Excellent, Reproducible Results for Difficult Samples

GC/MS Columns and Supplies Application Compendium

Agilent J&W GC Columns

Performance. Productivity. Profitability.

More samples. Lower detection limits. Fewer analysts. These demands challenge your lab to maximize productivity and performance.

For decades, Agilent has been building gas chromatographs that analysts rely upon worldwide—and we're still innovating after all these years. But we don't stop there. Agilent is continuously improving our portfolio of GC and GC/MS columns and supplies, designed to help you resolve the daily challenges encountered in your lab.

So whether your lab is large or small, contract or in-house, you can count on the timeliness and accuracy of your data.

What can Agilent offer you?

In this compendium, you'll find GC/MS applications for a wide variety of industries—and recommended columns and supplies for each application. These applications include the analysis of new and previously unknown contaminants.

And as always, our product and application experts are available to help you maximize productivity. They can provide simple workflows for identifying emerging chemicals while maintaining stringent standards for regulated compounds.

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Enhance Your GC/MS
Productivity and Accuracy

Agilent GC/MS columns and supplies

For a closer look at GC/MS columns and supplies, **download our brochure**

Learn how Agilent can help you meet your analytical and workflow challenges. Visit **www.agilent.com/chem/gc**

Cannabis Testing:
Ensure Potency and Safety

States and countries that have permitted medicinal and recreational marijuana use require rigorous quantitation of cannabis flower and hemp samples to ensure potency. Your lab may also need to identify parts per billion (ppb) levels of dangerous pesticides and mycotoxins.

From extracts to final derived cannabis products, the Agilent GC and GC/MS portfolio can help you effectively perform key applications such as:

– Residual pesticides analysis in cannabis flowers

– Qualitative and quantitative determination of cannabinoid potency

– Multi-element analysis of heavy metals

– Ensuring acceptable levels of residual solvents

– Quantitative measurement control of terpenes

Agilent products and solutions are intended to be used for cannabis quality control and safety testing in laboratories where such use is permitted under state/country law.

To access our application notes, click the titles.

Pesticides and mycotoxins

A Fast Analysis of the GC/MS/MS Amenable Pesticides Regulated by the California Bureau of Cannabis Control

Read about a fast method that uses high-resolution HP-5ms UI GC columns in a backflush setup to analyze GC/MS/MS amenable pesticides in dry flower extracts.

A Fast, Robust Approach to Measuring Pesticides and Mycotoxins in Dry Cannabis Flower and Concentrate

Explore a rapid, robust workflow that uses an inert flow path—including HP-5ms UI and DB-35ms GC columns.

A Sensitive and Robust Workflow to Measure Residual Pesticides and Mycotoxins from the Canadian Target List in Dry Cannabis Flower

Using Agilent LC and GC columns, including a slightly polar DB-35ms UI GC column, the required reporting limits were easily met.

Analysis of Challenging Pesticides Regulated in the Cannabis and Hemp Industry with the Agilent Intuvo 9000-7010 GC/MS/MS System: The Fast-5

This study demonstrates the accuracy, precision, LOD, LOQ, range, and linearity for the Fast-5 cannabis pesticides. Our method combined the Agilent Intuvo 9000 7010B GC/MS/MS system with a low-bleed HP-5ms GC column.

Analysis of Twenty-Seven GC-Amenable Pesticides Regulated in the Cannabis Industry in North America with the Agilent 8890/7010B Triple Quadrupole GC/MS System

This application used an 8890/7010 GC/MS, plus an inert flow path that included an HP-5ms UI GC column, to analyze pesticides that are challenging for LC/MS.

Agilent products and solutions are intended to be used for cannabis quality control and safety testing in laboratories where such use is permitted under state/country law.

Energy and Chemicals:
Increase Quality, Safety, and Profitability

Meeting the world's increasing need for energy is a challenge. Regulatory requirements, efficiency improvements dictated by downward price pressure, and good environmental stewardship impose tough demands on your industry.

From crude oil, natural gas, and refining... to specialty chemicals and alternative fuels...
Agilent GC/MS instruments and consumables let you:

– Increase production efficiency, reduce scrap and rework, and enhance product quality.

– Measure trace-level contaminates and high-concentration components.

– Discover more compounds and contaminants faster, and with greater precision.

To access our application notes, click the titles.

Aromatic amines

Determination of Aromatic Amines Derived from Azo Colorants by GC/MS Using Supported Liquid Extraction Chem Elut S Cartridges

Learn how Chem Elut S cartridges and a low-bleed DB-35ms GC column delivered excellent recoveries and reproducibility for European method ISO 14362-1.

