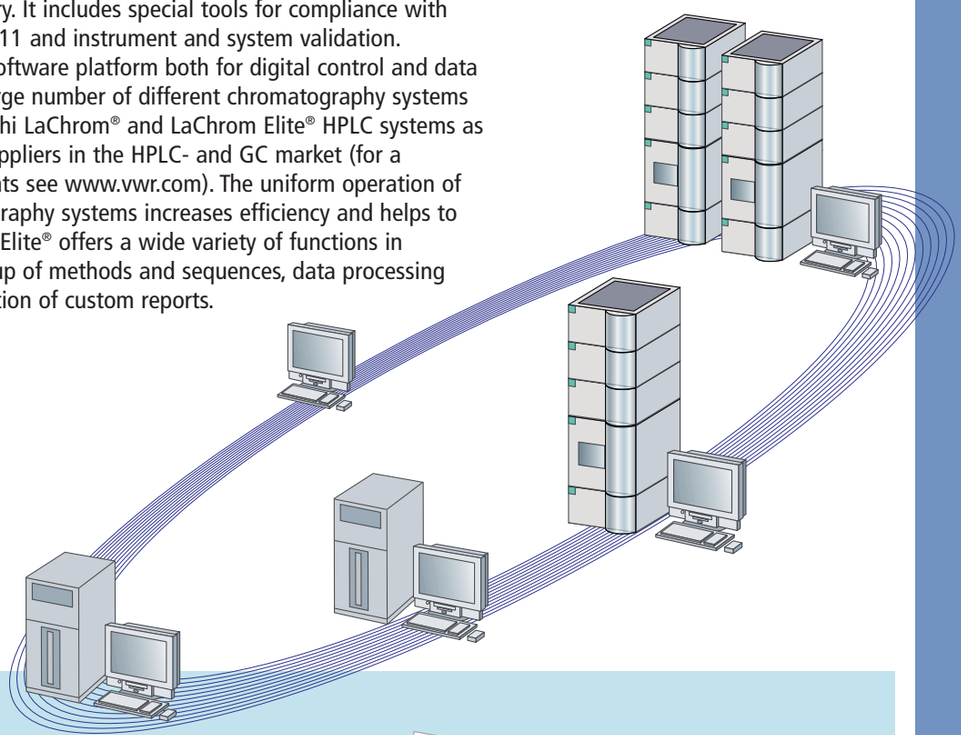


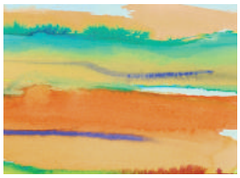




EZChrom Elite® software

EZChrom Elite® is one of the most popular chromatography data systems in the world. It supports today's demands in the analytical field - from a single workstation up to a fully equipped and company-wide client/server system. EZChrom Elite® is a user-friendly, intuitive software, developed for the current requirements of the pharmaceutical and chemical industry. It includes special tools for compliance with regulatory demands, e.g. FDA 21CFR11 and instrument and system validation. EZChrom Elite® offers one uniform software platform both for digital control and data processing and management of a large number of different chromatography systems (HPLC and GC), including VWR-Hitachi LaChrom® and LaChrom Elite® HPLC systems as well as those of most established suppliers in the HPLC- and GC market (for a complete list of supported instruments see www.vwr.com). The uniform operation of the software for different chromatography systems increases efficiency and helps to reduce user training costs. EZChrom Elite® offers a wide variety of functions in chromatography system control, setup of methods and sequences, data processing and visualisation as well as compilation of custom reports.





LaChrom Elite®

How to configure a System

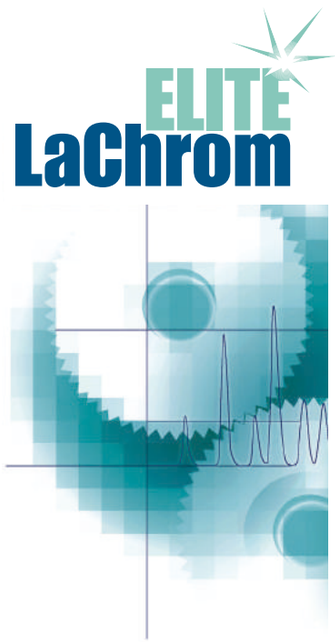
	Module	Accessory
Organiser		
Detector	- L-2400 UV - L-2420 UV-Vis - L-2455 DAD - L-2485 Fluorescence - L-2490 RI - MS-Systems - other / AID board	- Special flow cells - Analog signal output - UI pad kit - Power supply 100 W
Column Oven	L-2300 L-2350	- Different switching valves - UI pad kit
Autosampler	L-2200 L-2200 with cooling unit	- Special sample racks - Special syringe kits - System adaptation kits (micro-, high flow rate) - UI pad kit - Power supply 50 W
Pump	L-2130 (2x for high-pressure gradient)	- Low-pressure gradient accessory - High-pressure gradient accessory - In-built degasser - Pump seal washing kit for semi-micro kit - Semi-micro upgrade kit - Additional mixer - UI pad kit - Power supply 50 W
USB board	EZChrom Elite® Chromatography data System	Different licence packages depending on system configuration and detector used

How to configure a system

LaChrom Elite®

Our special services

The three essentials for achieving accurate and reliable analytical results are the suitability and performance of the method, the qualification of the analytical system and the training of the users. VWR has a dedicated team of specialists to provide a support network for these activities.



We guarantee your application!

Our application chemists have a wealth of experience in the development of HPLC applications and can offer the following support services:
- Application consultancy
- Optimisation of an existing method
- Development of a new method
- Transfer of an existing method to the LaChrom Elite® system
- Scale-up of a method from analytical to preparative HPLC
- Development of customised solutions and adaptations
- In-house application support
- Method validation consultancy

We train the users!

Well trained analysts deliver quality results. VWR offers training courses covering a variety of subjects including an introduction to HPLC analysis, advanced applications, tips, tricks and troubleshooting, operation of the LaChrom Elite® system, basic and advanced use of EZChrom Elite® software, as well as the special software tools. These courses are offered both at our central training facility and as in-house trainings at company sites. After attending the course all participants are issued with a training certificate.

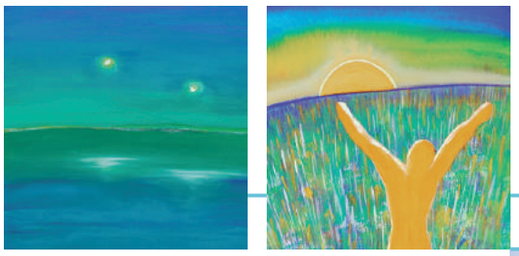
We install and qualify your system!

Trained and experienced service engineers install, commission, qualify and maintain your LaChrom Elite® system with calibrated tools and test materials according to authorised SOPs. Comprehensive IQ, OQ and PQ documentation is provided for you. A team of software specialists is available to support your data management, handle the installation and validation of your EZChrom Elite® workstation or client/server systems and support these systems through their complete life cycle.

We keep your system running!

Instrument reliability is dependent on regular and good quality maintenance. Taking out a service contract for ongoing maintenance and qualification work is an investment that will pay you back in productivity whilst freeing up laboratory staff for other tasks. Maintenance contracts with different levels of cover can be tailored to meet your needs.

VWR™
Supplier Partnerships for Customer Solutions



LaChrom Elite®

A masterpiece of modern technology

Precise and reliable Hitachi technology for your analysis

- Outstanding Performance
- Unique Detector Sensitivity
- Maximum Output
- Minimal Downtime
- Superior Productivity

Your European Distribution Partner

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