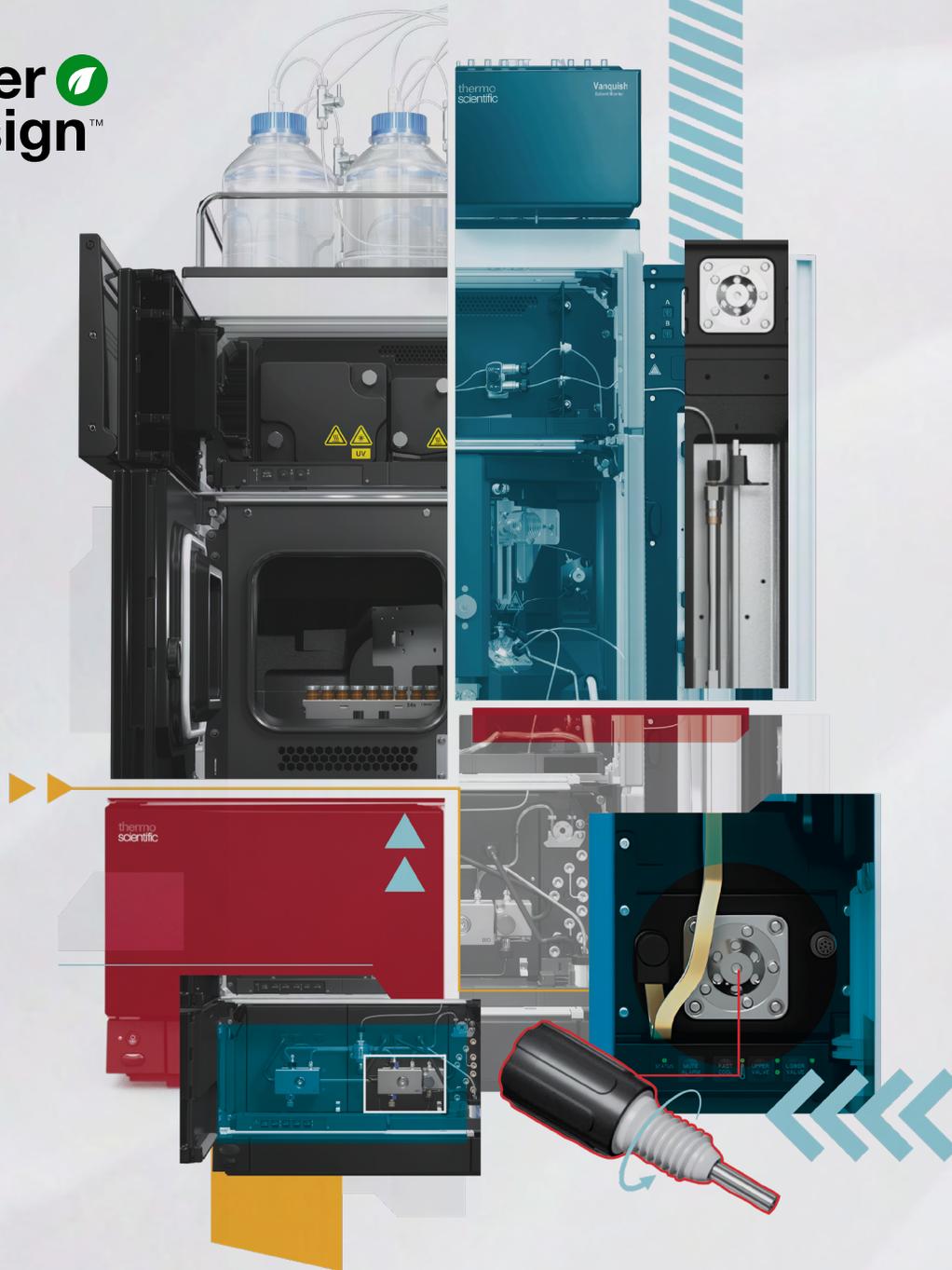


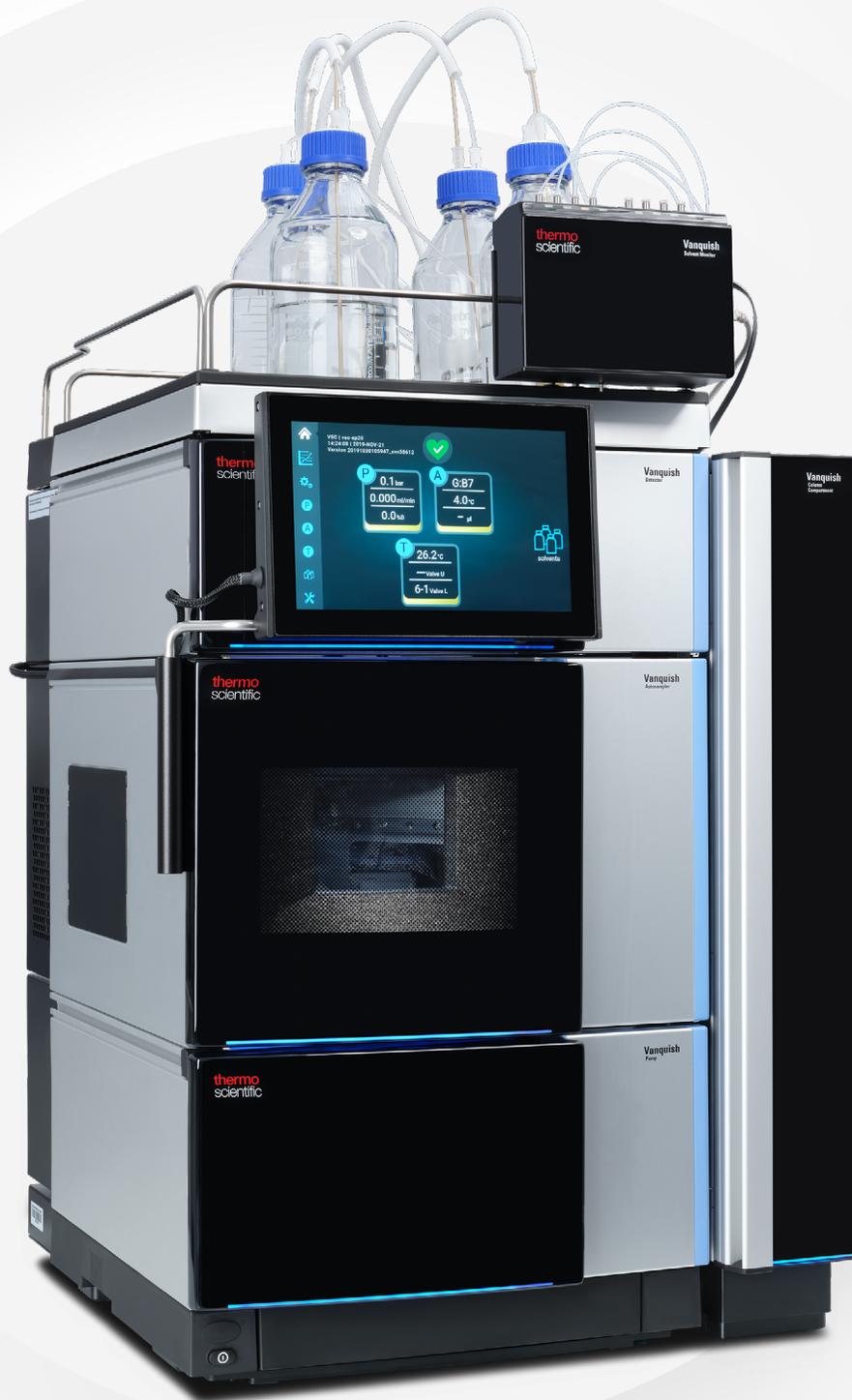
Greener 
by design™



Vanquish Flex UHPLC systems

Dependably different. Lab ready.

