



February 2, 2009

John Abbott
Department of Administration, Purchasing Division
2019 Washington Street East, Building 15
Charleston, WV 25305-0130

RE: Proposal and Exceptions for the State of West Virginia RFQ DPS0926

Agilent Technologies, Inc., (Agilent) is pleased to respond to RFQ DPS0926 with the enclosed proposal for the LC Triple Quadrupole MS. The Agilent model proposed has equivalent (i.e. equal) or greater performance than the specifications set forth in the solicitation. Features that Agilent wishes to highlight and exceptions that require notation will be expanded upon in this proposal letter. Agilent is bidding in accordance with Quote No. 812829, which is enclosed and hereby incorporated by reference. Please refer to our quotation for complete product listing, descriptions, and individual prices.

The Agilent proposal includes the 1200 RRLC systems for use with the QQQ MS system. The Agilent 1200 RRLC system can replicate any UPLC separation for forensic toxicology applications. This system has equivalent performance to the specified Acquity system with the following exceptions/substitutions:

On page 5 item 7, the specification calls for the degasser to have six chambers. The Agilent G1379B degasser will accommodate four channels of degassing.

On page 5 item 10, the specification calls for the UPLC Pressure Requirement to operate at 15000 psi up to 1 ml/min and at 9000 psi up to 2 ml/min. The Agilent 1200 Rapid Resolution Liquid Chromatograph (RRLC) generates approximately 30% less backpressure than the Waters UPLC configured with same column, flow rate & mobile phase composition; therefore, the RRLC does not require the same pressure specification to achieve equivalent results. The maximum pressure of the 1200 RRLC is 600 bar (approx 9000psi). The engineering design of the Agilent RRLC columns also allows for operation at lower pressures based on a particle size distribution rather than a discrete particle size. This allows for enhanced performance based on comparable resolution with a decrease in system pressure.

The Agilent proposal includes the 1200 high performance autosampler as a component of the RRLC system. This module offers exceptional performance in a flow through design and meets or exceeds the specifications set forth in the solicitation with the following exceptions:

On page 5, under sample management system requirements, item 1, Agilent will take exception to the specification for sample capacity configurations and offers the following substitutions:

Sample capacity:

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- 2 well-plates (96 and 384) plus 10 additional 2 mL vials
- 108 x 2 mL vials in 2 x 54 vial plates plus 10 additional 2 mL vials
- 30 x 6 mL vials in 2 x 15 vial plates plus 10 additional 2 mL vials
- 54 Eppendorf tubes (0.5/1.5/2.0 mL) in 2 x 27 Eppendorf tube plates, plus 10 additional 2 mL vials

On page 6 item 4, Agilent will take exception to the injection volume range. The Agilent high performance autosampler range is specified at .1 - 40 uL.

The Agilent proposal includes the 6410B Triple Quadrupole MS system. This system meets or exceeds the specifications set forth in the solicitation with the following exceptions:

Under general specifications:

Page 8 Item 2 - Agilent does not currently offer a dual APPI/APCI option. Please see more information pertaining to ionizations sources in the paragraph below.

Page 9 Item 9 - the dimensions of the 6410B are 43.5" W x 26" D x 18.5" H

Under performance specification:

Page 9 Item 2 - the mass range of the 6410 is 15 - 2,000 m/z

Page 9 Item 3 - the maximum scan speed of the Model 6410B is 5,200 u/sec.

Page 9 Item 6 - the switch from positive ion mode to negative ion mode is 500 ms on the Agilent 6410B

Additional Requirements:

Page 11 b. and Item 3 - the quantitative nature of the Triple Quadrupole instrument does not lend itself well to the production of commercial libraries. Agilent does have available user contributed databases for our qualitative instruments. The Agilent Triple Quadrupole instrument offers the ability to store user generated databases; however, as with all vendors of this type of equipment, the database would be unique to the instrument on which it was generated. This is because database entries are dependent upon the conditions under which they are run.

Page 11 Item 6 - the combined length of the Model 6410B and the 1200 RRLC is 57".

The Agilent 6410B offers several significant analytical advantages over the competitive equivalent system. These include the following:

Dynamic MRM: This is a new feature to the Agilent Triple Quad portfolio, sometimes called 'Scheduled MRM' by other competitive systems. This feature is now available on all Agilent Triple Quad models, and



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is not yet available on any of the Waters systems. Simply explained, it allows for each MRM to have its own time segment rather than bunching MRMs into collective time segments. The impact of this is to greatly simplify method development and modifications, (i.e. adding new targets to existing methods) and potentially increases sensitivity for targets.

Calibrant Delivery System (CDS): This is an integrated fluidic delivery system that provides for tuning & calibration standards delivery to the ionization source without user intervention; that is, the user instructs the system to 'tune' itself from the data system. The data system takes over control of the instrument, automatically self configures to introduce tuning solution via the CDS, optimizes all ion optic and detection elements to find sensitivity, resolution and peak shape for the mass range specified. It prints out a report (print, e-copy or both) that can be entered into a logbook. This automated process can be initiated remotely via the internet or scheduled to be performed before the operator arrives. This obviates the need for a syringe pump or any re-plumbing of the analytical system at all. This feature is available on all LCMS systems.

Ionization Sources: All Agilent LCMS systems utilize identical hardware mounts. This enables users to swap or share sources among Agilent LCMS systems. Each source has an RFID tag that identifies that source to the system and allows the system to self-configure for that specific source. In addition to the sources specified in this procurement, Agilent also offers the APCI, APPI, MALDI, Nanospray, Chip Nanospray, DESI & NanoMate sources.

Mass Hunter Software: This software features 'Batch-at-a-Glance' architecture that provides a 'sample centric' view of quantitative data and allows for fast processing and approval of sample data sets using outlier filters and visual cues to draw the reviewer's attention to only those data points that are suspect. 'Parameter Free Integration' (Agilent Patent Pending) which was designed specifically for MRM data, obviates the need for manual integration, saving hours of tedious re-integration of peaks.

Please consider the Agilent proposal of the LC/MS Triple Quadrupole to meet the needs of your analytical laboratory. If you have any questions regarding our products, please call Michael P. Scott toll-free at (866) 793-4962.

If Agilent should be the successful bidder, please reference our quote number on your purchase order. If you have any questions regarding our response, please call me at (800) 227-9770 x 8173.

Sincerely,


Jeff Harrigan



State of West Virginia
 Department of Administration
 Purchasing Division
 2019 Washington Street East
 Post Office Box 50130
 Charleston, WV 25305-0130

Request for Quotation

RFO NUMBER
DPS0926

PAGE
1

ADDRESS CORRESPONDENCE TO ATTENTION OF
JOHN ABBOTT
304-558-2544

VENDOR

RFQ COPY
TYPE NAME/ADDRESS HERE

Agilent Technologies, Inc.
 Attn: Jeff Harrigan, Bid Sales
 2850 Centerville Road
 Wilmington, DE 19808

SHIP TO

WEST VIRGINIA STATE POLICE

4124 KANAWHA TURNPIKE
SOUTH CHARLESTON, WV
25309 304-746-2141

DATE PRINTED	TERMS OF SALE	SHIP VIA	F.O.B.	FREIGHT TERMS
01/21/2009	Net 30	Vendor Choice&Expense	Destination	Vendor Choice&Expense

BID OPENING DATE: **02/04/2009** BID OPENING TIME **01:30PM**

LINE	QUANTITY	UOP	CAT NO	ITEM NUMBER	UNIT PRICE	AMOUNT
0001	1	LS		490-55	Included in total	Included in total
<p>MASS SPECTROMETERS (LABORATORY)</p> <p>CONTRACT TO PROVIDE ALL LABOR, MATERIALS, AND EQUIPMENT NECESSARY TO INSTALL A LIQUID CHROMATOGRAPHY TANDEM QUADRUPOLE MASS SPECTROMETER SYSTEM AT THE WV STATE POLICE FORENSIC LAB, SOUTH CHARLESTON, WV, PER THE SPECIFICATIONS.</p> <p style="text-align: center;">NOTICE</p> <p>A SIGNED BID MUST BE SUBMITTED TO:</p> <p style="text-align: center;">DEPARTMENT OF ADMINISTRATION PURCHASING DIVISION BUILDING 15 2019 WASHINGTON STREET, EAST CHARLESTON, WV 25305-0130</p> <p>THE BID SHOULD CONTAIN THIS INFORMATION ON THE FACE OF THE ENVELOPE OR THE BID MAY NOT BE CONSIDERED:</p> <p>SEALED BID</p> <p>BUYER: JOHN ABBOTT</p> <p>RFQ. NO.: DPS0926</p>						

SEE REVERSE SIDE FOR TERMS AND CONDITIONS

SIGNATURE * <i>[Signature]</i>	TELEPHONE 800-227-9770 x8173	DATE 01/30/09
TITLE Business Sales Specialist	FEIN 77-0518772	ADDRESS CHANGES TO BE NOTED ABOVE

WHEN RESPONDING TO RFQ, INSERT NAME AND ADDRESS IN SPACE ABOVE LABELED 'VENDOR'

**GENERAL TERMS & CONDITIONS
REQUEST FOR QUOTATION (RFQ) AND REQUEST FOR PROPOSAL (RFP)**

1. Awards will be made in the best interest of the State of West Virginia.
2. The State may accept or reject in part, or in whole, any bid.
3. All quotations are governed by the *West Virginia Code* and the *Legislative Rules* of the Purchasing Division.
4. Prior to any award, the apparent successful vendor must be properly registered with the Purchasing Division and have paid the required \$125 fee.
5. All services performed or goods delivered under State Purchase Order/Contracts are to be continued for the term of the Purchase Order/Contracts, contingent upon funds being appropriated by the Legislature or otherwise being made available. In the event funds are not appropriated or otherwise available for these services or goods, this Purchase Order/Contract becomes void and of no effect after June 30.
6. Payment may only be made after the delivery and acceptance of goods or services.
7. Interest may be paid for late payment in accordance with the *West Virginia Code*.
8. Vendor preference will be granted upon written request in accordance with the *West Virginia Code*.
9. The State of West Virginia is exempt from federal and state taxes and will not pay or reimburse such taxes.
10. The Director of Purchasing may cancel any Purchase Order/Contract upon 30 days written notice to the seller.
11. The laws of the State of West Virginia and the *Legislative Rules* of the Purchasing Division shall govern all rights and duties under the Contract, including without limitation the validity of this Purchase Order/Contract.
12. Any reference to automatic renewal is hereby deleted. The Contract may be renewed only upon mutual written agreement of the parties.
13. **BANKRUPTCY:** In the event the vendor/contractor files for bankruptcy protection, this Contract may be deemed null and void, and terminated without further order.
14. **HIPAA BUSINESS ASSOCIATE ADDENDUM:** The West Virginia State Government HIPAA Business Associate Addendum (BAA), approved by the Attorney General, and available online at the Purchasing Division's web site (<http://www.state.wv.us/admin/purchase/vrc/hipaa.htm>) is hereby made part of the agreement. Provided that, the Agency meets the definition of a Cover Entity (45 CFR §160.103) and will be disclosing Protected Health Information (45 CFR §160.103) to the vendor.
15. **WEST VIRGINIA ALCOHOL & DRUG-FREE WORKPLACE ACT:** If this Contract constitutes a public improvement construction contract as set forth in Article 1D, Chapter 21 of the West Virginia Code ("The West Virginia Alcohol and Drug-Free Workplace Act"), then the following language shall hereby become part of this Contract: "The contractor and its subcontractors shall implement and maintain a written drug-free workplace policy in compliance with the West Virginia Alcohol and Drug-Free Workplace Act, as set forth in Article 1D, Chapter 21 of the West Virginia Code. The contractor and its subcontractors shall provide a sworn statement in writing, under the penalties of perjury, that they maintain a valid drug-free work place policy in compliance with the West Virginia and Drug-Free Workplace Act. It is understood and agreed that this Contract shall be cancelled by the awarding authority if the Contractor: 1) Fails to implement its drug-free workplace policy; 2) Fails to provide information regarding implementation of the contractor's drug-free workplace policy at the request of the public authority; or 3) Provides to the public authority false information regarding the contractor's drug-free workplace policy."

INSTRUCTIONS TO BIDDERS

1. Use the quotation forms provided by the Purchasing Division.
2. **SPECIFICATIONS:** Items offered must be in compliance with the specifications. Any deviation from the specifications must be clearly indicated by the bidder. Alternates offered by the bidder as **EQUAL** to the specifications must be clearly defined. A bidder offering an alternate should attach complete specifications and literature to the bid. The Purchasing Division may waive minor deviations to specifications.
3. Complete all sections of the quotation form.
4. Unit prices shall prevail in case of discrepancy.
5. All quotations are considered F.O.B. destination unless alternate shipping terms are clearly identified in the quotation.
6. **BID SUBMISSION:** All quotations must be delivered by the bidder to the office listed below prior to the date and time of the bid opening. Failure of the bidder to deliver the quotations on time will result in bid disqualifications: Department of Administration, Purchasing Division, 2019 Washington Street East, P.O. Box 50130, Charleston, WV 25305-0130



State of West Virginia
 Department of Administration
 Purchasing Division
 2019 Washington Street East
 Post Office Box 50130
 Charleston, WV 25305-0130

Request for Quotation

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 304-558-2544**

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BID OPENING DATE: **02/04/2009** BID OPENING TIME: **01:30PM**

LINE	QUANTITY	UOP	CAT NO	ITEM NUMBER	UNIT PRICE	AMOUNT
BID OPENING DATE:				2/4/2009	-----	
BID OPENING TIME:				1:30 PM	-----	
PLEASE PROVIDE A FAX NUMBER IN CASE IT IS NECESSARY TO CONTACT YOU REGARDING YOUR BID:						
				FAX 302-993-5941	-----	
CONTACT PERSON (PLEASE PRINT CLEARLY):						
				Michael P. Scott 866-793-4962	-----	
***** THIS IS THE END OF RFQ DPS0926 ***** TOTAL:						<u>\$257,318.50</u>

*Agilent Technologies, Inc. (Agilent) is bidding in accordance with quotation 812829, which is attached and hereby incorporated by reference. Please refer to the enclosed letter for details of Agilent's proposal and exceptions. The above price does not include tax. Any applicable tax will be applied at the time of order placement. If you have any questions regarding our products, please call Michael P. Scott at (866) 793-4962. If you have any questions regarding our response, please call Jeff Harrigan at 800-227-9770 x 8173. If Agilent should be the successful bidder, please reference the quotation number 812829 on your purchase order.

SEE REVERSE SIDE FOR TERMS AND CONDITIONS

SIGNATURE * <i>Jeff Harrigan</i>	TELEPHONE 800-227-9770 x 8173	DATE 01/30/09
TITLE Business Sales Specialist	FEIN 77-0518772	ADDRESS CHANGES TO BE NOTED ABOVE

WHEN RESPONDING TO RFQ, INSERT NAME AND ADDRESS IN SPACE ABOVE LABELED 'VENDOR'

The West Virginia State Police is soliciting bids for a Liquid Chromatography tandem quadrupole mass spectrometer system for the Toxicology Section of the Forensic Laboratory.

All bids must include the following specifications.

