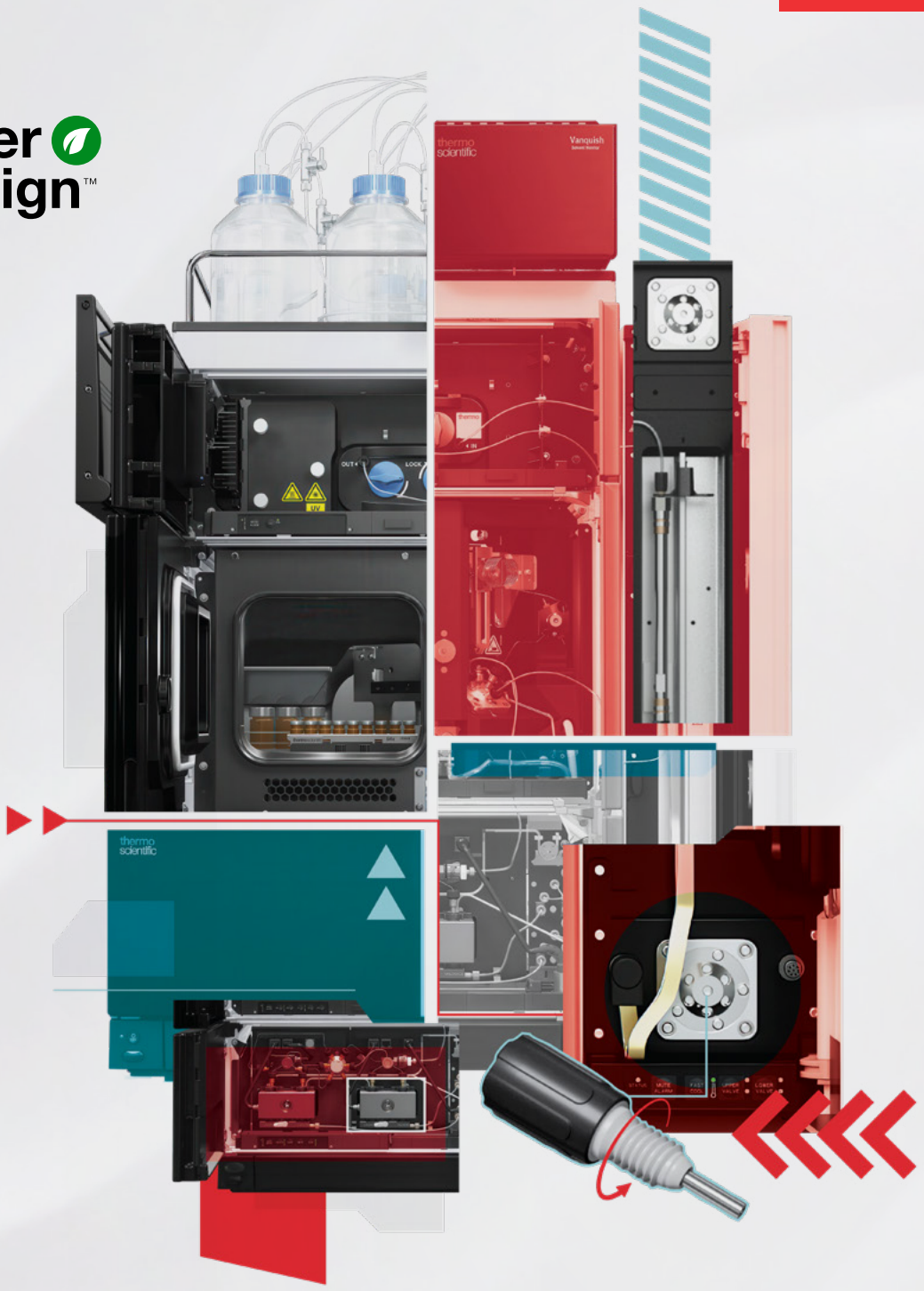
ThermoFisher SCIENTIFIC

Greener by design™

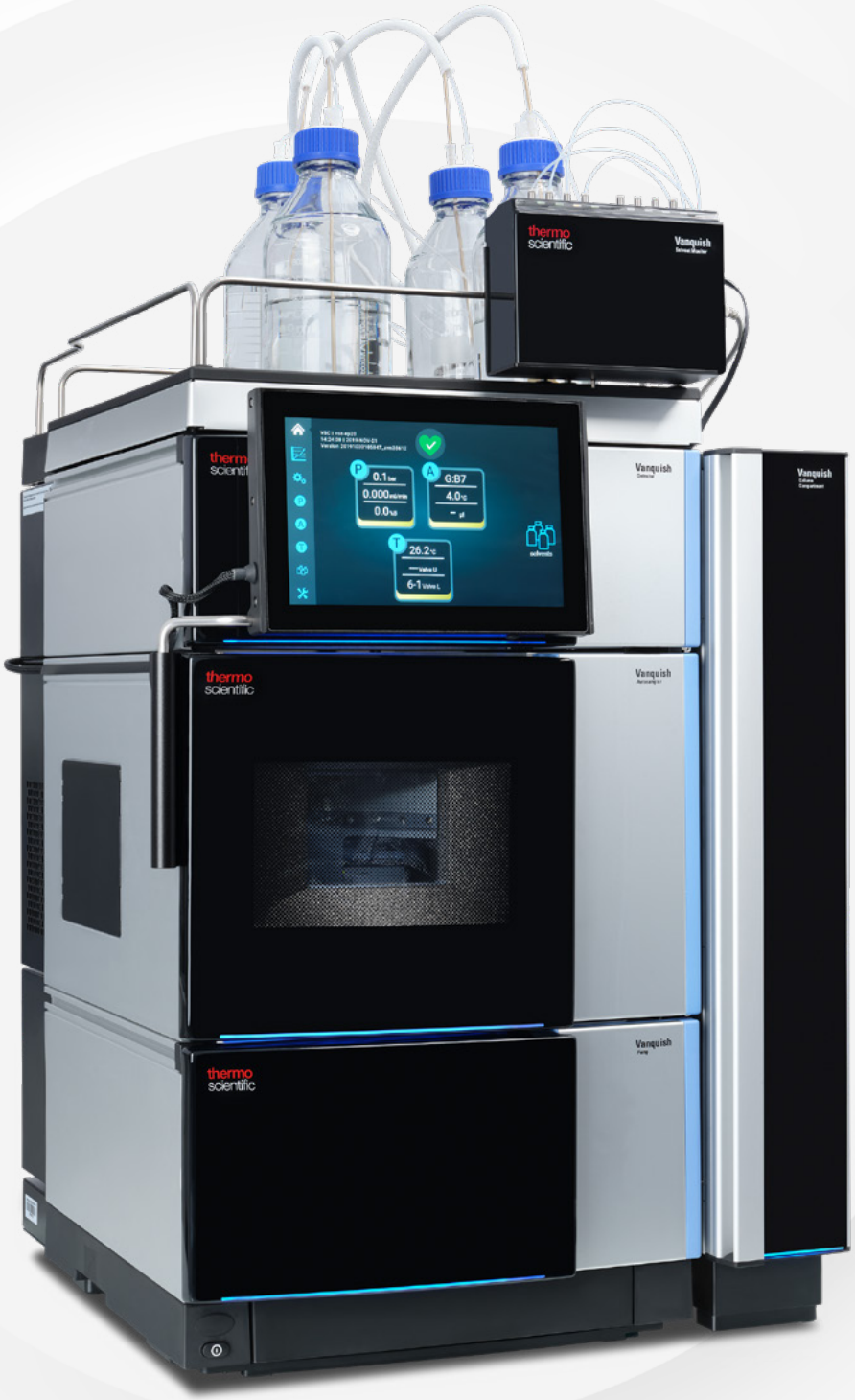


Vanquish Horizon UHPLC system

Dependably different. Lab ready.

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

thermo scientific

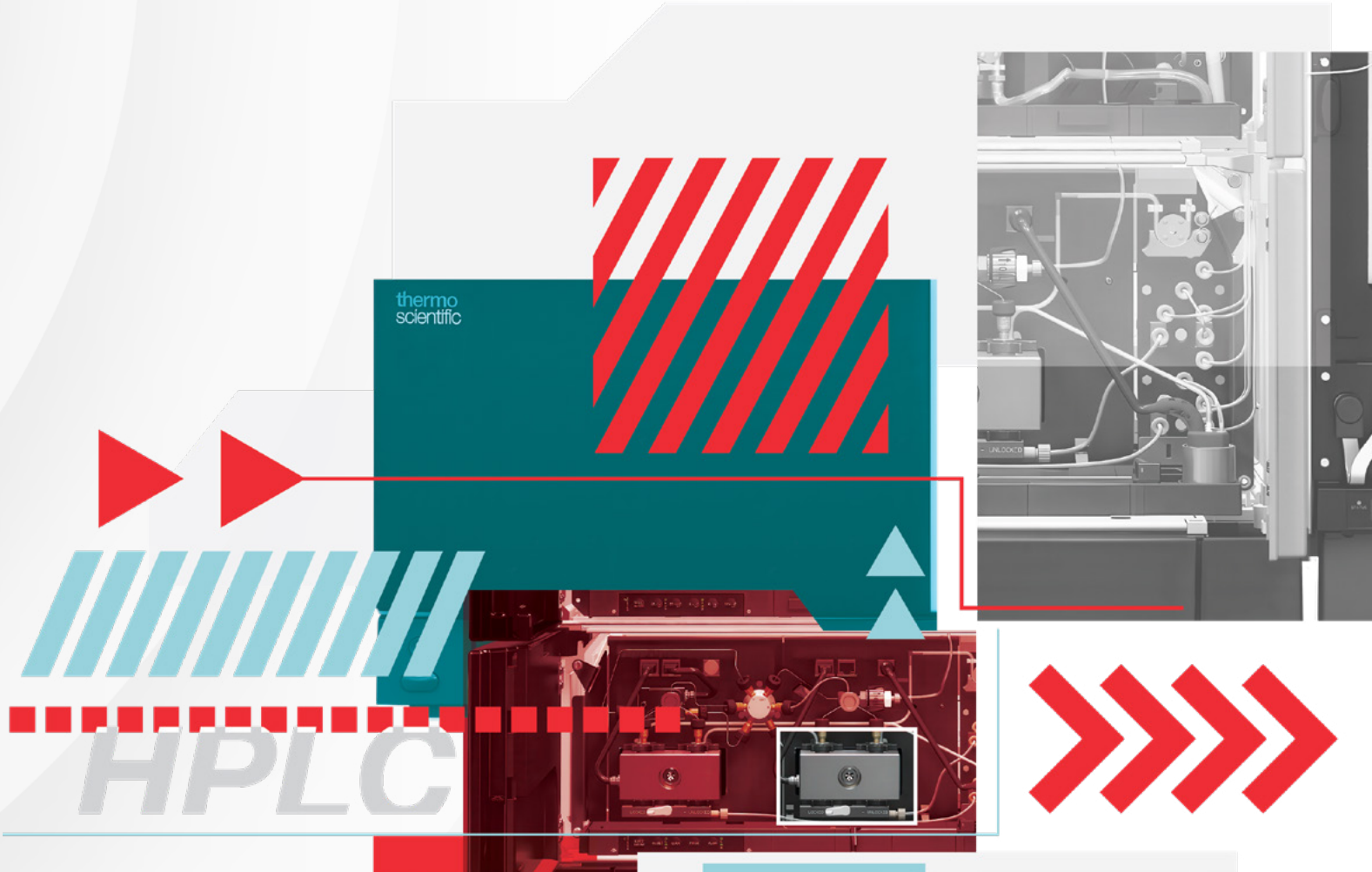

thermo scientific
Vanquish
0.1 bar
0.000 mL/min
0.0 kB
A
G:B7
4.0 °C
26.2 °C
6-1 Valve L

Experience uncompromised UHPLC performance

When you need the best analytical tools for the toughest analytical challenges, like producing life-saving medicines or ensuring the quality and safety of our food and environment, the Thermo Scientific™ Vanquish™ Horizon UHPLC system lets you push the boundaries of separation science.

