



HPLC Challenges and Solutions

**A guide to improved
HPLC routines**





Assistance



Confidence



Investment



Sustainability

HPLC Made for Tomorrow

Whether you are looking for assistance with your daily HPLC routines, confidence in your HPLC results, protecting your HPLC investments, or supporting your sustainability goals, Agilent products can help support your lab's HPLC goals for both today and tomorrow. See how your lab can benefit from the solutions to HPLC challenges that Agilent has to offer.

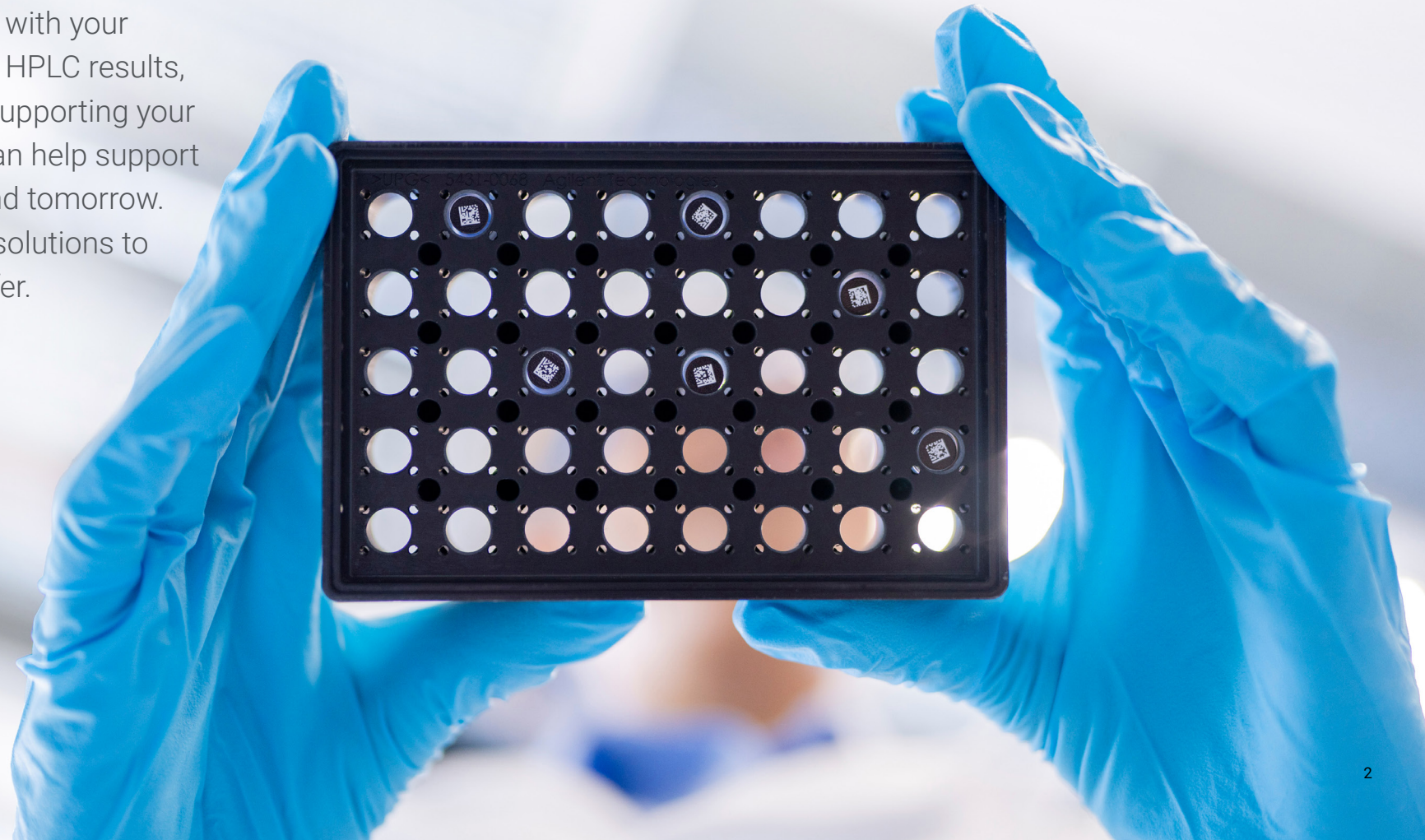




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Sustainability

Assisting with Your Daily HPLC Routines



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System Handling

Instruments, columns, and supplies |

Challenge	Solution	Benefit	Agilent Solutions	Compatible Agilent HPLC Instruments*
Reconfiguring or moving LC systems in the lab takes too much time	Adjustable benches enable easy and safe access to instrument components, solvent bottles, pumps, columns, and accessories, and even allow moving complete systems	Saves time and maintains flexibility	Agilent InfinityLab Flex Bench Family View flyer ↗	1, 2, 3, 4, 5, 6
Performing manual LC system start up and shut down procedures is time-consuming	Automated, programmable, and schedulable system start up and shut down tasks, which can also be controlled remotely	Minimizes hands-on time in front of system	Agilent InfinityLab Assist Tasks Screen View white paper ↗	1, 2, 3, 4, 5, 6
Manual purging of LC system is necessary, requiring more hands-on time	Automated purge via pump and autosampler	Minimizes hands-on time in front of system	Agilent InfinityLab Assist Smart Purge View white paper ↗	1, 2, 3, 4, 5, 6
Unexpected downtime needs to be reduced	Built-in system trend data on solvents, ambient temperature, and runs per day	Avoids downtime before it happens	Agilent InfinityLab Assist Insights—Instrument Trends View white paper ↗	1, 2, 3, 4, 5, 6
System downtime due to problems with column connections should be reduced	Fast and tool-free column connection up to 1300 bar	Creates a reliable connection with fewer damaged columns	Agilent InfinityLab Quick Connect Fitting View flyer ↗	1, 2, 3, 4, 5, 6, 7
Inconsistent results and long repair times need to be avoided	Track the performance of the LC system with standards	Lowers operational costs, supports proactive troubleshooting and maintenance of instrument	Agilent InfinityLab LC Performance Workflow View white paper ↗	1, 2, 3, 4, 5, 6, 7

* Compatible Agilent HPLC instruments:

1. 1290 Infinity III LC with High-Speed Pump

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3. 1260 Infinity III Prime LC System

4. 1260 Infinity III LC with Binary Pump

5. 1260 Infinity III LC with Quaternary Pump

6. 1260 Infinity III LC with Isocratic Pump

7. 1220 Infinity II LC System