- **Furnish and install all components of liquid chromatograph mass spectrometer**
- **Furnish and install corresponding data handling system including computer, cables, connections, software, operating software, hardware, and all components to make it fully operational**
- **All Freight costs**

System Specifications and Requirements

Solvent Delivery System Requirements:

1. **Flow Rate:** 0.010-2.0 ml/min, in 0.001 ml increments.
2. **Pressure Stability:** $\leq 0.5\%$ of system backpressure or 50 p.s.i at 10,000 p.s.i.
3. **Gradient Profiles:** Even pre-configured gradient profile shapes (linear, 2 step, 4 convex, 4 concave)
4. **Delay Volume:** $\geq 120 \mu\text{L}$, independent of system pressure (with standard mixer 50 μL)
5. **Solvent Selection:** Binary solvent delivery system, allowing the user to choose between two mobile phase for each of the two solvent channels for a total of four solvent choices.
6. **Compressibility Compensation:** Automatic and continuous compressibility compensation, requiring no user intervention.
7. **Degassing System:** Built in high efficiency, low volume, 6 chamber vacuum degassing system with a separate channel for each mobile phase solvent and 2 channels for Sample Manager wash solvents.
8. **Flow Precision:** $\leq 0.075\%$ RSD or ± 0.02 min SD, based on retention time with flow accuracy of $\pm 1\%$.
9. **Compositional accuracy:** $< 0.5\%$ and compositional precision is $< 0.15\%$ RSD or ± 0.04 min SD. The solvent delivery system must include an automated software assisted purge function for ease of solvent changing and system purging/priming
10. **UPLC Pressure Requirement:** The solvent delivery system must be able to operate at pressures up to 15000 psi up to 1 ml/min, 9000 psi up to 2 ml/min as required for UPLC analysis.
11. **Seal Wash:** Integral, active and programmable plunger seal wash system.
12. **Flow Characteristics:** The Solvent Delivery System must be able to run, at flow rates above 0.5 ml/min, newer, smaller particle size columns, such as those with sub-2.0 μm diameter particles. The system must not require any hardware modifications to be able to run these columns. The system must be also able to run HPLC columns with particle sizes of 3.0, 3.5, 5.0, 7.0 μm without any modifications to the system hardware.
13. **Inlet Valves:** The Solvent Delivery System must be equipped with controlled Intake Valves to deliver faster system priming and startup times. More robust operation and highly repeatable system performance are achieved even with difficult-to-pump solvents because disturbances to solvent flow in inlet lines are minimized. The valves actuation is precisely controllable, and the algorithms responsible for its operation respond instantly to the fast, pressure-sensing capability of the Solvent Delivery System.

Sample Management System Requirements:

1. **Sample Configurations:** The Sample Management System must be able to accommodate the following sample configurations without the use of an external sample handling device:

- 2 x 96 well plates
 - 2 x 384 well plates
 - 2 racks of 2 ml vials (48 vials/rack)
 - 2 racks of 4 ml vials (24 vials/rack)
 - 2 racks of 0.65ml microcentrifuge tubes (48 tubes/rack)
 - 2 racks of 1.5 microcentrifuge tubes (24/rack)
2. **Injections:** 1 to 99 injections per sample, dependant on sample volume available and injection volume.
 3. **Injection Modes:** The Sample Manager must support up to THREE injections modes : full loop, partial loop and partial loop using needle overfill (PLNO)
 4. **Injection Volume:** Injection volume range of 0.5 – 50 ul in 0.1ul increments, partial or full loop mode.
 5. **Sample Size:** Minimum sample required is 5ul, using 2ml Maximum Recovery Vials.
 6. **Needle Wash:** Needle wash system must wash with up to two solvents to minimize carryover.
 7. **Wash Solvent:** Fresh solvent for the needle wash with each injection to prevent possibility of carryover.
 8. **Random Access:** Random access to any vial for multi-method operation.
 9. **Injection Precision:** Sample delivery precision of 0.3% RSD, with a full injector loop, 5-50 ul.
 10. **Injection Linearity:** >0.999 coefficient of deviation from 2-10 ul.
 11. **Carryover:** Better than 0.005% or 2.0 nL of the compound assayed, whichever is greater.
 12. **Sample Temperature:** Sample compartment controlled from 4 to 40 °C, programmable in 1 °C increments.
 13. **Parallel Injection Capability:** The Sample manager must be able to load the injector loop before completion of the last injection.
 14. **Injection Loop Isolation:** The injector loop must be removed from the system flow path during injection to minimize carryover and to decrease injection cycle time.

Column Heater Compartment Requirements:

1. **Column Temperature Range:** 5 deg C above ambient to 90 deg C.

Other System Requirements:

1. **Remote Control:** The system must not have a keypad, all instrument control functions are available through MassLynx or Empower build 1154/2154 software, through third part Control Software and through the Standalone Console software application, or equivalent.
2. **System Volume:** Total effective system volume less than 120µL, independent of system pressure. This includes a 10 µL injector loop.
3. **Diagnostics:** The System must have diagnostic capabilities: ability to store up to 16 diagnostic data channels, for a total of 96 hours, including piston pressures, system pressure, sample manager pressures, temperature, including ambient, lamp hours,

- lamp ignitions. The diagnostic data must be collected when the instrument is powered up, regardless of the number of runs or run time set.
4. **Diagnostic reporting:** The system must create a standard format .pdf file listing all the diagnostic parameters, including firmware version, usage, such as solvent pumped and number of injections as well as maximum system pressure, error, diagnostic user and informational messages will be documented.
 5. **Maintenance Information:** The system must provide full maintenance information such as counters for total lamp hour usage, number of ignitions, solvent usage, number of injections etc.
 6. **Export of Diagnostic Data:** The system must export diagnostic data, uni-directionally across the internet if enabled by the Connections INSIGHT Agent installed on the same PC that runs Third Party, Console Software, Empower or MassLynx software that controls the system. If a significant event condition is encountered, system performance parameters are passed to a Server via a secure Internet connection. Information is analyzed where an alert can be generated.
 7. **Graphical Diagnostics:** The system must allow the user to access all diagnostic functions through a graphical interface.
 8. **UPLC Integration:** The acquisition must apply effective filtering and integration algorithms that are optimized for ultra fast UPLC separations enabled by the detector's fast data rates.
 9. **Leak Detection:** The system must be equipped with Leak sensing for unattended operation. The sensors must alert the user from the software and graphically locate the location of a leak. The Leak sensors must be capable of resetting in less than 5 minutes. All or a subset of the leak sensors can be enabled or disabled.

Detector System Requirements:

The Detector must be a compact, benchtop, tandem quadrupole mass spectrometer designed for UPLC/MS/MS when configured. The Detector must provide a simple, robust platform for quantitative LC/MS/MS enabled by hi-speed MRM (Multiple Reaction Monitoring) and ESCi® multimode ionization. The system must also incorporate IntelliStart™ Technology for automated system optimization and status monitoring. This ensures high quality data is routinely available to all levels of operators. The system must be available on either MassLynx™ or Empower™ 2 Software.

IntelliStart Technology

1. **System Parameter Checking and Alerts:** System must be capable of checking all operating parameters and indicating visually and verbally whether or not conditions are acceptable to begin an analysis. Operator is alerted if any system parameter, either UPLC or MS/MS is out of specification.
2. **Integrated sample/calibrant delivery :** System must allow for direct injection of both calibrant and sample, including combining direct injection with UPLC flow for calibration and instrument tuning.
3. **Programmable divert valve:** Divert valve must be programmable to allow flow to be automatically diverted to waste when the system is idle.
4. **Automated Mass Calibration:** Instrument Setup must automate calibration and

- resolution optimization for varying scan speeds (up to 10,000 amu/s)
5. **Automated Sample Tuning:** Sample tune must allow the operator to input targeted analyte masses, select the fluidics port and scheme for method development, and set method flow rate.
 6. **Automated Methods Development:** System must automatically create an optimized set of MS/MS parameters for selected analytes, including cone voltages, optimum MRM parameters, SIR parameters, and confirmation masses.
 7. **Performance Check:** System must run a predetermined sample set and evaluate all parameters, including tune, calibration, and quantitative parameters and indicate a pass/fail status for subsequent analysis.

SYSTEM GENERAL SPECIFICATIONS

1. **ESCI combined source:**
 - a. Combined source for simultaneous electrospray/APCI operation
 - b. ZSpray™ dual-orthogonal source for robust sampling
 - c. Vacuum isolation valve
 - d. Tool-free sampling cone removal
 - e. Plug and play probes
 - f. De-clustering cone gas
 - g. Software control of all gas flows
2. **Ionization modes:**
 - a. Electrospray – included as standard
 - b. ESCI multimode ionization – included as standard
 - c. IonSABRE™ APCI – option
 - d. Dual APCI/APPI – option
3. **Ion Source Transfer Optics:**
High efficiency hexapole ion guide
4. **Mass analyzer:**
Two high resolution quadrupole analyzers (MS1/MS2), plus pre-filters to maximize resolution and transmission while preventing contamination of the main analyzers.
5. **Collision cell:**
 - a. T-Wave™ collision cell traveling wave device with beam focusing at ion entry and exit for optimum ion transfer and confinement, allowing fast MS/MS acquisition.
 - b. Software programmable gas flow.
6. **Detector**
 - a. Low noise, off axis, long life photomultiplier detector
 - b. Digital dynamic range up to 4×10^6
7. **Vacuum system**
 - a. Single, split flow air-cooled Pfeiffer Vacuum turbomolecular pump evacuating the source and analyzer
 - b. One Leybold Sogevac SV40BI rotary backing pump.

8. **Software**
 - a. Mass Lynx 4.1
 - b. MassLynx includes OpenLynx™ and QuanLynx™ Application Managers as standard.
9. **Dimensions**
 - a. Width: 35.6 cm (14.0 in.)
 - b. Height: 53.3 cm (21.0 in.)
 - c. Depth: 84.8 cm (33.5 in.)
10. **Regulatory approvals**
IVD, NRTL, and CE

PERFORMANCE SPECIFICATIONS

1. **Acquisition modes**
 - a. Full scan MS (MS1 or MS2)
 - b. Selected ion recording (SIR)
 - c. Product ion scan
 - d. Precursor ion scan
 - e. Constant neutral loss/gain
 - f. Multiple reaction monitoring (MRM)
2. **Mass range**
2 to 2000 m/z
3. **Scan speed**
Up to 10,000 Daltons/sec
4. **Mass stability**
<0.1 Daltons over 8 hr
5. **Linearity of response**
The linearity of response relative to sample concentration, for a specified compound, is five orders of magnitude from the limit of detection.
6. **Polarity switching**
<=20 ms switching time between positive and negative ion modes without significant degradation in data quality.
7. **MRM acquisition cycle time**
Minimum dwell time of 5 ms per channel. Minimum inter-channel and inter-scan delays of 5 ms. Functions can be configured in retention windows, including mixed mode and overlapping, to optimize cycle time for each analyte.
8. **Inter-channel cross talk**
The inter-channel cross talk between two MRM transitions, acquired using an MRM dwell time of 10 ms and an inter-channel delay time of 10 ms, will be fewer than

0.02%.

9. Mass resolution

Tunable manually or automatically (IntelliStart) to desired resolution. The valley between the 2034.63 Da and 2035.63 Da peaks is <12% of the average height of the two peaks.

10. RM sensitivity (ESI+)

For a direct loop injection of reserpine (5 pg) at a flow rate of 200 μ L/min the chromatographic signal to noise for the transition 609>195 m/z will be greater than 1000:1.

11. RM sensitivity (ESI-)

For a direct loop injection of chloramphenicol (5 pg) at a flow rate of 200 μ L/min, the chromatographic signal-to-noise ratio for the transition 321 > 152 m/z will be greater than 180:1.

12. RM sensitivity (APCI+)

For a direct loop injection of 17- α -hydroxyprogesterone (100 pg) at a flow rate of 1 mL/min, the chromatographic signal-to-noise ratio for the transition 331 > 109 m/z will be greater than 150:1.

13. MRM Signal to noise definition

Signal is defined as the height of the chromatographic peak of interest and noise is defined as the RMS of a continuous section of the mass chromatogram.

UPLC-MS/MS Workstation and Software

1. General Software Specifications

- a. Software must accommodate simultaneous positive and negative ion data during a single UPLC/MS/MS chromatographic run
- b. Software must allow for switching of cone voltage and collision energy on a per function basis during a single UPLC/MS/MS chromatographic run
- c. Software must support automatic tuning for automated MS/MS setup
- d. Software must support automated MS/MS tuning for analytical components
- e. Software must support automated monitoring of instrument vacuum, gas flows, and voltages to warn the user of out of tolerance parameters

2. Target Compound Software, or equivalent

- a. System must include the **Target Lynx** software package, or equivalent for positive identification of targeted compounds, including the following confirmatory checks:
 - Analytes above a Maximum Reporting Level (MRM)
 - Analyte confirmatory ion ratios are outside specified limits
 - One or more analyte signal-to-noise ratios are below a defined value
 - An analyte retention time or relative retention time is outside limits
 - An analyte concentration is below set LOD and LQD thresholds
 - The standard deviation of response for QC standards exceeds a defined value
 - The blank response is too high

-The coefficient of determination (r^2) of the calibration curve exceeds a defined Value

- b. System must include a library for Toxicology screening, and a project with all files necessary for the acquisition (tune page, UPLC method, MRM method) and processing for target compounds using Target Lynx software
- c. Automatic Adjustment of Ion Ratios: the software must be able to compensate for variation in ion ratios, typically due to changes in tuning conditions, for a specified compound. By including a reference standard in the sample sequence the expected ion ratios for the target compounds and succeeding samples must be automatically adjusted to match the ratios for the target compounds in the reference standard, so that manual adjustment of ion ratios is not required upon retuning of the instrument.
- d. Cross compound calibration curves: the software must allow calibration curves to be applied to additional compounds in an analysis mixture for which standards or curves do not exist.

3. Workstation Hardware

System must have an Intel Core 2 Duo E6400 processor or equivalent operating at 2.13 MHz or faster. Operating system: Windows XP Professional SP2. System Warranty: Three Years Onsite for PC hardware.

System Warranty:

1. **UPLC/MS/MS Warranty Coverage**
All UPLC and MS/MS components and hardware must be covered by a one year on-site repair service.
2. **Workstation Warranty**
Computer workstation and monitor must be covered by a three year on-site warranty service

Additional Requirements:

1. Delivery and installation of hardware and software must be within 90 days of the approved purchase order.
2. Software familiarization must be performed at installation to the West Virginia State Police staff.
3. Vendor must supply all available MS/MS libraries – toxicology, drug, and pesticide.
4. Training of West Virginia State Police personnel must include 2 days of custom on-site training to be provided within 4 weeks after installation of equipment at the expense of the vendor. Training will incorporate West Virginia State Police staff and will take place at the West Virginia State Police Toxicology laboratory located at 725 Jefferson Road, South Charleston, WV 25309.
5. Due to space constraints, LC and MS footprint must not exceed 30 inches.

Cost Sheet

Bidders shall provide a cost for the following: Prices provided for Agilent's equivalent system

Waters Product Name	Waters Item #	Quantity	Cost
TQD Tandem Quadrupole MS/MS	176001263	1	Included
Mass Lynx 4.1, M55 & XP TQD	176001255	1	Included
Cord Kit USA	205000414	1	Included
Acquity UPLC Column heater solvent manager sample manager	176015000	1	Included
Acquity BEH C18 column 3 pack	176000864	1	Included
Rotary Roughing Pump	186003887	1	Included
TargetLynx V4.1	176001086	1	Included
Acquity UPLC PDA Detector	176015026	1	Included
20" Flat Panel Monitor	668000273	1	Included

TOTAL \$ 257,318.50

Please refer to our proposal letter for details and exceptions. See quotation 812829 for complete product listing, descriptions, and individual prices.

The award will be made to the vendor with the lowest overall total cost of the equipment which meets all requested specifications and requirements.

VENDOR PREFERENCE CERTIFICATE

Certification and application* is hereby made for Preference in accordance with *West Virginia Code*, §5A-3-37. (Does not apply to construction contracts). *West Virginia Code*, §5A-3-37, provides an opportunity for qualifying vendors to request (at the time of bid) preference for their residency status. Such preference is an evaluation method only and will be applied only to the cost bid in accordance with the *West Virginia Code*. This certificate for application is to be used to request such preference. The Purchasing Division will make the determination of the Resident Vendor Preference, if applicable.