Put your analysis on a path to greatness with refined
LC systems and torque-controlled fittings



Succeed with flexibility

Whether you are analyzing innovative biotherapeutics or novel chemical medicines, method development with Thermo Scientific™ Vanquish™ Flex UHPLC systems has never been easier.

More than 30 years of liquid chromatography expertise has led to the Vanquish Flex UHPLC systems, bringing exceptional analytical precision, detector sensitivity, and operational simplicity to enable unprecedented robustness and flexibility. Designed for the needs of UHPLC and LC-MS scientists, Vanquish Flex UHPLC systems provide:

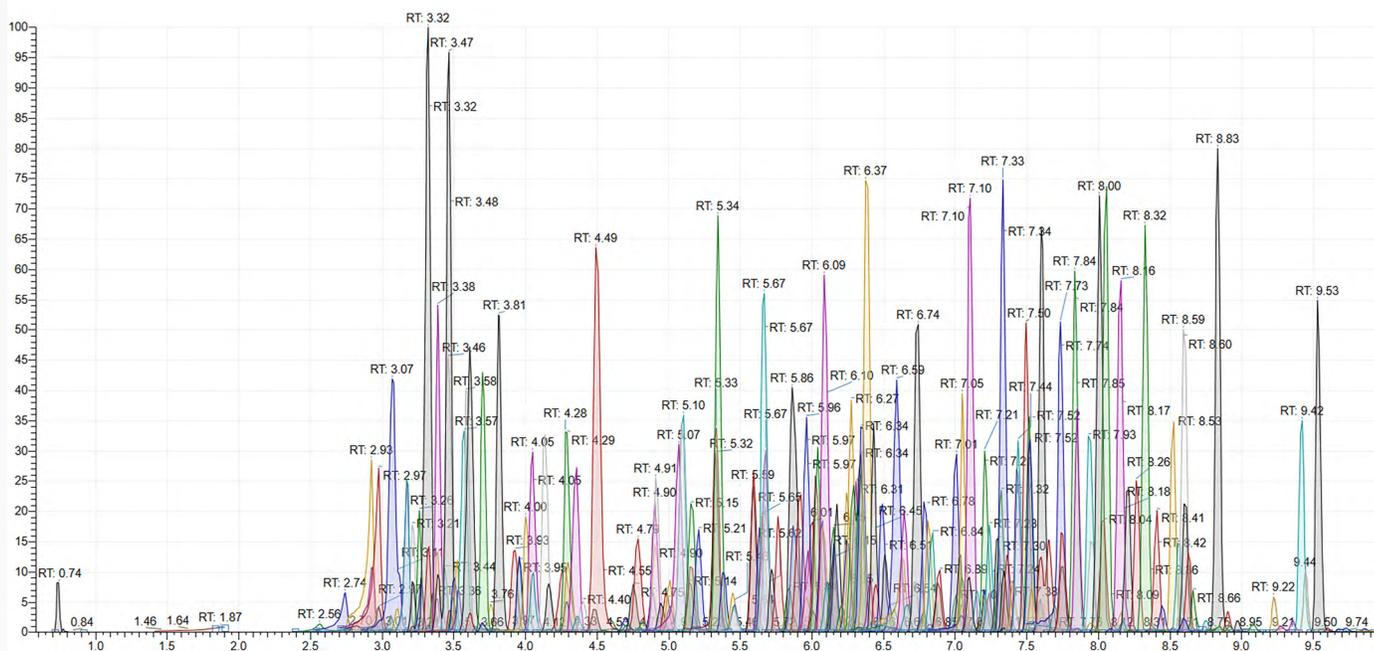
- Unparalleled flexibility to meet all needs of routine UHPLC applications
- Seamless integration with the broad Thermo Scientific LC-MS portfolio
- Fast, automated, and comprehensive method development
- Full biocompatibility to address the most challenging biotherapeutic applications
- Easy instrument familiarization with intuitive system operation and simplified user maintenance
- Simple integration with your Thermo Scientific™ Chromeleon™ Chromatography Data System (CDS), Waters™ Empower™ 3 CDS, and Agilent™ OpenLab™ CDS software
- Designed with sustainability in mind—portfolio certified with the ACT® Ecolabel by My Green Lab® and polyvinyl chloride polystyrene free secondary and tertiary packaging



Full flexibility for your UHPLC applications

In your laboratory, each analytical question brings a new challenge. Vanquish Flex UHPLC systems are an essential analytical tool to help you solve each of these challenges, bringing a choice of technology to move your innovation forward:

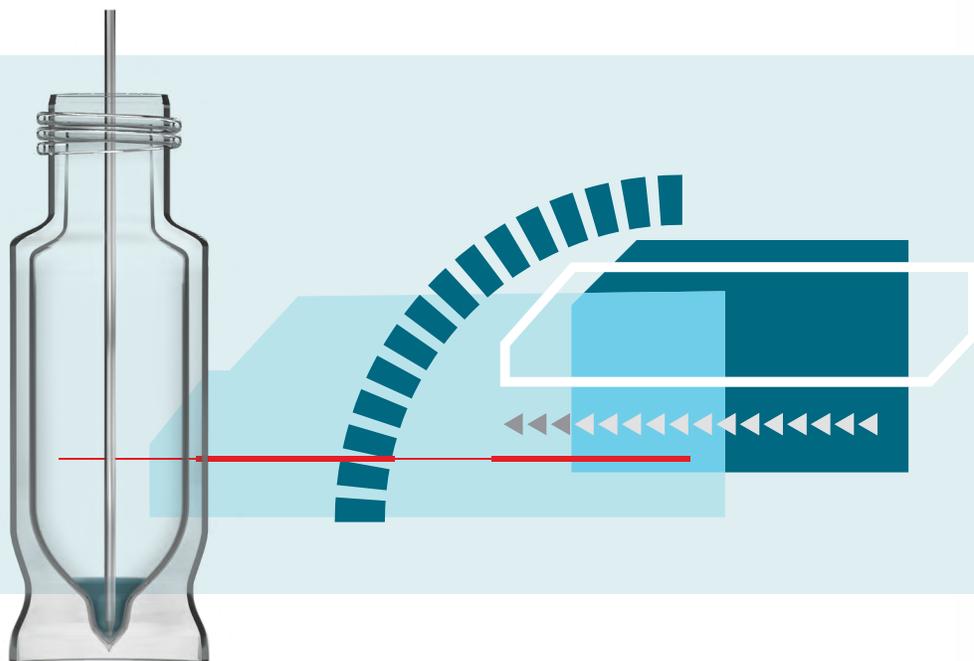
- Three pump types to meet your throughput, flexibility, or advanced workflow requirements, for normal and reversed-phase separations
- Five alternative detection principles
- Seamless integration with the Thermo Scientific mass spectrometry portfolio
- Biocompatibility for even the most challenging eluents
- Unique 2D-LC workflows covering single and multiple heart-cut LC as well as online SPE



