

CHROMATOGRAPHY SOLUTIONS





SCION GC & GC-MS Solutions

The perfect gas chromatograph (GC) for many applications without compromise on functionality and performance.

8500 Gas Chromatograph

- Versatile and offers flexibility.
- Supporting three injector and four detector positions (including the mass spectrometer) with full independent access, no other gas chromatograph system provides this capability.
- The platform for over 50 different configured analysers for petroleum, petrochemical and specialty gas applications.
- The perfect GC for any analytical challenge due to the wide array of options for configuration.



Highlights

- Ultimate flexibility/configurability.
- Fast ramping over (150°C/minute)
- Three channel architecture, with up to 3 injection ports and 4 detectors (including MS)
- 10" High resolution full-colour touchscreen, 16 languages supported
- Electronic Flow Control (EFC), up to 21 channels at 0.001psi resolution.
- Flexibility to add samplers, valves, valve oven, backflush and column switching capabilities, etc.
- Programmed and controlled and through Compass CDS.

DETECTORS	FID	TCD	ECD	PFPD	NPD	PDHID	MS
DETECTIVITY	1.2 pg C/sec	300 pg/mL (Butane)	7fg/s Lindane	*S: 1 pg S/sec (S/P tube) *P: 100 fg P/sec (S/P tube) *N: 20 pg N/sec (S/P/N tube)	N: 100 fg N/sec (Azobenzene) P: 100 fg P/sec (Malathion)	50 ppb (Methane)	MRM Mode SIM Mode Full Scan Mode Signal to Noise ratio: 1500 for Injection of 1 pg of OFN for EI source



8300 Gas Chromatograph

- The ideal gas chromatograph for many applications that saves space without compromise on performance, productivity and functionality.
- Capacity for 2 injection ports, 1 GC detector plus a mass spectrometer makes the SCION 8300 GC a perfect match for your analyses.

Highlights

- Compact footprint of only 32 cm (12.6") wide
- Fast ramp rate oven (170°C/minute)
- Two channel architecture, with up to 2 injection ports and 2 detectors (including MS)
- 10" High resolution full-colour touchscreen, 16 languages supported
- Electronic flow control (EFC), up to 3 EFC modules 0.001psi resolution
- Flexibility to add samplers, valves, valve oven and backflush capabilities.
- Programmed and controlled through Compass CDS

Autosamplers

Regardless of sample type or throughput, SCION GC's can provide an automated solution to meet your requirements for accuracy & precision. Two SCION GC autosampler options are available, the 8400Pro and 8410Pro. Each can be tailored to meet specific sampling needs and workloads. Next to the GC autosamplers we also offer SCION Versa and HT3 Headspace samplers. Third party samplers for Thermal Desorption and Purge & Trap are easily integrated.

Highlights

- 8400Pro AutoSampler; 100 x 2 ml vial sample capacity
- 8410Pro AutoInjector; low cost, accommodates 2, 5 and 10 ml vials
- SPME
- Dual / Duplicate injection

DETECTORS	FID	TCD	ECD	PFPD	NPD	PDHID	MS
DETECTIVITY	1.2 pg C/sec	300 pg/mL (Butane)	7fg/s Lindane	*S: 1 pg S/sec (S/P tube) *P: 100 fg P/sec (S/P tube) *N: 20 pg N/sec (S/P/N tube)	N: 100 fg N/sec (Azobenzene) P: 100 fg P/sec (Malathion)	50 ppb (Methane)	MRM Mode SIM Mode Full Scan Mode Signal to Noise ratio: 1500 for Injection of 1 pg of OFN for EI source

Gas Chromatograph Mass Spectrometry

Model 8700 SQ GC-MS

- Lens free analyser ion path delivers simplifies tuning
- Off Axis ion source and detector increase sensitivity
- Active focusing Q0 pre-filter
- Full automation capabilities

Specifications & Features

- Available with EI or CI ion source
- Mass range (m/z) 1 to 1200 Da
- Scan rate up to 20,000 Da/s
- Mass resolution of 0.7-4 Da with mass stability of 0.1 Da over 48h
- High-performance turbo pump for rapid time to vacuum
- Dual filament source increases uptime
- Extended Dynamic Range (EDR) >10⁵ range
- Easy access maintenance



Model 8900 TQ GC-MS

- Fastest GC-triple quadrupole on the market (30,000Da/s,1000 MRM/s)
- The most sensitive GC-TQMS available
- Small footprint without compromise on quality
- Compound-based scanning software
- Innovative Lens free analyser ion path
- Off Axis ion source and detector increase sensitivity
- Active focusing Q0 pre-filter
- Full automation capabilities