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System Handling

Instruments, columns, and supplies |

Challenge	Solution	Benefit	Agilent Solutions	Compatible Agilent HPLC Instruments*
LC system issues need to be fixed quickly	System-integrated, professional, step-by-step guide to identify and fix the root cause and to run test procedures	Reduces time loss due to unplanned downtime	Agilent InfinityLab Assist Troubleshooting View white paper ↗	1, 2, 3, 4, 5, 6
Simple self-maintenance work needs to be carried out	Built-in, professional, step-by-step guide providing on-screen repair and maintenance instructions	Reduces time loss due to maintenance	Agilent InfinityLab Assist Maintenance View white paper ↗	1, 2, 3, 4, 5, 6
Independent testing, calibration, and maintenance of LC instruments are needed	An easy-to-use software with comprehensive tools can be used independent of any Chromatography Data System (CDS)	Quickly verify or recover instrument integrity	Agilent Lab Advisor Software View web page ↗	1, 2, 3, 4, 5, 6, 7
System activities must be tracked for audit reasons	Software function that provides automated recording of system actions	Easy traceability for regulated environments	Agilent InfinityLab Assist Log View white paper ↗	1, 2, 3, 4, 5, 6
Remote control and monitoring of single LC systems still needs a client/server CDS	Control and monitor system activities not only directly in front of the LC system, but also remotely via browser on a PC or mobile device	Reduces operator time in front of the LC system	Agilent InfinityLab Assist Remote View white paper ↗	1, 2, 3, 4, 5, 6

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System Handling

Software |

Challenge	Solution	Benefit	Agilent Solutions	Compatible Agilent HPLC Instruments*
Full remote control for all LCs in the lab is necessary	A networked, cloud-enabled solution that allows secure controlling and monitoring of all LC systems in the network	Be more productive while spending less time in the lab	Agilent OpenLab Software—Remote Access Capability View web page ↗	1, 2, 3, 4, 5, 6, 7
System hard disk is reaching capacity	Manage computing resources in real-time to prevent bottlenecks	Minimizes unexpected downtime	Agilent Status Board for OpenLab Watch video ↗	1, 2, 3, 4, 5, 6, 7
Need for manual calculations during chromatographic data analysis	Use custom calculator results to generate application-oriented results or quality-control statistics	Saves hours of manual calculation time	Agilent OpenLab CDS Custom Calculator View web page ↗	1, 2, 3, 4, 5, 6, 7
Holistic view of status of all LC systems is needed , without spending time walking around to inspect each system	Manage system workload centrally and send samples for analysis to all LC systems connected to the CDS	Get centralized view of all laboratory instrument assets	Agilent Sample Scheduler for OpenLab View web page ↗	—