Extracted ion chromatogram of a matrix extracted spike (MES) of over 200 pesticide residues in baby food at 10 ng/g.

Vial bottom detection

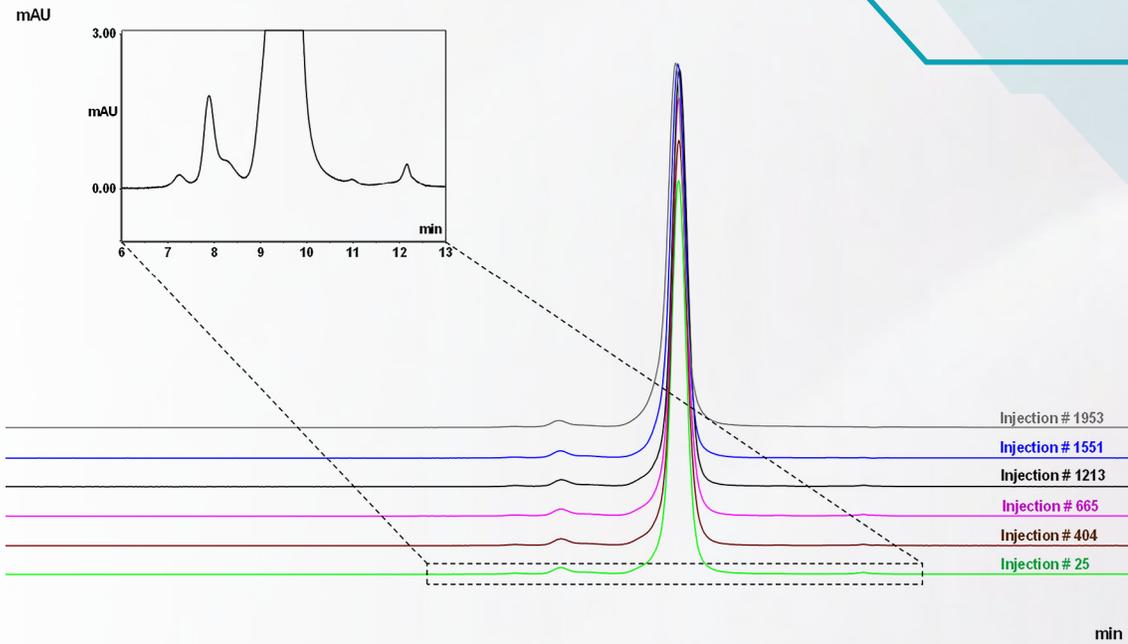
Samples analyzed by UHPLC and LC-MS can be limited by volume. The vial bottom detection technology incorporated in the Vanquish Flex UHPLC systems enables the sample draw right from the bottom of the sample container, ensuring maximum utilization of limited sample volumes. This technology removes the uncertainty of which needle depth settings to use when using a range of sample vials and plate types, preventing needle damage.



Biocompatibility for full application range

Whether you run traditional HPLC applications or high-efficiency UHPLC applications, analyze small molecules or innovative biopharmaceuticals, the Vanquish Flex UHPLC systems can meet your separation requirements. With fully biocompatible fluidics, the Vanquish Flex UHPLC systems provide:

- High salt eluent compatibility
- Corrosion-free fluidic path
- Virtually eliminated interaction of analytes with leaching iron ions

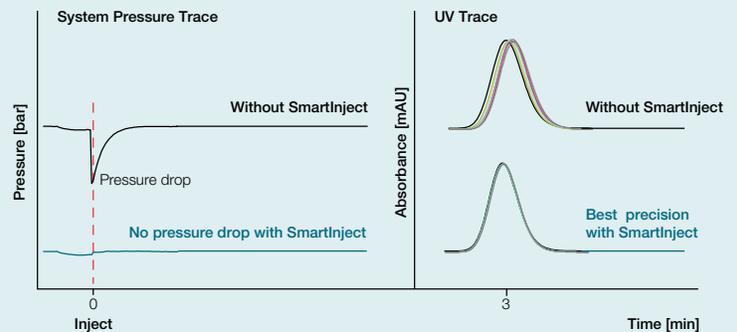


Aggregate analysis of bevacizumab using a Thermo Scientific™ MAbPac™ SEC-1 HPLC column (4.0 × 300 mm) allowing nearly 2,000 injections on the same column. Column lifetime is improved by Thermo Scientific™ SmartInject™ Technology.

Why SmartInject Technology?

During injections, the sample loop at atmospheric pressure is placed in line with the high-pressure flow path, typically resulting in a pressure drop. With regular UHPLC systems, this adversely affects retention time precision and column lifetime.

SmartInject Technology automatically eliminates the pressure drop, improving data confidence and reducing cost of ownership.



Significant reduction of pressure drop after injection using SmartInject Technology resulting in improved retention time reproducibility (six replicates) and enhanced column lifetime.



Develop with flexibility

Liquid chromatography method development is a time-consuming process, usually requiring expert knowledge. With Thermo Scientific™ Vanquish™ Flex Method Development UHPLC systems, your laboratory can significantly accelerate method development by taking advantage of a high degree of automation and utilization of sub-2 µm particle size columns.



