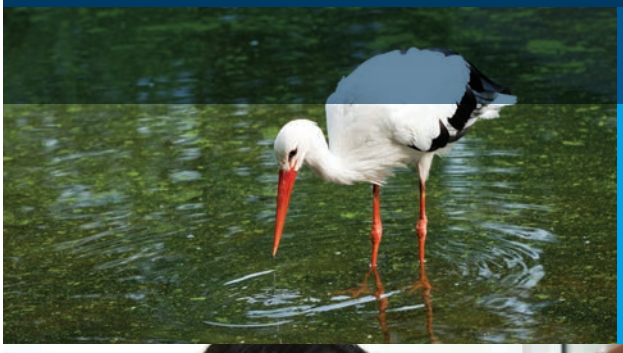
Agilent CrossLab
From Insight to Outcome

Detect Every Peak and Minimize Degradative Buildup in Your GC Flow Path

Agilent Inert Flow Path solutions







Agilent

Ensuring an Inert Flow Path from Injection Through Detection Is Critical—and Now, Easy to Achieve

As regulatory agencies drive limits of detection lower for increasingly active and more complex samples, you cannot afford adsorption caused by flow path activity. This is critical for food, environmental, and forensic sample matrices.

Having to repeat or verify suspect analyses wastes valuable resources, hinders productivity, and hurts your bottom line. With the clock ticking on sample viability and limited available sample, you might not even get a second chance.

Unreliable results can also have catastrophic implications in terms of environmental safety, the quality of the foods we eat, and inaccurate drugs-of-abuse accusations. Identification and quantification are more difficult in complex matrices such as fruits, vegetables, soils, and biological fluids. Therefore, you must be especially vigilant to make sure that your flow path is not compromising your results by adsorbing analytes of interest.



Detecting melamine and other dangerous substances in milk, milk products, and eggs



Performing trace-level analyses of active analytes in environmental matrices



Testing drinking water for semivolatile contaminants



Determining drugs of abuse in biological fluids

An integrated approach to inertness:

The Agilent Advantage

Flow path inertness is vital to your analysis; it is also on the cutting edge of GC.

As the GC industry's premier measurement company, Agilent ensures the inertness of every surface that touches your sample. So you can achieve the parts-per-billion—or parts-per-trillion—detection levels that today's analyses demand.

In 2008, Agilent laid the groundwork for flow path inertness with Agilent J&W Ultra Inert columns. They were the *first* GC columns proven to deliver on the promise of consistent column inertness and exceptionally low column bleed. Since then, we have continued to lead the way with Ultra Inert inlet liners and—most recently—inert fittings, ferrules, guard columns, and retention gaps. We've also introduced supplies for inlets and detectors.

By minimizing activity along every step of the GC and GC/MS flow path, Agilent Inert Flow Path solutions improve system performance and ensure better results. They also allow you to process more samples without unplanned maintenance and recalibration.

Inside:
Everything you need to build your inert flow path

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Agilent Inert Flow Path solutions

Agilent Inert Flow Path solutions ensure a reliably inert GC flow path for higher sensitivity, accuracy, and reproducibility… especially at trace levels.

To learn how Agilent Inert Flow Path solutions can give you the utmost confidence in your results, visit www.agilent.com/chem/inert



With Agilent Inert Flow Path Solutions, You Won't Miss a Thing in Your GC and GC/MS Analysis



1a Gas Clean filter

Installing an Agilent Gas Clean filter removes contaminants, ensuring that the highest-quality gas flows—leak free—through the system. The benefits to you include flow path inertness and column integrity. Highly sensitive indicators provide maximum instrument protection.



1b Gas Clean sensor

(available for the 8890 and 8860 GC systems)

- Monitors the chemical indicators, alerting you via the touch screen and software when a filter is saturated and needs replacing.
- Replacing the filters when they have reached absorption capacity ensures maximum protection of the GC inert flow path and GC columns.



2 Ultra Inert inlet liners

Agilent Ultra Inert inlet liners, with or without glass wool, are certified to provide low surface activity and highly reproducible sample vaporization. They facilitate best-in-class delivery for active analytes.



