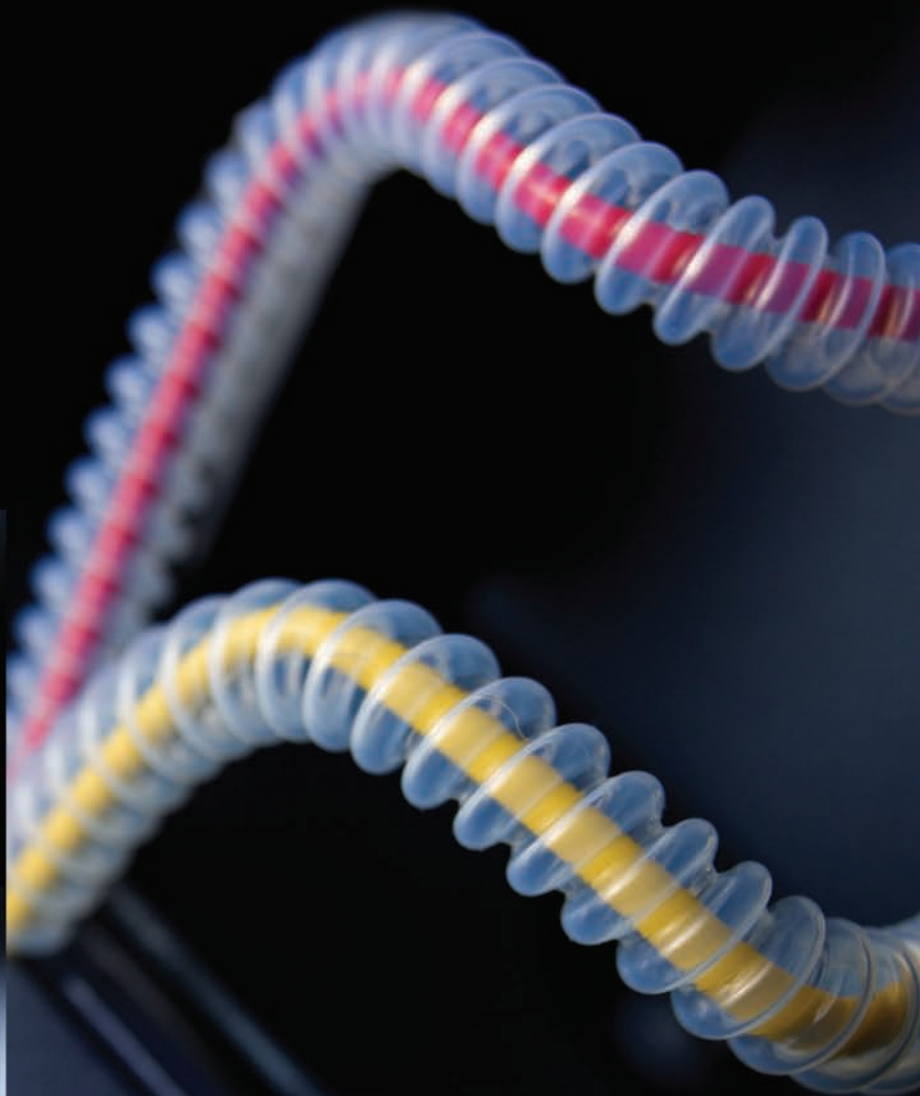


[nanoACQUITY uPLC SYSTEM]

YOUR DIRECT
NANO-FLOW SOLUTION



Waters

THE SCIENCE OF WHAT'S POSSIBLE.™

NANO-SCALE CHROMATOGRAPHIC PERFORMANCE YOU CAN COUNT ON.

Scientists working in proteomics and biomarker discovery must obtain the most information from very small amounts of highly complex, often irreplaceable samples. ■ For these analyses, fragmented LC and MS solutions are often the norm, creating a steep learning curve for analysts and less than ideal results. ■ With Waters® nanoACQUITY UPLC® system, you will experience increased reliability and ease-of-use through holistic design, intuitive diagnostics, and customized nano-scale fittings and columns. ■ Experience reproducible, high peak capacity separations that provide better data quality and more confident results. ■ Maximize your laboratory resources with a flexible system designed to work with any mass spectrometer. ■ Break through the limitations of your current nano-scale HPLC system and step into a world of information-rich analyses your laboratory can count on.