Aromatics and oxygenates

Determination of Benzene and Toluene in Gasoline by ASTM D3606 on an Agilent 8890 GC with Capillary Columns

Read how ASTM D3606 was implemented using two capillary GC columns—an HP-1ms UI and a DB-WAXetr—along with midcolumn backflush. Hydrogen was used as carrier gas to speed the analysis time.

Consumer products

Phthalate Analysis Using an Agilent 8890 GC and an Agilent 5977A GC/MSD

Three real-world samples were analyzed to demonstrate the screening power of the Agilent 8890 GC, paired with a low-bleed HP-5ms GC column and an Agilent 5977A GC/MSD.

Petrochemical

ASTM D7593—Analysis of Diesel for In-Service Motor Oils

Learn how Agilent DB-1ms UI GC columns help to meet and exceed method requirements for sensitivity and reproducibility.

Fuel Marker Analysis in Diesel Fuel Using 2D-GC/MS

This analysis was performed by 2-dimensional GC/MS using a pair of DB-35ms UI GC columns. A Capillary Flow Technology (CFT) Deans Switch provided robustness and sensitivity for detecting and quantitating the fuel marker down to low ppb levels.

Using the PSD for Backflushing on the Agilent 8890 GC System

This note demonstrates the pneumatic switching device (PSD) for Deans switching and backflushing with the 8890 GC and several standard and low-bleed GC columns, including DB-1ms UI.

Sulfur compounds

Analysis of Sulfur-Containing Compounds in Diesel and Residual Fuel Oil with Heart-Cutting Multidimensional Gas Chromatography Using the Agilent 8890 GC System

This note examines the separation of sulfur compounds in middle and heavy distillate hydrocarbon samples. A Capillary Flow Technology (CFT) Deans Switch with GC columns of different polarities (DB-1ms UI and DB-17ht) was used.

GC-APCI IMS of Diesel

This note describes the use of ion mobility and high-resolution GC/MS for profiling sulfur compounds in complex samples such as diesel fuel. The low bleed and robustness of Agilent DB-5ms GC columns provide ideal resolution and reproducibility.

Environmental:
Safeguard Our Planet and Its People

Speed. Accuracy. Productivity. Whether you're analyzing wastewater contaminants, indoor air quality, or soil impurities, environmental analysis must be done more reliably and efficiently than ever before.

If you are involved in measuring organic and inorganic chemicals in water, soil, air, or food, Agilent GC and GC/MS instruments, columns, and supplies are designed to help you:

– Identify, characterize, and quantify targets and unknowns, such as pesticides and industrial contaminants.

– Discover more compounds/contaminants faster, and with greater precision—including unknowns.

– Meet stringent environmental safety standards and regulations.

– Confidently detect and quantify emerging threats.

To access our application notes, click the titles.

Benzene

Determination of Benzene and Certain Derivatives in Water by Headspace Gas Chromatography (ISO 11423-1)
Benzene and derivatives were analyzed using the Intuvo 9000 GC, an inert flow path with HP-5ms UI GC column, and a 7697A headspace sampler.

Chlorinated paraffins

A New Approach to the Analysis of Chlorinated Paraffins by Gas Chromatography
See how GC/Q-TOF, together with an inert flow path that included an HP-5ms UI GC column, achieved the desired selectivity and sensitivity for these challenging compounds.

Short Chain Chlorinated Paraffins Analysis Using Negative Chemical Ionization and Low Energy EI by High-Resolution 7250 GC/Q-TOF
This analysis was performed using negative chemical ionization and Low-Energy EI by high-resolution GC/Q-TOF.
A low-bleed DB-5ms GC column reduced background interferences at high temperatures.

Endrin and DDT

Endrin and DDT Stability Study for Drinking Water Method EPA 525.2 on the Intuvo
This study highlights the stability of DDT and Endrin on the Intuvo 9000 GC using an inert flow path, including a DB-UI8270D GC column.

Endrin and DDT Stability Study for Drinking Water Methods with an Agilent 8890 GC/5977B GC/MSD Combined System
Learn how the Agilent 8890 GC paired with a DB-UI8270D GC column can meet instrument performance criteria set by international drinking water standards.

Organophosphorous pesticides (OPP)

Analysis of Drinking Water with the Agilent 8860 Gas Chromatograph and 7697 Headspace Sampler
This note describes the pairing of an Agilent 8860 GC with two UI GC columns (DB-624 UI and HP-5ms UI) to maximize sensitivity and reproducibility.