3 Inert flow path split/splitless inlet

Portions of the split/splitless inlet that come in contact with the sample undergo the same proprietary deactivation treatment as Ultra Inert gold seals and UltiMetal flexible ferrules. The result: a continuous inert surface throughout the flow path.





4 Ultra Inert gold seals

Ultra Inert chemistry on top of gold plating reduces active analyte adsorption while ensuring a leak-free seal.



5 UltiMetal and gold-plated Flexible Metal ferrules

Agilent UltiMetal Plus Flexible Metal ferrules are the only ferrules with a deactivated surface that maintains the inertness of the GC flow path. Agilent gold-plated Flexible Metal ferrules are recommended for CFT connections.



6 Inert capillary flow technology (CFT)

Inert CFT provides increased GC system flexibility while making reliable, leak-free, capillary connections.

Flow splitters and Deans switches enable multiple detectors, peak cutting, and multidimensional GC analysis for increased resolution of trace compounds in complex matrices.





7a Ultra Inert GC column

GC column inertness is critical as columns contribute toward the largest surface area within the flow path. Every Agilent J&W Ultra Inert GC column is rigorously tested to ensure consistently high inertness and low bleed, for optimal delivery of analytes to the detector.



7b Agilent J&W column smart key

(available for the 8890 GC system)

Smart ID keys provide information on column, configuration, age, number of injections, use, and temperature limits.



8 Self-Tightening column nut

The innovative spring-driven piston continuously presses against the ferrule, maintaining a leak-free seal—critical to the integrity of the GC flow path.



9 FID/NPD detector jets

Universally fit all GC platforms, and both capillary column and packed column detector body.



10 Inert ion source

An inert ion source ensures the integrity of your analytes reaching the detector.



11 IDP-3 oil-free vacuum pump

The IDP-3 oil-free vacuum pump is not part of the GC flow path. However, it ensures reliable MS detector performance—critical for accurate, reproducible results. Agilent IDP-3 pumps are oil-free, providing a quieter and cleaner laboratory environment compared to standard oil rotary vane pumps.

Solutions

Ensure a Reliably Inert Flow Path—and Improve Response with Active Analytes

Whether you are analyzing difficult, active environmental samples or screening for drugs of abuse, Agilent Inert Flow Path solutions help ensure an inert GC flow path. So you can achieve higher sensitivity, accuracy, linearity, and reproducibility, especially at trace levels. They also minimize the need for frequent inlet maintenance and system recalibration.

Agilent Ultra Inert inlet liners

Deactivation performance makes trace-level analysis easier

Inertness is critical inside the heated injection port, where labile analytes are prone to adsorption or degradation. The Agilent proprietary manufacturing process produces Ultra Inert inlet liners with superior deactivation coverage that ensures reproducibility, reliability, and more accurate sample transfer onto the GC column.

- Highly inert glass wool is compatible with samples containing active compounds.
- Liners with inert wool keep nonvolatiles inside the inlet, extending column life and increasing the time between source maintenance.
- Greater sensitivity boosts your productivity by allowing you to run more samples.

Remember, too, that Agilent CrossLab Ultra Inert GC liners deliver flawless performance for all instruments in your lab—regardless of make or model.



Agilent Ultra Inert inlet liner

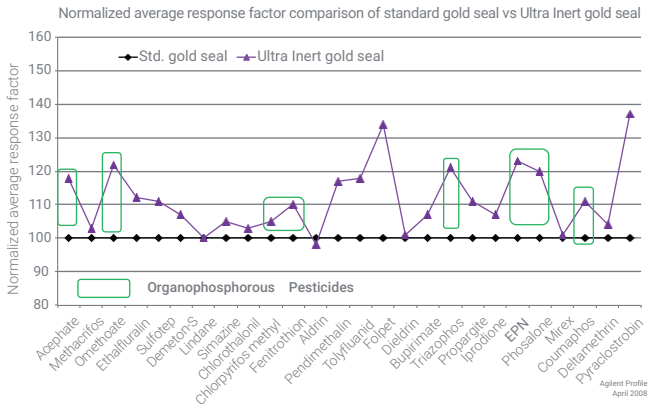
Agilent Inert Flow Path components

Prevent active sites from ruining your analysis

All flow path surfaces can contribute to sample loss or degradation. That is why Agilent now applies proprietary chemistries to all sample flow path surfaces.