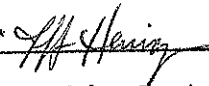
- 1. **Application is made for 2.5% resident vendor preference for the reason checked:**
 Bidder is an individual resident vendor and has resided continuously in West Virginia for four (4) years immediately preceding the date of this certification; or,
 Bidder is a partnership, association or corporation resident vendor and has maintained its headquarters or principal place of business continuously in West Virginia for four (4) years immediately preceding the date of this certification; or 80% of the ownership interest of Bidder is held by another individual, partnership, association or corporation resident vendor who has maintained its headquarters or principal place of business continuously in West Virginia for four (4) years immediately preceding the date of this certification; or,
 Bidder is a nonresident vendor which has an affiliate or subsidiary which employs a minimum of one hundred state residents and which has maintained its headquarters or principal place of business within West Virginia continuously for the four (4) years immediately preceding the date of this certification; or,
- 2. **Application is made for 2.5% resident vendor preference for the reason checked:**
 Bidder is a resident vendor who certifies that, during the life of the contract, on average at least 75% of the employees working on the project being bid are residents of West Virginia who have resided in the state continuously for the two years immediately preceding submission of this bid; or,
- 3. **Application is made for 2.5% resident vendor preference for the reason checked:**
 Bidder is a nonresident vendor employing a minimum of one hundred state residents or is a nonresident vendor with an affiliate or subsidiary which maintains its headquarters or principal place of business within West Virginia employing a minimum of one hundred state residents who certifies that, during the life of the contract, on average at least 75% of the employees or Bidder's affiliate's or subsidiary's employees are residents of West Virginia who have resided in the state continuously for the two years immediately preceding submission of this bid; or,
- 4. **Application is made for 5% resident vendor preference for the reason checked:**
 Bidder meets either the requirement of both subdivisions (1) and (2) or subdivision (1) and (3) as stated above; or,
- 5. **Application is made for 3.5% resident vendor preference who is a veteran for the reason checked:**
 Bidder is an individual resident vendor who is a veteran of the United States armed forces, the reserves or the National Guard and has resided in West Virginia continuously for the four years immediately preceding the date on which the bid is submitted; or,
- 6. **Application is made for 3.5% resident vendor preference who is a veteran for the reason checked:**
 Bidder is a resident vendor who is a veteran of the United States armed forces, the reserves or the National Guard, if, for purposes of producing or distributing the commodities or completing the project which is the subject of the vendor's bid and continuously over the entire term of the project, on average at least seventy-five percent of the vendor's employees are residents of West Virginia who have resided in the state continuously for the two immediately preceding years.

Bidder understands if the Secretary of Revenue determines that a Bidder receiving preference has failed to continue to meet the requirements for such preference, the Secretary may order the Director of Purchasing to: (a) reject the bid; or (b) assess a penalty against such Bidder in an amount not to exceed 5% of the bid amount and that such penalty will be paid to the contracting agency or deducted from any unpaid balance on the contract or purchase order.

By submission of this certificate, Bidder agrees to disclose any reasonably requested information to the Purchasing Division and authorizes the Department of Revenue to disclose to the Director of Purchasing appropriate information verifying that Bidder has paid the required business taxes, provided that such information does not contain the amounts of taxes paid nor any other information deemed by the Tax Commissioner to be confidential.

Under penalty of law for false swearing (*West Virginia Code*, §61-5-3), Bidder hereby certifies that this certificate is true and accurate in all respects; and that if a contract is issued to Bidder and if anything contained within this certificate changes during the term of the contract, Bidder will notify the Purchasing Division in writing immediately.

Bidder: Agilent Technologies, Inc.

Signed: ** 

Date: 01/30/09

Title: Business Sales Specialist

*Check any combination of preference consideration(s) indicated above, which you are entitled to receive.

**Agilent is not applying for a preference as we do not meet the criteria outlined. We, however, have reviewed the criteria and are acknowledging this by our signature.

STATE OF WEST VIRGINIA
Purchasing Division

PURCHASING AFFIDAVIT

VENDOR OWING A DEBT TO THE STATE:

West Virginia Code §5A-3-10a provides that: No contract or renewal of any contract may be awarded by the state or any of its political subdivisions to any vendor or prospective vendor when the vendor or prospective vendor or a related party to the vendor or prospective vendor is a debtor and the debt owed is an amount greater than one thousand dollars in the aggregate.

PUBLIC IMPROVEMENT CONTRACTS & DRUG-FREE WORKPLACE ACT:

If this is a solicitation for a public improvement construction contract, the vendor, by its signature below, affirms that it has a written plan for a drug-free workplace policy in compliance with Article 1D, Chapter 21 of the *West Virginia Code*. The vendor **must** make said affirmation with its bid submission. Further, public improvement construction contract may not be awarded to a vendor who does not have a written plan for a drug-free workplace policy in compliance with Article 1D, Chapter 21 of the *West Virginia Code* and who has not submitted that plan to the appropriate contracting authority in timely fashion. For a vendor who is a subcontractor, compliance with Section 5, Article 1D, Chapter 21 of the *West Virginia Code* may take place before their work on the public improvement is begun.

ANTITRUST:

In submitting a bid to any agency for the state of West Virginia, the bidder offers and agrees that if the bid is accepted the bidder will convey, sell, assign or transfer to the state of West Virginia all rights, title and interest in and to all causes of action it may now or hereafter acquire under the antitrust laws of the United States and the state of West Virginia for price fixing and/or unreasonable restraints of trade relating to the particular commodities or services purchased or acquired by the state of West Virginia. Such assignment shall be made and become effective at the time the purchasing agency tenders the initial payment to the bidder.

I certify that this bid is made without prior understanding, agreement, or connection with any corporation, firm, limited liability company, partnership or person or entity submitting a bid for the same materials, supplies, equipment or services and is in all respects fair and without collusion or fraud. I further certify that I am authorized to sign the certification on behalf of the bidder or this bid.

LICENSING:

Vendors must be licensed and in good standing in accordance with any and all state and local laws and requirements by any state or local agency of West Virginia, including, but not limited to, the West Virginia Secretary of State's Office, the West Virginia Tax Department, West Virginia Insurance Commission, or any other state agencies or political subdivision. Furthermore, the vendor must provide all necessary releases to obtain information to enable the Director or spending unit to verify that the vendor is licensed and in good standing with the above entities.

CONFIDENTIALITY:

The vendor agrees that he or she will not disclose to anyone, directly or indirectly, any such personally identifiable information or other confidential information gained from the agency, unless the individual who is the subject of the information consents to the disclosure in writing or the disclosure is made pursuant to the agency's policies, procedures and rules. Vendor further agrees to comply with the Confidentiality Policies and Information Security Accountability Requirements, set forth in <http://www.state.wv.us/admin/purchase/privacy/noticeConfidentiality.pdf>.

Under penalty of law for false swearing (*West Virginia Code* §61-5-3), it is hereby certified that the vendor affirms and acknowledges the information in this affidavit and is in compliance with the requirements as stated.

Vendor's Name: Agilent Technologies, Inc.

Authorized Signature: _____

Date: 01/30/09



Quotation

John Abbott
 State of West Virginia
 Dept of Administration
 Purchasing Div
 PO Box 50130
 Charleston WV 25305-0130

Quote No.	Create Date	Delivery Time	Page
812829	01/29/2009	3 Weeks	1 of 8
Contact		Phone no.	Valid to
Michael P. Scott		866-793-4962	04/29/2009
To place an order: Call 1-800-227-9770 Option 1 For Instruments Fax : 302-633-8953 For Consumables Fax : 302-633-8901 Email : lscainstrumentsales@agilent.com For additional instructions, see last page			

State of West Virginia DPS0926

Product/Description	Qty/Unit	Unit List Price	Discount Amount	Extended Net Price
G6410BA 6410 Triple Quadrupole LC/MS system. Includes 6410 triple quad, API-ESI source, MassHunter acquisition, qual, quant, and compliance software, PC and Printer, Inst. and Fam. and Image recovery service. With the following configuration: Ship-to Country : USA Installation (44K) Familiarization at Installation (44L) 1 Year SW Update/Phone Assist (44W) Training (44P) 1YR PC Repair Recovery Service (0TP)	1.000 EA	226,408.00 USD	56,602.00-	169,806.00
Item Total				169,806.00
Special discount of 25.00 % is applied.				



Quotation

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 Charleston WV 25305-0130

Quote No.	Create Date	Delivery Time	Page
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Contact		Phone no.	Valid to
Michael P. Scott		866-793-4962	04/29/2009
To place an order: Call 1-800-227-9770 Option 1 For Instruments Fax : 302-633-8953 For Consumables Fax : 302-633-8901 Email : lscainstrumentsales@agilent.com For additional instructions, see last page			

Product/Description	Qty/Unit	Unit List Price	Discount Amount	Extended Net Price
G1312B 1200 Series Binary Pump SL. Includes solvent cabinet, 2 solvent bottles, connecting capillaries and CAN cable.	1.000 EA	21,005.00 USD	5,251.25-	15,753.75
With the following configuration:				
Ship-to Country : USA				
Active seal wash option	1 EA	1,391.00 USD	347.75-	1,043.25
Solvent Selection Valve Option	1 EA	1,820.00 USD	455.00-	1,365.00
Installation (44K)				
Familiarization at Installation (44L)				
		Item Total		18,162.00
Special discount of 25.00 % is applied.				



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Product/Description	Qty/Unit	Unit List Price	Discount Amount	Extended Net Price
G1379B 1200 Series Micro Degasser. Includes 4-channel micro-vacuum degasser, remote control cable and connecting tubing. With the following configuration: Ship-to Country : USA Installation (44K)	1.000 EA	4,098.00 USD	1,024.50-	3,073.50
Item Total				3,073.50
Special discount of 25.00 % is applied.				
G1367C 1200 Series High Performance Autosampler SL. Includes 100 ul injection loop and tray for two wellplates and 10 x 2 ml vials, 2x 54-vial plates, Rheodyne injection valve (600 bar) and 0.5m CAN cable. With the following configuration: Ship-to Country : USA Installation (44K) Familiarization at Installation (44L)	1.000 EA	21,043.00 USD	5,260.75-	15,782.25
Item Total				15,782.25
Special discount of 25.00 % is applied.				



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Contact		Phone no.	Valid to
Michael P. Scott		866-793-4962	04/29/2009
To place an order: Call 1-800-227-9770 Option 1 For Instruments Fax : 302-633-8953 For Consumables Fax : 302-633-8901 Email : lscainstrumentsales@agilent.com For additional instructions, see last page			

Product/Description	Qty/Unit	Unit List Price	Discount Amount	Extended Net Price
G1330B 1200 Series Thermostat. For autosampler/fraction collector/spotter. Includes Peltier device to control the temperature of the 1200 Series autosamplers/fraction collectors. With the following configuration: Ship-to Country : USA Installation (44K)	1.000 EA	5,405.00 USD	1,351.25-	4,053.75
		Item Total		4,053.75
Special discount of 25.00 % is applied.				
G1316B 1200 Series Thermostatted Column Compartment SL. For rapid resolution LC, temperatures up to 100 degree C and pressures up to 600 bar. With the following configuration: Ship-to Country : USA Installation (44K) Familiarization at Installation (44L)	1.000 EA	5,006.00 USD	1,251.50-	3,754.50
		Item Total		3,754.50
Special discount of 25.00 % is applied.				



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Contact		Phone no.	Valid to
Michael P. Scott		866-793-4962	04/29/2009
To place an order: Call 1-800-227-9770 Option 1 For Instruments Fax : 302-633-8953 For Consumables Fax : 302-633-8901 Email : lscainstrumentsales@agilent.com For additional instructions, see last page			

Product/Description	Qty/Unit	Unit List Price	Discount Amount	Extended Net Price
G1315C 1200 Series Diode Array Detector SL. Provides 80Hz data acquisition rate and 128MB compact flash card for data recovery. Includes long-life deuterium and tungsten lamp. No flow cell included.	1.000 EA	21,939.00 USD	5,484.75-	16,454.25
With the following configuration:				
Ship-to Country : USA				
Semi-micro flow cell	1 EA	1,399.00 USD	349.75-	1,049.25
Standard flow cell	1 EA	1,268.00 USD	317.00-	951.00
Installation (44K)				
Familiarization at Installation (44L)				
		Item Total		18,454.50
Special discount of 25.00 % is applied.				



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Quote No.	Create Date	Delivery Time	Page
812829	01/29/2009	3 Weeks	6 of 8
Contact		Phone no.	Valid to
Michael P. Scott		866-793-4962	04/29/2009
To place an order: Call 1-800-227-9770 Option 1 For Instruments Fax : 302-633-8953 For Consumables Fax : 302-633-8901 Email : lscainstrumentsales@agilent.com For additional instructions, see last page			

Product/Description	Qty/Unit	Unit List Price	Discount Amount	Extended Net Price
G1978B Multimode ESI/APCI Source	1.000 EA	23,516.00 USD	5,879.00-	17,637.00
With the following configuration: Configuration for usage with : Triple Quad Ship-to Country : USA Installation (44K) Familiarization at installation (44L)				
			Item Total	17,637.00
Special discount of 25.00 % is applied.				
H2149A Chemical Analysis Application Consulting Provides on-site assistance. For consulting, training, documentation and implementation services. Requires option.	1.000 EA			
With the following configuration: Ship-to Country : USA Two Day On-site (Includes Travel)				
		1 EA	5,200.00 USD	5,200.00
			Item Total	5,200.00



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Contact		Phone no.	Valid to
Michael P. Scott		866-793-4962	04/29/2009
To place an order: Call 1-800-227-9770 Option 1 For Instruments Fax : 302-633-8953 For Consumables Fax : 302-633-8901 Email : lscainstrumentsales@agilent.com For additional instructions, see last page			

Product/Description	Qty/Unit	Unit List Price	Discount Amount	Extended Net Price
959764-902 Eclipse Plus C18,2.1x100mm,1.8um,600bar	3.000 EA	620.00 USD	465.00-	1,395.00
Item Total				1,395.00
Special discount of 25.00 % is applied.				
Gross Amount				: \$ 341,358.00
Total Discount				: \$ 84,039.50
Total				: \$ 257,318.50



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Quote No.	Create Date	Delivery Time	Page
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To place an order: Call 1-800-227-9770 Option 1 For Instruments Fax : 302-633-8953 For Consumables Fax : 302-633-8901 Email : lscainstrumentsales@agilent.com For additional instructions, see last page			

TO PLACE AN ORDER, Agilent offers several options:

- 1) Visit <http://www.agilent.com/chem/supplies> to place online orders using a purchase order or credit card.
- 2) Call 1-800-227-9770 (option 1) any weekday between 8am and 8 pm Eastern time in the U.S., Canada & Puerto Rico.
- 3) To place an order for Consumables, please fax the order to 302-633-8901.
To place an instrument and/or software order, please fax the order to 302-633-8953.
- 4) Or you can mail your order to:
 Agilent Technologies
 North American Customer Contact Center
 2850 Centerville Road BU3-2
 Wilmington, DE 19808-1610

To place an order, the following information is required:

- Purchase order number or credit card, delivery date, ship to, invoice to, end user, and quote number.
- GSA customers please provide GSA contract #.

EXCLUSIVE OFFERS FOR NEW INSTRUMENT CUSTOMERS, go to www.agilent.com/chem/exclusiveoffers

TO CHECK THE STATUS OF AN ORDER:

- 1) Visit www.agilent.com/chem/supplies to check the status of your order.
- 2) Call 1-800-227-9770 (option 1) any weekday between 8 am and 8 pm Eastern time, in the U.S., Canada & Puerto Rico. You will need to know the purchase order or credit card number the order was placed on.

FINANCING AND LEASING - A wide range of options are available from Agilent's preferred financing partner, GE Capital Solutions. For more information or to discuss how monthly payments could suit your operational or budgetary requirements, contact your Agilent Account Manager.

TERMS AND CONDITIONS:

- Pricing: Web prices are provided only for the U.S. in U.S.dollars. All phone prices are in local currency and for end use. Applicable local taxes are applied.
 - All Sales Tax is subject to change at the time of order.
 - Shipping and Handling Charges: Orders with a value less than \$2000 or those requiring special services such as overnight delivery may be subject to additional shipping & handling fees. Some of these charges may be avoided by ordering via the Web
 - Payment Terms: Net 30 days from invoice date, subject to credit approval.
- * Quotation Validity: This quotation is valid for 90 days unless otherwise indicated.
 * Warranty period for instrumentation is 1 year. The Warranty period for columns and consumables is 90 days.

The Delivery Time reflected is based on availability at the time of quotation and is only a guideline for delivery receipt. Order specific Delivery Time will be determined at order placement and is subject to current availability.