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System Handling

Services |

Challenge	Solution	Benefit	Agilent Solutions	Compatible Agilent HPLC Instruments*
Getting real-time status of all instruments across the lab is necessary	Software solution with real-time notifications for replacing key instrument consumables, performing preventative maintenance, and identifying when an instrument stops running anywhere in the lab	Reduces unplanned downtime and provides streamlined access to service requests	Agilent CrossLab Connect View web page	1, 2, 3, 4, 5, 6, 7
Getting rapid, professional assistance with system faults and breakdowns is necessary	Full service with fast reaction time and guaranteed fix	Fast and transparent support, without hidden costs	Agilent CrossLab Service Plan View flyer	1, 2, 3, 4, 5, 6, 7
Gaining LC knowledge from other fellow professionals is needed	A user community that helps develop and maintain professional relationships among peers by providing mutual support	Gain new insights for your daily HPLC routine	Agilent Community View web page	1, 2, 3, 4, 5, 6, 7
Getting Agilent LC insight knowledge from Agilent experts is needed	The Agilent Knowledge Portal provides easy access to current operation, maintenance, best practices, and troubleshooting information	Gain new insights for your LC system handling	Agilent Knowledge Portal View web page	1, 2, 3, 4, 5, 6, 7

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Solvent Handling

Instruments, columns, and supplies |

Challenge	Solution	Benefit	Agilent Solutions	Compatible Agilent HPLC Instruments*
Need to avoid running out of solvent , breaking up a sequence	Measure the solvent level at any time and predict whether there is enough solvent for a run before starting a sequence	Ensure success of the analysis without empty runs	Agilent InfinityLab Level Sensing View web page ↗	1, 2, 3, 4, 5, 6
Manual preparation of calibration solutions is necessary	Automation of liquid handling steps obtains excellent linearity for calibrations	Reliable results, independent of skill of the operator	Agilent Injector Program View technical overview ↗	1, 2, 3, 4, 5, 6
Manual mixing of different buffer or modifier concentrations is necessary	Automatic, software-controlled solvent blending for target buffer or modifier concentration	Precise, reproducible, and timesaving creation of buffer or additive blending	Agilent BlendAssist Software View technical overview ↗	2, 3
Instrument purging is inconvenient	Purge multiple solvent channels with the same solvent	Simplifies ease-of-use and reduce laboratory solvent vapors	Agilent InfinityLab Stay Safe Purging Bottle View flyer ↗	1, 2, 3, 4, 5, 6, 7

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Sample Handling

Instruments, columns, and supplies |

Challenge	Solution	Benefit	Agilent Solutions	Compatible Agilent HPLC Instruments*
Verification of the correct sample injection is necessary	Upgradable barcode reading workflow in sampler provides confidence	No manual check necessary	Agilent InfinityLab Sample ID Reader View technical overview ↗	1, 2, 3, 4, 5, 6
Strong solvents require extra sample dilution or solvent exchange	By infusing sample into the mobile phase stream, solvent effects are minimized	Improved peak shapes and easy peak integration without extra sample preparation	Agilent Feed Injection View web page ↗	1, 2, 3
Injection cycle time limits analysis time for short runs	Cycle times reduced through overlapped sample runs and injection cycles	Reduces injection cycle times to mere seconds, virtually eliminating conventional wait times	Agilent Dual-Needle Injection View application ↗	1, 2, 3, 4, 5, 6
Limited space for unattended, high-throughput analysis (thousands of samples)	Sampler that handles vials and microplates, with capacity of up to 6,144 samples	Contained within the footprint of an Agilent LC stack	Agilent Multisampler Capacity View technical overview ↗	1, 2, 3, 4, 5, 6
Samples must be transferred from automated processes to HPLC and LC/MS instruments	Well plates for most common HPLC challenges that complies with worldwide ANSI and SLAS standards	No missed data points, sample rerun, or failure to meet project deadlines	Agilent InfinityLab Well Plates View brochure ↗	1, 2, 3, 4, 5, 6