Designed with innovative technology and attention to fine detail, the Vanquish Horizon UHPLC system brings exceptional analytical precision, detector sensitivity, and operational simplicity to enable unmatched robustness and performance. Designed for research labs who need the highest performing UHPLC and LC-MS, the Vanquish Horizon UHPLC system delivers:

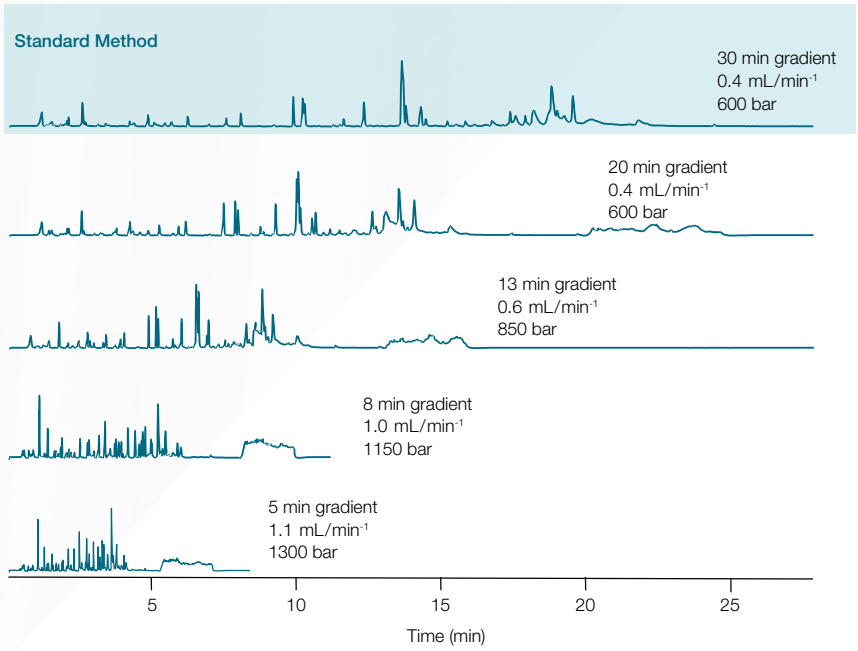
- Unparalleled performance for challenging UHPLC separations requiring the best pumping precision and widest application range
- Full biocompatibility to address the most challenging biotherapeutic applications with unsurpassed retention time and peak area precision even with lowest sample volumes available
- Highest throughput capabilities for UHPLC and LC-MS with extra-long unattended operation
- Dedicated solutions for exceptional and seamless LC-MS integration
- Maximum detector sensitivity with minimized baseline noise
- 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 and polystyrene free secondary and tertiary packaging



Uncompromised performance

In your laboratory, UHPLC is an essential tool to advance your research and prevail against the toughest analytical challenges. The Vanquish Horizon UHPLC system is built with innovative technologies to improve your UHPLC analysis with:

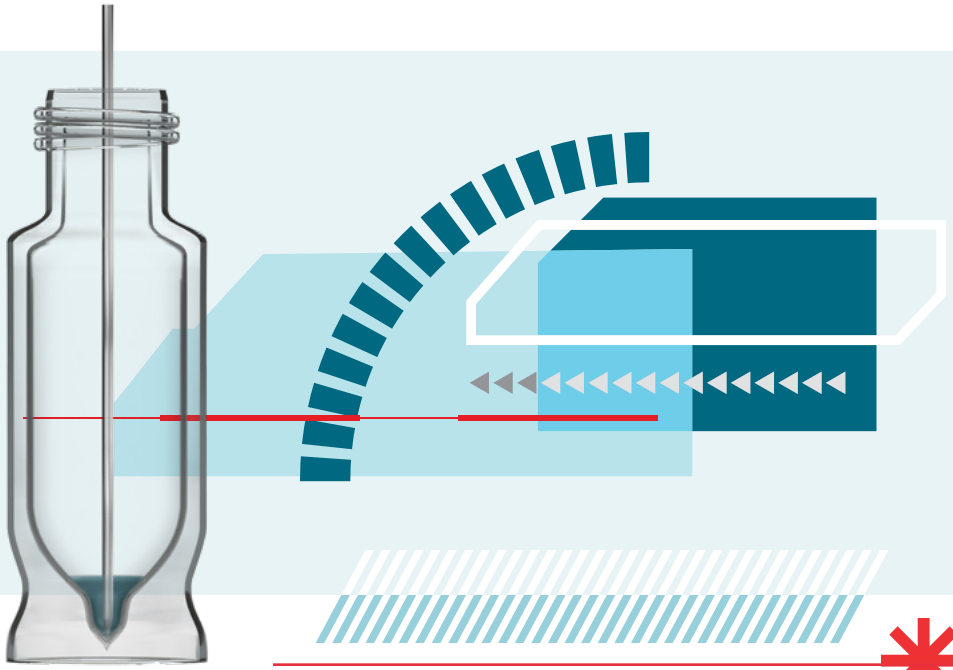
- Highest pressure capabilities allowing use of extra-long sub-2 µm particle columns
- Dedicated 1.5 µm columns with solid core particle column technology and fully porous columns validated for Vanquish LC systems for optimized separations
- Minimized system dispersion by employing low-dispersion Thermo Scientific™ Viper™ TQ UHPLC Fittings
- Multiple thermostatting options to refine and take full advantage of your sub-2 µm particle column separations
- Outstanding peak area and retention time precision of small sample volumes with vial bottom detection technology
- Enhanced solvent filtration for increased pump robustness



Accelerated peptide mapping utilizing the full power range of the Vanquish Horizon UHPLC system while maintaining 100% sequence coverage using a Thermo Scientific™ Acclaim™ RSLC 120, C18, 2.2 µm column.

Vial bottom detection

Samples analyzed by UHPLC and LC-MS can be limited by volume. The vial bottom detection technology incorporated in the Vanquish Horizon UHPLC system 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.



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 Horizon UHPLC system brings ease of use to a new level, enabling every user to deliver exceptional results, independent of user experience.