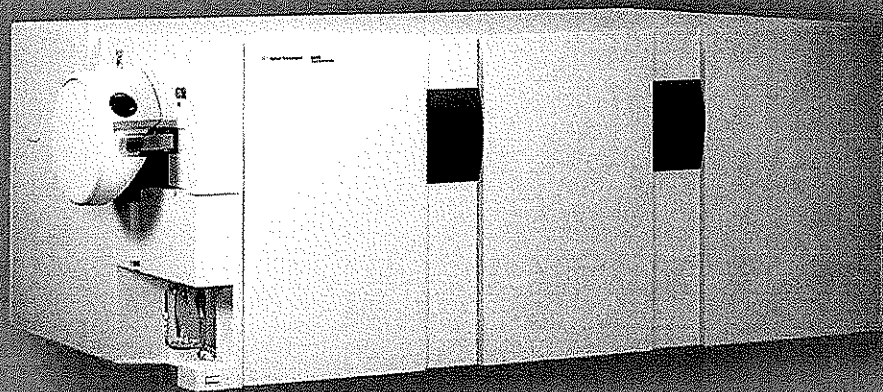
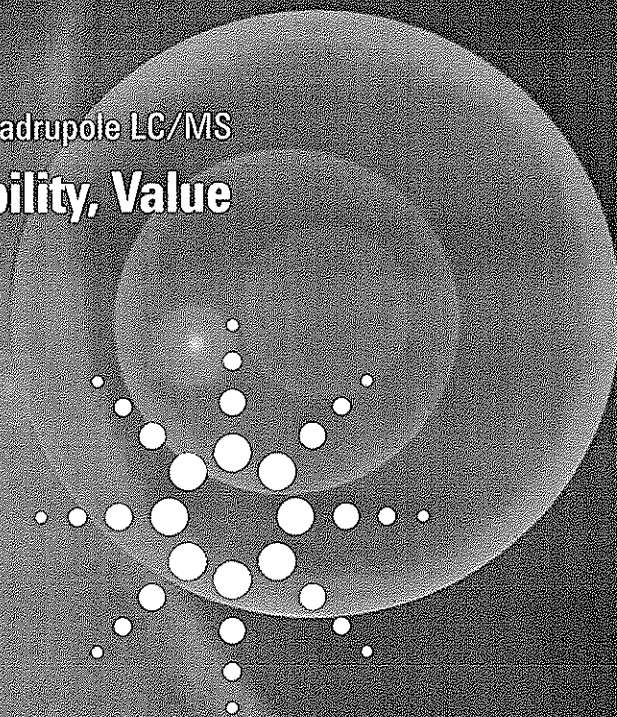
It is Agilent Technologies intent to ship product at the earliest available date unless specified otherwise.

The sale of standard Products and Services referenced in this quotation is subject to the then current version of Agilent's Terms of Sale, and any LSCA Supplemental Terms or other applicable terms referenced herein. If any Products or Services are manufactured, configured or adapted to meet Customer's requirements, the sale of all Products and Services referenced in this quotation is subject to the then current version of Agilent's Terms of Sale for Custom Products and any LSCA Supplemental Terms or other applicable Terms referenced herein. A copy of Agilent's Terms of Sale, Agilent's Terms of Sale for Custom Products and the LSCA Supplemental Terms is either attached or has been previously provided to you. Please contact us if you have not received a copy or require an additional copy. If you have a separate agreement in effect with Agilent covering the sale of Products and Services referenced in this quotation, the terms of that agreement will apply to those Products and Services. Agilent expressly objects to any different or additional terms in your purchase/sales order documentation, unless agreed to in writing by Agilent. Product and Service availability dates are estimated at the time of the quotation. Actual delivery dates or delivery windows will be specified at the time Agilent acknowledges and accepts your purchase order. The above conditions shall apply to the fullest extent permitted by the law. You may have other statutory or legal rights available. Commodities, technology or software exported from the United States of America ("U.S.") or from other exporting countries will be subject to the U.S. Export Administration Regulations and all exporting countries' export laws and regulations. Diversion contrary to U.S. law and the applicable export laws and regulations is prohibited.

2/2/09 JH

Agilent 6410 Triple Quadrupole LC/MS

Sensitivity, Reliability, Value



Agilent Technologies

Sensitivity, Reliability, Value

Whether you quantitate drug metabolites, measure herbicide levels in food, or determine contaminant levels in ground water, the triple quadrupole mass spectrometer is unequalled for quantitating trace organic compounds in complex matrices. The Agilent 6410 Triple Quadrupole LC/MS establishes a new standard for value in a triple quadrupole mass spectrometer. It delivers outstanding sensitivity, great ease of use, and legendary Agilent reliability—all at a very attractive price.

Performance and reliability for demanding quantitative analyses

The 6410 Triple Quad is built upon Agilent's proven expertise in quadrupole mass spectrometry. Paired with Agilent's industry-leading 1200 Series LCs and ZORBAX LC columns, the 6410 delivers sensitive, reproducible analyses of target compounds in complex matrices.

• Femtogram-level sensitivity –

Maximized ion generation and transmission across a broad mass range ensure low limits of detection and quantitation—regardless of application.

• Fast, high-throughput MS/MS –

An innovative collision cell maintains sensitivity and avoids memory effects even at very short dwell times.

• Rugged, reliable performance –

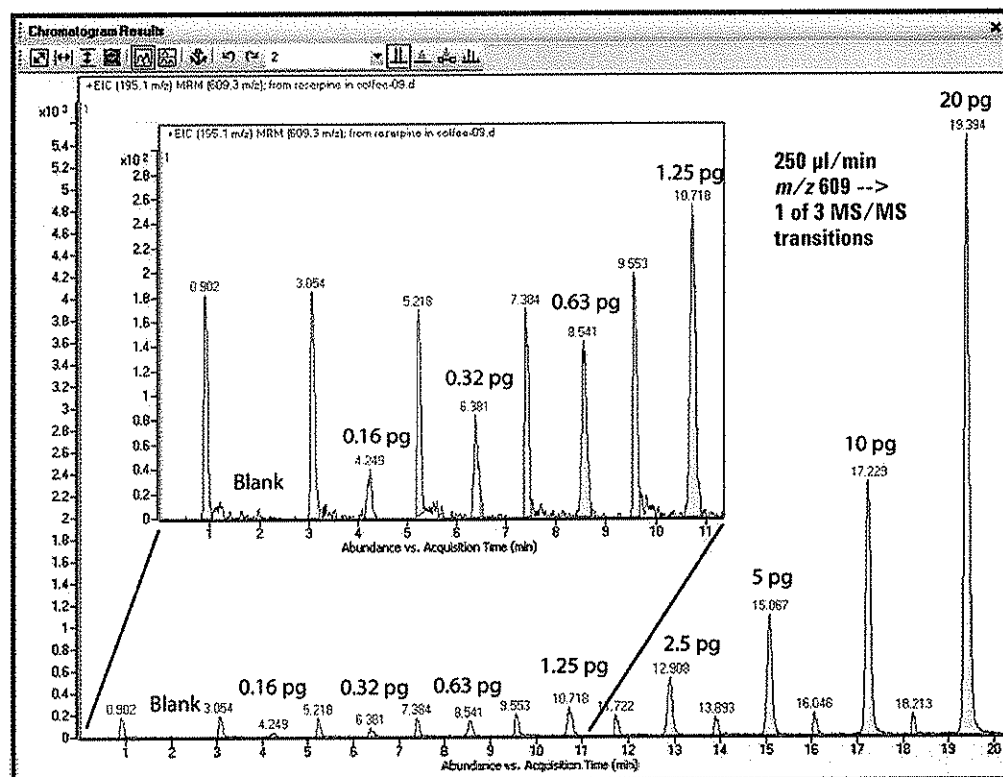
Orthogonal nebulization and high drying capacity simplify operation, allow split-less operation at common flow rates, keep the ion optics cleaner, and reduce background.

• Tremendous versatility –

A broad selection of ion sources allows the 6410 to address the widest range of applications.

• Simplified operation –

Automated tuning, parameter-less integration, method editor, curve-fit assistant, batch review, outlier flagging, and customizable reporting maximize convenience and throughput for the quantitation of large, multi-compound batches.



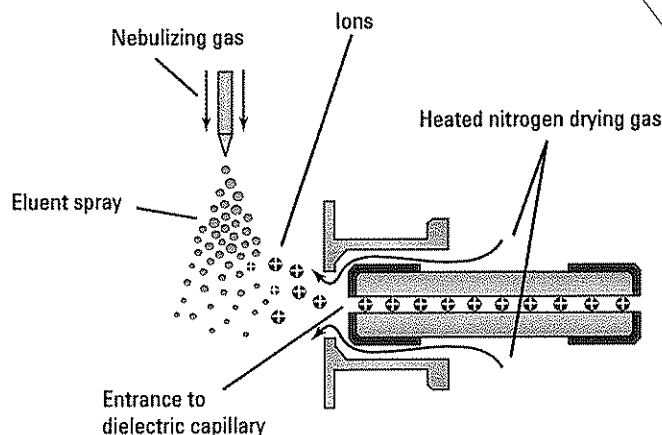
Analysis of a reserpine dilution series in coffee shows femtogram-level sensitivity even in a complex matrix

Low limits of quantitation regardless of application

The Agilent 6410 Triple Quadrupole LC/MS has been designed to maximize ion generation and ion transmission across a broad mass range, for low limits of detection and quantitation regardless of application.

Great sensitivity starts with superior ionization technology

Agilent's LC/MS ion sources use our patented nebulization technology. Superior nebulization, orthogonal to the axis of the sampling capillary, reduces noise related to incomplete drying of solvent droplets. It also keeps the sampling capillary and ion optics cleaner, for reduced maintenance. The standard sources allow split-less operation at all common flow rates.

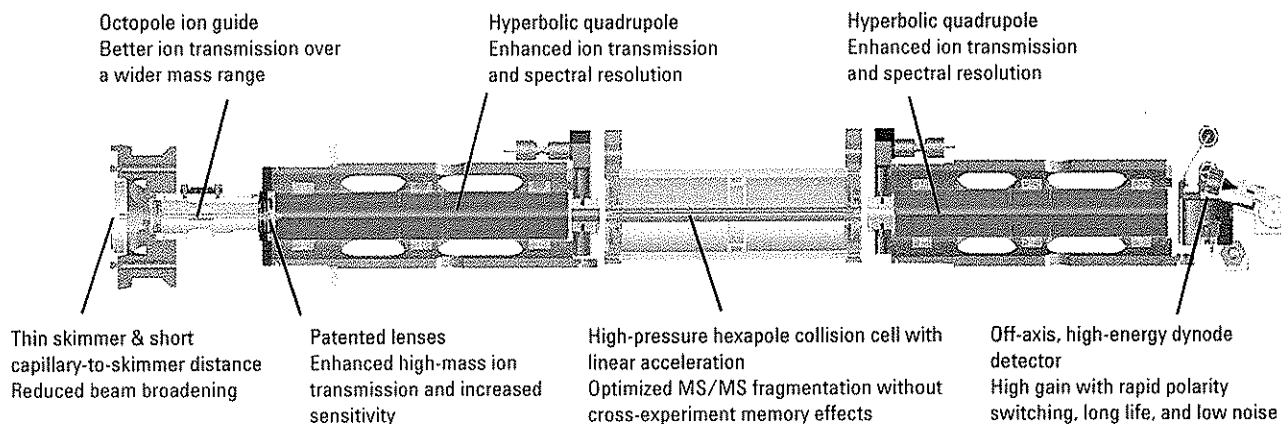


Orthogonal nebulization and high drying capacity reduce droplet noise for better sensitivity, and also reduce maintenance requirements

Collision cell innovations enhance sensitivity and speed

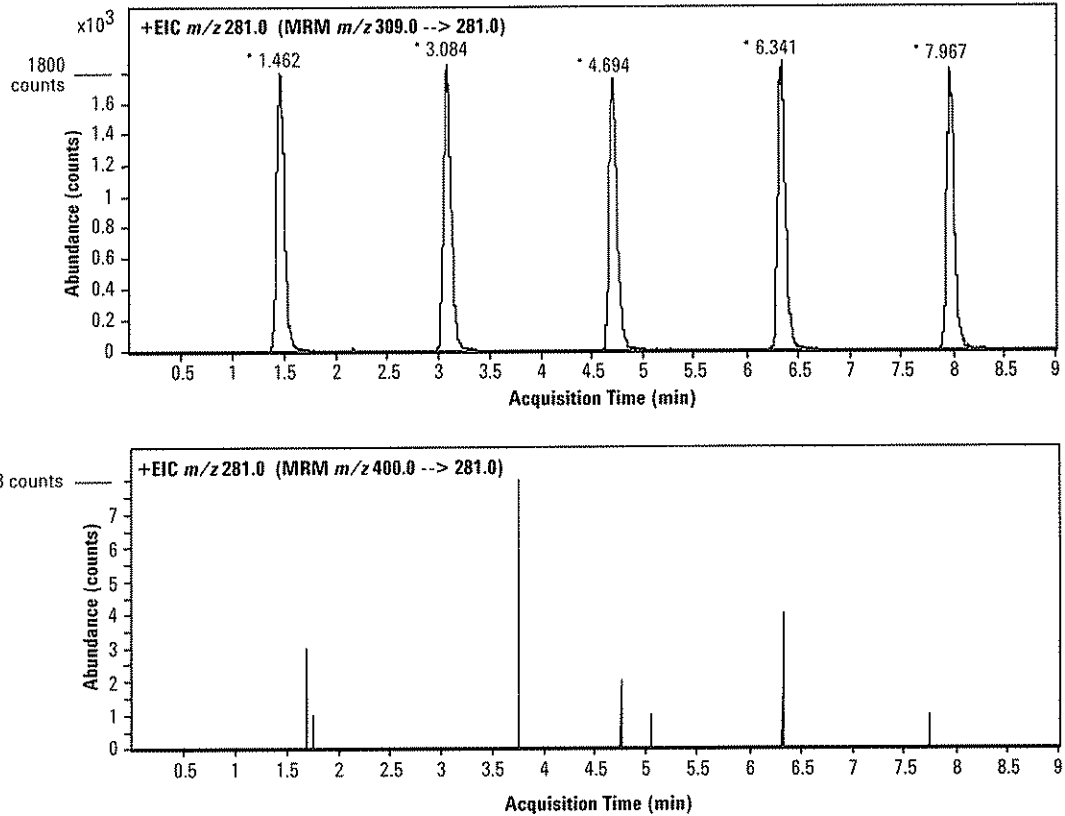
The 6410 Triple Quad features a high-pressure, high-frequency hexapole collision cell that delivers rich MS/MS spectra with both sensitivity and speed. The collision cell uses linear axial acceleration to achieve very fast MS/MS,

without cross-experiment memory effects (see page 4). It maintains excellent sensitivity even with five-millisecond dwell times (see page 4), so you can perform measurements over even the narrowest chromatographic peaks.