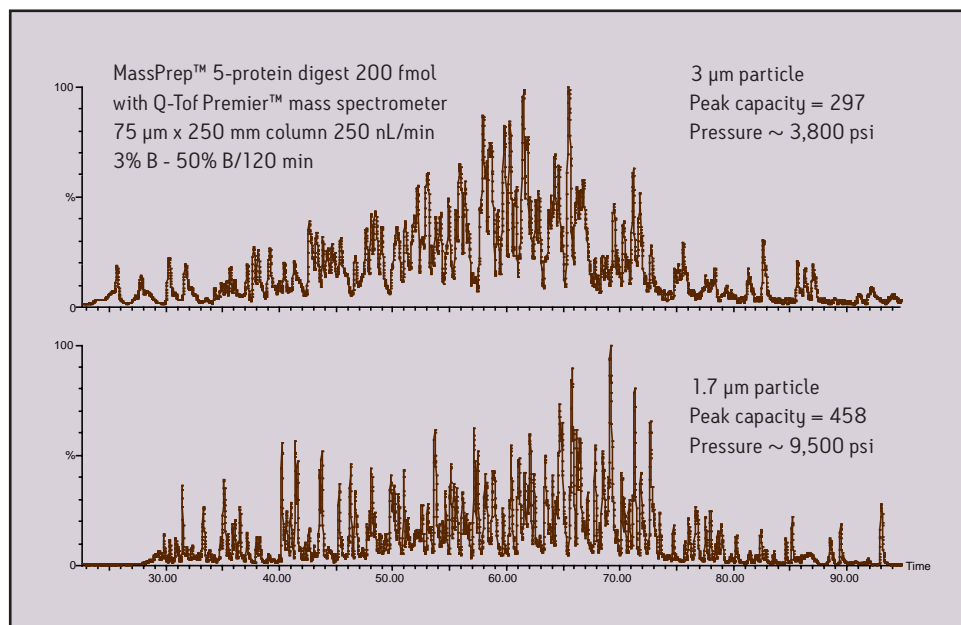
nanoACQUITY UPLC system and BEH Technology™ columns provide higher resolution and better peak capacity. This combination enables you to obtain information-rich data in a shorter timeframe, resulting in increased productivity.

A SYSTEM BUILT WITHOUT COMPROMISE

Built on the groundbreaking technology of Waters ACQUITY UPLC® system, nanoACQUITY UPLC is a platform specifically designed for applications that depend on nano-scale separations such as biomolecule identification, post-translational modifications, and biomarker discovery.

UNPARALLELED PERFORMANCE

Increase information content through better chromatographic resolution from every sample—with the combination of nanoACQUITY UPLC BEH 1.7 µm columns with an optimized fluidic path. You'll see improved peak capacity and peak shape, and increase the number of components that can be detected per separation. The nanoACQUITY UPLC system's 10,000 psi operating pressure capability allows for superior high peak capacity separations by effectively operating longer columns packed with sub-2-micron particles.



In this comparison, the same sample (a tryptic digest of ADH, enolase, phosphorylase b, BSA, and hemoglobin) is run on two columns of the same dimensions, the only difference being particle size. The separation on the 1.7 µm particle shows better chromatographic resolution. As the number of peptides increases, chromatographic resolution becomes critical. These smaller particles, packed in longer columns, generate high peak capacity separations for maximum information in UPLC/MS and UPLC/MS/MS modes.



nanoACQUITY UPLC SYSTEM FEATURES

Maximum resolution – Optimized system to drive 1.7 μm BEH particle technology to yield maximum peak capacity for complex mixtures.

Maximum reproducibility – Direct nanoflow control and a novel, moveable heating and trapping module for < 0.25-minute standard deviation run-to-run reproducibility, even over long gradients.

Maximum throughput – BEH Technology columns enable faster gradient separations for simple mixtures, or when performing targeted analyses without compromising resolution.

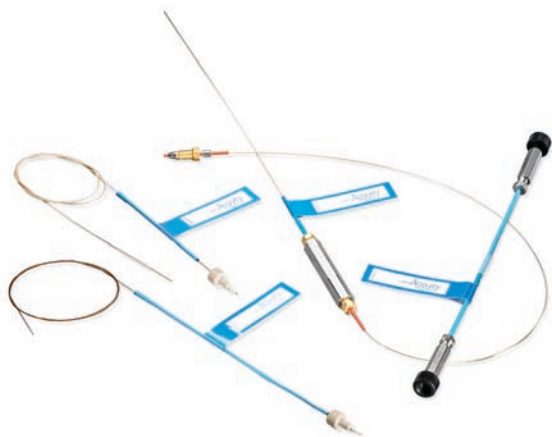
Robustness – Nano-scale columns and fittings (PEEK, 1/32 stainless steel and gold coating) provide reliable operation for up to 10,000 psi, with novel high pressure trapping.