- Viper TQ UHPLC Fittings for nearly zero dead-volume fluidic connections
- Automatic and remote instrument purging
- At-instrument user interface that provides status display, maintenance instruction, and at-instrument control for system setup
- Easy-to-use Chromeleon CDS method setup wizards and Smart Startup, Standby, and Shutdown for safe operation



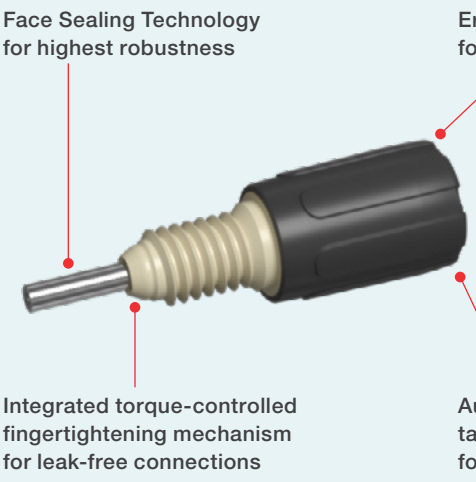
Vanquish Solvent Monitor manages your eluent and waste level for highest confidence during analysis.

Vanquish Solvent Monitor

The Thermo Scientific™ 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 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.



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.

High-throughput capabilities

Keep up with the ever-increasing sample processing demand by improving productivity and throughput. The system can cope with ultra-high-throughput analysis with:

- Extra-low overall system gradient delay volume
- Highest pumping precision for even the most challenging gradients
- Incredibly short injection cycle which can be nearly eliminated by additional smart Chromeleon CDS control features
- Maximized sample throughput with Thermo Scientific™ Vanquish™ Horizon High-throughput LC systems

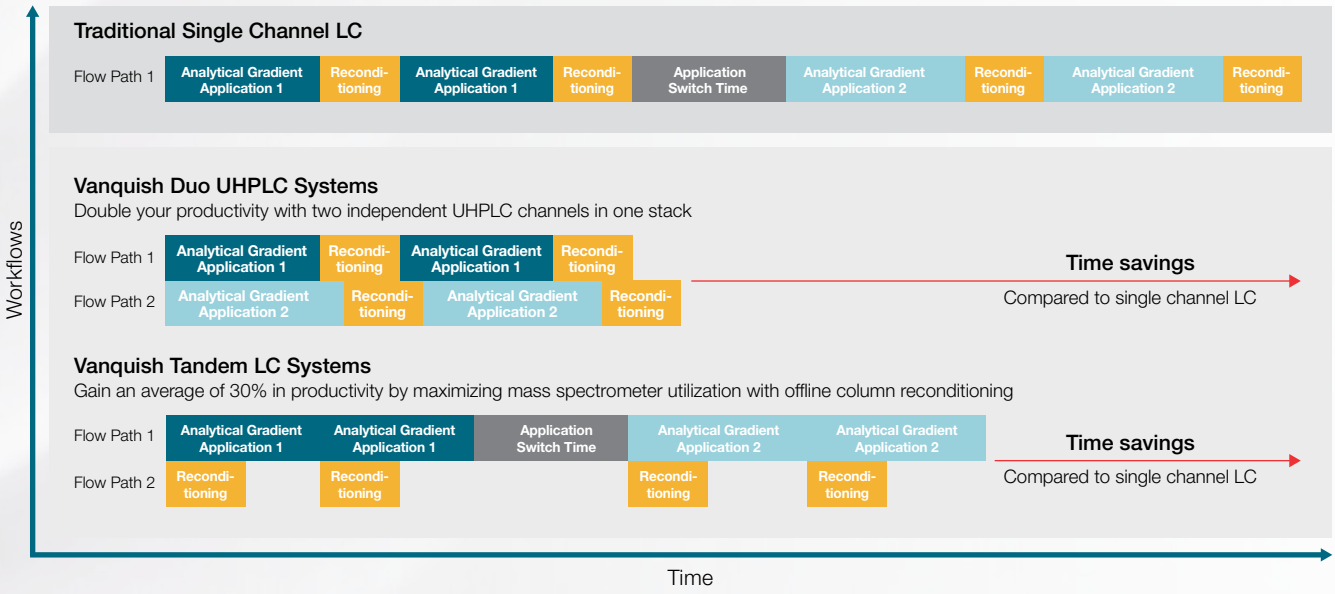
Vanquish Horizon High-throughput LC systems

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 in one system 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.



Built for productivity and throughput

Increase sample capacity with the Thermo Scientific™ Vanquish™ Sample Hub module for a total capacity of up to nearly 9,000 samples while the barcode reader simultaneously manages the complete inventory.

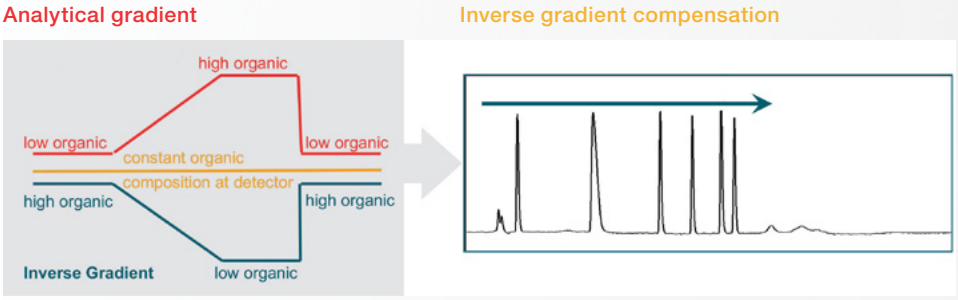


Improve your quantification

Improve your lab's quantification capabilities with Thermo Scientific™ Vanquish™ Inverse Gradient LC systems, employing the unique and universal charged aerosol detection to consistently quantify all non-volatile and semi-volatile compounds, even when no reference standard is available.