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Method Handling

Instruments, columns, and supplies |

Challenge	Solution	Benefit	Agilent Solutions	Compatible Agilent HPLC Instruments*
Method transfer between different LC systems is time-consuming and requires different LC systems	Only one LC system needed to run LC methods from other LC systems, getting the same results	Transfers methods with one click	Agilent Intelligent System Emulation Technology (ISET) View application	1, 2, 3
Manual scanning of different LC method development parameters such as mobile phases and columns is time-consuming	Automatically create LC sequences from user-selected parameters and present the most suitable methods for comparison	Reduces time for finding optimum separation conditions	Agilent Method Scouting Wizard Software View application	1, 2, 3, 4, 5, 6
Manual ion exchange method development steps of buffer preparation, buffer blending, and pH scouting are tedious and error-prone	Automatic adjustment of a salt or pH gradient for ion exchange chromatography	Simplifies ion-exchange chromatography workflows and supports design of experiments	Agilent Buffer Advisor Software View application	1, 2, 3, 4
Keeping track of column use	Monitor column by logging various column properties and usage parameters	Track usage of the columns automatically	Agilent InfinityLab Column ID Tag View flyer	1, 2, 3, 4, 5, 6
Determining the best column for separation needs and LC system compatibility	Select needed column based on desired specifications such as particle size, column length, and bonded phase	Achieve higher chromatographic efficiencies while boosting performance and throughput	Agilent InfinityLab Poroshell 120 Columns View ordering guide	1, 2, 3, 4, 5, 6, 7

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Providing Confidence in Your Results





Higher Reproducibility

Instruments, columns, and supplies | 

Challenge	Solution	Benefit	Agilent Solutions	Compatible Agilent HPLC Instruments*
Need for precise delivery of flow precision and flow and compositional accuracy	Thorough mixing of mobile phase components occurs without having a detrimental effect on the system's dispersion characteristics	High retention time precision	Agilent Jet Weaver Mixer View application	1, 2
Shallow gradient with low pressure mixing pump creates problems	High precision of solvent composition	High retention time stability and result reproducibility	Agilent 4CGV 4-channel gradient valve View application	2, 3, 5
Carryover issues during injection creates problems	Automatic cleaning of inside and outside surfaces of the injection needle, as well as the needle seat is performed	Reduces carryover for most compounds to less than 9 parts per million (ppm)	Agilent Multisampler with Multiwash Function View application	1, 2, 3, 4, 5, 6
Increasing the maximum injection volume is necessary	Total injection volume for standard autosampler with 100 µL analytical head can be increased to 500 µL or 1500 µL	Enables maximum injection volume	Agilent Multisampler with Multidraw Function View application	1, 2, 3, 4, 5, 6
Consistent sample temperature in sampler must be maintained	Providing sample temperature control in the range of 4 to 40 °C	Ensures more accurate analysis results	Agilent InfinityLab Sample Thermostat View web page	1, 2, 3, 4, 5, 6
Broad or tailing peaks , loss of resolution, or overall poor chromatography due to badly connected fittings should be avoided	Fast tool-free column connection up to 1300 bar	Offers reliable chromatographic performance and fewer damaged columns	Agilent InfinityLab Quick Connect Fitting View web page	1, 2, 3, 4, 5, 6, 7

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Higher Reproducibility

Instruments, columns, and supplies |

Challenge	Solution	Benefit	Agilent Solutions	Compatible Agilent HPLC Instruments*
Poor solvent quality negatively impacting instrument performance and limit of detection/quantification	High-purity solvents, specially formulated for analytical HPLC and UHPLC-MS applications	Provides reliable chromatographic performance and results	Agilent InfinityLab Solvents View brochure	1, 2, 3, 4, 5, 6
Inconsistent results should be avoided	An LC performance standard can be used to control and evaluate the performance of an LC system	Lowers operating costs due to less unscheduled downtime	Agilent InfinityLab LC Performance Standard View white paper	1, 2, 3, 4, 5, 6, 7
Particles in the flow path clog the column frit and shorten lifetime of LC columns	Easy to handle, tool-free filter captures particles before they reach the column	Lowers operation costs through protection of valuable columns	Agilent InfinityLab Quick Change Inline Filter View flyer	1, 2, 3, 4, 5, 6, 7
Ensure that correct sample has been injected	Built-in sample ID reader scans QR codes on vials within seconds, ensuring the right sample is injected for every run	Manual check no longer necessary	Agilent InfinityLab Sample ID Reader View technical overview	1, 2, 3, 4, 5, 6
Reproducible analysis of new modalities is affected by unwanted flow path surface interactions	Flow path consisting of MP35N minimizes unwanted surface interactions and provides high salt tolerance (8 M) and a wide pH range (1-13)	High reproducibility of retention time and area	Biocompatible Agilent LC systems View web page	1, 2, 3