Specifications & Features

- Available with EI ion source
- Mass range (m/z) 1 to 1200 Da
- Scan rate up to 30,000 Da/s
- Mass resolution of 0.7-4 Da with mass stability of 0.1 Da over 48h
- MRM speed (1000 MRM/s)
- High-performance turbo pump for rapid time to vacuum
- Dual filament source increases uptime
- Six orders of magnitude Extended Dynamic Range (EDR)
- Easy access maintenance



Gas Analysers:

HYDROGEN ANALYSER:

Low level CO, CO₂, CH₄ and C₂⁺ in hydrogen using FID

- This analyser is based on international standards NEN-ISO 21087 & ISO 14687 & is specially made for CO, CO₂, CH₄ and C₂⁺ in hydrogen.
- This special analyser combines a super inert injector, multi column system, methanizer & FID with narrow bore ceramic jet so even 10 ppb of these components can be detected.



SCION instruments 8500 GC hydrogen analyser using a FID as detector.

Refinery Gas Analysis using the SCION Rapid RGA Analyser

- The Rapid RGA determines the chemical composition of reformed gas and similar gaseous mixtures containing the following components: Helium (He), Hydrogen (H₂), Oxygen (O₂), Nitrogen (N₂), Carbon monoxide(CO), Carbon dioxide(CO₂), C1-C6 hydrocarbons isomers and Hydrogen Sulfide(H₂S).
- All in one single analysis within 6 minutes.



SCION 456 -GC Rapid Refinery Gas Analyser

LOW LEVEL OXYGENATES ANALYZER

The Scion low level oxygenates Analyzer is an easy to use turnkey solution to determine sub to high ppm levels of ethers, alcohols, aldehydes and ketones in different hydrocarbon matrices in the petroleum refining & petrochemical industry.

Key Benefits:

- **Factory optimized to ensure excellent analysis results** – analyzes oxygenated components at concentrations as low as 100 ppb in streams with final boiling point of upto 250 C & no interference from the hydrocarbon matrix.
- **Easy to operate** – The Scion GC & compass CDS Chromatography Data handling software generates reliable results
- **Flexible, economical analysis solution** – The analysis system is configured to accommodate Gas, liquid & LPG streams. Configured with both a gas sampling valve and a liquid sampling valve, all 3 samples can be injected without the need to change the system configuration.
- **Cost effective & time saving solution** – All scion GC analyzers not only include proven GC hardware & Software but are also preloaded with analysis methods & documentation specific to the method required.
- **A comprehensive single vendor solution** – The hardware, Software, application optimization, documentation, installation & support services are all provided by Scion allowing analysis to be carried out quickly & efficiently.



a

The analyzer incorporates the Scion GC

Amino Acid Analyzer

Amino Acid Analysis made easy with the Artemis 6000

- Turn-key solution complete with a sophisticated HPLC system, ready-to-use buffers, reagents and columns.
- The Artemis 6000 combines the advantages of the classical ion exchange separation methods with the modern techniques of HPLC.

Product Description

- Fully controlled by 21 CFR part 11 compliance data system with multi-language support
- Powerful data processing and reporting function
- Visualised LCD with direct control and support method creation, editing and saving
- Modular design, ease of maintenance
- Excellent sensitivity with a detection limit as low as 8 pMol (Asp 3p Mol), with great separation power: average peak resolution >1.5, all peak resolution >1.2 (hydrolysate AA) or >1.0 (free AA)



Productivity & Robust

- Fully automated analysis with protection, e.g. auto washing, leakage protection, etc.
- Rapid analysis: 30 – 50 min for hydrolysate sample, 70 – 180 min for physiological sample
- Outstanding repeatability in both retention time and peak area
- Long-term stability with replaced buffer and consumables
- High efficient separation column and ammonia filter column with long lifetime
- Inert and non-metal materials for pipes contact with buffer solutions & samples to avoid interference
- All buffers protected by inert gas, store in reagent organizer with refrigeration

Spares and Consumables

- Columns
- Filters
- Ferrules
- Septa
- Liners
- Vials etc.





Arc HPLC System

Performance You Need,
Results You Can Trust



Alliance

Ease of Use, Ease of
Science, Ease of Mind



Breeze QS

Simple HPLC at its Best

HPLC/ UHPLC/ UPLC Columns



Maximize your separations

Waters offers you an ever-expanding portfolio of application-specific, tailored system solutions encompassing UPLC, HPLC, informatics, services and world-leading mass spectrometers.