By utilizing a second pump to deliver an inverse gradient, the detector offers:

- Uniform response with charged aerosol detection under gradient elution conditions
- Reliable standard-free quantification of knowns and unknowns
- Simplifed method setup with automatic inverse gradient calculation considering all system volumes





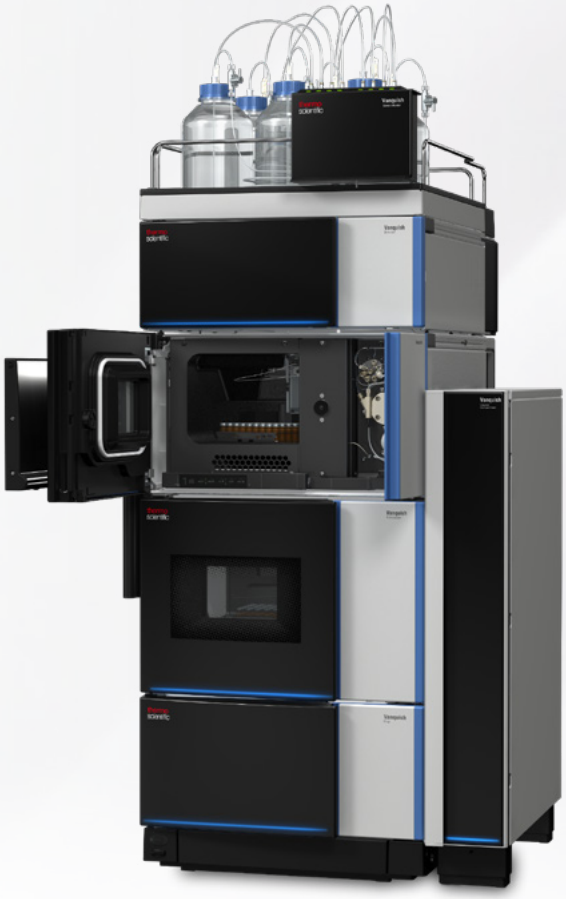
Purify your samples

The isolation of a single compound from a complex mixture can be a major challenge for scientists tasked with in-depth sample characterization. The demands for isolation followed by further investigation can be multifaceted, based on the key area of focus of the drug development process.

The Thermo Scientific™ Vanquish™ Analytical Purification LC systems support a broad range of applications for both upstream and downstream processes. They match the separation power of the LC systems with compelling fractionation for high-purity and high-yield compound collection. Built with Vanquish HPLC and UHPLC system components, they deliver unrivaled performance, robustness, and user-friendliness.

Purify by fractionation to:

- Identify and characterize new target analytes
- Improve production process by impurity profiling
- Isolate reference material
- Enrich compound of interest by pooling



Increased confidence

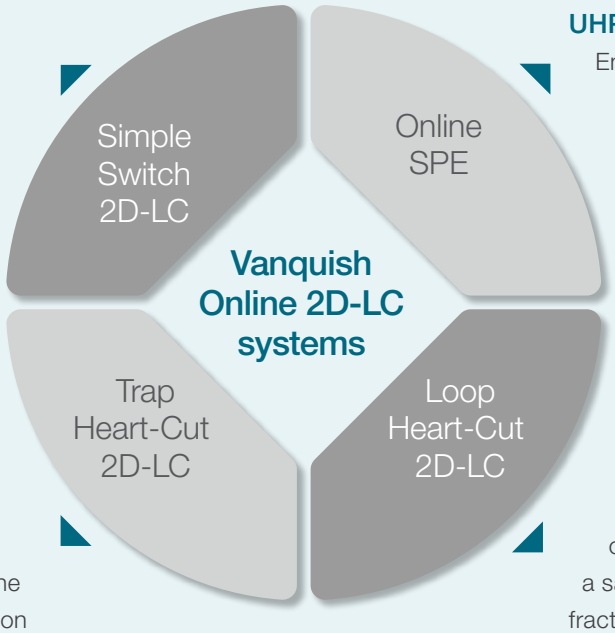
Complex samples with co-eluting peaks or interfering matrixes are not always successfully separated with conventional UHPLC utilizing a single column chemistry. In these cases, the analysis can be improved by employing two-dimensional liquid chromatography to resolve co-eluting peaks and gain confidence in your separation.

Four different Vanquish 2D-LC systems can be configured from Vanquish Horizon modules/components targeting different two-dimensional LC workflows:

Vanquish Online 2D-LC systems

Thermo Scientific™ Vanquish™ Simple Switch 2D-LC system
Achieve utmost application flexibility through seamless switching between a Vanquish Trap Heart-Cut 2D-LC instrument and a Vanquish Duo UHPLC system.

Thermo Scientific™ Vanquish™ Online SPE HPLC and UHPLC system
Ensure analyte pre-concentration and sample clean-up in an automated repeatable workflow while saving solvent and time.



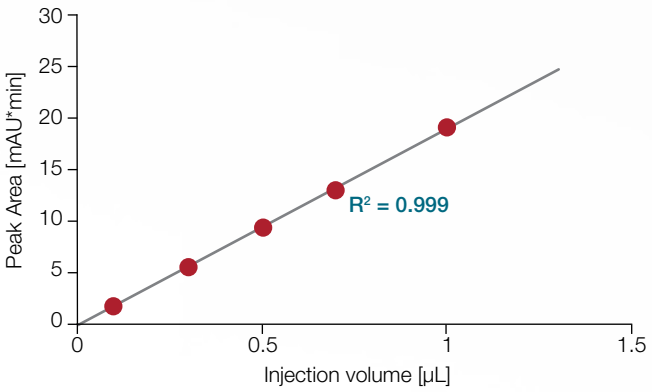
Thermo Scientific™ Vanquish™ Trap Heart-Cut 2D-LC system
Transfer one or multiple fractions of the first dimension analytical column to a trap column before submitting to the second dimension for improved detection flexibility, such as, making non-MS-compatible separations MS compatible.

Thermo Scientific™ Vanquish™ Loop Heart-Cut 2D-LC system
Collect one or multiple fractions of the first dimension separation in a sample loop and transfer the cut-out fraction(s) to a complementary column chemistry for a second dimension separation for peak purity confirmation.