- Ultra Inert gold seals offer the best inlet sealing surface with unsurpassed inertness.
- Gold-plated Flexible Metal ferrules prevent sample loss while using inert capillary flow technology devices, such as backflush or Ultimate Unions. The novel design of these ferrules provides a reliable leak-free seal, and robust column connections even at high temperatures for extended periods of time.
- UltiMetal Plus treatment of inlet weldments further reduces the chance of analyte interaction with active sites on the inlet. These ferrules are recommended for inlet and detector fittings.

Improvement on organophosphorous pesticide peak shapes and responses using Ultra Inert gold seal

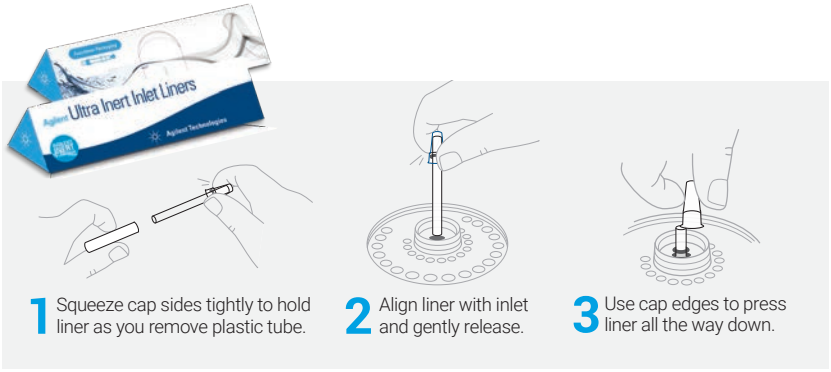


Ultra Inert gold seals give you better response and results than standard gold seals.

Touchless packaging—an Agilent exclusive—reduces contamination concerns

Agilent Ultra Inert inlet liners are packaged with a *preinstalled O-ring* that has been cleaned, conditioned, and nonstick plasma-treated. This unique touchless packaging allows you to easily install the new liner without searching for and installing the O-ring—saving time and reducing the risk of contamination.

View the touchless packaging demonstration video at www.agilent.com/chem/touchless



See Page 25 for ordering information.

UltiMetal Plus and gold-plated Flexible Metal ferrules are conveniently packaged to let you thread the column through the ferrule *while the ferrule is still in the package*. So you don't risk handling or dropping.



See Page 26 for ordering information.

Certified performance

Each Ultra Inert inlet liner deactivation lot is certified to ensure efficient, consistent coverage using acidic and basic probes at trace (2 ng) levels on-column. In addition, every liner is packaged with a performance certificate that you can peel and stick into your lab notebook for quick compliance reference.



Easy traceability: The deactivation lot number is printed directly on the performance certificate. The liner lot number and part number are permanently etched on the glass.

Agilent proprietary surface treatments further expand your inert flow path

Ultra Inert and UltiMetal Plus surfaces are tested for inertness with stringent chromatographic quality control processes based on decades of GC experience and leadership.

Agilent J&W Ultra Inert GC columns:

Perform Trace-Level Analysis with Confidence

The Agilent J&W Ultra Inert GC column family pushes industry standards for consistent column inertness and exceptionally low column bleed. The result? Lower detection limits and more accurate data for difficult analytes. Each J&W Ultra Inert GC column is tested with the industry's most demanding test probe mixture—and we prove it with a performance summary sheet shipped with each column.

Confidently analyze active compounds, trace-level samples, and unknowns without changing selectivity

Agilent's leading-edge manufacturing processes—combined with optimized chemistries and design advancements—improve the inertness of our Ultra Inert columns while maintaining the selectivity of their non-Ultra Inert counterparts.

In addition, every J&W Ultra Inert GC column is tested using probes with varying chemical characteristics to avoid subtle polymer selectivity variations. This ensures that J&W Ultra Inert GC columns have the same selectivity as Agilent MS columns—eliminating the need for method revalidation, as you can see below.