Ease-of-use – Direct gradient control enables minimized tubing assemblies and simplified loading and trapping schemes.

Enhanced on-board diagnostics – Efficiently monitor system performance.

Combine with any MS – Control the nanoACQUITY UPLC system from your Waters, Thermo Fisher Scientific, or ABI/MDS SCIEX mass spectrometer software platforms.

UPLC and HPLC – Compatible with a wide range of conventional nano-scale columns with a flow rate range from 200 nL/min to 100 $\mu\text{L}/\text{min}$.



nanoACQUITY UPLC columns are available with BEH, Atlantis®, and Symmetry® chemistries in a range of ID's (75 μm to 300 μm) and lengths (100 mm to 250 mm). Specialized Trap columns and custom packings are also available.



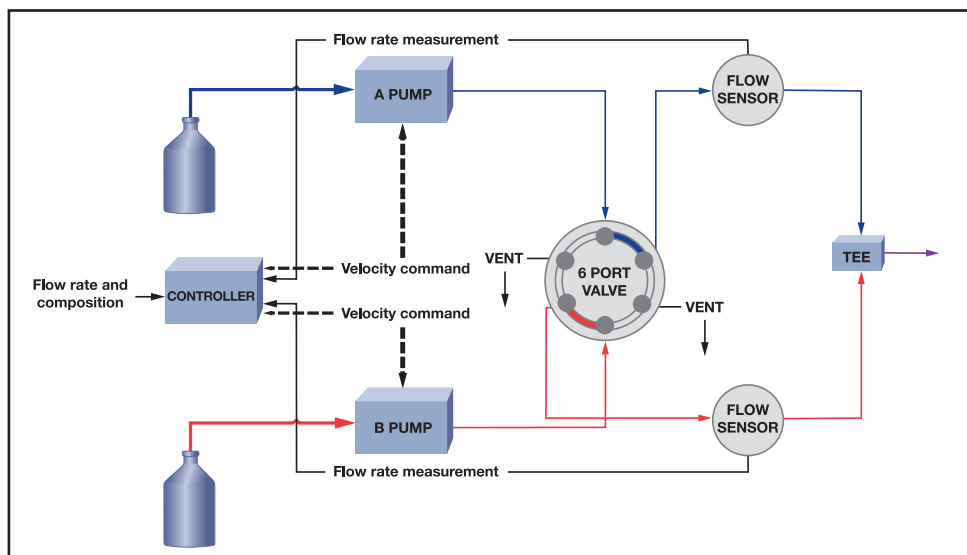
The nanoACQUITY UPLC system features a Heating and Trapping Module, Sample Manager, Binary Solvent Manager, Auxiliary Solvent Manager (optional), and FlexCart.



FLEXIBILITY TO SUIT YOUR SEPARATION NEEDS

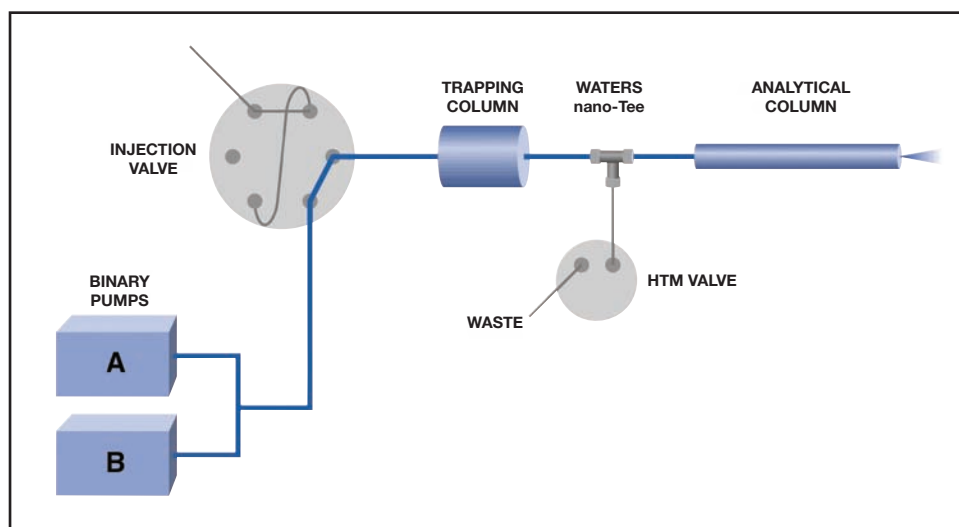
The direct nano-flow design of the nanoACQUITY UPLC system runs without a flow-splitter, removing the need to adjust fittings and perform flow calibrations just to change the flow rate. With this easy-to-use system, you'll see better robustness and chromatographic reproducibility.