Analysis of Parathion-Ethyl in Water with 85 Micron Polyacrylate SPME Fibers
Here, parathion-ethyl in water was analyzed using an 85 µm polyacrylate SPME fiber and inert flow path that included a DB-5ms UI GC column.

PAHs

Examination of Lower Molecular Weight PAHs in Drinking Water Using Agilent PDMS SPME Fibers
This note describes a novel sample preparation method. An Agilent DB-EUPAH column was also used for robustness and improved sensitivity.

To access our application notes, click the titles.

Fast Separation of 16 US EPA 610 Regulated PAHs on Agilent J&W Select PAH GC Columns

Read how an optimized oven program using an Agilent J&W Select PAH GC column delivered an interference-free analysis of 16 PAHs listed in EPA 610.

Optimized GC/MS/MS Analysis for PAHs in Challenging Matrices

The Agilent 8890 GC, combined with an Agilent DB-EUPAH GC column and a 7000D triple quadrupole GC/MS system, provided a robust means for analyzing PAHs.

PBDEs (flame retardants)

Analysis of Polybrominated Diphenyl Ethers and Novel Brominated Flame Retardants in Soil Using the Agilent 7000 Triple Quadrupole GC/MS

This sensitive, reliable method for simultaneous quantitation of eight PBDEs and six NBFRs used selective pressurized liquid extraction (S-PLE) and a DB-5ms GC column. Analysis was performed on an Agilent 7000C triple quadrupole GC/MS.

Pesticides and mycotoxins

GC/Q-TOF Workflows for Comprehensive Pesticide Analysis

Explore the sensitive qualitative and quantitative analysis of contaminants in water samples using GC/Q-TOF, together with a low-bleed DB-5ms GC column.

Pesticide Analysis in Drinking Water with Disk Extraction and Large Volume Injection

See how an inert flow path, including an HP-5ms UI GC column, improved the reproducibility and robustness of a method based on EPA 525.2.

Phenols

Determination of Phenolic Compounds (HJ 703-2014)

Learn how the Intuvo 9000 GC system, paired with an Agilent DB-UI8270D GC column, achieved the performance specifications for 21 phenols analyzed per method HJ 703-2014.

Polychlorinated biphenyls (PCBs)

18 Polychlorinated Biphenyls (PCBs) Analysis on the Agilent 8890 GC-5977B MSD by Following China HJ 743-2015 Method

An Agilent 8890-5977B GC/MSD with low-bleed DB-5ms GC column was used to analyze 18 polychlorinated biphenyls following the HJ 743-2015 method. This setup exceeds method linearity, detection limit, and recovery rate requirements.

Fast Analysis of 18 Polychlorinated Biphenyls (PCBs) Using the Agilent Intuvo 9000 GC Dual ECD

Read how this method resolved all 18 PCBs in less than seven minutes using an ECD detector and dual-column confirmation (DB-5ms UI and DB-1701).

To access our application notes, click the titles.

Semi-volatiles

A Fast Method for EPA 8270 in MRM Mode Using the 7000 Series Triple Quadrupole GC/MS

A fast method for EPA 8270D/E has been developed for the Agilent 7000 Series triple quadrupole GC/MS system in multiple reaction monitoring (MRM) mode. The method includes an inert flow path with a DB-5ms UI GC column.

Analysis of Combustion Byproducts on Firefighter Protection Equipment Using a Novel High-Resolution GC/Q-TOF

Read how an Agilent 7250 GC/Q-TOF, paired with a low-bleed DB-5ms GC column, identified PAHs, PBDEs, and other combustion products.

Analysis of Semivolatile Organic Compounds in Drinking Water on the Agilent 8890 GC and 5977 GC/MSD with Extended Calibration Range

An Agilent 8890 GC was coupled with a DB-UI8270D GC column and 5977 GC/MSD to analyze semivolatile organic compounds according to US EPA 525.

Analysis of Semivolatile Organic Compounds in Drinking Water on the Agilent Intuvo and 5977 With Extended Calibration Range

Learn how to achieve the quantitative dynamic range specified in EPA 525 using an Agilent Intuvo 9000, 5977 MSD, and DB-UI8270D GC column.

EPA 8270 Re-optimized for Widest Calibration Range on the 5977 Inert Plus GC/MSD

A re-optimized EPA Method 8270 combined the 5977 Inert Plus GC/MSD with an inert flow path to achieve the widest single-injection calibration range.