Our rigorous test probe mixture ensures consistent column inertness—and results

A strong test probe mixture can highlight deficiencies in column activity, while a weak mixture can actually mask such deficiencies.

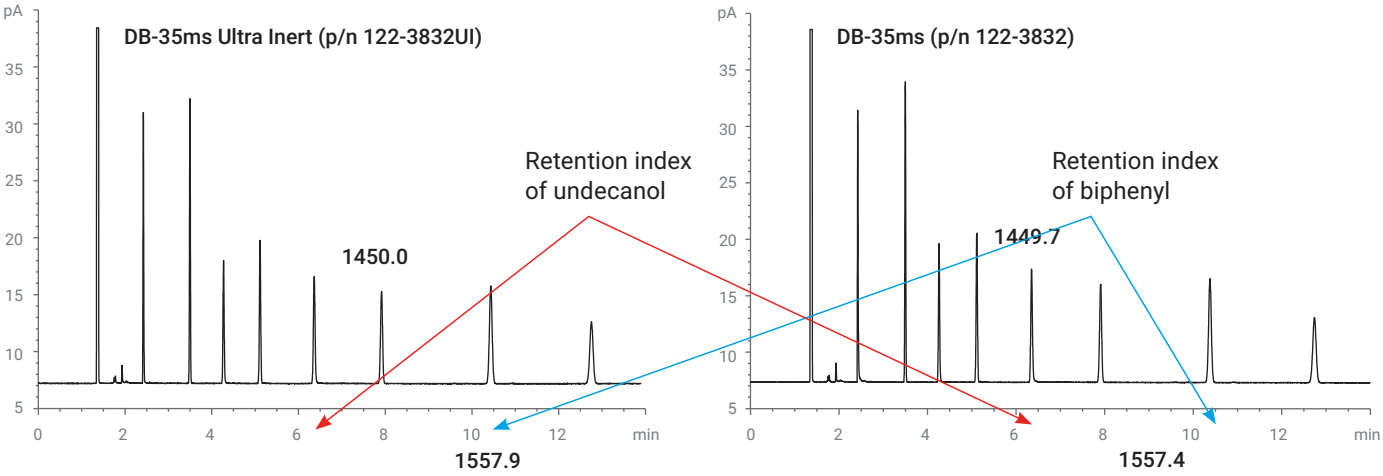
The test probes in the Agilent Ultra Inert test probe mixture have low molecular weights, low boiling points, and no steric shielding of their active groups. These characteristics allow the probative portion of the test molecules to penetrate—and fully interact with—the stationary phase and column surface.

Low column activity for your sensitive, trace-level applications

Benefits of high column inertness

- Increased signal for more accurate peak identification
- Minimum peak tailing for active analytes
- Longer maintenance-free instrument uptime
- Minimal compound loss and degradation for more accurate quantitation





With Agilent J&W Ultra Inert GC columns, selectivity remains the same, allowing you to confidently integrate Ultra Inert columns into your current methods.



See application note *Semivolatile Analysis with Specially Designed Agilent J&W DB-UI 8270D Columns* (5991-0250EN)

Solutions

Agilent GC/MSD and GC instruments:

Maximize Your Quantification Sensitivity and Accuracy

More than just instruments, Agilent GC and GC/MS analyzers are complete workflow solutions. They incorporate innovations—such as capillary flow technology and target compound databases—that optimize your system for your unique application. The Agilent Inert Flow Path comes standard with all 8890 GC systems. It ensures reliable, consistent inertness from injector to detector—decreasing analyte adsorption for lower limits of detection (LODs) and better signal-to-noise response.

Industry-leading Agilent GC/MS systems combine an inert ion source with the analytical capabilities you need to keep pace with stringent new methods and demanding sample loads. Our GC/MS portfolio includes single quadrupole systems, tandem quadrupole MS/MS systems, and high resolution quadrupole-time-of-flight (Q-TOF) mass spectrometers.

Agilent 5977 GC/MSD system

Boost your lab's operational capabilities

Improve your sample throughput, analytical performance, and business outcomes with the Agilent 5977B GC/MSD system. The patented quadrupole operates at up to 200 °C—to prevent contamination by high boiling compounds and ensure long-lasting tune and calibration.



