A sophisticated solution for complex purification needs

Waters

THE SCIENCE OF WHAT'S POSSIBLE.™

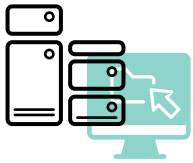
Satisfy all purification requirements without compromise

Waters' advanced LC Prep AutoPurification System offers robust, scalable solutions for every purification requirement. The flexible, expandable platform grows with your lab's needs – from UV-based fraction collection of a few dozen samples to mass-directed purification when your workflow demands high-throughput, parallel runs for selective fraction collection. Waters™ LC Prep AutoPurification System is a fully automated preparative system providing advanced functionality to satisfy all purification requirements without compromise.

Versatile solutions that are capable of purifying micrograms to multigram quantities

Robust and reliable systems improve your ability to manage increasing workload demands, including unattended instrument operation

Flexible configurations enable easy scale-up from analytical to preparative chromatography



User-friendly console and software features help you manage solvents and samples

Easy-to-upgrade systems help you bring the latest technologies to your lab

High capacity sample processing

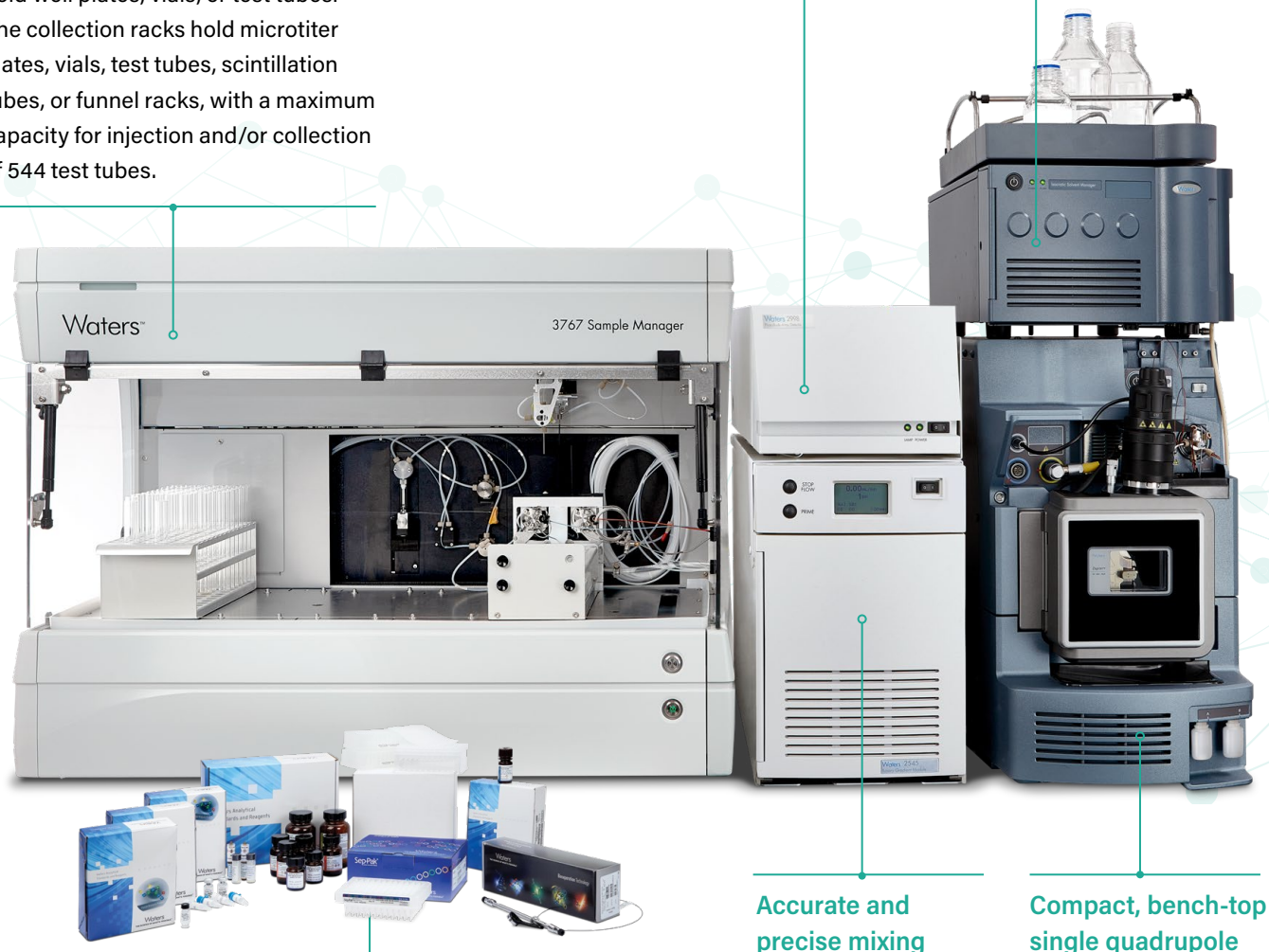
The Waters 3767 Sample Manager (Injector/Fraction Collector) delivers highly precise and reproducible analytical and preparative injections while utilizing separate analytical and prep flow paths. The injection and collection bed accommodate five racks. The first four can be utilized for either injection or collection vessels, and the fifth is reserved for injection vessels only. The injection racks hold well plates, vials, or test tubes. The collection racks hold microtiter plates, vials, test tubes, scintillation tubes, or funnel racks, with a maximum capacity for injection and/or collection of 544 test tubes.