EPA 8270E with Pulsed Split Injection and Retention Time Locking on an 8890 GC with a 5977 Series MSD

See how an Agilent DB-UI8270D GC column exceeds the requirements for US EPA 8270 in analyzing more than 200 semivolatile organic compounds (SVOCs) by GC/MS.

Evaluation of Fused Silica Tubing for Active Compound Analysis in an Inert Flow Path

Guard columns made from Agilent Ultimate Plus deactivated fused silica tubing, together with UI GC columns, delivered superior inertness.

GC/MS Analysis of Semivolatile Organic Compounds Using an Agilent J&W VF-5ms Intuvo GC Column

This note demonstrates the stability and robustness of an Agilent VF-5ms Intuvo GC column for semivolatile analysis.

High Sensitivity Analysis of Trace Organic Pollutants in Mussel Tissue Using the 7010 Triple Quadrupole Mass Spectrometer

Learn how to improve sensitivity with an inert flow path—including a DB-5ms UI GC column—and a 7010 GC/TQ.

Reducing Analysis Time of 8270D with the Intuvo 9000 GC

EPA 8270D was translated to a faster method, using a conductively heated 20 m × 0.18 mm DB-UI8270D column on the Intuvo 9000 GC.

Environmental

To access our application notes, click the titles.

Screening of Semivolatile Organic Compounds (SVOCs) in Aerosol Particles
This method enabled nontarget detection at trace levels by combining HP-5ms UI GC columns with the Agilent 7200 Series Accurate Mass GC/Q-TOF and Agilent MassHunter software.

Non-targeted screening

Analysis of Wastewater Effluent Samples to Identify Toxic Chemicals Using the High-Resolution Agilent 7250 GC/Q-TOF
This study used a workflow that combined an inert flow path—including an HP-5ms UI GC column—with a GC/Q-TOF for broad-scope suspect screening.

Combination of Chemical Ionization (CI) and Low Energy Ionization (EI) Capabilities with High-Resolution Q-TOF GC/MS
This study describes the application of high-resolution GC/MS with a low-bleed HP-5ms GC column for untargeted screening, as well as unknown compound identification.

Comprehensive Profiling of Environmental Contaminants in Surface Water Using High-Resolution GC/Q-TOF
Read how low limits of detection were achieved using an inert flow path that included an HP-5ms UI GC column.

The Use of High Resolution Accurate Mass GC/Q-TOF and Chemometrics
A GC/Q-TOF method employing an inert flow path including a DB-5ms UI GC column, a 7200 Series GC, and Agilent Mass Profiler Professional software effectively identified environmental pollutants.

Screening for Water Pollutants With the Agilent SureTarget GC/MSD Water Pollutants Screener, SureTarget Workflow, and Customized Reporting
Discover how the Agilent SureTarget GC/MSD water pollutants screener with HP-5ms UI GC column, SureTarget workflow, and customized reporting improved qualitative analysis.

Volatiles (including aromatic hydrocarbons)

Analysis of Drinking Water with the Agilent 8860 Gas Chromatograph and 7697 Headspace Sampler
An Agilent 8860 GC was paired with UI GC columns (DB-624 UI and HP-5ms UI) to maximize sensitivity and reproducibility.

Determination of Volatile Organic Compounds in the Cabins of Vehicles by Agilent 8890 GC/5977B MSD and Thermal Desorption Sampler
See how this method achieved minimal retention time variation (< 0.05% RSD) using a TD/GC/MSD method that included a low-bleed HP-5ms GC column.

Improved Volatiles Analysis Using Static Headspace, the 5977B GC/MSD, and a High-efficiency Source
This method significantly improved detection limits (< 10 parts per trillion) for environmental volatiles in water. It combined the Agilent 7697A headspace sampler, a VF-624ms GC column, and a 5977B GC/MSD with high-efficiency source.

Food Testing and Agriculture:
Protect Lives and Livelihoods

You are committed to providing food, produce, and beverages of consistent quality and uncompromising safety. And with the globalization of the food chain, protecting both the consumer and your brand is more important than ever.

Agilent GC/MS instruments, columns, and supplies help you meet current and future challenges, and enable you to:

– Identify, characterize, and quantify targets and unknowns, such as pesticides and mycotoxins.

– Discover more compounds/contaminants, faster, and with high precision—including compounds you didn't know were there.

– Meet stringent standards and regulations.

– Confidently identify species, confirm pathogens, and detect allergens.

To access our application notes, click the titles.