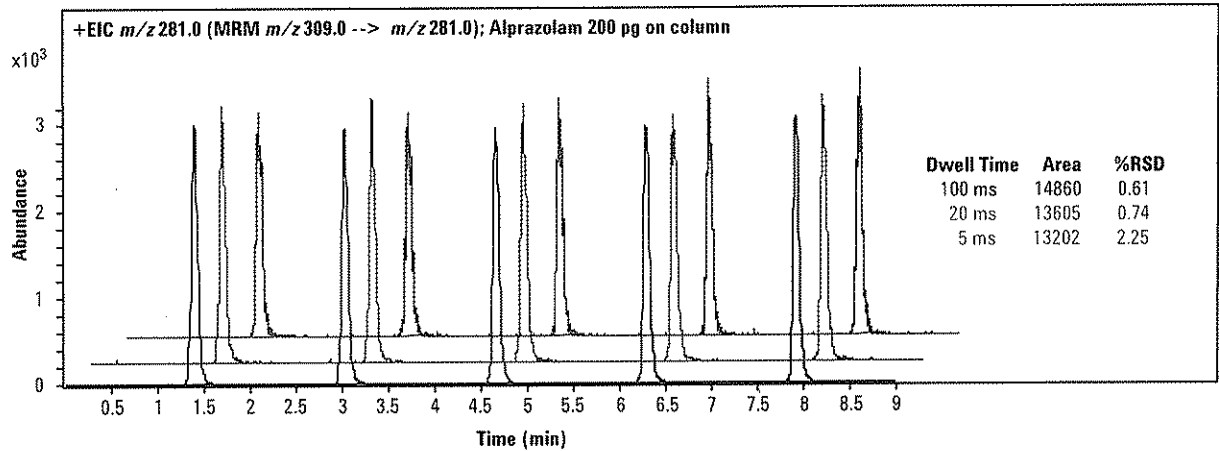
Ion optics are optimized for ion transmission across a broad mass range

No cross-experiment memory effects



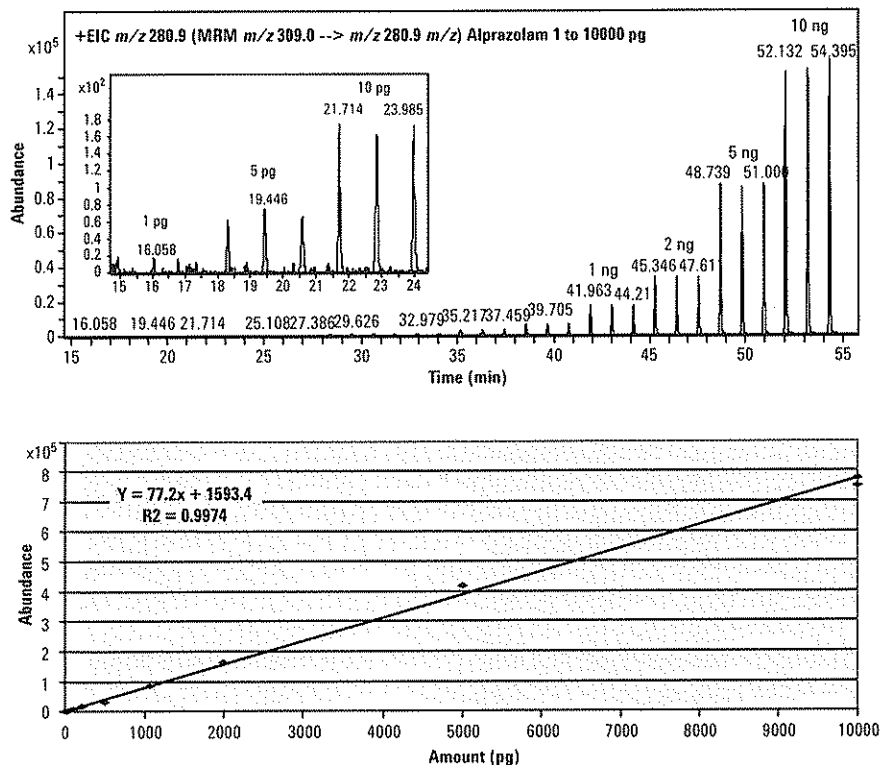
MS/MS analysis of 500 μg of alprazolam at 20 ms dwell time shows excellent RSD and no detectable cross-experiment memory effects (cross talk). Note that the top scale is 225 times the bottom scale.

Excellent %RSD even at short dwell times



Analysis of 200 μg of alprazolam on column shows only minor changes in peak area and percent RSD even at very short MS/MS dwell times. This makes the 6410 ideal for fast chromatography and high throughput.

Excellent linearity over a wide dynamic range



This alprazolam analysis in positive electrospray mode demonstrates excellent linearity over a wide dynamic range

Versatility of multiple ionization choices

For maximum flexibility in matching your 6410 to your applications, Agilent offers a wide selection of ionization sources:

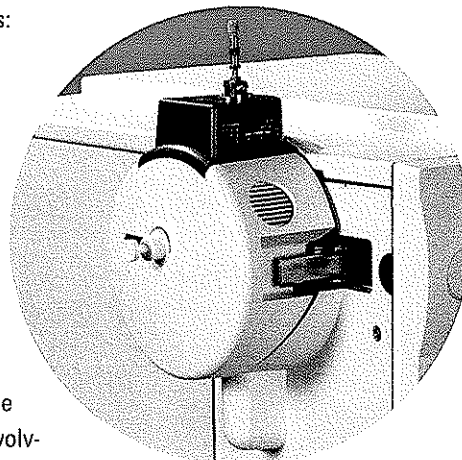
- Electrospray ionization (ESI)
- Atmospheric pressure chemical ionization (APCI)
- Atmospheric pressure photoionization (APPI)
- Multimode (ESI/APCI)
- HPLC-Chip Cube MS interface

The multimode source is a breakthrough offering nearly universal ionization for LC/MS users who want greater versatility, throughput, and convenience.

It can operate in, and automatically switch between, a variety of modes:

- ESI only
- APCI only
- Alternating ESI/APCI mode
- True simultaneous ESI and APCI

with results as good as or better than dedicated, single-mode sources. The multimode source facilitates access for multiple users and long, unattended runs involving more than one ionization mode.



Agilent multimode (ESI/APCI) source simplifies access and maximizes throughput while delivering superior performance

All new, sample- and compound-centric software

The all-new Agilent MassHunter Workstation software makes your analyses easier. It includes separate programs for instrument control and data acquisition, qualitative data analysis, and quantitative data analysis. Each program is designed to simplify operation and maximize productivity.

Faster, easier setup and acquisition

Whether you are an expert or new to LC/MS, MassHunter Workstation software greatly simplifies operation of your LC/MS system.

- **Tune automatically** – A proven, reliable autotune program maximizes performance and minimizes effort.
- **Save time setting up analyses** – Import worklists directly from spreadsheet programs such as Microsoft® Excel.
- **Operate from a single user interface** – A single interface for both LC and MS can be configured to display only the information you need.

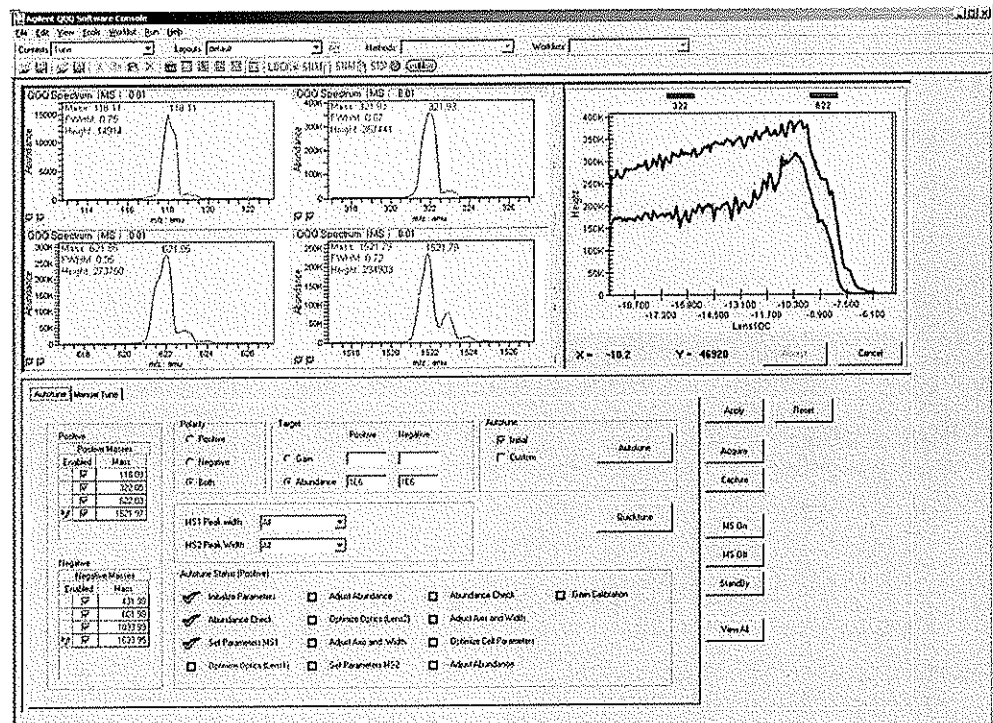
Better, easier quantitation

All-new, sample- and compound-centric quantitation software ensures that you spend less time analyzing your data.

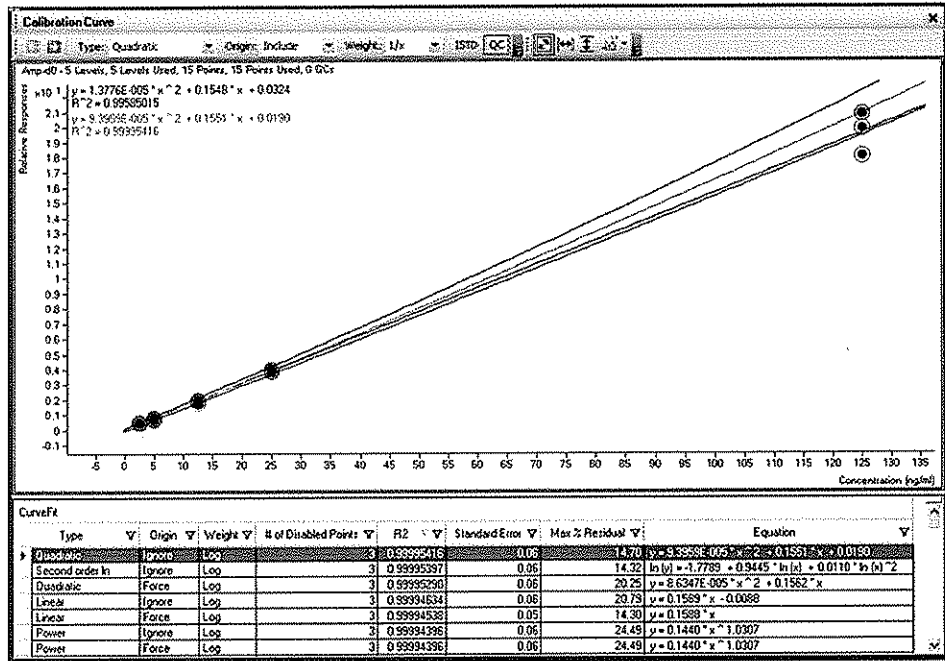
- **Set up quantitation more easily** – Import information directly from the data acquisition method.
- **Find the best curve fit faster** – A curve-fit assistant tests all fits and provides statistics on their quality.
- **Better integration** – Automated, parameter-less integrator uses a novel algorithm, optimized for MRM data from a triple quad, to achieve superior integration with minimum user input.

Dynamically linked results save time –

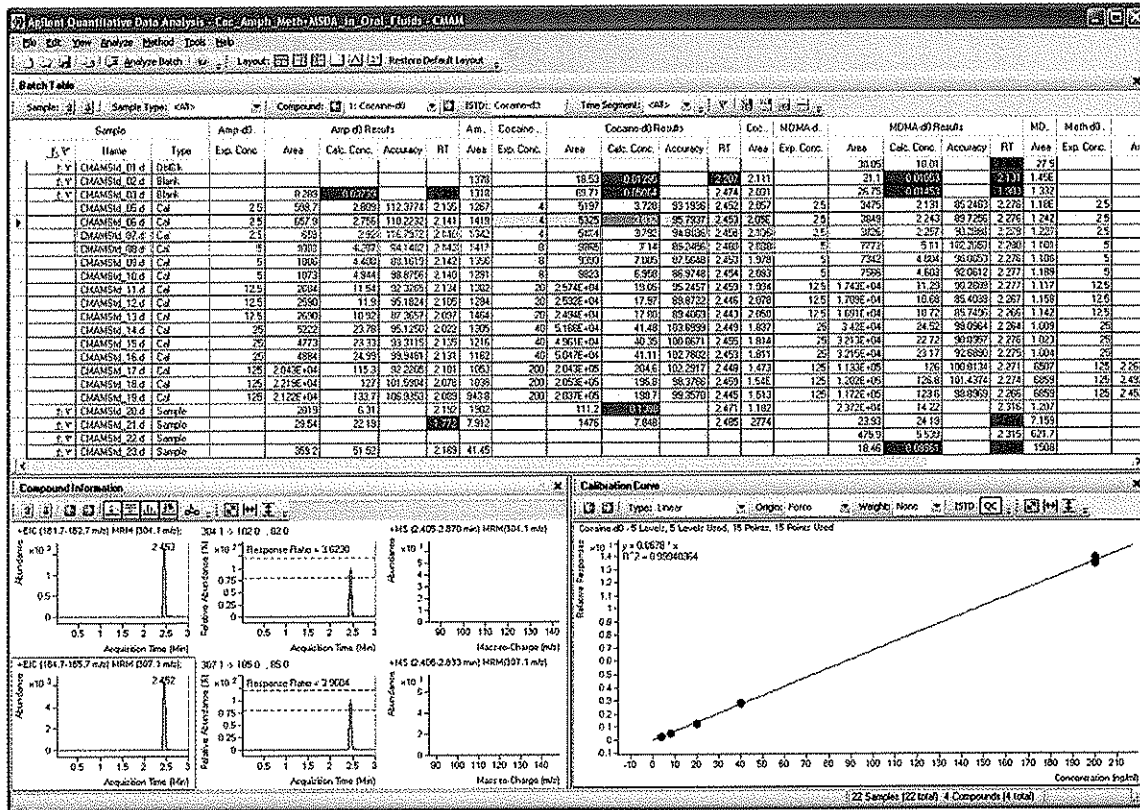
- Calibration curves are automatically updated when you reintegrate a peak.
- **Review an entire batch at once** – The batch-at-a-glance interface helps you review more samples more easily.
- **Outlier values are automatically flagged** – Color coding focuses your attention where it is needed.



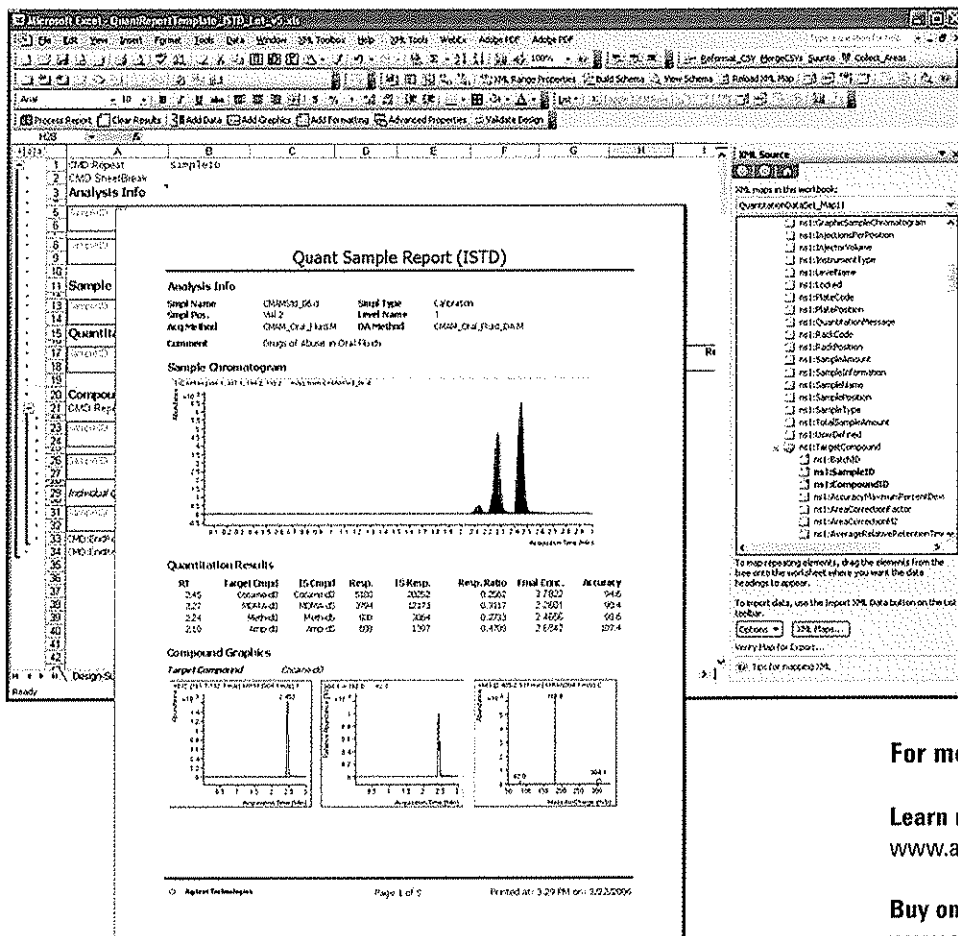
MassHunter Workstation software for the 6410 includes a range of calibration options, from manual tuning to the fully automated autotune program shown here that ensures maximum performance with minimum effort



The curve-fit assistant automatically tests all possible fits and provides statistics on their quality, making it easy for you to select the best fit



The "batch-at-a-glance" interface allows you to navigate the results on a compound- or sample-centric basis. Dynamic linking of compound results and color coding of outliers help you focus on problem data and significantly speed up results review. Shown here is quantitation of four drugs of abuse with ISTDs in oral fluid.



For more information

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Flexible reporting

With the MassHunter Workstation software, reporting is fast and flexible.

Preconfigured templates simplify basic reports, or you can create custom reports in the familiar Microsoft® Excel user interface. Processed results and

system parameters are stored in XML, a standard data interchange format, so they can easily be imported into proprietary databases or informatics systems.