High performance analytical detectors

A wide range of high-performance detection capabilities, optimized to support a diversity of applications. Includes photodiode array (PDA), UV/Vis, evaporative light scattering, and mass detection. Both the PDA and UV/Vis detectors have flow cells that have separate flow paths for analytical and prep flow.

Optional make-up pumps for use with chemically destructive detectors such as MS or ELS

Choice of the Isocratic Solvent Manager (ISM) or 515 HPLC make-up pumps to increase the split flow velocity to the detector for sensitive and accurate fraction triggering.



Holistic offerings

Benefit from an integrated offering of industry-leading chemistry and software solutions.

Accurate and precise mixing with either high pressure binary or low pressure quaternary mixers

Flow rate ranges of 0.5 mL/min to 300 mL/min in 0.01 increments.

Compact, bench-top single quadrupole mass spectrometers for accurate mass-directed purification

The SQ Detector 2 and ACQUITY™ QDa™ Mass Detector offer mass ranges of up to 3072 *m/z* and 1250 *m/z*, respectively.

Flexible configurations enable easy scale-up from analytical to preparative chromatography

To minimize the consumption of sample and solvents, there is a benefit in developing separation methods on a small scale and transferring them to a larger scale. Considering several important parameters and applying appropriate scaling factors enables users to scale up from analytical chromatography to larger-scale preparative separations easily and successfully. The ultimate goal is to maintain chromatographic resolution between key components and enable users to better predict chromatographic performance between analytical and preparative chromatography. Using Waters LC Prep AutoPurification System, separation methods can be developed on an analytical scale and transferred to preparatory scale on the same system, reducing a laboratory's overall capital investment.

The Waters LC Prep AutoPurification System has two separate flow paths for analytical and preparative LC, resulting in performance without compromise.

- Separate analytical and prep inject valves provide optimum performance with minimum dispersion and high resolution
- UV detection designed to eliminate compromise with the AutoPurification flow cell comprising of two separate flow paths
- Waters LC Prep AutoPurification System column switching feature enables fast column regeneration, thus saving time

KEY FACTORS TO CONSIDER WHEN SCALING FROM ANALYTICAL TO PREPARATIVE CHROMATOGRAPHY

Column chemistry

The heart of the separation is the column. Ideally, identical column chemistries should be chosen. Waters offers a wide range of column chemistry choices available in analytical- and preparative-scale dimensions. Waters' proprietary Optimum Bed Density (OBD™) Column design offers excellent sample loading and column stability in an extensive array of chemistries and configurations.