Environmental pollutants

Contaminants Screening Using High-Resolution GC/Q-TOF and an Expanded Accurate Mass Library of Pesticides and Environmental Pollutants

Read about a workflow that combines an inert flow path with a GC/Q-TOF accurate-mass library for strawberry extract analysis. An HP-5ms UI GC column provided consistent lot-to-lot retention time reproducibility.

Flavors and fragrances

Profiling Flavors and Fragrances in Complex Matrices Using Linear Retention Indices Without Sample Preparation

Learn about analyzing flavors and fragrances using an Agilent Intuvo 9000 GC, a low-bleed HP-5ms GC column, and a thermal separation probe.

Herbicides

Analysis of Triazines Herbicides

This robust GC method, performed with an Agilent CP-Sil 5 CB-MS column, separates 12 triazine herbicides in 16 minutes.

PAHs

Determination of 14 Polycyclic Aromatic Hydrocarbon Compounds in Edible Oil

Read about a rugged and reliable method using liquid extraction, Agilent Captiva EMR, a DB-EUPAH GC column, and a GC/MS/MS system.

Determination of 19 Polycyclic Aromatic Hydrocarbon Compounds in Salmon and Beef

This method uses liquid extraction, followed by Agilent Captiva EMR—Lipid cleanup. Analysis was performed with a DB-EUPAH GC column and a GC/MS/MS system.

PAH Analysis in Fish by GC/MS Using Agilent Bond Elut QuEChERS dSPE Sample Preparation and a High Efficiency DB-5ms Ultra Inert GC Column

A simplified QuEChERS method with dSPE, together with a DB-5ms Ultra Inert GC column and an Agilent 7890/5975B GC/MS system, resolved 16 targeted PAHs.

PAH Analysis in Salmon with Enhanced Matrix Removal

This simple QuEChERS workflow uses dSPE sorbent to minimize fat co-extracts, maximize recovery, and deliver high precision. A DB-5ms GC column improves sensitivity for late-eluting PAHs.

PAHs in Chocolate and Peanuts with Agilent J&W Select PAH and Longer GC Columns

Separating isomeric PAHs at ppb levels using GC/MS in SIM mode enables this analysis, which uses Bond Elut SPE and an Agilent J&W Select PAH GC column.

To access our application notes, click the titles.

Pesticides

Accurately Identify and Quantify One Hundred Pesticides in a Single GC Run

See how inert flow path technology, including an HP-5ms UI GC column, helped dMRM achieve better-quality data.

Advantages of Reversed Sandwich Injection for Pesticide Residue Analysis

This note focuses on the Agilent 7693A automatic liquid sampler's reversed 3-layer switch sandwich injection. A series of Ultra Inert consumables was used, including an HP-5ms UI GC column, to achieve reproducible LODs at trace levels.

Analysis of Multiclass Multiresidue Pesticides in Milk Using Agilent Captiva EMR—Lipid with LC/MS/MS and GC/MS/MS

Samples were prepared based on Agilent QuEChERS extraction, followed by Agilent Captiva EMR-Lipid cleanup. The GC/MS/MS separation was performed using an HP-5ms UI GC column that improved S/N ratio and linearity while reducing %RSD.

Analysis of Multiresidue Pesticides in Salmon Using Agilent Captiva EMR-Lipid with GC/MS/MS

This method combined the Agilent Captiva EMR-Lipid, inert flow path, and Intuvo 9000 GC with a 7010B triple quadrupole MS. An HP-5ms UI GC column helped to achieve fast analysis time, good linearity, and consistent reproducibility.

Analysis of Pesticide Residues in Mango by GC/MS/MS With Bond Elut QuEChERS

Read about our quantitative analysis of 28 regulated pesticides in mango. Using an Agilent QuEChERS extraction kit and DB-5ms GC columns, the samples were also screened for 258 pesticides.

Analysis of Multipesticide Residues in Tobacco

A fast MRM method was developed for analyzing 162 multiclass pesticides in tobacco on an Agilent 7000C triple quadrupole GC/MS. This system was equipped with a multimode inlet and a DB-5ms UI GC column.

Determination of Multiclass, Multiresidue Pesticides in Olive Oils by Captiva EMR—Lipid Cleanup and GC/MS/MS

This pesticide residue method combined liquid extraction with Agilent Captiva EMR-Lipid cleanup. GC/MS/MS analysis was performed with an inert flow path that included an HP-5ms UI GC column.

Examining Maximum Residue Levels for Multiresidue Pesticides in Jasmine Rice

This method combined the Agilent Intuvo 9000 GC with an inert flow path, an Agilent HP-5ms UI GC column, and a 7000C triple quadrupole GC/MS.