Vanquish Flex Method Development UHPLC System



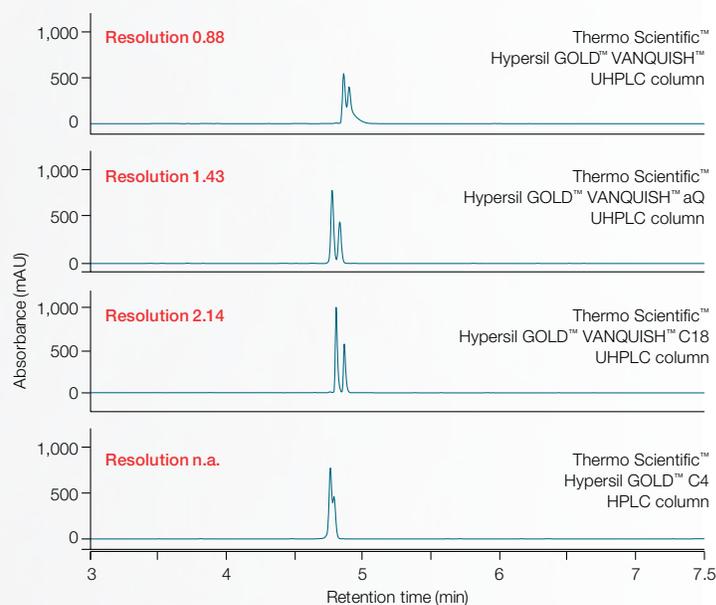
Automated method scouting

Automated method scouting on Vanquish Method Development UHPLC systems provides:

- Sequential scouting of up to six different column chemistries
- Wide eluent scouting capabilities
- Easy-to-use and efficient data processing tools

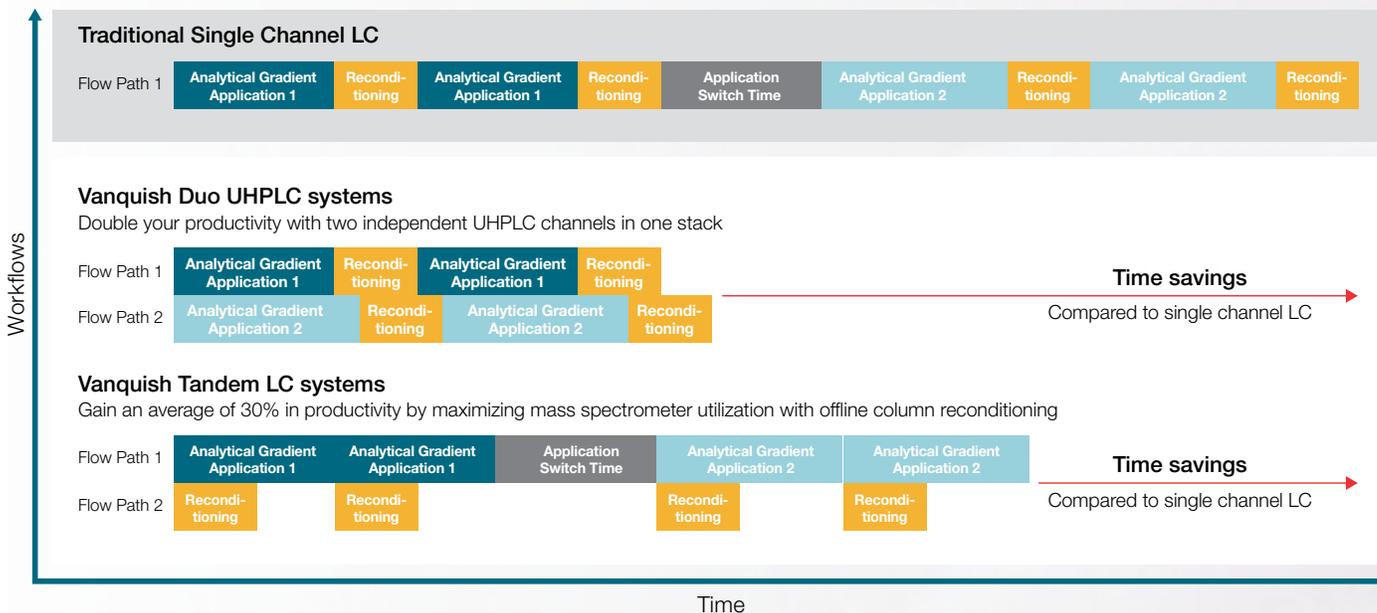
Automated method development

The combination of Chromeleon CDS with ChromSword Chromeleon Connect or S-Matrix® Fusion QbD® software provides a complete solution from method development to method validation, following Analytical Quality by Design (AQbD) principles. It also enables automated optimization to develop and improve methods faster and more efficiently with tools to make compliance easier.



Automatic scouting of different column chemistries for fastest method development.

Boost your productivity

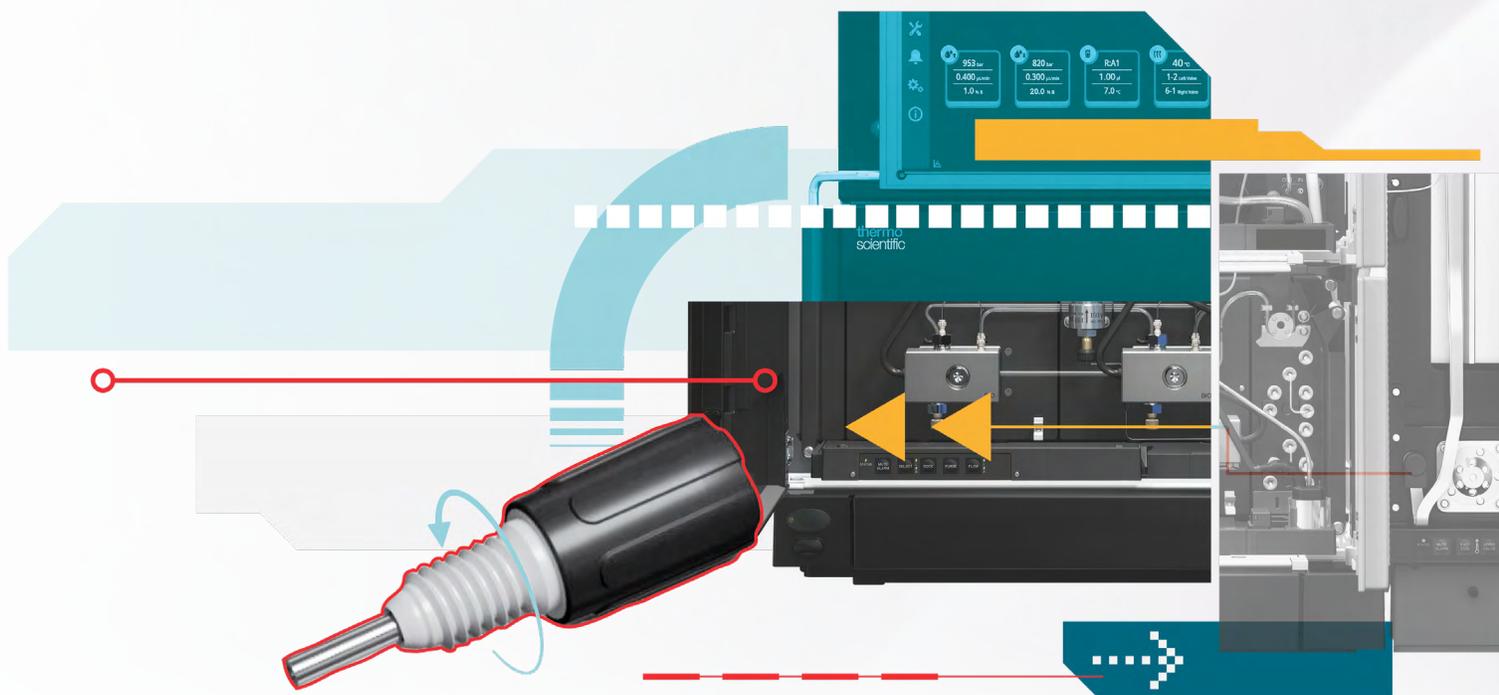


Vanquish Duo UHPLC systems

Double your throughput, deepen your sample knowledge, and better utilize your bench space with the Thermo Scientific™ Vanquish™ Duo UHPLC systems. Two completely independent flow paths for maximum productivity.