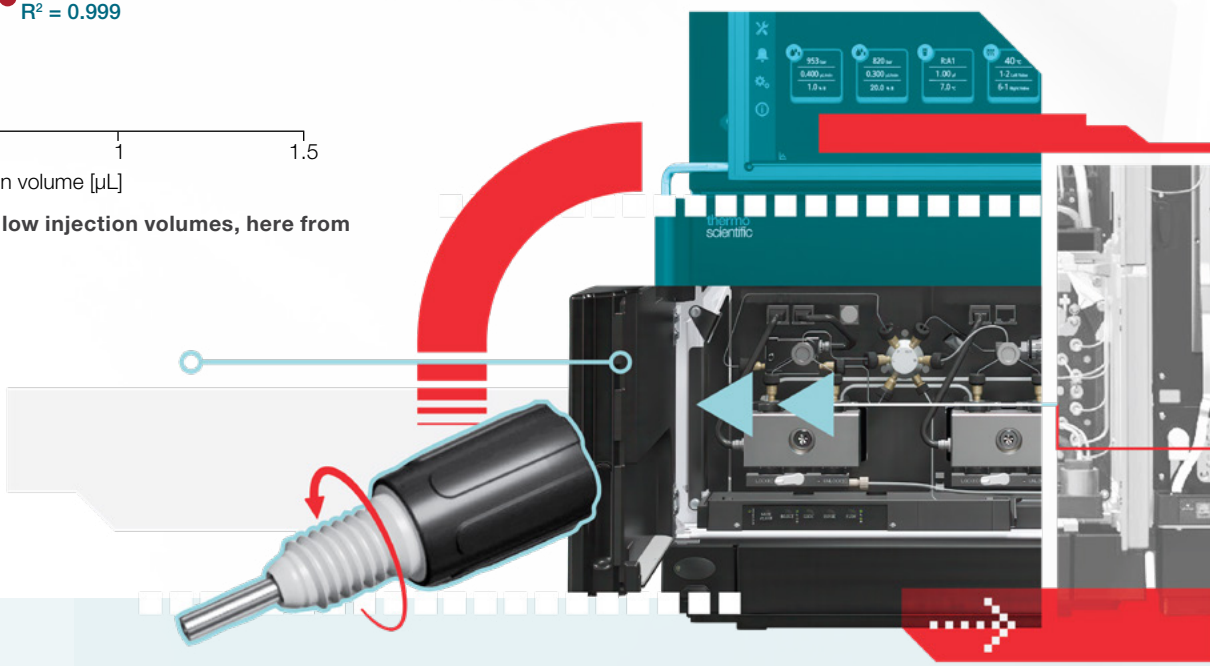
Precision on new levels

Analytical precision, for both retention times and peak areas, is critical to obtain reliable qualitative and quantitative analytical results for every application—specifically in 2D-LC applications. The Vanquish Horizon UHPLC system brings this precision to new levels of confidence in your results.

- Thermo Scientific™ SmartInject™ Technology for increased retention time precision and prolonged column lifetime
- Thermo Scientific™ SmartFlow™ pumping algorithm for improved flow accuracy and superior system-to-system reproducibility
- Thermo Scientific™ SmartStroke™ technology for a variable stroke volume, resulting in improved signal-to-noise performance for applications utilizing trifluoroacetic acid
- Outstanding precision for improved compound identification and quantification, even for minimal sample volumes, automated data processing, efficient selected reaction monitoring scheduling, and precise 2D-LC chromatography



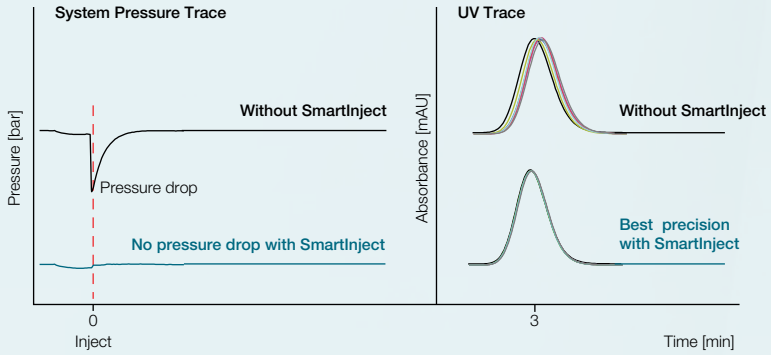
Autosampler linearity for even low injection volumes, here from 100 nL to 1 µL.



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.

Use your existing software infrastructure for implementation

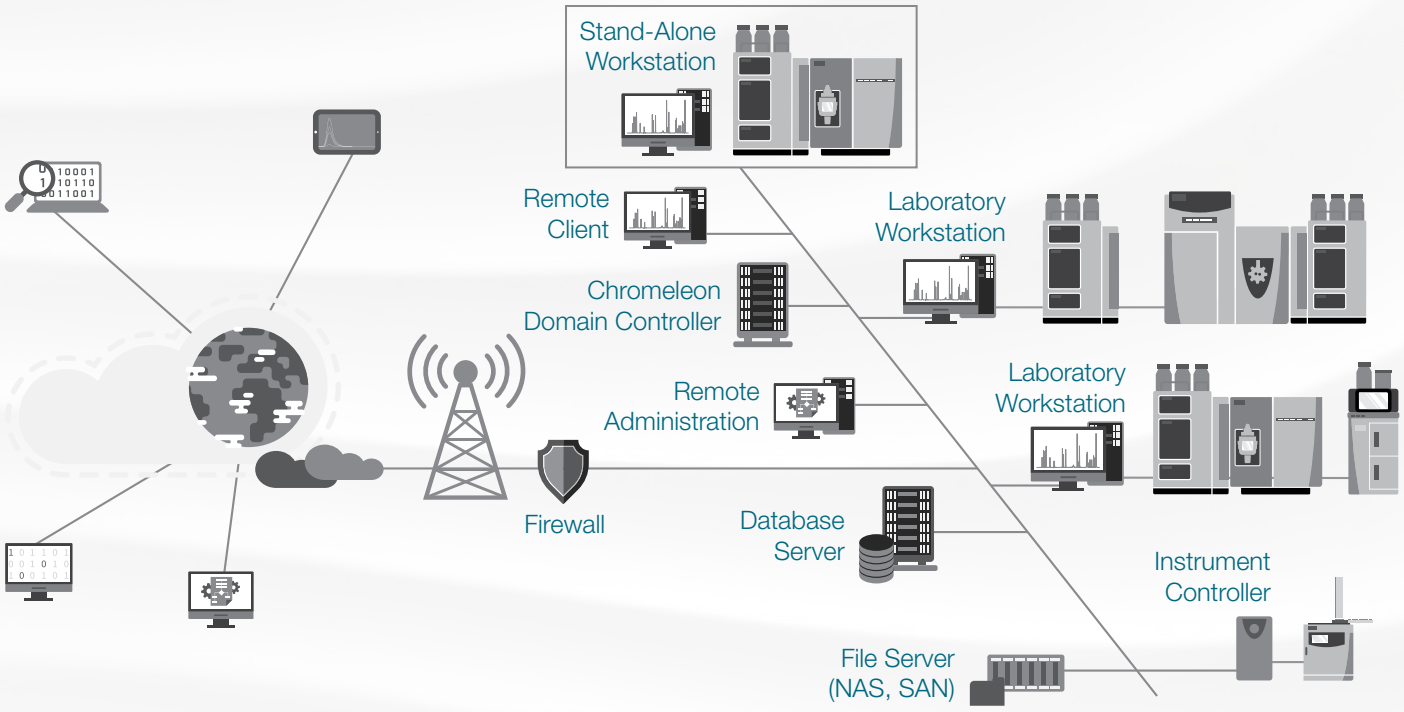
No matter your current software setup, you can maximize the benefits of the cutting-edge innovation of your Vanquish UHPLC system by seamlessly integrating with our recommended software, Chromeleon CDS, to deliver the highest levels of control and automation with unparalleled flexibility and ease of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