Maintaining Sensitivity and Reproducibility with the Agilent JetClean Self-Cleaning Ion Source for Pesticides in Food and Feed

This method analyzed approximately 200 pesticides in organic honey extract with an Agilent DB-5ms UI GC column and the 7010A Series Triple Quadrupole GC/MS. Tests were conducted with and without the Agilent JetClean self-cleaning ion source.

To access our application notes, click the titles.

Meeting European Union Maximum Residue Level Regulations for Pesticides in Tea and Honey

Learn about a pesticide analysis method that combines an Agilent Intuvo 9000 GC with an HP-5ms UI GC column and a 7000C triple quadrupole GC/MS.

Multipesticides Residue Determination in Fresh Okra Using QuEChERS Sample Preparation

Explore the use of Agilent QuEChERS technology and an HP-5ms GC column to analyze multipesticide residue in fresh okra.

Multiresidue Pesticide Analysis in Food Matrices with an Ultra Inert Splitless Glass Frit Liner by GC/MS/MS

Discover the advantages of using an inert flow path, including a DB-5ms UI GC column, for analyzing multiresidue pesticides in food.

Multiresidue Pesticide Analysis with the Agilent Intuvo 9000 GC and Agilent 7000 Series Mass Spectrometer

Pesticides were evaluated in several matrices using the Agilent Intuvo 9000 GC and an Agilent 7000 Series mass spectrometer. Excellent response and peak shape consistency were obtained with an HP-5ms UI GC column and Guard Chip.

Optimize Food Analysis with Miniaturized QuEChERS and 7010 Triple Quad GC/MS

See how sample preparation costs can be reduced by 75% using miniaturized QuEChERS extraction. The method also combined an Agilent HP-5ms UI GC column with an efficient ion source to quantitate 95% of pesticide residue at or below 10 ng/g.

QuEChERS Combined with GC-MS/MS for Analysis of Over 200 Pesticides in Cereals

Learn about a simple, robust QuEChERS method for preparing corn, wheat flour, and rice samples. The method combines a VF-1701ms GC column and a 7000 triple quadrupole GC/MS/MS.

QuEChERS Combined with GC-QQQ for Analysis of Over 200 Pesticides in Leek and Garlic

Learn a simple, high-throughput method for analyzing 213 pesticides in leek and garlic using an Agilent QuEChERS kit combined with a VF-1701ms GC column and GC/TQ.

Rapid Rinse and Shoot: Screening Workflow for Pesticides in Fruit by GC/MSD in Under Six Minutes

Learn how an Agilent Intuvo 9000/5977B GC/MSD system, inert flow path, HP-5ms UI GC column, and Intuvo Guard Chip enabled fast screening.

Reduce Cost of Pesticide Residue Analysis

Find out how Agilent mini-QuEChERS sample preparation, UI GC columns, and GC/MS/MS systems reduced solvent, sorbent, and ISTD cost by more than 40%.

Sample Matrix Influence on GC/MS/MS Multiresidue Pesticide Analysis

Discover how an inert flow path—including an HP-5ms UI GC column, backflushing, and matrix-optimized multiple reaction monitoring (MRM)—minimized matrix influence.

To access our application notes, click the titles.

Screening for Hundreds of Pesticide Residues Using a GC/Q-TOF

This method screened, identified, and quantified pesticides by combining the Agilent 7200 GC/Q-TOF with an Agilent 7890B and dual-HP-5ms UI GC column with backflush. To facilitate data analysis, the Agilent MassHunter Qualitative Analysis All Ions workflow was used.

Screening of Pesticides and Other Contaminants in Food Matrices Using a Novel High-resolution GC/Q-TOF with a Low-energy-capable EI Source

Explore how high-resolution GC/Q-TOF—paired with an inert flow path that includes HP-5ms UI GC columns—delivers a highly sensitive screening method.

Phthalates

Phthalates Analysis With Method GB 5009.271-2016 Using the Agilent 8890 GC and MSD with Agilent JetClean6

Together, the Agilent 8890 GC, the 5977B GC/MSD, and a low-bleed HP-5ms GC column analyzed phthalates by Chinese national food safety method GB 5009.271-2016.

Terpenes

SPME-GC/MS of Selected Terpenes Using Agilent DVB/CAR-WR/PDMS SPME Fiber

This note describes a method for analyzing flavors and fragrances using an Agilent Intuvo 9000 GC, a low-bleed HP-5ms GC column, and a thermal separation probe.