Vanquish Tandem LC systems

Increase your lab throughput by 30% with the Thermo Scientific™ Vanquish™ Tandem LC systems. Maximize the utilization of your optical detector or mass spectrometer.



Enable your operators

In today's analytical laboratory environment, your scientific personnel have limited time for in-depth familiarization with new instrumentation. An LC system should seamlessly fit into your existing workflows and processes without requiring extra training or expertise.

The Vanquish Flex UHPLC systems bring ease of use to a new level, enabling every user to deliver exceptional results, independent of user experience.

- Thermo Scientific™ Viper™ TQ UHPLC Fittings for nearly zero dead-volume fluidic connections
- Automatic and remote instrument purging
- Thermo Scientific™ Vanquish™ Solvent Monitor to ensure enough eluent and waste capacity for every sequence
- Vanquish User Interface to provide direct, at-instrument monitoring of system status, at-instrument control for system preparation tasks, and support for operator-controlled maintenance



Vanquish Solvent Monitor manages your eluent and waste level for highest confidence during analysis.

Vanquish Solvent Monitor

The Vanquish Solvent Monitor enables Vanquish HPLC and UHPLC systems to accurately and automatically measure the liquid levels in each individual solvent channel and waste container.

Deep integration of the Vanquish Solvent Monitor with the Vanquish system provides direct viewing of solvent and waste volumes within Chromeleon CDS, on the Vanquish User Interface, and directly on the module itself.

Run large sample sets with confidence, avoiding lost time, eliminating procedural deviations by monitoring mobile phase levels, and preventing hazardous spills by monitoring waste levels.

Face Sealing Technology for highest robustness

Ergonomic design for improved grip



Integrated torque-controlled fingertightening mechanism for leak-free connections

Audible click and tactile feedback for confidence

The best LC connection just got better

Thermo Scientific™ Viper™ Fingertight Fittings revolutionized LC connections more than a decade ago. Now, the all-new Viper TQ UHPLC Fittings set new standards for the easiest and most durable fluidic connections in liquid chromatography. Featuring a torque-controlled design, these fittings provide an audible click and tactile feedback when a secure sealing is achieved. Remarkably, the new fittings can be used for over 300 connections, ensuring long-lasting performance and reliability.

Monitor your instrument

The interactive Vanquish User Interface allows operators to intuitively, immediately, and intelligently monitor the current system status:

- Fulfills compliance needs with a direct interface to the system without the need for a network connection
- Glove-enabled and solvent-resistant touch display
- Status display of current instrument parameters, such as pressure and detector signal
- Monitoring of column equilibration progress through graphical representation of pump pressure data
- Display of step-by-step maintenance videos
- Complaint-ready at-instrument control for system preparation tasks
- Multi-language support