Agilent 8860-5977 GC/MSD system

Agilent 8890 GC system

Resolve your search for value

The Agilent 8890 GC system has everything you need to boost productivity and generate data with confidence. Its seamless communication with the Agilent 5977 GC/MSD provides faster vent times, better resource management, and safer operation.

- **Inert Flow Path option—an Agilent exclusive**
  Inert inlets, together with Ultra Inert inlet liners and columns, ensure that your entire sample reaches the detector for confident trace-level analysis.
- **Intelligent consumables**
  Smart ID keys for Agilent J&W GC columns provide information such as column use, configuration, age, number of injections, and temperature limits. They also include default parameters for configuration.
- **Gas Clean filters with smart sensors**
  The Gas Clean filter system delivers clean gases, reducing the risk of column damage, sensitivity loss, and instrument downtime. The smart sensor automatically monitors and notifies you when the filters become saturated and need replacing.
- **Enhanced capillary flow technology**
  CFT modules enable leak-free, inert in-oven connections while improving throughput and reliability.
- **Choice of inlets and detectors**
  A variety of inlet and detector modules allows you to customize your GC in minutes.
- **GC and GC/MS system tools**
  Reduce downtime with simplified maintenance and status monitoring.
- **Intuitive system and data handling software**
  Choose the software package that fits *your* lab's needs—and turn your results into answers, faster.
- **Less dependence on helium**
  Integrated calculators help you convert He methods to more available—and less expensive—gases such as hydrogen or nitrogen.
- **Interactive Parts Finder software**
  Image-based inventory helps you quickly identify the parts and supplies you need.

Agilent Intuvo 9000 GC system

This innovative ultrafast GC system incorporates proprietary surface deactivation for a completely inert flow path. An innovative column design eliminates column trimming while providing the same high level of column inertness and performance as the traditional J&W cage columns.

For more information visit:
www.agilent.com/chem/intuvo



Agilent 8890-5977 GC/MSD system



Agilent Intuvo 9000-5977 GC/MSD

Applications

Foods and Flavors:

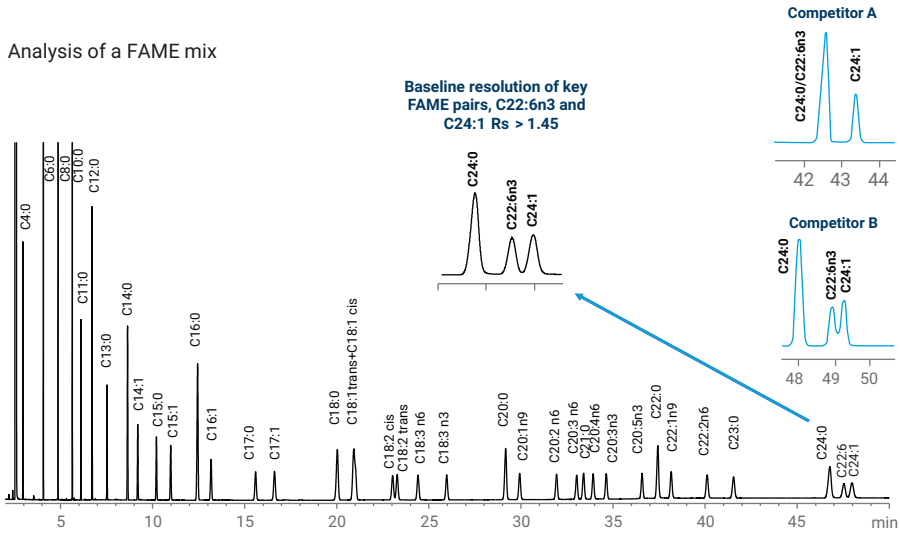
Ensure Consistent Quality and Uncompromising Safety Throughout the Food Production Chain

Food supply globalization, novel food-borne pathogens, and aging populations have combined to increase the demand for highly sensitive food testing applications.

Flow path inertness is the next frontier in food analyses. Agilent is breaking new ground with our ongoing development of Inert Flow Path solutions including liners, columns, and instruments—as well as test mixes and procedures. Together, these innovations ensure a highly inert flow path, improving your ability to analyze difficult, active compounds at trace levels.