Gradient scaling

When columns are of identical length, no changes to the gradient profile are required. If scaling to longer or shorter columns, the gradient segment volume must be maintained to preserve the separation profile. The Waters Optimum Bed Density (OBD) Prep Calculator, a free download, is an easy-to-use tool that aids in these analytical-to-preparative scaling calculations.

waters.com/prepcalculator

Fraction collection with the specificity of mass-directed purification or the inclusiveness of a UV system

The LC Prep AutoPurification System is compatible with both the Waters ACQUITY QDa Mass Detector and the SQ Detector 2 Mass Detector.

Although traditional compound isolation is usually performed with UV detection, introducing a mass detector to the preparative chromatography system provides an increased level of confidence in elucidating target compounds and collecting them. With the specificity that mass detection brings to purification, fewer fractions are collected (reducing evaporation time and analysis), compounds without chromophores are more easily targeted, and, when combined with UV detection, higher product purity and yield may be realized. Streamlining the purification process ultimately leads to improved efficiency with both time and cost savings.

The **ACQUITY QDa Mass Detector** is a single quadrupole mass detector with a mass range up to 1250 *m/z*. The small size, automatic calibration and optimization routines, and easy system integration, makes mass-directed isolation more readily accessible.

The **SQ Detector 2** is a compact, bench-top single quadrupole mass detector with a mass range up to 3072 *m/z*, making this the ideal selection for larger molecule applications. The system features automated set-up technology and fast acquisition capability for simple, rapid LC-MS.

FractionLynx, an application manager in MassLynx,™ manages and automates the sample purification process. FractionLynx controls fraction collection and tracks samples, their fractions, and associated data, all accessible through the FractionLynx browser. The software can trigger collection using a variety of detector signals including UV/Visible, Evaporative Light Scattering (ELS), MS, and analog.

- AutoPurify, a software feature in FractionLynx, executes all phases of the purification process, from crude sample analysis to final fraction evaluation, which includes using the results of the analytical analysis to determine the purification process. AutoPurify effectively improves productivity by increasing sample throughput with minimal user intervention at each step of the isolation process.
- Open Access Software, included with the FractionLynx application manager, provides an alternative access method to the traditional sample list enabling simple walk up and walk away access and a single page access. The software enables assignment of access privileges to users and reports that can be emailed or printed.

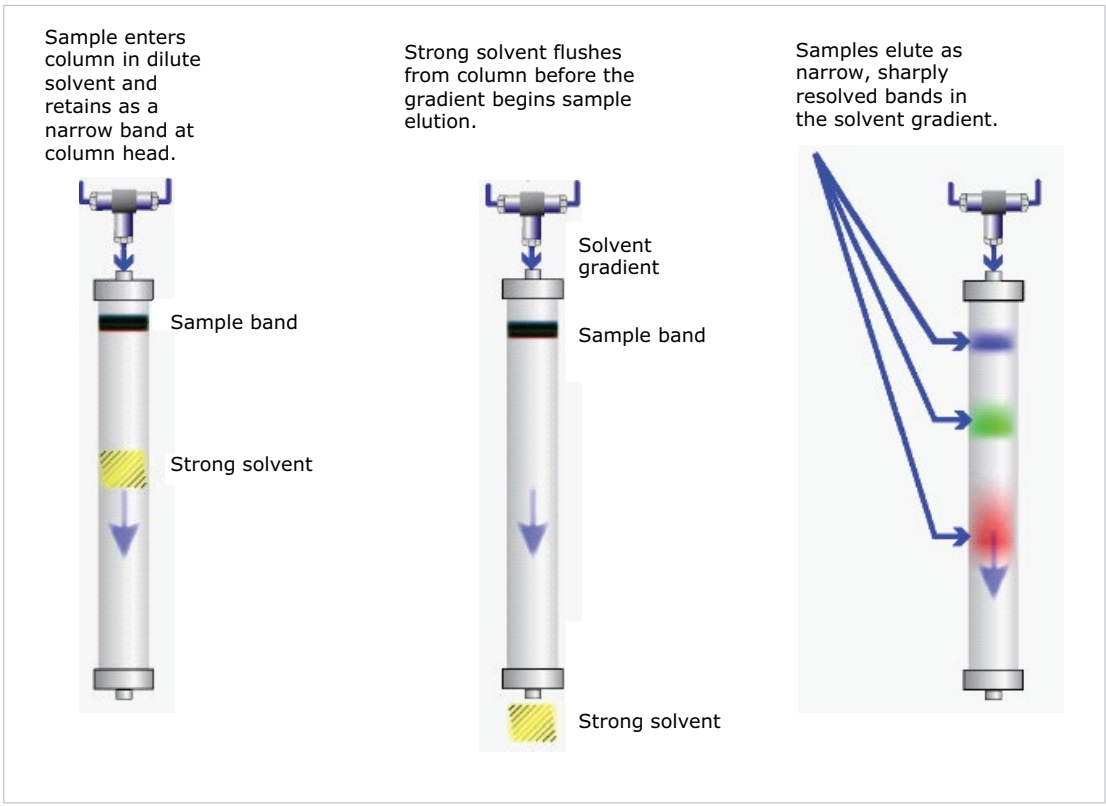
The Waters 3767 Sample Manager (Injector/Fraction Collector) provides expansive bed collection capabilities with a variety of collection racks.