Volatiles

Chemometric Methods for the Analysis of Graftage-Related Black Tea Aroma Variation by Solid Phase Micro-Extraction and Gas Chromatography-Mass Spectrometry

Read about a GC/MS/MS method that combines SPME with a low-bleed DB-5ms GC column to analyze graftage-related black tea samples.

Chemometric Methods for Botanical Classification of Chinese Honey Based on the Volatile Compound Profile

This study features a method for the discrimination and prediction of honey samples using SPME, a low-bleed HP-5ms GC column, and chemometric analysis by GC/MS.

Forensic Toxicology:
Produce Rapid, Accurate Results
and Legally Defensible Data

You are on the front lines in the battle to ensure public health and safety. Designer drugs, prescription pharmaceutical abuse, and steroid use among athletes are just some of the factors driving the need for fast, dependable forensic toxicology analysis.

The Agilent portfolio of GC/MS instruments, columns, and supplies enables you to perform critical tasks such as:

– Confidently carrying out forensic toxicological analysis in areas such as regulated/non-regulated urine testing, alternative matrix testing, postmortem toxicology, and doping control.

– Identifying both target and unknown substances.

– Meeting stringent chain of custody protocols.

For Forensic Use.

To access our application notes, click the titles.

Drugs of abuse

A Sensitive and Reliable Method for Anabolic Agents in Human Urine on the Agilent 7000 Triple Quadrupole GC/MS

This method was applied to the analysis of 1,367 samples collected during doping control at the XVI Pan-American Games. It included an HP-1ms UI GC column and an Agilent 7890 Series GC, coupled to the Agilent 7000 Series triple quadrupole GC/MS system.

Analysis of Drugs of Abuse by GC/MS Using Ultra Inert Universal Sintered Frit Liners

An inert flow path—including frit liners and a DB-5ms UI GC column—helped to improve reproducibility and limits of detection for these challenging compounds.

Confirmation and Quantification of Synthetic Cannabinoids in Herbal Incense Blends by Triple Quadrupole GC/MS

See how an inert flow path, including an HP-5ms UI GC column, improved sensitivity and linearity for trace-level analysis.

Determination of Bath Salts (Pyrovalerone Analogs) in Biological Samples

Read about an EI-MS/MS method that uses a low-bleed DB-5ms GC column on the Agilent 220 quadrupole ion trap to analyze pyrovalerone analogs in biological samples.

Detection of Cannabinoids in Oral Fluid Using Inert Source GC/MS

This method achieves the required sensitivity for detecting THC, CBN, CBD, and THCA-A, 2-carboxy-THC in oral fluid specimens. It uses a DB-5ms GC column and a 5975 GC/MS with inert source.

Determination of Cannabinoids (THC) in Biological Samples

Learn how a GC quadrupole ion trap MS/MS—combined with an inert flow path that included a DB-5ms UI GC column—improved signal-to-noise and trace-level sensitivity.

Determination of Gamma-Hydroxy-Butyrate (GHB) in Biological Samples

EI-MS analysis on an Agilent 220 quadrupole ion trap using an Agilent DB-5ms GC column translated into better sensitivity and signal-to-noise ratio.

Determination of Pentobarbital in Biological Samples

Read how to improve method linearity and signal-to-noise ratio by performing CI-MS analysis on the Agilent 220 quadrupole ion trap using a DB-5ms GC column.

Determination of Propofol in Biological Samples

This method combines a DB-5ms UI GC column with an Agilent 220 quadrupole ion trap using EI-MS/MS. An inert flow path helped improve S/N ratio, selectivity, and sensitivity.

Forensic Analysis of Drugs of Abuse With the Agilent 8890 GC

This workflow maximizes resolution and sensitivity by combining an Agilent 8890 GC, a DB-5ms UI GC column, a 5977A GC/MSD, and a 7693A automated liquid sampler.

For Forensic Use.

To access our application notes, click the titles.

Improving Efficiency in the Forensics Laboratory: Introducing a New Controlled Substances Analyzer

See how a new Controlled Substances Analyzer, combined with low-bleed DB-5ms GC columns, achieved the sensitivity and reproducibility needed for these challenging analytes.

Rapid and Robust Detection of THC and Its Metabolites in Blood

This robust method uses SPE extraction, an Agilent HP-5ms UI GC column, and GC/MS/MS with backflushing. The run time was six minutes, with a cycle time of eight minutes.