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Higher Reproducibility

Instruments, columns, and supplies | 

Challenge	Solution	Benefit	Agilent Solutions	Compatible Agilent HPLC Instruments*
Inconsistent results or contamination should be avoided	Utilizing internal standards of high quality	Ensuring the integrity of the sample and understand potential sample preparation interference	Agilent Chemical Standards Portfolio View web page	1, 2, 3, 4, 5, 6, 7
Ghost peaks or deposits through solvent contamination should be avoided	Purify the solvent to eliminate ghost peaks and unwanted impurities from the mobile phase	Minimizes the negative influence of varying mobile phase purities	Agilent InfinityLab Quick Change Solvent Purifier View web page	1, 2, 3, 4, 5, 6, 7

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Higher Resolution

Instruments, columns, and supplies | 

Challenge	Solution	Benefit	Agilent Solutions	Compatible Agilent HPLC Instruments*
Biomolecules can be affected by their environment and may undergo degradation or modification when exposed to substances such as iron	By eliminating metals from the solvent delivery lines, the system helps maintain the integrity of the biomolecules throughout the analysis	Ensures integrity of analyzed modalities and minimizes surface interactions	Agilent 1260 Infinity III Bio-Inert LC System View web page	5
System dispersion needs to be minimized for increased peak capacity and resolution is necessary	Minimizing LC system dispersion with a kit	Offers higher plate counts and higher peak capacity	Agilent Ultra-Low Dispersion Kit View application	1, 2
Compounds not resolved by LC need to be analyzed	Mass detection quickly confirms compounds and provides more specificity and selectivity than a UV detector	Enables mass detection within an LC stack	Agilent InfinityLab Pro iQ Series View web page	1, 2, 3, 4, 5, 6, 7
Need to perform high-speed, high-resolution separations	Superficially porous columns deliver higher chromatographic efficiencies and enable fast, high-resolution separations	Significant performance improvement for every HPLC and UHPLC system	Agilent InfinityLab Poroshell 120 Columns View brochure	1, 2, 3, 4, 5, 6, 7

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Higher Sensitivity

Instruments, columns, and supplies | 

Challenge	Solution	Benefit	Agilent Solutions	Compatible Agilent HPLC Instruments*
Strong solvents lead to peak breakthrough and poor peak shapes	By infusing sample into the mobile phase stream, solvent effects are minimized	Improved peak shapes with higher sensitivity and easy peak integration	Agilent Feed Injection View application ↗	1, 2, 3
Higher flow cell volumes in UV detection cause peak broadening due to dispersion effects	Using flow cells that simultaneously maximize signal height and minimize baseline noise	Offers up to 10x higher UV sensitivity than detectors with conventional flow cells	Agilent Max-Light Cartridge Cell with Optofluidic Waveguide View technical overview ↗	1, 2, 3, 4, 5, 6, 7
Mixtures with widely different concentration levels need to be analyzed	Products with a 30 times wider linear UV range	Detect and quantify all components in a single run	Agilent High Dynamic Range UV Detection View application ↗	1, 2

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Better Results

Challenge	Solution	Benefit	Agilent Solutions	Compatible Agilent HPLC Instruments*
Sample traceability throughout sample preparation and analysis must be maintained	Digital workflow which reduces the risks of manual sample transfer and labeling steps	Saves time	Agilent Advanced Sample Linking View white paper ↗	1, 2, 3, 4, 5, 6
Requirements of 21 CFR Part 11 and Annex 11 without software SOPs (procedural controls) must be met	Color-coded cues which enable quick review of the data analysis audit trail	More expedient audit reviews	Agilent OpenLab CDS—Audit Trail Review View video ↗	1, 2, 3, 4, 5, 6, 7
Setting proper integration paramaters is difficult and results in subjective manual integration	Reduction or potential elimination of manual integration	Gain confidence in final results	Agilent Integration Optimizer for OpenLab CDS View video ↗	1, 2, 3, 4, 5, 6, 7