Choose the right solution for your analysis

Dependability: Accurate analysis for all.

Flexibility: Adaptable to your sample complexity.

Performance: The very best in chromatography.

Speciality Solutions: Specialized solutions for your unique needs.

Purification Systems: A wide range of scale and throughput capabilities.

ARC HPLC

- Enhance LC performance without redeveloping your method.
- Run methods with greater robustness over traditional HPLCs
- Easily replicate and enhance existing HPLC methods with low analyte carryover, high injection precision, and high back pressure tolerance
- Seamlessly receive transferred methods from other HPLC platforms, preserving analyte retention time and reproducibility of your analysis
- Support compliance with Empower Chromatography Data System (CDS), the gold standard, compliant-ready software
- Improve productivity and efficiency
- Range of detectors available like UV, DAD, RI, FLUORESCENCE etc.



ACQUITY UPC2 systems

- The ease of reversed-phase meets the power of normal-phase
- Using green and non-toxic compressed liquid CO₂ as a primary mobile phase, the ACQUITY UPC2® System delivers the ability to precisely vary mobile phase strength, pressure, and temperature
- The ability to fine-tune the resolving power and selectivity of the system, enables better control over the retention of analytes for separating, detecting, and quantifying structural analogs, isomers, and enantiomeric and diastereomeric mixtures - all compounds that are often a challenge to separate by any other means.



ALLIANCE HPLC

- Quaternary solvent blending. Support isocratic and gradient applications with 11 unique gradient profile curves and blend up to 4 solvents in any proportion with Auto-Blend Technology. Compatible with solvent types such as reversed-phase, normal-phase, GPC, SEC, and IEX.
- Advanced solvent delivery capabilities. Serial flow path with pulse-free solvent delivery without the use of dampeners. Online solvent degassing and automated solvent compressibility compensation for accurate flow. Integrated seal wash for robust operation with all solvent types is standard.
- Optional, temperature-controlled environment. House up to 120 vials in an optional, temperature-controlled environment. Achieve low carryover with active and user programmable needle wash. Variable injection volumes from 0.1 to 100 µL standard, and up to 2 mL optional. Support STAT samples and auto-addition.
- Detection and column options. Get optional column heating, heating/cooling, or column switching capabilities. Detection capabilities include photodiode array, UV/Vis, fluorescence (FLR), refractive index (RI), evaporative light scattering (ELS), electrochemical, conductivity, and mass detection.
- Intuitive interface and software. Get instant access to system settings through the large LCD screen with simplified daily set-up with SystemPREP. Supports Empower, MassLynx, and 3rd party software packages.
- Compliance-ready. Supports Waters Empower-based automated system qualification tool (SQT), minimizing the time and cost of annual qualification with standards like GMP, GLP, ISO 17025, and USP <1058>.



ACQUITY UPLC/UHPLC SYSTEMS

- Get the flexibility of multi-solvent blending- Blend up to nine solvents with integrated solvent-select valve with the Quaternary Solvent Manager
- Deliver precise and accurate binary solvent blending - Blend up to four solvents with integrated solvent-select valve with the Binary Solvent Manager
- Get high-precision injections with direct inject sampling - The needle-in-flow path design ensures an accurate needle seal at high pressure
- Get accurate temperature control across the entire column - Configurable for 1 to 6 columns with active preheating
- Automate the formulation of mobile phases - Significantly reduce the time you spend in the prep lab with Auto Blend Plus Technology
- Transfer methods more easily - Easily adjust for system volume differences when transferring methods from an alternative LC system without alteration to the method table using Gradient SmartStart
- Wide software support – ACQUITY UPLC H-Class PLUS System is supported by Empower, MassLynx, UNIFI, and several 3rd party software packages
- Recommended for improving laboratory productivity by transitioning methods to UPLC technology.



SUPERCritical FLUID CHROMATOGRAPHY

- For laboratories overwhelmed with solvent disposal and time-consuming solvent cleanup, supercritical fluid chromatography (SFC) is a beneficial alternative to purification and analytical applications.
- Considered a leading "green" purification technology, SFC systems from Waters are used to separate and isolate chiral and achiral chemical compounds using various methods of detection.