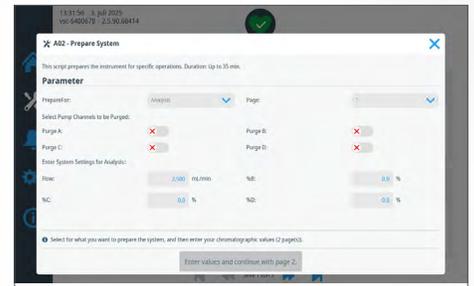
Vanquish User Interface



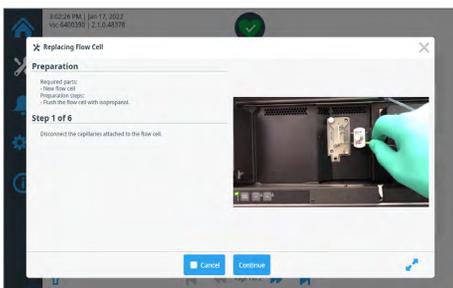
Instrument status display



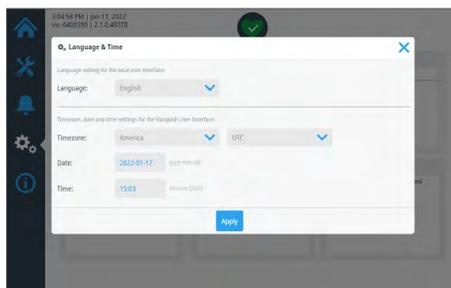
Instrument equilibration monitoring



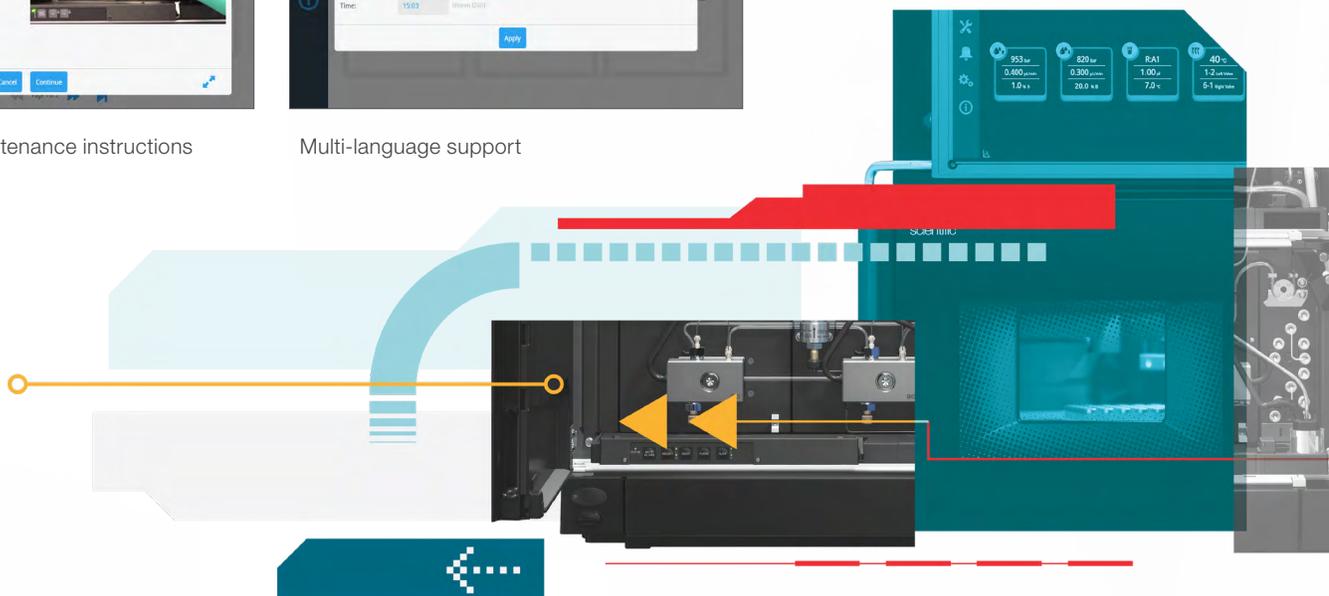
At-instrument control



On-instrument maintenance instructions



Multi-language support



Use your existing software infrastructure for implementation

No matter your current software setup, you can maximize the benefits of the cutting-edge innovation of your Vanquish UHPLC system by seamlessly integrating with our recommended software, Chromeleon CDS, to deliver the highest levels of control and automation with unparalleled flexibility and ease of use.



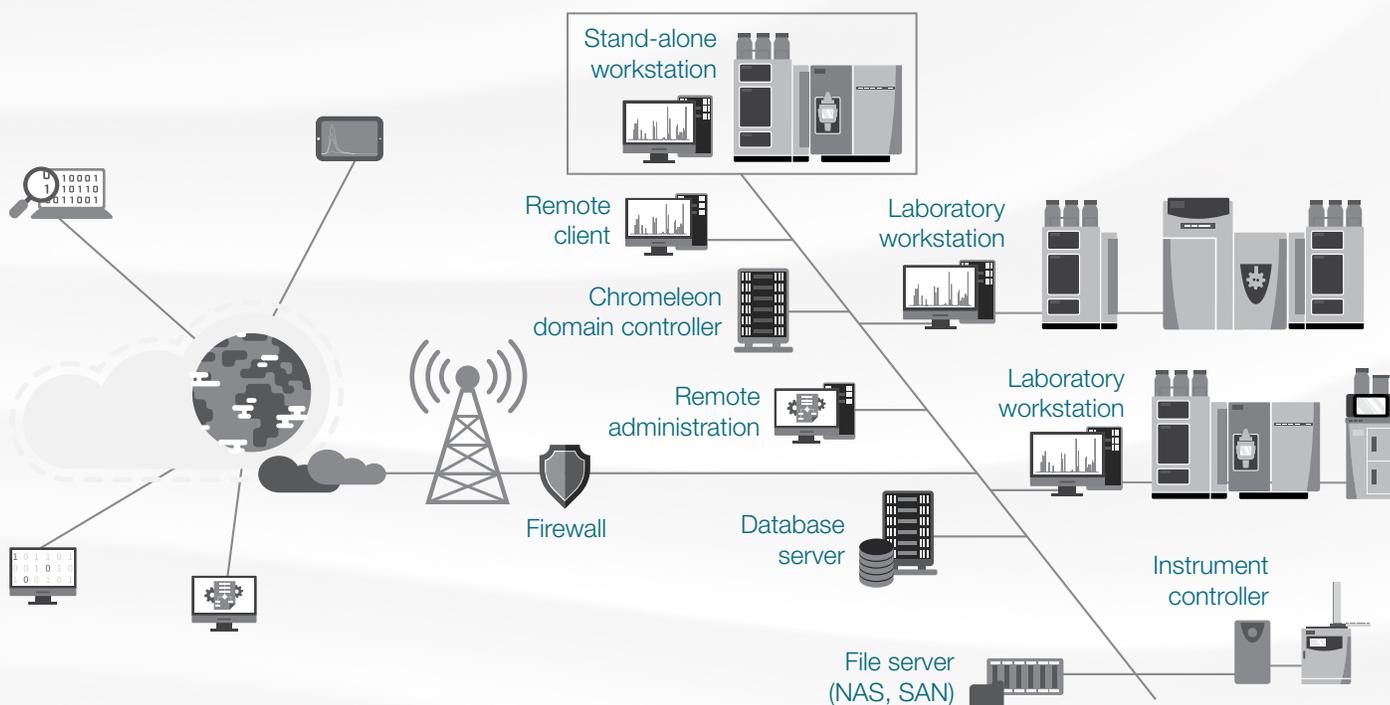
Chromeleon CDS

Connecting people, instruments, and data to deliver control, productivity gains, data integrity, and full support of GMP compliance. Run your lab on an intuitive, user-friendly software that easily scales from workstation to global deployment.

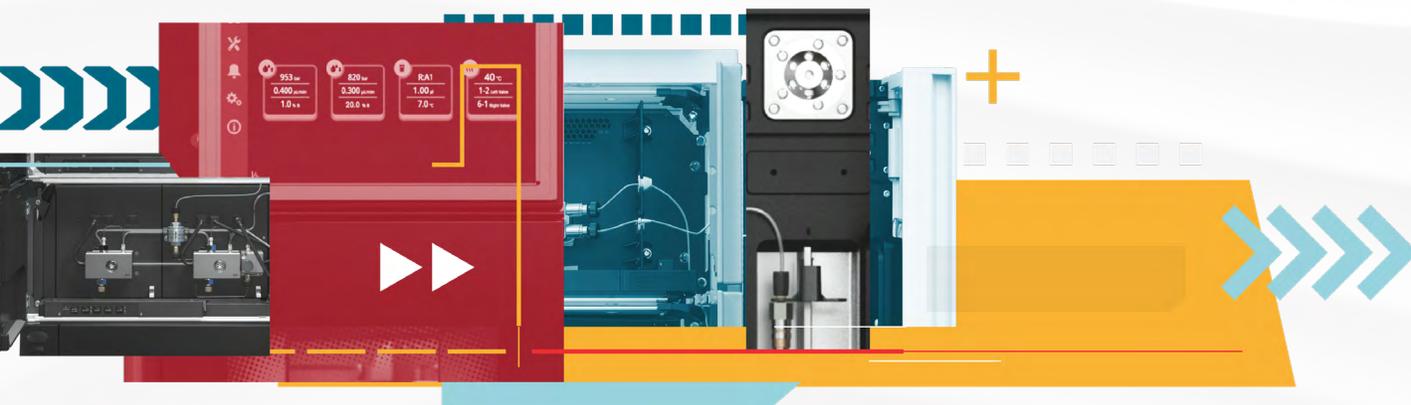


Standard Instrument Integration (SII) for Empower 3 and OpenLab software

Enabling seamless instrument control and method creation for all laboratories currently using Waters Empower and Agilent OpenLab software.