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Better Results

Challenge	Solution	Benefit	Agilent Solutions	Compatible Agilent HPLC Instruments*
Getting LC support from other fellow professionals is needed	A user community that helps develop and maintain professional relationships among peers by providing mutual support	Gaining confidence in the way you are creating results	Agilent Community View web page	1, 2, 3, 4, 5, 6, 7
Getting Agilent LC insight knowledge from Agilent experts is needed	A knowledge portal that provides easy access to current operation, maintenance, best practices, and troubleshooting information	Gain confidence in your Agilent LC system	Agilent Knowledge Portal View web page	1, 2, 3, 4, 5, 6, 7
Instrument qualification and reporting is required	A software that supports the end-to-end analytical instrument qualification process and complies with USP <1058> Analytical Instrument Qualification (AIQ)	Compliance with protocols, consistent calculations, and accurate reports	Agilent Automated Compliance Engine (ACE) View web page	1, 2, 3, 4, 5, 6, 7

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Sustainability

Protecting Your Investments



System Related

Instruments, columns, and supplies |

Challenge	Solution	Benefit	Agilent Solutions	Compatible Agilent HPLC Instruments*
Upgrading existing HPLC systems to latest technology	HPLC systems that are compatible with new LC modules providing new functionalities	Benefit from latest LC technology with less investment	Agilent InfinityLab LC Series Upgrade Possibilities View web page	1, 2, 3, 4, 5, 6, 7
Adapting current HPLC system configuration to special application needs	Having access to a broad portfolio of compatible modules for different application areas	Flexibility for any application or budget	Agilent InfinityLab LC Series Mix and Match Value Promise View web page	1, 2, 3, 4, 5, 6, 7
Controlling a newly purchased instrument with installed software base	LC instrument firmware sets which have been designed and tested to be backward compatible for the installed software base	Increased productivity	Agilent InfinityLab LC Series Backward Compatibility Contact Agilent	1, 2, 3, 4, 5, 6, 7
Understanding the performance and proactively protecting LC instruments	A quick method that confirms that instrument is working properly and informs which part of LC is not when the check fails	Lowers operational costs, supports proactive troubleshooting and maintenance of instrument	Agilent InfinityLab LC Performance Workflow View white paper	1, 2, 3, 4, 5, 6, 7

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Software Related


Challenge	Solution	Benefit	Agilent Solutions	Compatible Agilent HPLC Instruments*
Non-Agilent LCs need to be operated in the Agilent chromatography data system (CDS)	Access to the most comprehensive solution for non-Agilent LC system control	Only one CDS in the lab to maintain and train employees	Agilent OpenLab CDS—multi-vendor instrument control View web page	1, 2, 3, 4, 5, 6, 7
Operating Agilent LCs along with Agilent GC, GC/MSD, and LC/MSD, in addition to non-Agilent GCs, inlets, and detectors in the same lab	A single data system for all your Agilent LC, GC, GC/MSD, and LC/MSD and non-Agilent LCs, GCs, inlets, and detectors in the same Agilent chromatography data system (OpenLab CDS)	Only one CDS in the lab to maintain and train employees	Agilent OpenLab CDS—multi-vendor instrument control View web page	1, 2, 3, 4, 5, 6, 7
Different vendor solutions for application-specific software are needed	Extend functionality or add additional capabilities of existing CDS with software add-ons instead of using additional standalone software	Flexibility of CDS to perform a variety of applications with the same base CDS (OpenLab CDS)	Agilent OpenLab—application-specific software add-ons View web page	1, 2, 3, 4, 5, 6, 7
Adding new instruments can be cost prohibitive and requires additional bench space for the instrument controller	Central access to all instruments and information across multiple labs allows for sharing of resources	Less hardware investment and ability to scale your laboratory without additional PCs on the bench	Agilent OpenLab CDS—scalable architecture View video	1, 2, 3, 4, 5, 6, 7

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Software Related

Challenge	Solution	Benefit	Agilent Solutions	Compatible Agilent HPLC Instruments*
Agilent LCs need to be operated in non-Agilent chromatography data systems (CDS)	A framework with comprehensive and straightforward control of Agilent LC systems, regardless of chromatography data system	Using Agilent LC system features in any environment	<div>Agilent Instrument Control Framework</div> <div>View brochure </div>	1, 2, 3, 4, 5, 6, 7