Chromeleon CDS

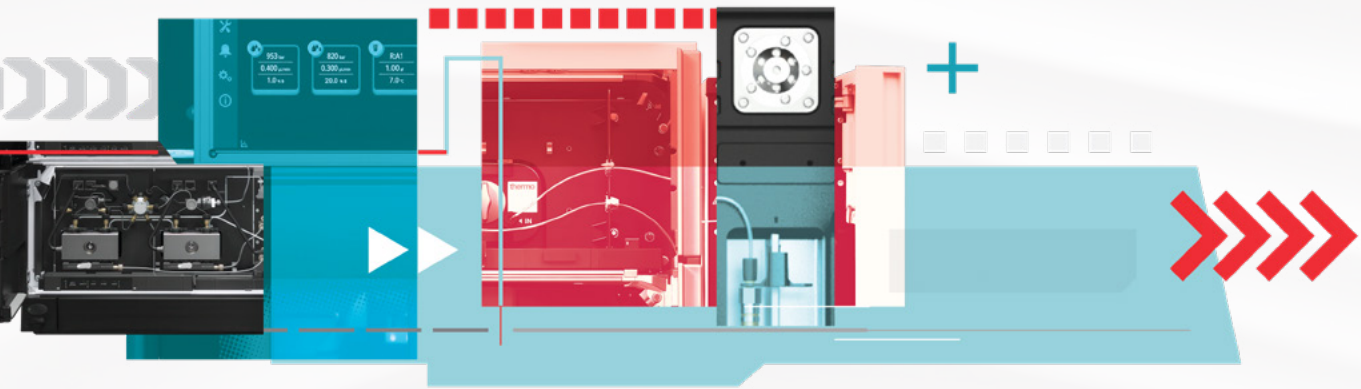
Connecting people, instruments, and data to deliver control, productivity gains, data integrity, and full support of GMP compliance. Run your lab on an intuitive, user-friendly software that easily scales from workstation to global deployment.

Thermo Scientific™ 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.



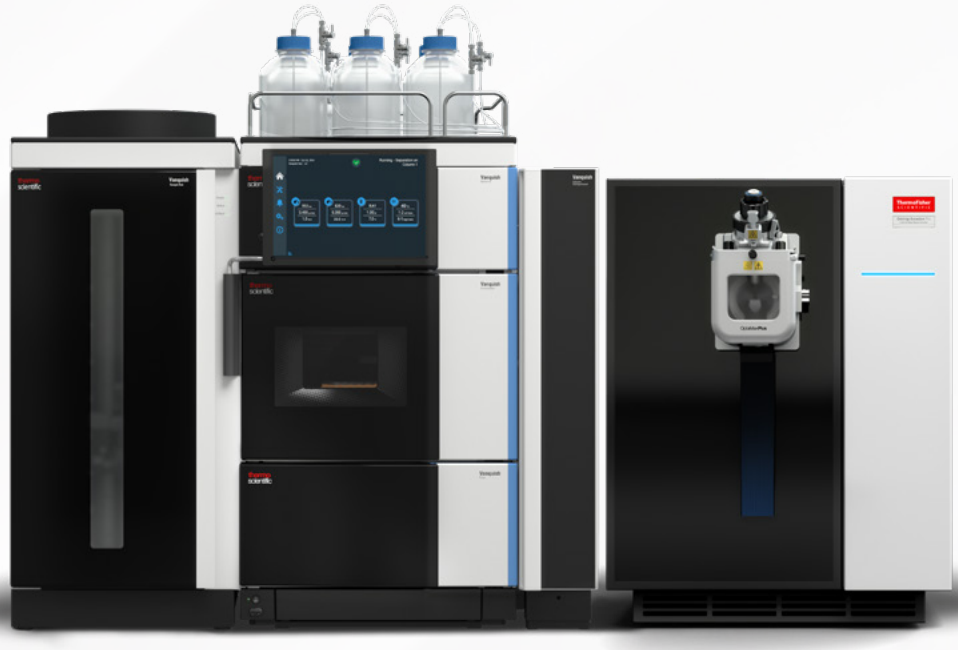
Network scalability—stand-alone to a global network with secure central data storage.



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.

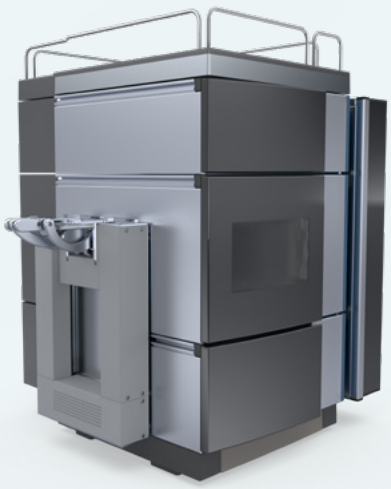
- Best-in-class retention time precision for optimal selected reaction monitoring
- Superior separation for minimal ion suppression
- Minimum carry-over for reliable trace-level LC-MS quantification



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

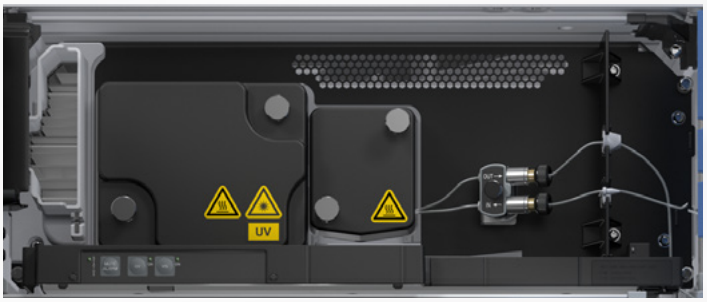
Built for automation

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.