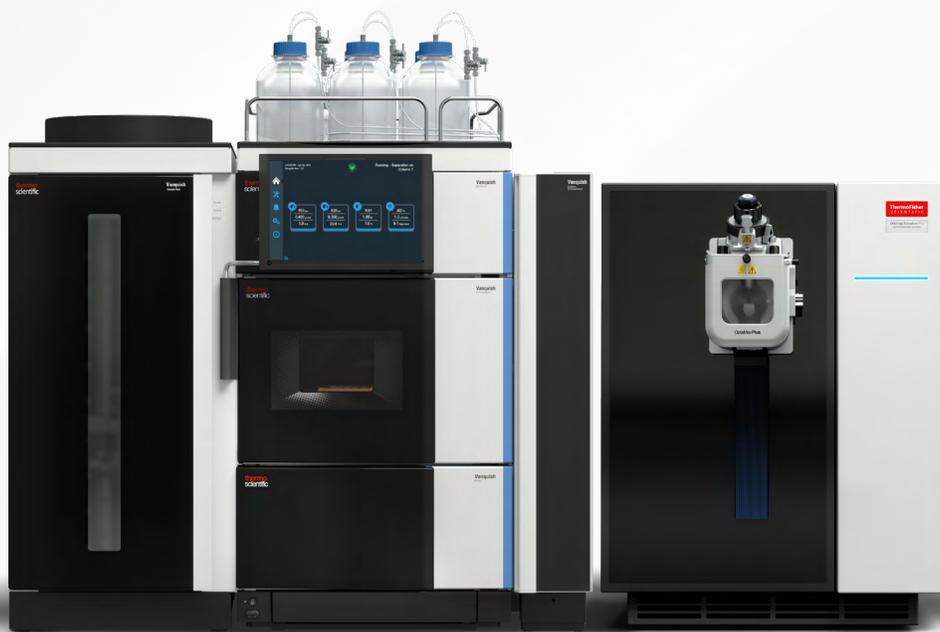
Network scalability—stand-alone to a global network with secure central data storage.



Benefit from highly sensitive and selective mass spectrometry

Mass spectrometry (MS) is a prevalent tool in many laboratories. The system can be seamlessly coupled to best-in-class Thermo Scientific triple quadrupole or Thermo Scientific high-resolution accurate mass Orbitrap mass spectrometers. For single-point control, your LC-MS system can be controlled completely by Chromeleon CDS.

- Best-in-class retention time precision for optimal selected reaction monitoring
- Superior separation for a minimal ion suppression
- Minimum carry-over for reliable trace-level LC-MS quantification



The Vanquish Flex UHPLC System including the high sample capacity Thermo Scientific™ Vanquish™ Sample Hub with the Thermo Scientific™ Orbitrap™ Excedion Pro Mass Spectrometer.

Built for automation

Workflow automation is important for many industries in order to increase consistency of results and lab efficiency. Vanquish HPLC and UHPLC systems can be easily equipped with a Thermo Scientific™ Vanquish™ Loader to fully automate your LC or LC-MS analysis when used in combination with a robotic mover.



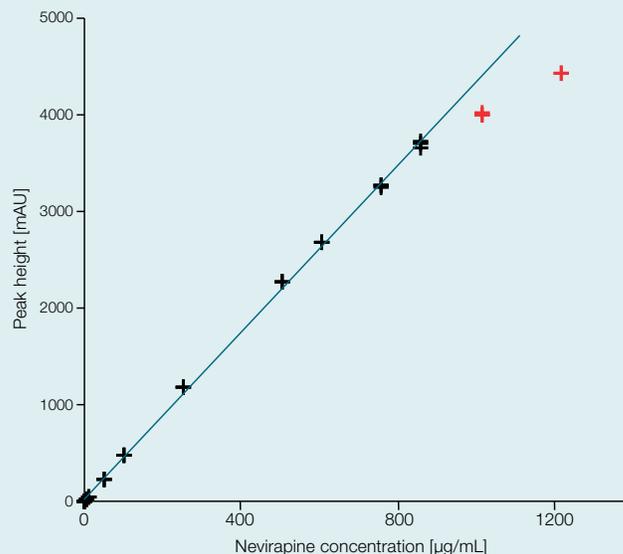
Detect your analyte

Choosing the right detection technology is key to revealing all the components of interest in your sample. The Vanquish Flex UHPLC systems offer a wide range of detection capabilities that can be easily integrated and combined to fit your methods.



Industry-leading diode array detection

The Thermo Scientific™ Vanquish™ Diode Array Detector HL delivers supreme analyte sensitivity by a low baseline noise and low dispersion. The Thermo Scientific™ Vanquish™ Diode Array Detector FG offers cutting-edge detector linearity as well as a smooth and robust LC-MS integration. Based on diode array detection technology, the multiple wavelength detector offers a cost-effective solution for simultaneously acquiring up to eight UV-Vis wavelength channels.



Concentration vs. peak height plot of nevirapine with data points that were considered for calibration (black) and data points that were eliminated from calibration due to curve decline (red). Linear calibration with permitted offset and no weighting.

Variable wavelength detection

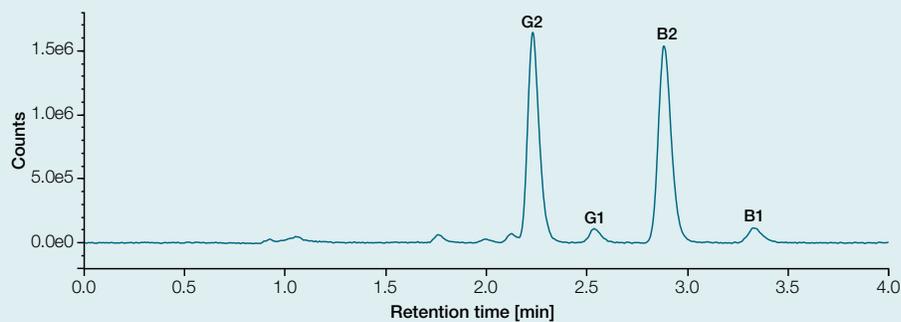
UV-Vis detection with excellent sensitivity and linearity is a cost-effective and powerful solution for quantitative compound analysis.

Refractive index detection

Isocratic separations with refractive index detection offers cost-effective, universal detection for routine analysis.

Powerful fluorescence detection

Fluorescence detection enables high sensitivity and selectivity.