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Service Related

Challenge	Solution	Benefit	Agilent Solutions	Compatible Agilent HPLC Instruments*
Monitoring fleet-wide usage of all lab instruments including chromatography, mass spectrometry, spectroscopy, liquid handlers, plate reader, and more is needed	Identify over/under used instruments for improved workload balancing	Improves lab planning and optimizes operational spend	Agilent CrossLab Connect View web page	1, 2, 3, 4, 5, 6, 7
A lab-wide, proactive instrument maintenance strategy is needed	Software that allows you to view instrument service history, and to request service, all in one application	Reduces the time you spend reporting issues, gathering data, and scheduling service	Agilent CrossLab Connect View web page	1, 2, 3, 4, 5, 6, 7
Need to create meaningful inventory of the laboratory assets	Real-time access to all of your scientific equipment inventory data	Better asset control and fleet optimization	Agilent CrossLab Connect View web page	1, 2, 3, 4, 5, 6, 7
Need the ability to view lifecycle analytics for each instrument	Software that can provide data for inventory, service history, entitlement, and use	Identify and analyze underused instruments, and determine whether a replacement is a better option than repair	Agilent CrossLab Connect View web page	1, 2, 3, 4, 5, 6, 7
Need to acquire job-relevant skills that can be implemented in daily practice	Improve lab operations and minimize downtime with courses covering troubleshooting, maintenance, sample preparation, and software operations	Helps to optimize investments made	Agilent University View web page	1, 2, 3, 4, 5, 6, 7

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Service Related

Challenge	Solution	Benefit	Agilent Solutions	Compatible Agilent HPLC Instruments*
Make use of all lab assets for maximum productivity	Turn unused equipment into credit or cash	Several options available	Agilent Trade-in / Buyback Service View web page ↗	1, 2, 3, 4, 5, 6, 7
Finding the right service to optimize individual operating cost models	A differentiated service plan portfolio with various components and options	Less unexpected downtime and unexpected costs	Agilent Service Plans View web page ↗	1, 2, 3, 4, 5, 6, 7

* Compatible Agilent HPLC instruments:

1. 1290 Infinity III LC with High-Speed Pump

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3. 1260 Infinity III Prime LC System

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5. 1260 Infinity III LC with Quaternary Pump

6. 1260 Infinity III LC with Isocratic Pump

7. 1220 Infinity II LC System



Assistance



Confidence



Investment



Sustainability

Supporting Your Sustainability Goals



Assistance



Confidence



Investment



Sustainability

System Level

Instruments, columns, and supplies |


Challenge	Solution	Benefit	Agilent Solutions	Compatible Agilent HPLC Instruments*
Method transfer between different LC systems is needed	Only one LC system needed to run LC methods from other LC systems	Avoid unnecessary purchase of extra LC instruments	Agilent Intelligent System Emulation Technology (ISET) View application ↗	1, 2, 3
Need to invest in new HPLC system configuration to adapt to special application needs	Select from a broad portfolio of compatible LC modules to upgrade your existing Agilent LC for your needs	Existing HPLC systems can be reused	Agilent InfinityLab LC Series Mix and Match Value Promise View web page ↗	1, 2, 3, 4, 5, 6, 7
Newly purchased instruments often require updating chromatography data software (CDS)	LC instrument firmware sets have been designed and tested to be backward compatible for the installed CDS base	Seamless upgrade of existing Agilent LC systems with new LC modules	Agilent InfinityLab LC Series Backwards Compatibility Contact Agilent ↗	1, 2, 3, 4, 5, 6, 7
Environmentally unfriendly substances in the lab should be reduced	Use of environmentally friendly, natural-gas coolant like R600a for thermostatted samplers	No conflict with internal company EHS regulations	Agilent InfinityLab Sample Thermostat View web page ↗	1, 2, 3, 4, 5, 6
The replacement of hazardous solvents should be reduced	The use of Supercritical Fluid Chromatography (SFC) technology can lead to lower solvent consumption and less waste	Use of beverage-grade CO ₂ achieves 10 to 15 times lower operating costs	Agilent Supercritical Fluid Chromatography (SFC) solutions View web page ↗	4, 5, 6