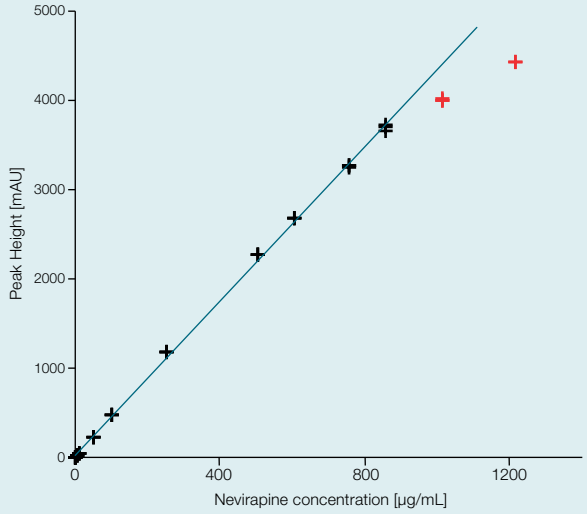
Detect your analyte

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



Industry-leading diode array detection

Thermo Scientific™ Vanquish™ Diode Array Detector HL with the Thermo Scientific™ LightPipe™ detection technology delivers supreme analyte sensitivity through low baseline noise and longer effective light path by total internal reflection. 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

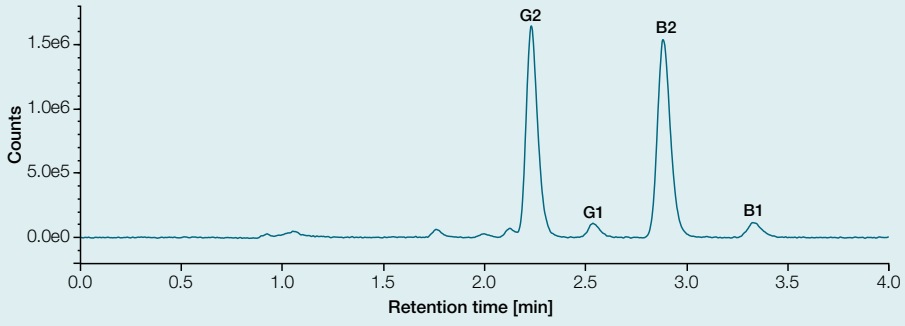
UV-Vis detection with excellent sensitivity and linearity is a cost-effective and powerful solution for quantitative compound analysis.

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.

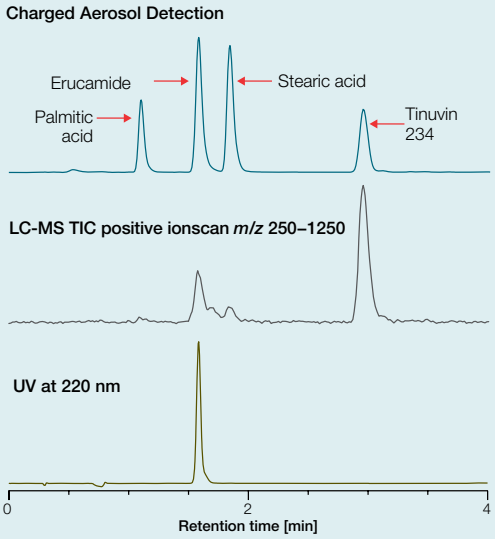


FLD chromatogram of the four aflatoxins: G2, G1, B2 and B1 at a concentration of 0.9 µg/kg for G2 and B2 and 2.9 µg/kg for G1 and B1.



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.



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 integrates 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.

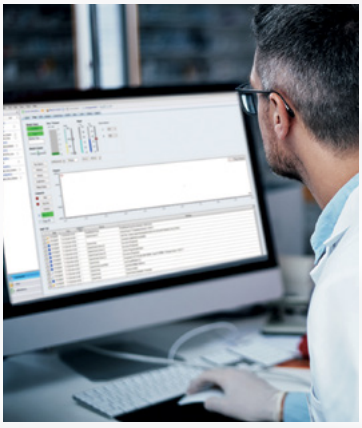
Pairing smoothly with your LC-MS

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.

Explore the system



2



14



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 for 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. Vanquish 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 UHPLC 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

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



10 Keep your lab tidy

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

11 Absolute precision

The Vanquish Horizon pump delivers the best retention time precision of the complete portfolio, even for the most shallow gradients. Smart algorithms improve flow accuracy and minimize baseline pulsation. Combined with improved check valves, outstanding performance can be achieved robustly.

12 Higher data confidence

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

13 Biocompatibility

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

14 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™ Amplify UHPLC systems
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

Nano-, cap-, micro-flow UHPLC

Dependability	Flexibility	Performance	Sensitivity
			
Thermo Scientific™ Vanquish™ Core HPLC systems	**Thermo Scientific™ Vanquish™ Flex UHPLC systems**	**Thermo Scientific™ Vanquish™ Horizon UHPLC system**	**Thermo Scientific™ Vanquish™ Neo UHPLC system**
• High-pressure binary and low-pressure quaternary solvent blending or isocratic flow delivery • Workhorse instrument • Seamless method transfer • System intelligence for improved productivity	• High-pressure binary and low-pressure quaternary solvent blending • Biocompatible • Unparalleled flexibility and control	• High-pressure binary solvent blending • Biocompatible • Industry-leading specifications • Unmatched detection sensitivity	• 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
700 bar	1000 bar	1500 bar	1500 bar

my green lab. ACT Ecolabel

Certified with ACT Ecolabel 2.0

Learn more at **thermofisher.com/vanquishhorizon**

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