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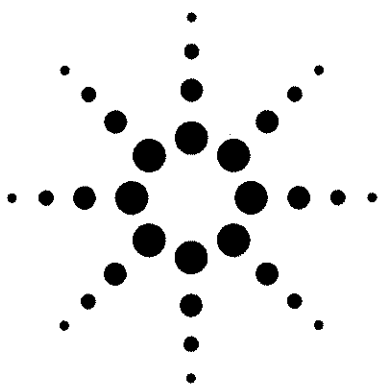
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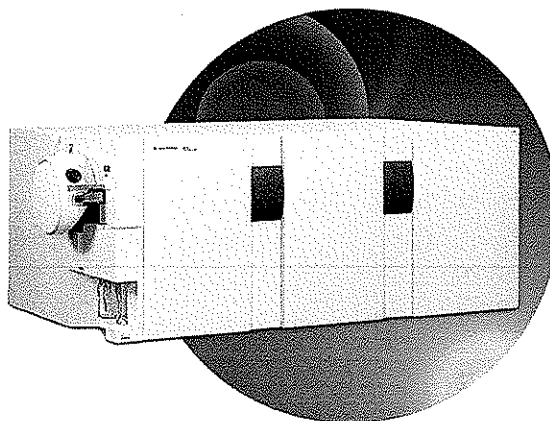


Agilent Technologies



Agilent 6410B Triple Quadrupole LC/MS

Data Sheet



The Agilent 6410B Triple Quadrupole LC/MS achieves sensitivity and resolution specifications after autotune without manual user intervention.

Parameter	Measure	Specification
Electrospray ESI MS/MS sensitivity	1 pg of reserpine injected on column, ESI source (G1948B), quantifying on the transition m/z 609 to 195.	Signal-to-noise ratio >50:1, where noise = 3x RMS
Multimode ESI/APCI MS/MS sensitivity	1 pg of reserpine injected on column, multimode source (G1978B) in mixed ESI/APCI mode, quantifying on the transition m/z 609 to 195	Signal-to-noise ratio >60:1 where noise = 3x RMS
ESI MS/MS sensitivity with the LC/MS QQQ HS Upgrade Kit	1 pg of reserpine injected on column, ESI source (G1948B), quantifying on the transition m/z 609 to 195	Signal-to-noise ratio >100:1 where noise = 3x RMS
Mass range		m/z 15–2000
Polarity switching		Switch from positive ion mode to negative ion mode in 500 ms
Mass resolution		Three settings (FWHM) Unit: 0.7 u; Wide: 1.2 u; Widest: 2.5 u
Mass accuracy		0.1 u across the mass range
Mass stability		<0.15 u in 24 h
Dynamic range		>6.0 × 10 ⁶
Scan rate		5,200 u/s
Scan modes		MS scan, MS/MS product ion scan, MRM, MS/MS neutral loss/gain scan and precursor ion scan, SIM
Minimum MRM dwell time		5 ms
MRM transitions		200 per time segment, >10,000 MRMs possible in a method
Collision cell		High-pressure, hexapole with linear acceleration
Cross-talk		None detectable



General System Specifications

Parameter	Measure
Single point of control	Single-point data system method capability with full control of Agilent 1100 and 1200 Series HPLC systems and 6410B (G6140B) Triple Quadrupole LC/MS
Time programming	<ul style="list-style-type: none"> • Polarity change in time segment • Scan and SIM or MRM (plus other modes of data collection) • Solvent divert through calibrant delivery system valve • Possible 99 time segments with potential 200 MRMs per time window
Wide range of ionization sources	<ul style="list-style-type: none"> • Electrospray (ESI) • Nanospray with HPLC-Chip Cube MS interface • Atmospheric pressure chemical ionization (APCI) • Multimode source (simultaneous ESI and APCI) • Atmospheric pressure photoionization (APPI)
Autotune	Automated optimization of ion optics and mass axis calibration for ESI, multimode, and nanospray with HPLC-Chip Cube MS interface
Solvent declustering	Countercurrent gas
Detector	High-energy conversion dynode and high-gain electron multiplier horn
Vacuum system	One triple-stage turbomolecular pump with one mechanical pump

Ordering Information

Description	Product Number
LCMS Triple Quad ES Bundle Includes G6410B Triple Quadrupole LC/MS, G1948B electrospray ion source, workstation data system (PC) and printer, MassHunter Workstation software with 2 data analysis software licenses. Includes 24 hours installation and familiarization training, and image recovery service.	G6410BA
LC/MS QQQ HS Upgrade This upgrade kit adds a second turbomolecular pump to the 6410B and increases the S/N noise specification two fold. Includes installation.	G2573A
Multimode Ion Source Includes multimode spray chamber and multimode nebulizer for simultaneous electrospray and APCI	G1978B

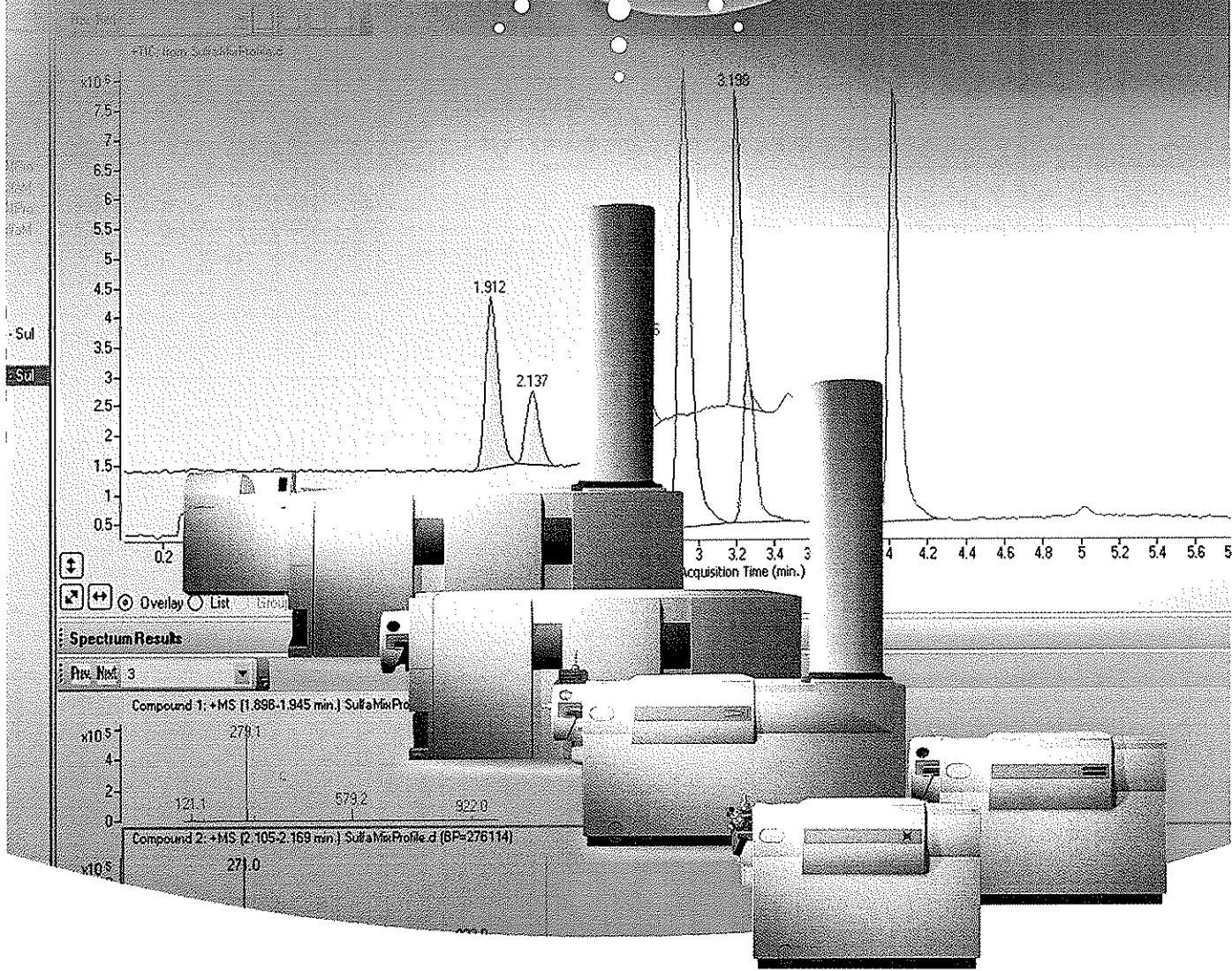
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**Introducing the New
Agilent MassHunter Workstation Software
for 6000 Series LC/MS Systems**
All the performance. All the time.



Control. Acquire. Analyze. Agilent MassHunter Workstation Software.

The all new Agilent MassHunter Workstation software provides intuitive, yet powerful, instrument control, data acquisition, and qualitative and quantitative data analysis for your Agilent 6410 Triple Quadrupole and 6510 Q-TOF LC/MS systems. It can be complemented by new application-specific MassHunter software packages that provide even more power and streamlined operation for specialized analytical tasks.

Easier method set-up and instrument control

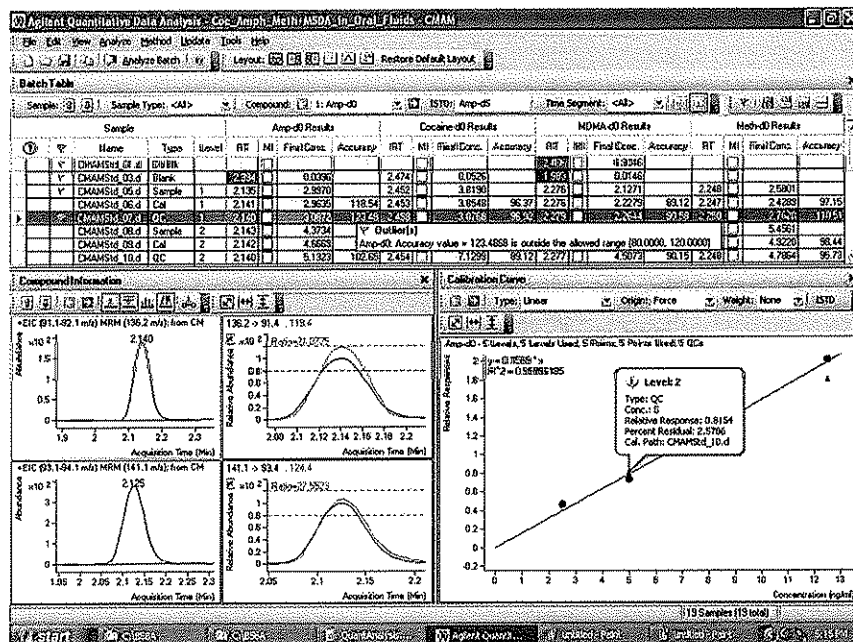
The MassHunter Workstation software makes instrument operation and method development as easy as possible. Fast, reliable automated tuning, a rarity in both triple quadrupoles and Q-TOFs, maximizes instrument performance without complicated manual adjustments. Creation of long worklists can be simplified by importing information from a CSV file. And you can adjust the real-time data monitoring to suit your needs and interests.

Better qualitative analysis

The MassHunter Workstation software's qualitative analysis tools allow you to immediately focus on the important aspects of data when reviewing chromatographic and mass spectral results. Advanced algorithms help you find all compounds, or "molecular features", in a chromatographic run, not just the peaks.

More powerful quantitative analysis

Application-centric quantitation in the MassHunter Workstation software ensures that you spend less time analyzing your data. It includes helpful features such as a curve-fit assistant, dynamically linked results, outlier flagging, batch-at-a-glance data review, and customizable views.



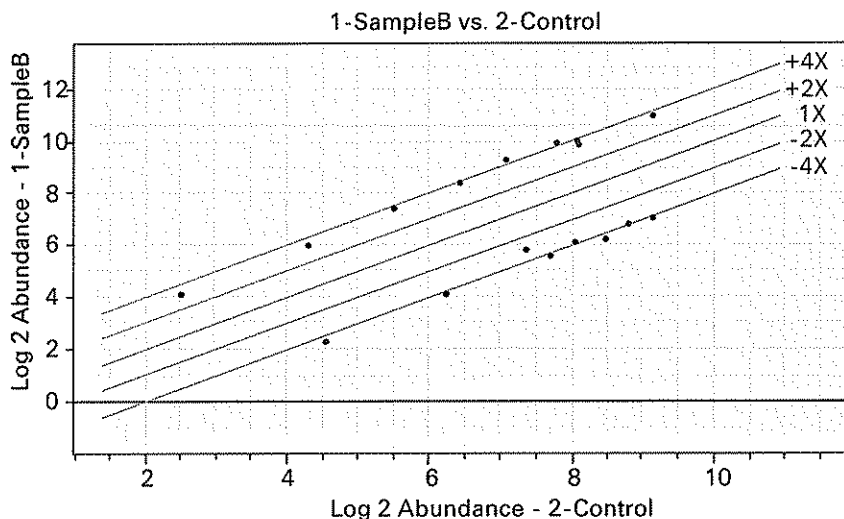
The MassHunter Workstation quantitative analysis software allows batch-at-a-glance data review, and includes effort-saving features like parameterless integration and a curve-fit assistant.

Customizable reports

Presenting critical information from your MS experiments allows you to make important scientific or business decisions. With the flexibility to fully customize reports, the MassHunter Workstation software also offers Microsoft® Excel capability for custom calculations and reporting while providing access to all system parameters through XML data interchange format.

Discover differentially expressed features with MassHunter Profiling software

For challenging expression profiling and biomarker discovery applications, the MassHunter Workstation software first simplifies a complex data set of accurate mass MS results with intelligent feature identification algorithms. Once relevant molecular features are identified, the MassHunter Profiling software employs a variety of statistical methods and visualization tools to allow the identification of meaningful differences between sample groups (e.g., healthy versus diseased). In addition, the profiling software calculates ratios of abundances of differentially expressed features, and allows flexible selection of the comparison criteria and inspection of any selected feature.



Log2-Log2 abundance plot from MassHunter Profiling software makes it easy to identify features that are differentially expressed (up and down) between samples.

Use Spectrum Mill software for protein identification and quantitation

Spectrum Mill for MassHunter Workstation quickly identifies proteins and peptides via fast database searches, and provides automatic and manual match validation. The Spectrum Mill software also offers *de novo* spectral interpretation for peptides not found in any database. Proteins of interest can be quantified by comparing relative abundances of all component peptides observed for a given protein, revealing twofold or higher changes in relative abundance without the need for labeling. When preferred, Spectrum Mill software supports stable- isotope-based and other labeling strategies.

E_51_Br36 #spectra intensity	E_59_Br26 #spectra intensity	E_69_Br35 #spectra intensity	E_67_Br42 #spectra intensity	E_70_Br43 #spectra intensity	N_52_Br29 #spectra intensity	N_54_Br28 #spectra intensity	N_56_Br34 #spectra intensity	N_55_Br36 #spectra intensity	N_58_Br39 #spectra intensity	Protein Name
							0	2	1	CALGRANULIN A(MIGRATION INHIBIT
0						0	0	4	4	C-REACTIVE PROTEIN PRECURSOR
0.00e+000					0	0	0	4.19e+007	2.2e+007	RHO GDP-DISSOCIATION INHIBITOR 2
					0.00e+000	0	0	4.01e+007	0.00e+000	PROFILIN 1
				0	2			0		HEMOGLOBIN ALPHA CHAIN
				0.00e+000	3.72e+007			0.00e+000		MUMFONDOLOBULIN J CHAIN
	0		0							APOLIPOPROTEIN G PRECURSOR
0.00e+000										
						5		5	0	transalpha2-macroglobin inhibitor family heavy
5.20e+007				0	0	1		1	0	I4-3-3 PROTEIN BETA/ALPHA (PROTEI
0.00e+000				0.00e+000	0.00e+000	2.76e+007	0	5.34e+007		Ig G1 H N α
0				0	0	0	0	0	0	OSTEOPONTIN PRECURSOR (BONE SI
0.00e+000			0	0	0	0	0	0	0	TRIOSEPHOSPHATE ISOMERASE (TM)

Spectrum Mill for MassHunter Workstation can accurately determine not only protein identities, but relative abundances of a given protein in multiple samples. Color coding makes relative abundances apparent at a glance.