Binary Solvent Manager



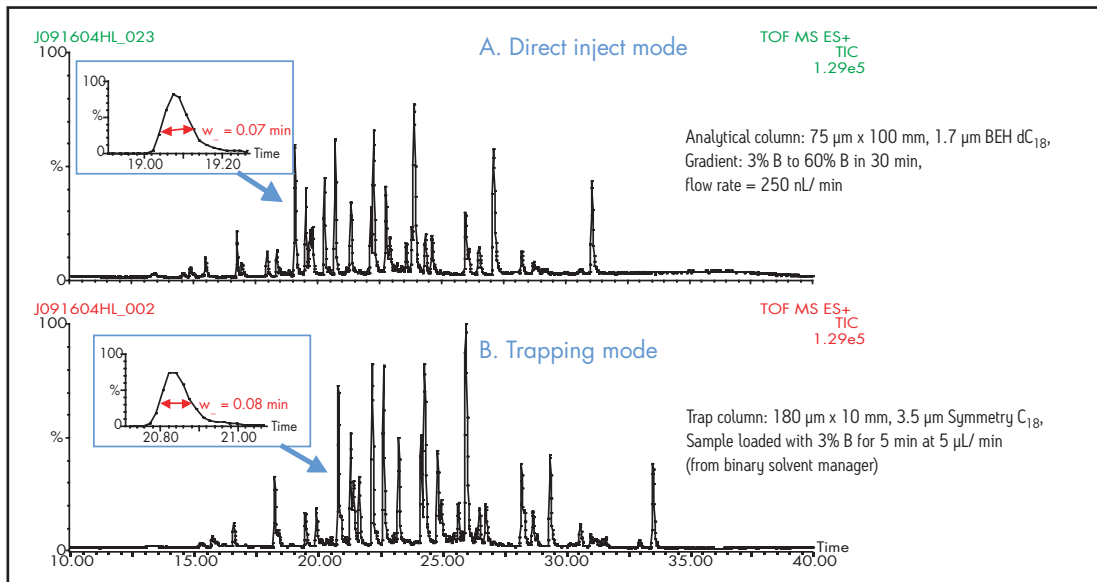
nanoACQUITY UPLC system's Binary Solvent Manager (BSM) - Responsive flow sensors, optimized tubing, and sophisticated algorithms enable flow rates from 200 nL/min to 100 μ L/min. An automated vent valve facilitates rapid priming and purging and solvent select valves permit alternate solvents for each pump. Two high pressure streams, in 25 μ m ID tubing, converge in the tee. The system volume from the site of gradient mixing in the tee to the trapping column is < 1 μ L.

Heating and Trapping Module



nanoACQUITY UPLC system's Heating and Trapping Module - The analytical column is housed in an extendable arm that delivers analytes directly to the source of the mass spectrometer. It is contained in a thermally controlled sleeve, which, when combined with the minimized dead volume of the system, leads to improved peak shape, peak resolution, and reproducibility for HPLC and UPLC separations. A trapping column can also be easily added to desalt and pre-concentrate larger sample volumes.

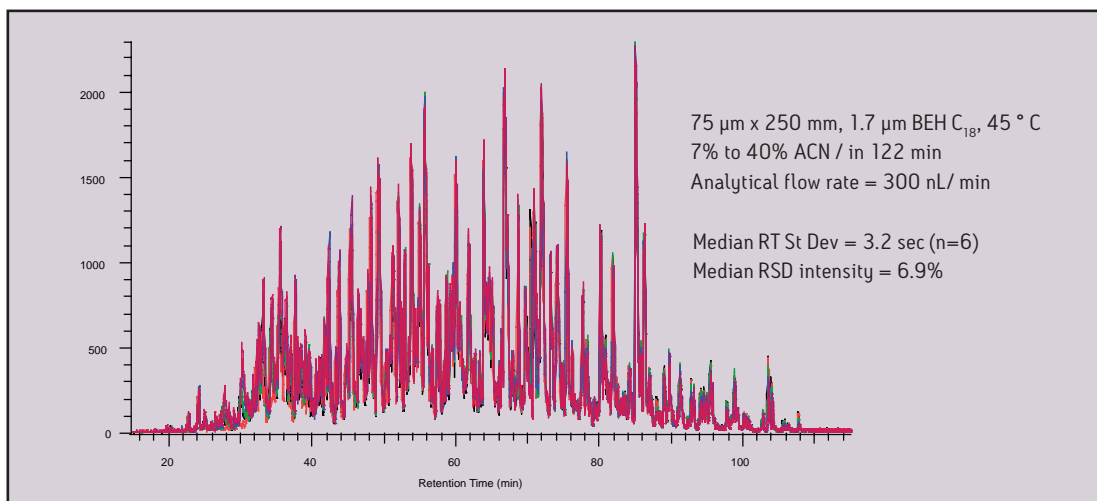
Direct loading and trapping



Direct loading and trapping - The chromatographic separation of a tryptic digest of 200 fmol yeast enolase using (a) direct loading onto the analytical column and (b) sample trapping followed by separation on an analytical column. Both methods demonstrate the ability to efficiently resolve the same peptide components, revealing virtually identical chromatographic profiles.