Rapid, Robust, and Sensitive Detection of 11-nor-D9-Tetrahydrocannabinol-9-Carboxylic Acid in Hair

This method was developed using a 2D-GC system that includes a DB-1ms GC column, along with a more polar DB-17ms GC column. The total run time is seven minutes, with a cycle time of nine minutes using column switching and backflushing.

For Forensic Use.

Metabolomics:
Answer Challenging Biological Questions

Metabolomics is the fastest-growing "omic" in the field today—and no wonder. Measuring the metabolome gives you important information about the functional status of a biological system. What's more, a metabolome's close proximity to the phenotype of an organism provides complementary information to genomics and proteomics.

Exciting new Agilent GC and GC/MS products are designed to accelerate your metabolomics research by enabling you to:

– Extract metabolites from plasma samples.

– Perform room-temperature quenching with lipid removal.

– Accelerate your lipidomics research.

– Obtain consistent answers.

– Discover meaningful biomarkers with speed and confidence.

For Research Use Only. Not for use in diagnostic procedures.

To access our application notes, click the titles.

Fatty acids

[GC/MS Detection of Short Chain Fatty Acids from Mammalian Feces Using Automated Sample Preparation in Aqueous Solution](#)
The method in this note uses the Agilent 5977B GC/MSD equipped with an Agilent 7890B GC, a low-bleed VF-5ms GC column, and an Agilent 7693A autosampler.

Untarget metabolomics

[Metabolomic Changes in Lung Tissue of Tuberculosis-Infected Mice Using GC/Q-TOF with Low Energy EI](#)
This untargeted metabolomics study was performed using an Agilent low-bleed DB-5ms GC column and a novel high-resolution 7250 GC/Q-TOF.

For Research Use Only. Not for use in diagnostic procedures.

Pharmaceutical Impurities:
Meet Global Requirements for
Detection and Quantification

Chemical synthesis, scale-up, and manufacturing processes can result in a range of impurities that remain with active pharmaceutical ingredients or drug product formulations. Even in trace amounts, these impurities can negatively impact your final product. Therefore, identifying and quantifying impurities is critical to product quality—and subject to stringent regulatory restrictions.

– Extractables are container-closure and packaging contaminants that can be extracted from plastic materials under extreme conditions, such as high temperatures or pressures and organic solvents.

– Leachables are contaminants that leach from container closures under standard storage conditions.

– Genotoxic impurities—specifically, mutagenic impurities in APIs and drug products—pose a significant risk to patient health, even in trace amounts. These impurities can interact with DNA, leading to mutations and potentially cancer.

You can confidently detect, identify, and quantify impurities in pharmaceuticals using Agilent GC and GC/MS instruments, columns, and supplies.

Pharmaceutical

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Extractable and leachables

Analysis of Extractable/Leachable Compounds from Generic Liquid Drug Formulations

Two 5977A Series GC/MSD systems paired with Agilent HP-5ms UI GC columns were used to analyze extractable/leachable compounds by headspace and liquid injection. SIM analysis confirmed the migration of plasticizers from IV bag to IV solution under accelerated aging.

Analysis of Extractables from a Pressurized Metered Dose Inhaler (pMDI) Using GC/MSD

Extractables were identified using two Agilent 5977A Series GC/MSD systems with HP-5ms UI GC columns. Device components were analyzed by headspace and large-volume injection using MMI inlet.

Analysis of Extractables and Leachable (E&L) Compounds Using a Low-Energy EI-Capable High-Resolution Accurate Mass GC/Q-TOF

This work presents a novel tool to study E&L compounds with enhanced flexibility and confidence. Our method paired a high-resolution accurate mass GC/Q-TOF with inert flow path consumables—including a DB-5ms UI GC column.

Extractables and Leachables Analysis of IV Bag Systems

See how Agilent HP-5ms GC columns improve system integrity and repeatability, even after you encounter samples with high extractable concentrations.

Genotoxic impurities

Quantification of Potential Genotoxic Impurities in Amlodipine Besylate

This GC/Q-TOF method determines methylbenzene sulphonate (MBS) and ethylbenzene sulphonate (EBS) in amlodipine drug product. An Agilent DB-5ms GC column resolved these analytes with great peak symmetry for improved sensitivity.

Agilent CrossLab services

CrossLab is an Agilent capability that integrates services and consumables to support workflow success and important outcomes like improved productivity and operational efficiency. Through CrossLab, Agilent strives to provide insight in every interaction to help you achieve your goals. CrossLab offers method optimization, flexible service plans, and training for all skill levels. We have many other products and services to help you manage your instruments and your lab for best performance.

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