Positively confirm peptide and protein identities with MassHunter Bioconfirmation software

Agilent MassHunter Bioconfirmation software is ideally suited for recombinant protein expression and process development, known-protein characterization, or synthetic peptide confirmation. Our bioconfirmation software will help you confirm identities and identify variants before you start expensive testing.

The bioconfirmation software program employs sophisticated algorithmic tools for truly automated, unattended or interactive confirmation and characterization of recombinant proteins or synthetic peptides. The result is accurate determination of the mass and abundance of each peptide.

Peptides produced from in silico digestion

Index	Location	Target Mass	Links	Sequence	Modifications	Reagent	Missed Cleavage
1	A(7-9)	728.4116		MRPVR		Trypsin	0
2	A(7-23)	1840.9539		ALLACAVLGLCADPEP	Alkylation (iodoacetamide)	Trypsin	0
3	A(24-26)	374.2278		TVR		Trypsin	0
4	A(27-37)	1345.6085		WCTISTHFAEK	Alkylation (iodoacetamide)	Trypsin	0

Match Results

Index	RT (min)	Abundance	Measured Mass	Theoretical Mass	Delta ppm	Location	Sequence	Modificati...	Links	Reagent	Descripti...
1	0.2658	5.8694	1345.8052	1345.8085	-2.4611	A(27-37)	WCTISTHFAEK	Alkylation...		Trypsin	Complete
2	0.2300	2.7771	1345.8038	1345.8085	-3.4558	A(27-37)	WCTISTHFAEK	Alkylation...		Trypsin	Complete
3	0.2891	22.5838	1344.6870	1344.6904	-2.5916	A(49-59)	ILESQPFVSVK	Alkylation...		Trypsin	Complete
4	0.7080	157.2305	3951.0401	3951.0338	0.5815	A(69-106)	ASINSEADAV			Trypsin	Complete
5	0.2669	21.2998	6603.7940	6603.7955	-2.9118	A(107-120)	INPDTHTYA			Trypsin	Complete

When analysis of recombinant proteins indicates that the wrong protein was produced, the interactive Sequence Editor/Matcher in the Bioconfirmation software helps locate the site of the modification.

For more information

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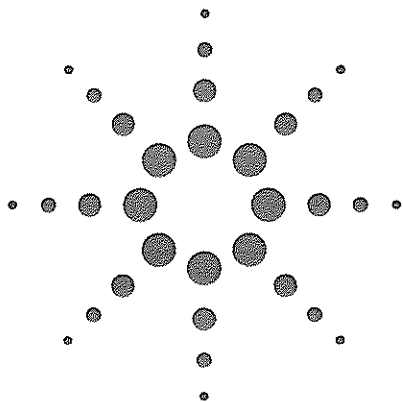
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 5989-4895EN



Agilent 1200 Series Rapid Resolution LC System

All the Performance. All the Time.

- Up to 20 times faster than HPLC
- 60% higher resolution than HPLC
- Throughput of 2000 samples per day
- Peak capacity of 500 in 30 minutes
- Full compatibility with HPLC methods
- Agilent intelligent services

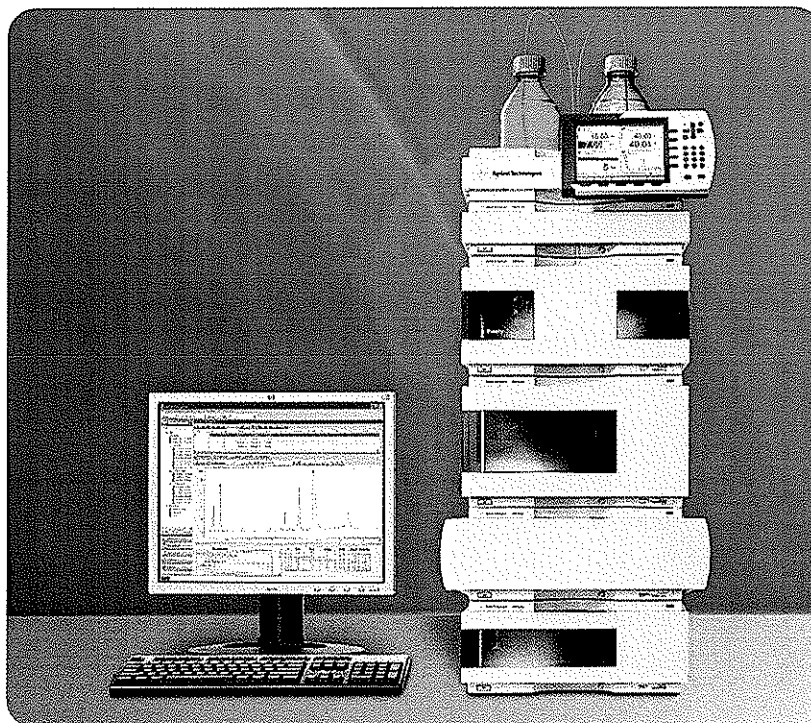
Fastest, most efficient and most flexible LC system in the world

Increasing productivity, confidence in analytical results and cost-effectiveness are key objectives in today's analytical laboratories.

The Agilent 1200 Series Rapid Resolution LC system (1200 Series RRLC system) is designed to meet these challenges with a universal LC system for analytical flow rates ranging from 0.05 to 5 mL/min. The system provides a new world of RRLC and RRLC/MS performance, accompanied by all the capabilities of conventional 1200 Series HPLC instruments. In addition, the Agilent 1200 Series Rapid Resolution LC system offers new levels of serviceability, uptime and compliance.

Speed

The Agilent 1200 Series RRLC system, equipped with new, second generation ZORBAX Rapid Resolution HT 1.8- μ m columns, enables analysis that is up to 20 times faster than HPLC, while maintaining the high quality resolution, precision and sensitivity that HPLC is known for.



Resolution

150-mm long ZORBAX Rapid Resolution HT columns provide 60% higher resolution than HPLC columns with the same dimensions, making it possible to resolve more trace level impurities than ever before and to achieve peak capacities of more than 600.

Flexibility

The 1200 Series RRLC system provides full support for narrow and standard bore columns 10 – 300 mm in length, with internal diameters from 1 to 4.6 mm and particle sizes ranging from 1.5 to 10 μ m. This enables RRLC methods using columns with particle size < 2 μ m, as well as HPLC methods with particle size > 2 μ m, to be run without limitations. This unique flexibility gives users confidence that they have made a secure investment

in an instrument which fulfills today's requirements and is prepared to meet the requirements of the future.

Reliability and compatibility

With more than 60,000 installed systems throughout the world, the Agilent 1100 Series LC system technology has a well-earned reputation for excellence. The new Agilent 1200 Series RRLC system builds on the design of the highly successful Agilent 1100 Series to provide highest analysis speed and resolution, while keeping system pressure at a minimum. Consequently, the system maintains the robustness, performance and operating principles of conventional HPLC instruments and methods. Users familiar with running an HPLC instrument will immediately feel at home with the 1200 Series RRLC system, with no need to retrain.



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A New Level of Analysis Speed – for a New World of Lab Productivity and Cost Effectiveness

Speed

Short rapid resolution HT columns with 1.8- μ m particles offer a unique opportunity to dramatically reduce analysis time by increasing flow rate and temperature, without loss of separation performance. The Agilent 1200 Series Rapid Resolution LC system has been optimized for lowest pressure at high flow rates in order to achieve highest analysis speed. Combined with increased temperatures of up to 100 °C, linear flow rates of more than 15 mm/s can be achieved on 50-mm RRHT columns. This represents gains in analysis speed of up to 20 times that of conventional HPLC methods.

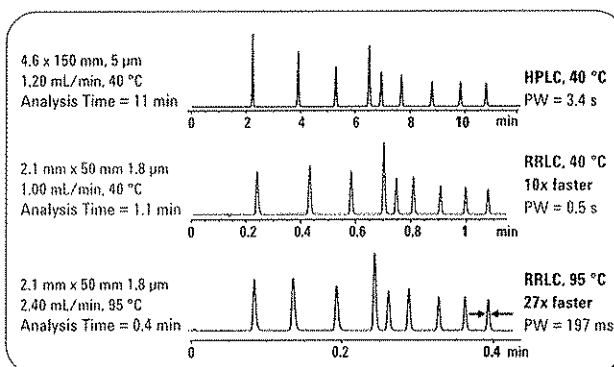
Shorter time-to-result increases lab productivity and reduces the overall cost-per-analysis significantly, typically by more than 70%.

Throughput of 2000 Samples per Day

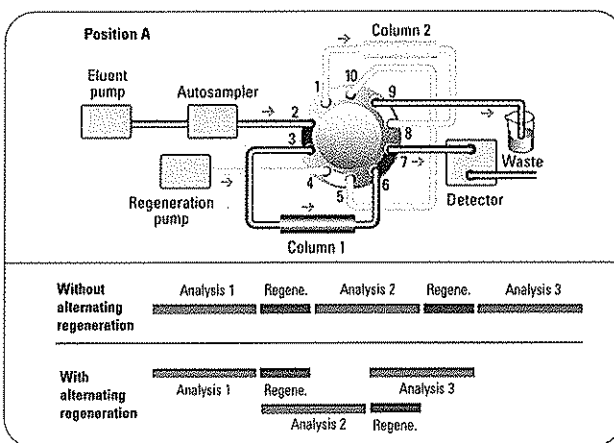
A special high-throughput (HT) configuration of the 1200 Series RRLC system enables maximized productivity for laboratories with high sample loads. While one column is used for the analysis the second column is washed and regenerated by a second regeneration pump. After the last peak has eluted the 2-position/10-port valve is switched and the next run can be started immediately. With this HT configuration cycle times can be reduced by up to 50%.

Maintaining resolution in ultra-fast RRLC separations

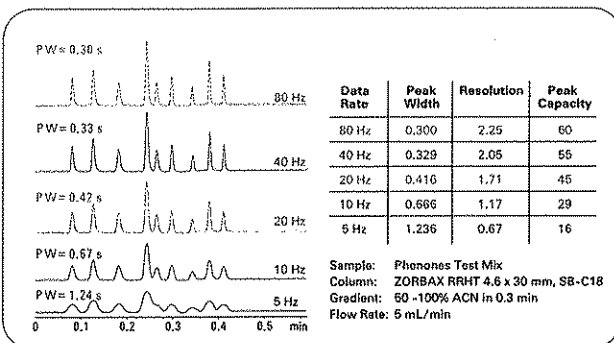
Ultra-fast RRLC applications can generate peak widths as narrow as 0.2 seconds. To keep up with the separation speed delivered by RRLC, the 1200 Series Rapid Resolution LC system is equipped with high-speed UV-visible and MS detectors to provide uncompromised resolution in ultra-fast RRLC separations.



RRLC provides speed gains of 10x at unchanged temperature and 27x at increased temperature versus HPLC. Sample: phenone mix



Throughput of more than 2000 samples/day can be achieved by alternating column regeneration (ACR).

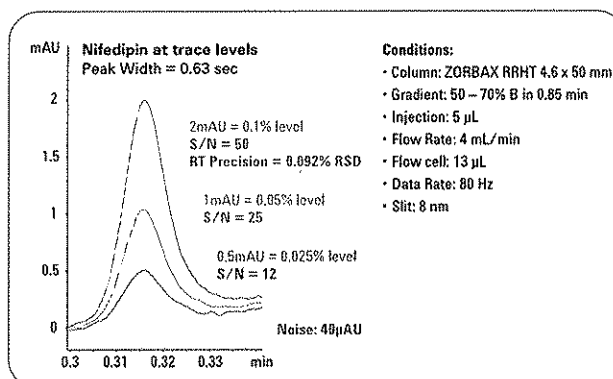


80-Hz sampling rate of the Agilent 1200 Series DAD SL provides resolution and peak capacity gains of 90% (30%) relative to 10-Hz (20-Hz) sampling rates.

Maintaining sensitivity in ultra-fast RRLC separations

The 1200 Series DAD SL and MWD SL have new low-noise flow cell design, new low-noise diode-array electronics, and new electronic temperature control (ETC), which minimizes baseline noise and drift, even under harsh and fluctuating ambient temperature and humidity conditions.

Combining these innovations enables accurate quantification, peak purity analysis and spectral identification, even at trace level, working with data rates of up to 80 Hz. This exceptional capability of the new 1200 Series DAD SL means that your ultra-fast RRLC methods achieve the same limit of detection as HPLC methods, complying with the strictest regulatory performance requirements.

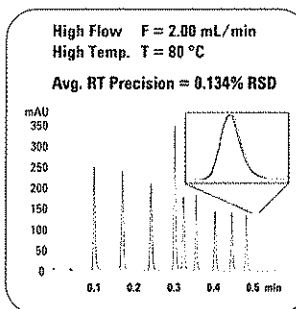
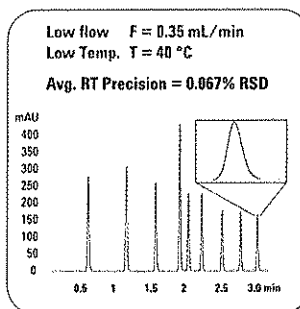


Lowest detector noise, even under demanding ultra-fast RRLC conditions, allows accurate simultaneous quantitation of main compounds and trace level impurities at levels smaller than 0.05% of the main compound – all from a single run.

Maintaining retention precision in ultra-fast RRLC separations

The new electronic damping control (EDC) of the 1200 Series binary pump SL, combined with improved Peltier temperature control of mobile phase and column, provides highest RT precision and baseline stability under the most demanding ultra-fast RRLC conditions.

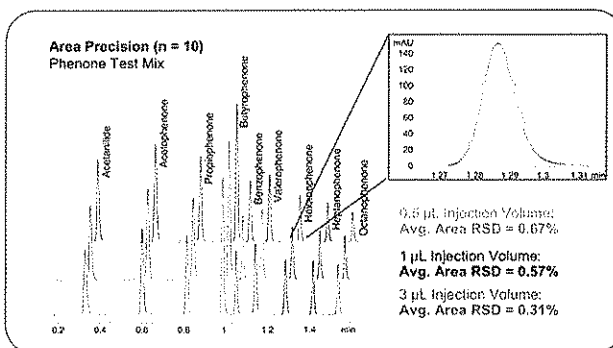
Even at the highest linear flow rates of more than 14 mm/s and temperatures up to 100 °C, the reproducibility of the 1200 Series Rapid Resolution system fulfills the most demanding requirements.



Highest retention time precision is achieved under both low speed and highest speed RRLC conditions.

Maintaining area precision in ultra-fast RRLC separations

The new injection valve technology of the 1200 Series high-performance autosampler SL enables precise and robust high-speed injections at pressures up to 600 bar. The flow-through design, together with overlapped injections, delivers cycle times of less than 30 s, while keeping carryover below the limit of detection. Variable loop technology ensures highest injection volume linearity from 0.1 to 100 µL, without loop change, making the autosampler compatible even with smallest sample amounts.



Precise high-speed injections using the Agilent 1200 Series Rapid Resolution LC system ensure highest area precision in RRLC applications, even at very small injection volumes of 3 µL and less.

A New Level of Efficiency – for a New World of Information and Confidence

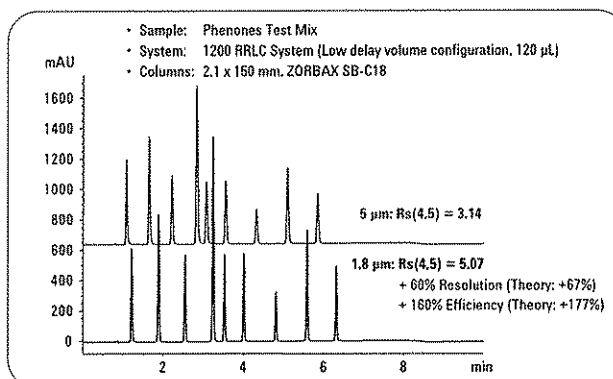
Resolution

Long Rapid Resolution HT columns with 1.8- μm particle size offer the unique opportunity to increase the chromatographic efficiency and resolution, thereby increasing knowledge of the analyzed sample and, ultimately, the confidence in analytical results.