LC 150 PREP HPLC SYSTEM

- The LC Prep 150 System is the perfect fit-for-purpose solution for the rapid isolation and collection of your valuable complex samples with complete confidence.
- Flexible solvent delivery options allowing binary or quaternary based pumps providing low-pressure multi-solvent blending or high pressure gradient mixing of flow rates up to 150 ml/min
- Identify and isolate your compounds of interest with the highly sensitive 2489 UV/Visible or 2998 Photodiode Array detectors, providing enhanced linear range to accommodate highly concentrated samples.. One can connect Fraction Collector as per the need
- Confidently purify sample loads of milligrams to grams when using internal column diameters of up to 50mm.



ACQUITY QDa Detector

- ACQUITY QDa Mass Detector enables your lab to confirm compound identities, eliminate co-elutions, and shorten method development time – critical for success with upcoming ICH14 guidelines.
- It integrates with your current Waters LC platforms
- Expand your workflows with an accessible, affordable, and reliable mass detector



SQD2 – Single Quad Mass Detector

- Compatible with a broad range of chromatography platforms and ionization sources, including APCI and UniSpray, the SQ Detector 2 is the ultimate single quadrupole mass detector for chromatography.
- With SQ Detector 2, your lab can achieve uncompromised analysis of both low and high molecular weight species with a wide mass range.



RADIAN ASAP DIRECT MASS DETECTOR

Combining flexibility, ease of operation, and speed without the need for complex sample preparation, separation or extensive MS experience, the RADIAN ASAP helps you and your laboratory achieve more.



XEVO TQ-S CRONOS TANDEM QUAD MS

- The Xevo TQ-S Cronos triple quad MS is extremely robust and includes new reversed geometry sample cone that maximizes uptime, using proven technology
- Easily acquire and review your quantitative data to meet your analytical and regulatory needs
- Targets more analytes per injection and cover a wider concentration range
- Develops robust methods and easily set up your system for analysis



XEVO TQ-S MICRO TANDEM QUAD MS

- The Xevo TQ-S micro triple quad mass spectrometer with mass range from 2 to 2048 m/z is able to reproduce high quality analytical performance injection after injection, even with the most complex sample matrices.
- Robust performance begins in the source with Z-Spray geometry, efficiently removing neutral molecules while drawing ions through the sample cone into the analyzer.
- The StepWave ion guide in the Xevo TQ-S micro is designed to cope with the challenges in the modern laboratory that are produced by high sample throughput and difficult matrices.



XEVO TQ-XS TANDEM QUAD MS

- Advanced benchtop tandem quadrupole mass spectrometer with a mass range of 2 to 2048 m/z range expands the scope of ultimate sensitivity analysis
- The new StepWave XS ion guide provides improved sensitivity that is reproducible for multiple injections and can provide reliable quantitation at the very lowest levels. StepWave XS ensures neutrals and gas load are passively removed for enhanced transmission, with the ions actively transferred into the mass analyser, improving sensitivity and robustness



High Resolution Mass Spectrometer (HRMS)



Xevo G2XSQTOF system:

- Patented Lockspray
- StepWave
- eXtra sensitivity
- Resolution > 40000 FWHM
- Mass accuracy < -> ppm
- QuanTOF – extended dynamic range
- Universal source capability
- LC-GC-UPCC-QTOF



Vion IMS QTOF system:

- Patented Lockspray
- StepWave
- eXtra sensitivity
- Routine ion mobility CCS value
- Resolution > 50000 FWHM
- Mass accuracy < -> ppm
- Quantof – extended dynamic range
- Universal source capability
- LC-GC-UPCC-IMS QTOF



Synapt G2 XS HRMS System:

- Patented Lockspray
- StepWave
- Triwave – Ion Mobility
- Research Advanced IMS
- Resolution > 80000FWHM
- Mass Accuracy < 1 ppm
- Universal source capability
- LC-GC-UPCC-Q-IMS QTOF



BIOACCORD:





- Bioprocess development & optimization
- Late Dev/ QC monitoring batch release
- Intact mass
- Reduced LC/HC
- Peptide mass mapping
- Glycan analysis
- Clone selection, upstream and downstream optimization

COLUMNS :




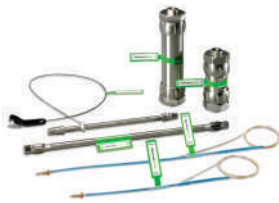

WATERS offers a wide array of column choices and formats, including but not limited to HPLC, UPLC, UHPLC, GPC, SFC, SEC and application specific columns.