REPRODUCIBILITY NEVER SEEN BEFORE AT NANO-SCALE

Improve accuracy in qualitative and quantitative applications - the unparalleled run-to-run reproducibility (even over long gradients) of the nanoACQUITY UPLC system's direct nano-flow functionality is essential for components to be confidently identified or tracked across sample sets as well as performing accurate quantitative comparison across sample sets.



In this tryptic digest of human cells (n=6 over a 12-hour period), it is possible to see retention time reproducibility usually achieved at analytical scale flow rates. Using shallow gradient conditions, there is a change of 0.3% B/min over two hours. Changes in retention time between comparable samples are due to changes in peptide structure (an indication of changes in protein expression).



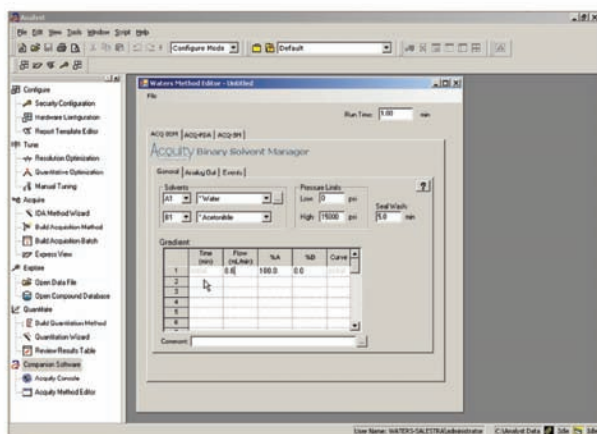


nanoACQUITY UPLC system.

ENHANCE YOUR EXISTING INVESTMENT: nanoACQUITY UPLC AND THIRD-PARTY MASS SPECTROMETERS

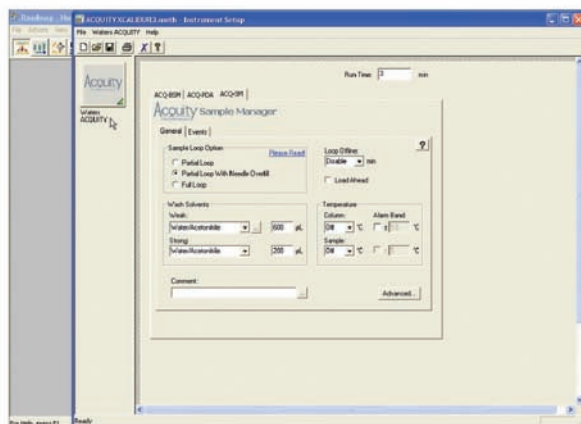
Waters recognizes that a majority of labs have already made significant capital commitments to mass spectrometry equipment that may be manufactured by third-party providers. You can still take advantage of the significant benefits that the nanoACQUITY UPLC system offers as a front-end to a variety of MS instruments.

The nanoACQUITY UPLC system is now easily compatible with third-party MS solutions via expanded software control options, allowing you to get the most efficiency and performance from your existing technologies.



ABI/MDS SCIEX's Analyst software acquisition method page.

Thermo Fisher Scientific's Xcalibur software instrument method page.



MAXIMIZE LC/MS PERFORMANCE AND PRODUCTIVITY

From Waters' Quattro Premier XE tandem quadrupole mass spectrometer, for routine quantification to the Synapt™ High Definition MS (HDMS™) system for cutting edge applications, the nanoACQUITY UPLC system is the only inlet you'll need for high-sensitivity nano-scale MS analyses, when sample-limited.

nanoACQUITY UPLC system's dramatic chromatographic resolution results in greatly enhanced detection sensitivity, allowing you to see more quality information in less time.

By matching our nano-scale UPLC/MS system solutions with MassLynx™ software for specialized data processing, you will complete your analysis accurately, quickly and with complete confidence in your answers.



nanoACQUITY UPLC system with Quattro Premier™ XE mass spectrometer and MassLynx software.



nanoACQUITY UPLC system with the Synapt HDMS system.

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