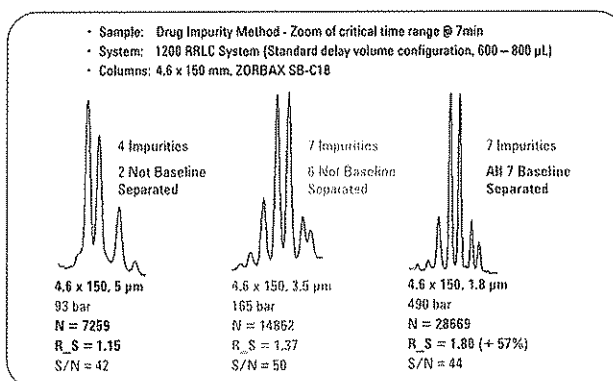
Pressure and delay volume optimization of the 1200 Series Rapid Resolution LC system allows usage of both narrow and standard bore rapid resolution HT columns 150 mm in length. This provides efficiencies of close to 30,000 plates, enabling a gain of up to 60% in chromatographic resolution compared to conventional HPLC, in the same analysis time and with the same or improved precision and sensitivity.

Peak capacity

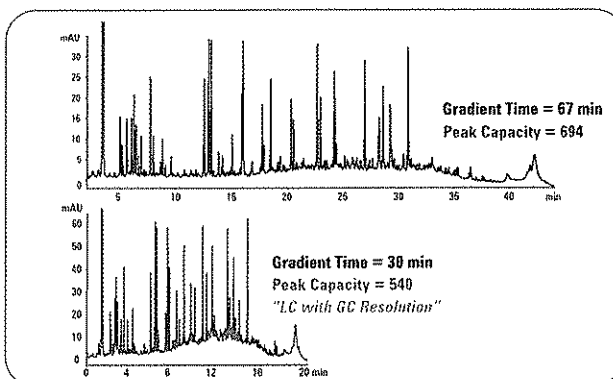
150-mm RRHT columns are also the first choice for the analysis of complex samples. Depending on gradient time, peak capacities of 700 and more can be achieved, providing a new dimension of information in both LC and LC/MS applications. The increased temperature range of up to 100 °C even allows coupling of several RRHT columns to achieve efficiencies of more than 50,000 plates on 1.8 μm RRHT columns and more than 80,000 plates on 3.5 μm and 5 μm columns.



Using a narrow bore 2.1 x 150 mm, 1.8- μm Rapid Resolution HT column on the Agilent 1200 Series RRLC system in a low delay volume configuration provides a 60% gain in resolution compared to a 5- μm particle size column of same dimension.



Using a standard bore 4.6 x 150 mm, Agilent 1200 Series RRLC HT column on the Agilent 1200 Series RRLC system in standard delay volume configuration gives 57% gain in resolution compared to a 5- μm particle column of same dimension, with the same sensitivity or S/N.



Peak capacities of more than 700 can be achieved using a ZORBAX 1.8 μm RRHT SB-C18, 2.1 x 150 mm column to analyze a peptide map of tryptic digest of BSA.

A New Level of Flexibility – for Maximum Method Freedom and Minimized Investment Costs

Two tasks – one system

The 1200 Series Rapid Resolution LC system not only complies with new RRLC applications but also with traditional HPLC methods giving users the confidence of a secure investment that fulfills the requirements of today and the future. It supports narrow and standard bore columns with internal diameters from 1 to 4.6 mm, 10 – 300 mm in length and particle sizes ranging from 1.5 to 10 μm . This unique flexibility and scalability is enabled by the configurable delay volume of the 1200 Series binary pump and the ability to optimize the hydraulic path of the instrument and flow cell volume of the UV detector for any analytical condition.

The standard delay volume configuration makes it possible to run both standard bore RRLC and HPLC methods on a single instrument configuration – without compromising performance or needing to revalidate methods.

The low delay volume configuration with 120 μL provides optimum support for high-speed, narrow bore LC and LC/MS applications.

Method development flexibility

More than 80 ZORBAX 1.8- μm RRHT columns are available in various bonded phases, from 20 to 150 mm in length, with internal diameters from 1 to 4.6 mm. They provide a wide range of selectivity and efficiency choices for maximized method flexibility.

RRHT columns use the same chemistry as ZORBAX 3.5 and 5- μm particle columns. As a result, all bonded phases with 5, 3.5 and 1.8- μm particle size provide identical selectivity, which allows for easy, fast and secure method transfer from HPLC to RRLC and vice versa.

The standard delay volume configuration of the 1200 Series Rapid Resolution LC system allows HPLC methods to be run with minimum RT-shifts of less than 2%. This enables unambiguous peak tracking and ID and eliminates the need to revalidate HPLC methods.

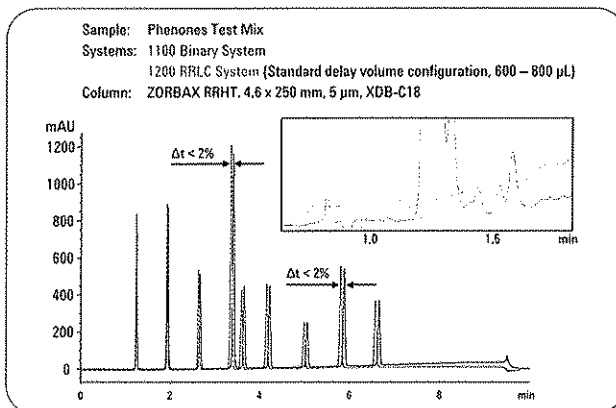
		1200 RRLC	Standard HPLC
RRLC Narrow Bore	Ultra-fast		
	High-resolution		
RRLC Standard Bore	Ultra-fast		
	High-resolution		
HPLC – Narrow bore			
HPLC – Standard bore			

Narrow bore:	1–21 mm ID	Full Compatibility	Legacy Compatibility
Standard bore:	3–40 mm ID		
Ultra-fast:	10–50 mm length		
High-resolution:	100–150 mm length		

The Agilent 1200 Series RRLC system offers uncompromised support of RRLC and HPLC methods on both standard and narrow bore columns.

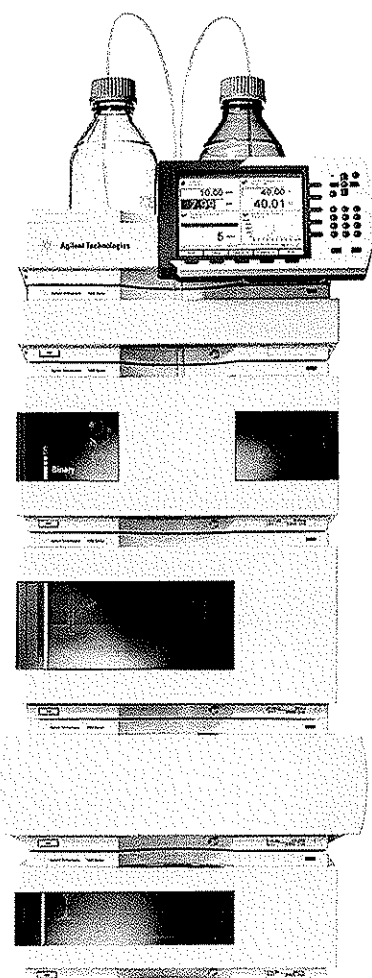
	Narrow Bore		Standard Bore		
	1 mm ID	2.1 mm ID	3.0 mm ID	4.6 mm ID	
High-Resolution	150	150	150	150	1200 RRLC
	100	100	100	100	
	50	50	50	50	
Ultra-Fast		30	30	30	1100 Binary
		20	20	20	

Supported sub-two micron column dimensions on different systems. The Agilent 1200 Series RRLC system offers full support of standard and narrow bore 1.8- μm ZORBAX RRHT columns from 20 to 150 mm in length.



The standard delay volume configuration allows to run not only RRLC but also traditional HPLC methods without compromising performance or changing chromatographic pattern.

The 1200 RRLC System – New Modules for a New World of Performance and Flexibility



ZORBAX Rapid Resolution HT 1.8-µm Columns

- Choice of more than 80 columns covering a broad range of phases and dimensions for greatest flexibility
 - Internal diameter: 1 – 4.6 mm
 - Length: 20 – 150 mm
- Engineered particle size distribution reduces pressure and enables higher analysis speed and resolution
- SB-C18 columns allow stable operation at temperatures of up to 100 °C for even more speed and resolution
- RRHT columns have the same chemistry and, consequently, same selectivity as ZORBAX 3.5 and 5 µm columns, which facilitates easy, fast and secure method transfer from HPLC to RRLC and vice versa

Agilent 1200 Series Binary Pump SL

- Configurable delay volume from 600-800 µL down to 120 µL, flow rates up to 5 mL/min and 600 bar pressure provide universal applicability in narrow and standard bore HPLC and RRLC with column IDs from 1 to 4.6 mm
- New Electronic Damping Control (EDC) provides highest RT precision and baseline stability
- Optimum support of analytical LC/MS applications with 120-µl delay volume

Agilent 1200 Series High-Performance Autosampler SL

- High-speed 600-bar injector with new µ-valve design for highest instrument and column robustness at high pressures
- Cycle times < 30 s with overlapped injections
- Highest precision and linearity from 0.1 to 100 µL without loop change

Agilent 1200 Series Thermostatted Column Compartment SL

- Up to 100 °C for higher speed and resolution in RRLC
- Two independently controllable heat exchangers with configurable volumes allow optimized pre-column heating and post-column cooling for lowest detection limits in ultra-fast, high-temperature applications for both narrow and standard bore columns
- Improved Peltier control provides temperature stability of ± 0.05 °C for minimized baseline noise in high-flow, high-temperature ultra-fast RRLC applications
- 600-bar 2-position/10-port valve enables minimized cycle times by alternating column regeneration to allow for highest throughput of more than 2000 samples/day

Agilent 1200 Series Diode Array Detector SL

- 80-Hz data acquisition of full spectra and up to 8 signals provide maximum resolution and sample information in ultra-fast RRLC applications
- New flow cell design, low-noise electronics and electronic temperature control for highest sensitivity in ultra-fast RRLC applications
- Data recovery card provides "data-never-lost insurance"
- RFID-tags of flow cells and lamp provide new level of data traceability

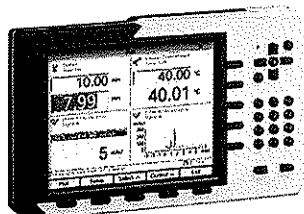
Agilent 1200 Series Variable Wavelength Detector SL

Cost-effective, 55-Hz high-speed detector for highest resolution and sensitivity in ultra-fast RRLC applications

New Instrument Control, Data Analysis and Services – for a New Level of Usability, Uptime and Robustness

Agilent 1200 Series instant pilot

- Cost-effective, standalone solution for single instrument control
- Provides full instrument, method and sequence control and display of online signals



New ChemStation for faster data analysis and review

A new user interface enables you to analyze and review large amounts of data in a much shorter time.

- Level 5 instrument control for your Agilent instruments
- Control of LC/MS, GC/MS, CE, CE/MS and generic A/D converters
- Built-in macro language enables easy customization and software supports numerous add-ons
- Seamless integration of 3rd party detectors (ESA CAD and CCIII)

EZChrom Elite for maximum flexibility and compliance

An easy to use software solution for labs with instruments from multiple vendors.

- Full compliance features
- Powerful and flexible reporting capabilities with automated spreadsheet calculations
- SMART sequencing for flexible automation tasks
- Easy scale-up from workstation to client-server system

Agilent OL ECM reaches beyond the single laboratory

The Enterprise Content Management system (ECM) enables you to acquire and organize your data across laboratories and departments.

- Saves all documentation and data in a single repository
- Organize and retrieve data using advanced search engines
- Enables several people to rapidly and easily review a complete result set for a sample, including graphical results

Agilent intelligent services

Agilent intelligence services provide a new generation of services with on-demand remote connectivity for a new level of productivity.

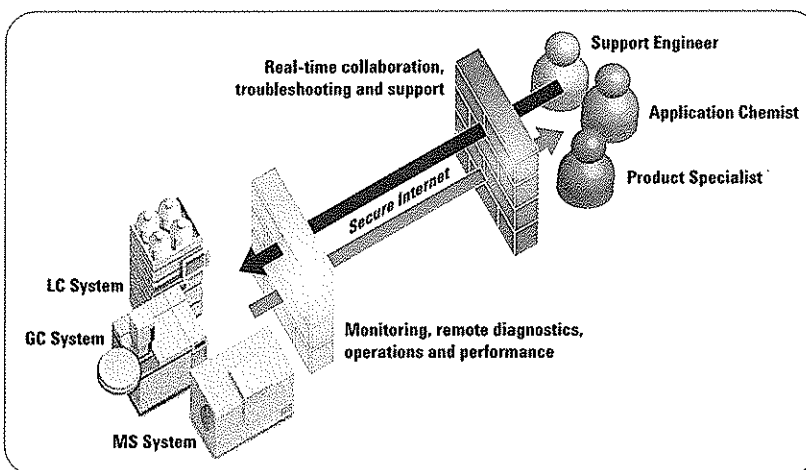
- Push for Help: Agilent LC diagnostics instrument status report includes all important information, e.g. error log book, system configuration, EMF and guidance report
- Secure, streamlined communication between your lab and the Agilent support organization
- Proactive monitoring of instrument performance and utilization

Agilent system intelligence

- Early Maintenance Feedback (EMF) tracks system usage and alerts you for timely replacement of parts
- Column identification module records column parameters (such as number of injections, particle size), maximizes pressure and provides a unique column signature
- Patented RFID tracking technology in the DAD SL saves all relevant meta data from the flow cells and UV lamp
- Control Area Network (CAN) provides inter-modular, real-time communication for reliable operation, regardless of PC failures or network interruptions
- Software independent LC diagnostic tool assists users and the support experts interpreting the instrument status

Compliance Enterprise Edition

Agilent can now streamline compliance procedures across your entire company and save you time and money with Enterprise Edition, a new qualification service built on a new software – the patent-pending *Agilent Compliance Engine (ACE)*. With ACE you can configure every step in your protocol from tests, limits and set points to the size and detail of your reports.



Agilent 1200 Series Rapid Resolution LC System Specifications

Selected System Specifications

Pump delay volume:	Configurable <ul style="list-style-type: none">• Low delay volume configuration: 120 μL• Standard delay volume configuration: 600 – 800 μL
Flow rate range:	0.05 – 5 mL/min
Maximum pressure:	600 bar
Injection volumes:	0.1 – 100 μ L without loop change or hardware modification, no overflow (drawn = injected volume), up to 1500 μ L with multiple draw kit
Column dimensions:	Length: 10 – 300 mm, ID: 0.05 – 8 mm
Maximum Column Capacity:	Three 300 mm columns
Temperature range:	10 °C below ambient – 100 °C
Temperature stability:	< \pm 0.05 °C

Performance Specifications

Maximum linear velocity:	> 15 mm/s on 50-mm ZORBAX 1.8- μ m RRHT column (water/ACN gradient)
Flow precision:	< 0.07 % RSD, or \leq 0.02 min SD whatever is greater, based on retention time at constant room temperature
Flow accuracy:	\pm 1% or 10 μ L/min whatever is greater
Composition precision:	\leq 0.15% RSD at 1 mL/min
Composition accuracy:	\pm 0.35% absolute
Injection volume precision:	typically < 0.25 % from 5 – 100 μ L, < 1 % from 1 – 5 μ L
Injection cycle time:	< 30 sec using 5 μ L injection volume
Carry over:	< 0.01%
UV baseline noise:	< \pm 0.8 \times 10 – 5 AU, at 254 nm and 750 nm (1200 DAD SL and MWD SL)
UV baseline drift:	< \pm 0.9 mAU/h at 254 nm (1200 DAD SL and MWD SL)
Linearity:	> 2 AU upper limit
Maintenance and system test:	Front access to all maintenance parts Maintenance instructions on multimedia CD-ROM Time for full system test (OQ/PV) < 4 hours
Standard GLP features:	Early Maintenance Feedback—EMF (tracks lamp burn time, usage, number of injections, with limits and feedback messages)
Extended GLP features: (for systems incl. MWD SL or DAD SL)	Data Recovery Card (DRC) for data security (prevents data losses due to communication breakdowns) Radio Frequency Identification (RFID) for data traceability (RFID tags for flow cells and UV lamp allow unambiguous traceability of measurement conditions)
System control:	Through local workstation software, client/server network data system and/or local handheld control module (1200 Series instant pilot). Default control: LAN/CAN

www.agilent.com/chem/1200RR

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