Range of chromatography columns and accessories :






- Sample preparation
- Sample Vials and Accessories
- Sub-2-um UPLC Columns
- 2.X um UHPLC Columns
- > 3 um Analytical HPLC Columns
- > 5 um Preparative HPLC columns
- SFC Analytical and Preparative Columns
- Biomolecular Purification, Characterization, and analysis
- Size-Exclusion Chromatography Columns and Standards
- Nano- and Micro-Flow LC-MS
- Reliant HPLC columns

PRODUCT	FEATURES
ACQUITY Premier Range of Columns 	<p>Utilize MaxPeak High Performance Surfaces (HPS) to reduce analyte/surface interactions</p> <p>Waters PREMIER Class of columns provides, Trusted Particle Technologies</p> <p>Maxpeak HPS hardware</p> <p>VanGuard FIT Column Format Option</p>
BIORESOLVE 	<p>Bio Resolve RP: An innovative solution for the analytical characterization of intact protein analysis of mAbs and ADCs.</p> <p>Bio Resolve SCX: Simple and easy to implement solutions for Characterizing, monitoring and QC charge variants of mAb-based therapeutics for discovery.</p> <p>BioResolve SEC: A solution purposely designed for research and/or development of monoclonal antibody (mAb) drugs who require accurate quantitation of mAb aggregates(HMWS), monomers, and fragments/clips(LMWS).</p>
Amino Acid kit 	<p>Amino Acid Analysis solution is a comprehensive package that combines chemistries, reagents, standards and performance-qualified methods for turn-key application success. For applications in Food and Feed, Pharma, Biopharma, Cell culture and Clinical Research</p>
Anionic Polar Pesticide Column 	<p>Highly Anionic polar pesticides will be analyzed, without the need for Derivatization with Improved Separation Power.</p> <p>This application specific column provides quick, reproducible testing methods for highly anionic polar pesticides found in agriculture products and finished foods. This column exhibits very stable retention times.</p>

Analytical Separations: Small and large molecules

<p>HPLC/ UHPLC/ UPLC Columns</p> 	<p>Industry leading columns supported by innovative chemistries and technologies. Maximize your laboratory performance by optimizing method development or purification</p>
<p>Preparative Columns</p> 	<p>Preparative columns for Isolation & Purification: Uniform packing density throughout the column to maximize mechanical stability, extended column lifetimes and high mass loading capacity to have maximum productivity.</p>
<p>Oligonucleotide columns</p> 	<p>Waters oligonucleotide separation technology delivers exceptional sample resolution and superior column life. In addition, Waters manufacturing and quality control testing procedures help ensure consistent batch-to-batch and column -to-column performance regardless of application demands</p>
<p>Peptide separations</p> 	<p>Reversed-phase, ion- exchange , hydrophilic -interaction , and size exclusion chromatography modes for peptide separation applications ranging from the analysis and purification of synthetic peptides to the characterization of complex biotherapeutic proteins</p>
<p>Protein Separations</p> 	<p>Chromatographic modes for the analysis and purification of proteins include reversed -phase, ion-exchange, hydrophobic-interaction and size-exclusion.</p>

Sample preparation:

<p>Oasis Sample Extraction Products</p> 	<p>Oasis, Polymeric Sorbents Deliver: Optimal sensitivity for small molecule and therapeutic peptide analysis, Reduced matrix effects, Selectivity, Consistent retention with highest SPE recovery. Choice of seven sorbents available for method development. Oasis HLB, MCX, MAX, WAX, MAX, PRIME HLB and PRIME MCX.</p>
<p>Sep-Pak Sample extraction products</p> 	<p>A diverse selection of formats and silica-based sorbents provide the ideal sample extraction solution for GC, HPLC and UPLC analysis methods</p>
<p>"QuEChERS" Dispersive Solid Phase Extraction</p> 	<p>"QuEChERS" is a simple and straightforward sample preparation technique suitable for multi-residue pesticide analysis in a wide variety of food and agricultural products.</p>
<p>Sample/ Autosampler Vials</p> 	<p>Wide selection of vials, including HPLC Certified vials (tested by HPLC for cleanliness) and LCMS Certified vials (tested for total ion count and presence of clusters in the high mass range). These are the cleanest vials in the industry.</p>
<p>Quan Recovery Vials and Plates</p> 	<p>Protect peptides/proteins from non-specific binding losses. Improved LC-MS analysis of peptides and proteins. Improved recovery and sensitivity. Maximize small sample volume utilization. Maxpeak High Performance Surfaces.</p>