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System Level

Instruments, columns, and supplies | 

Challenge	Solution	Benefit	Agilent Solutions	Compatible Agilent HPLC Instruments*
Solvent consumption needs to be reduced	Automatic, software-controlled solvent blending for the target buffer or modifier concentration	Saves time and money	Agilent BlendAssist software View technical overview ↗	2, 3
Need to remove particles in the flow path that shorten the lifetime of LC columns	Easy to handle, tool-free filter captures particles before they reach the column	Lower operation costs through protection of valuable columns	Agilent InfinityLab Quick Change Inline Filter View video ↗	1, 2, 3, 4, 5, 6, 7
Need to prevent solvent vapors from leaching into laboratory air, from solvent bottles that are either open or just covered with parafilm/aluminum foil	Closing caps seal off mobile phase bottles during purging	Less personnel exposure to solvents	Agilent InfinityLab Stay Safe Solvent Cap Starter Kit View brochure ↗	1, 2, 3, 4, 5, 6, 7
Need to reduce consumption of plastic and unrecyclable materials	Streamlined product packaging for consumables	New package design increases the protection of glass ampoules during shipment while decreasing unrecyclable materials	Agilent Chemical Standards Portfolio View web page ↗	1, 2, 3, 4, 5, 6, 7

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System Level

Challenge	Solution	Benefit	Agilent Solutions	Compatible Agilent HPLC Instruments*
Need to reduce costly on-site tech support expert visits	Many issues can be resolved remotely in minutes, without the need to schedule an on-site visit	Using remote methods to troubleshoot issues before scheduling an onsite visit avoids unnecessary travel or instrument shipments, reducing carbon emissions	<div>Agilent CrossLab Virtual Tech Support</div> <div>View web page ↗</div>	1, 2, 3, 4, 5, 6, 7

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Lab Level

Challenge	Solution	Benefit	Agilent Solutions	Compatible Agilent HPLC Instruments*
Proper disposal of used instrumentation equipment is necessary	Use trade-in or buyback services	Meet company targets for waste reduction	Agilent Trade-in / Buyback Service View web page	1, 2, 3, 4, 5, 6, 7
Finding budget to purchase new instruments	Factory refurbished, tested, and certified LC systems with a one year warranty	Making economic and sustainable choices for your lab	Agilent Certified Pre-Owned Instruments View web page	1, 2, 3, 4, 5, 6, 7

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Lab Level

Instruments, columns, and supplies | 

Challenge	Solution	Benefit	Agilent Solutions	Compatible Agilent HPLC Instruments*
Need information about a laboratory product's environmental impact to help justifying new investments	Get third-party verified product info about environmental impact from manufacturing, use, packaging, and end-of-life	All information in one view	ACT Label View web page	1, 2, 3, 4, 5, 6, 7
Need to replace LC systems to benefit from latest technology	Add instead new modules to your existing Agilent HPLC system to meet your needs	Benefit from latest LC technology without replacing systems	Agilent InfinityLab LC Series Upgrade Possibilities View web page	1, 2, 3, 4, 5, 6
Limited space for unattended, high-throughput analysis (thousands of samples)	One sampler module that handles vials and microplates, with capacity of up to 6,144 samples	All within the footprint of an Agilent LC stack	Agilent Multisampler Capacity View user manual	1, 2, 3, 4, 5, 6

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Lab Level

Challenge	Solution	Benefit	Agilent Solutions	Compatible Agilent HPLC Instruments*
Manual transcription of chromatography workflow information, which is time-consuming and error-prone	Automate the worklist scheduling and assignments from LIMS	Enhances the quality of results by automating the transfer of all relevant sample information	Agilent Sample Scheduler for OpenLab View web page	1, 2, 3, 4, 5, 6, 7

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Enterprise Level

Instruments, columns, and supplies | 

Challenge	Solution	Benefit	Agilent Solutions	Compatible Agilent HPLC Instruments*
Certificate of Analysis (CoAs) should be attached to the electronic laboratory notebook (ELN)	Online database with PDF-based CoAs	Saves time and reduces paper waste	<div>Agilent eCertificates</div> <div>View web page </div>	1, 2, 3, 4, 5, 6, 7

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Enterprise Level

Challenge	Solution	Benefit	Agilent Solutions	Compatible Agilent HPLC Instruments*
Eliminating the paper-based storage of all lab data where needed	Centralized cloud and on-premises storage of data generated by Agilent and non-Agilent data systems and other laboratory software	Access to paperless data from a single source	Agilent OpenLab ECM XT View web page	1, 2, 3, 4, 5, 6, 7

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