The **3767 Sample Manager** is a high-capacity sample processing system that easily and automatically manages concurrent sample injection, collection of peak fractions, and fraction analysis on a single HPLC or LC-MS platform. Intended for applications involving analytical and preparative scale purifications, the 3767 is controlled by Waters MassLynx Software. The 3767 comes equipped with one analytical and one preparative injector. A variety of sample formats (test tubes, microtiter plates, and vials) can be used for injection and collection. An optional fume hood accessory provides an outlet for localized ventilation of hazardous vapors.

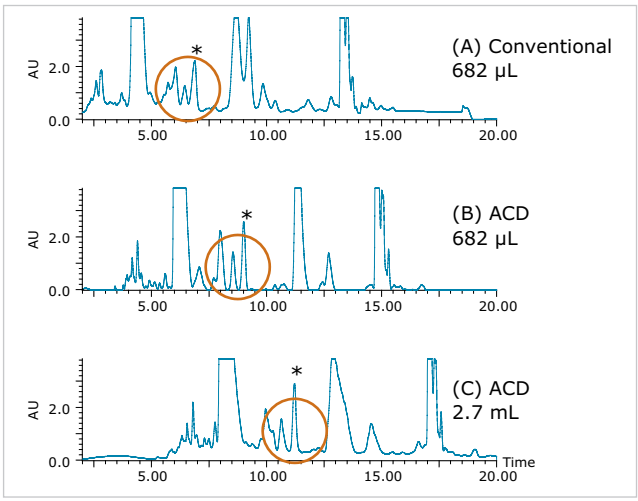
- High capacity single platform (up to 15 microtiter plates, 544 test tubes, or 2160 vials) for injection and collection
- Collect sample fractions sequentially or with one-for-one mapping
- Self-venting probe that performs accurate sample injections from tightly covered containers
- Separate analytical and preparative injection valves allow you allowing you to alternate between analytical and preparative scale isolation and purification
- High velocity wash pumps that quickly wash your probes while maintaining high sample throughput

Waters patented At-column Dilution (ACD) technology results in the alleviation of peak distortion and loss of resolution attributed to the injection of large volumes of strong solvent, leading to improved resolution, column loading, and overall productivity.

With Waters ACD, an alternative injection technique, the chromatographic system is plumbed so that the sample in strong solvent is diluted at the head of the column with aqueous mobile phase. The sample is deposited on the column and the strong solvent flushes from the column before sample elution begins. Once the gradient is initiated, the sample components elute as narrow, sharply resolved bands, as shown in the figure below. The strong solvent effect is effectively alleviated, and the resolution is preserved. Furthermore, because the sample is continually surrounded by organic solvent until the point of dilution at the head of the column, no sample precipitation occurs.



At-column Dilution schematic.



Comparison of prep LC/UV chromatograms with 682-µL and 2.7-mL injections of peppermint extract on an XSelect™ C_{18} Prep OBD 19 x 100, 5 µm Column with the AutoPurification System plumbed in conventional and At-column Dilution modes.

waters.com/purification

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