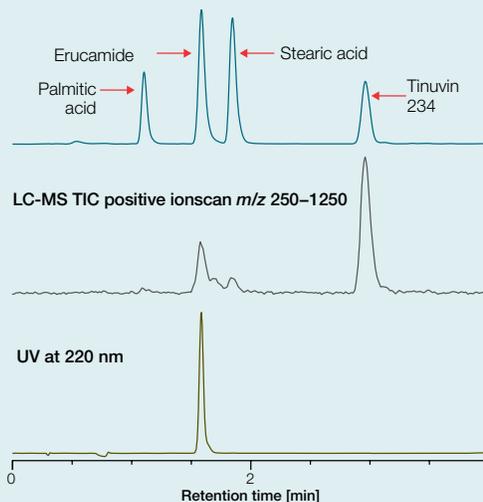
FLD chromatogram of the four aflatoxins: G2, G1, B2, and B1 at a concentration of 0.9 µg/kg for G2 and B2 and 2.9 µg/kg for G1 and B1.



Unique universal charged aerosol detection

The Thermo Scientific™ Vanquish™ Charged Aerosol Detector (CAD) P Series is powerful, uniform, and universal—able to detect virtually any large and small molecule with sub-nanogram-level sensitivity, even those that lack a chromophore or that poorly ionize. The flexibility and performance of charged aerosol detection is ideal for analytical R&D, while its simplicity and reproducibility benefit manufacturing QA/QC applications.

Charged Aerosol Detection



Unlike MS and UV, the CAD is able to measure all analytes in the sample. MS requires the analyte to form gas phase ions while response by a UV detector depends upon the nature of the chromophore.



Simple mass detection

MS gives access to valuable data no other technology can deliver. The easy-to-use Thermo Scientific™ ISQ™ EM Single Quadrupole Mass Spectrometer or the Thermo Scientific™ ISQ™ EC Single Quadrupole Mass Spectrometer integrate with LC systems for reliable, robust, and easy LC-MS routine analysis with an extended mass range for more flexibility. Integrated software allows both novices and experts to quickly master MS to gain more insights from every sample.



Pairing smoothly with your LC-MS

Whichever Thermo Scientific LC-MS instrument you are using, we have powerful software solutions that can provide instrument control, data acquisition, data processing, and reporting. Choose between Thermo Scientific™ Xcalibur™ software for control and acquisition, and compliance-ready Chromeleon CDS or feature-rich Thermo Scientific™ TraceFinder™ software for end-to-end coverage.



Innovating for you



2



13



1 Vanquish Solvent Monitor

Use the Vanquish Solvent Monitor to increase your regulatory compliance, productivity, and safety of your laboratory. That device guarantees that your HPLC systems will never run dry and the waste will not spill over, reducing loss of valuable measurement time and sample material.

2 Vanquish User Interface

With the Vanquish User Interface, you are the master of your LC instrument. The display always shows you the key parameters of your instrument, provides step-by-step maintenance guidelines, and allows compliant at-instrument control for system preparation, such as purging and parameter settings.

3 Detection capabilities

Differing molecular characteristics of your analyte, from small molecules to complex biomolecules, necessitates multiple detector technologies. The Vanquish Flex UHPLC systems have been built to utilize a wide range of analytical detectors, including MS, diode array detection, multi-wavelength detection, charged aerosol detection, variable wavelength detection, and fluorescence detection.

4 Ultra-high sample capacity

The Vanquish autosampler has a default sample capacity of 216 1.5 mL glass vials or four well plates. This capacity can be further increased with the Vanquish Sample Hub module to a capacity of up to 23 well plates.

5 Built for automation

The Vanquish autosampler has the option to add the Vanquish Loader to connect the LC or LC-MS system to the sample preparation robotics, allowing the complete analysis of the sample from preparation to reporting without human intervention.

6 Proprietary injection and switching valves

The valves used in the system are designed to meet the reliability needs to make your HPLC run robustly and routinely. The valves are long-life and follow a no-maintenance philosophy, reducing your overall cost of ownership.

7 SmartInject Technology

Superior retention time precision and accuracy, as well as enhanced column protection.

8 Vial bottom detection

Enabling precise usage of even the smallest amounts of precious samples with unparalleled confidence.

9 Easier operation

The systems utilize tool-free Viper TQ UHPLC Fittings with torque-controlled design, ergonomic handling, and a lifespan of over 300 connections.



10 Higher data confidence

Highest injection precision for even the lowest injection volumes and retention time precision for reliable qualitative and quantitative sample characterization.

11 Biocompatibility

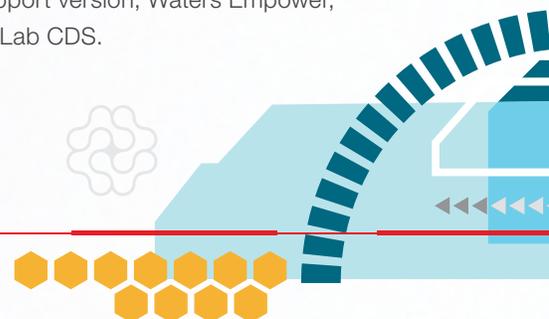
Vanquish Flex UHPLC systems are biocompatible by design to deal with all challenging eluents for biopharmaceutical characterization, increasing data confidence and instrument uptime.

12 Keep your lab tidy

The built-in drawer stores accessories, related documents, or any other useful material for the system.

13 Compatible with your software infrastructure

The system can be operated in various software environments, including the latest Chromeleon software feature release, Chromeleon CDS long-term and extended support version, Waters Empower, and Agilent OpenLab CDS.



Thermo Scientific LC portfolio overview

Analytical HPLC and UHPLC			
Application-specific HPLC and UHPLC			
Thermo Scientific™ Vanquish™ High-throughput LC systems Thermo Scientific™ Vanquish™ Inverse Gradient LC systems Thermo Scientific™ Vanquish™ Method Development LC systems Thermo Scientific™ Vanquish™ Online 2D-LC systems Thermo Scientific™ Vanquish™ Analytical Purification LC systems Thermo Scientific™ Transcend™ UHPLC systems			
Dependability		Flexibility	
Performance		Sensitivity	
  	  	  	 
<p>Thermo Scientific™ Vanquish™ Core HPLC systems</p> <ul style="list-style-type: none"> High-pressure binary and low-pressure quaternary solvent blending or isocratic flow delivery Workhorse instrument Seamless method transfer System intelligence for improved productivity 	<p>Thermo Scientific™ Vanquish™ Flex UHPLC systems</p> <ul style="list-style-type: none"> High-pressure binary and low-pressure quaternary solvent blending Biocompatible Unparalleled flexibility and control 	<p>Thermo Scientific™ Vanquish™ Horizon UHPLC system</p> <ul style="list-style-type: none"> High-pressure binary solvent blending Biocompatible Industry-leading specifications Unmatched detection sensitivity 	<p>Thermo Scientific™ Vanquish™ Neo UHPLC system</p> <ul style="list-style-type: none"> All-in-one nano-, capillary-, and micro-flow LC system Accelerating productivity with long-term, trouble-free operation Intelligent at-system or remote control, method setup, diagnostics, and troubleshooting
 <p>Certified with ACT Ecolabel 2.0</p>			
700 bar	1000 bar	1500 bar	1500 bar

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