Analysis of Omega 3, Omega 6, and other FAMEs with DB-FATWAX Ultra Inert

The Agilent J&W DB-FATWAX Ultra Inert GC column was developed to exceed the requirements for the analysis of Omega 3 and Omega 6 FAMEs. These requirements include AOAC Method 991.31 for encapsulated fish oil.



J&W DB-FATWAX Ultra Inert resolve DHA from common interferences.

Conditions:

GC system:	Agilent 7890B
Column:	J&W DB-FATWAX UI, 30 m x 0.25 mm, 0.25 µm, (p/n G3903-63008)
Inlet:	250 °C, split/splitless mode, split ratio 50:1
Carrier gas:	Helium, constant flow, 40 cm/s @ 50 °C
Oven:	50 °C (2 min), 50 °C/min to 174 °C (14 min), 2 °C/min to 215 °C (25 min)
FID:	280 °C, Hydrogen: 40 mL/min, Air: 400 mL/min, make-up gas: 25 mL/min
Injection:	1µL

Organophosphorus residue in olive oil

Chromatographically active compounds such as organophosphorus (OP) pesticides can adsorb onto active sites in the sample flow path (particularly at trace levels). This can compromise analyte response and increase the risk of peak tailing. An inert flow path is, therefore, essential for accurate quantitation.

In this study, we demonstrate that the complete transfer of analytes from inlet to detector is critical. To avoid activity, we recommend using a total Agilent Inert Flow Path.

Test conditions:

GC/MSD:	Agilent 7890/5975C
Sampler:	Agilent 7683B, 5.0 µL syringe
CFT device:	Purged 2-way splitter, split ratio 1:1 MSD:FPD
Inlet:	1 µL splitless, 250 °C, purge flow 60 mL/min at 0.25 min, gas saver on at 2 min 20 mL/min
Column:	Agilent J&W DB-35ms Ultra Inert, 30 m x 0.25 mm, 0.25 µm (p/n 122-3832UI)
Post-run backflush:	7.5 min at 290 °C, Aux EPC pressure 54 psi during backflush, 2 psi inlet pressure during backflush
MSD:	300 °C transfer line, 300 °C source, 150 °C quad
FPD:	230 °C, hydrogen 75 mL/min, air 100 mL/min, carrier + makeup (N_2) 60 mL/min

Flow path supplies:

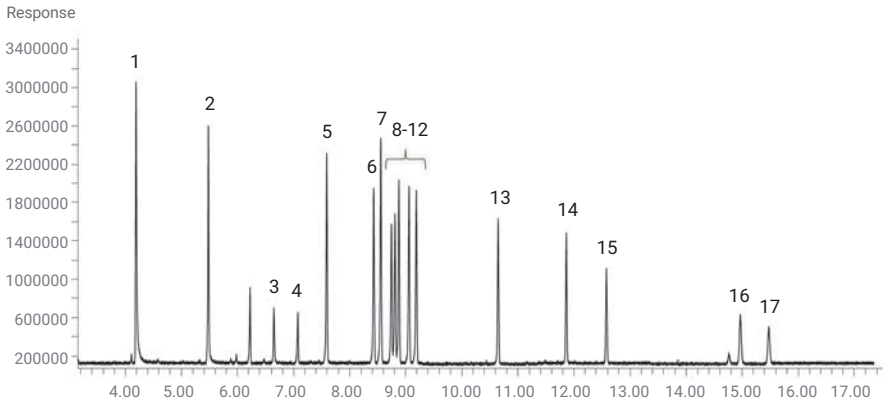
Vials:	Amber crimp top glass vials (p/n 5183-4496)
Vial caps:	Crimp caps (p/n 5181-1210)
Vial inserts:	250 µL glass/polymer feet (p/n 5181-8872)
Syringe:	5 µL (p/n 5181-1273)
Septum:	Advanced Green (p/n 5183-4759)
Inlet liner:	Ultra Inert single taper splitless liner with wool (p/n 5190-2293)
Ferrules:	0.4 mm id short, 85/15 Vespel/graphite (p/n 5181-3323)



Organophosphorus residues test

The Agilent J&W DB-35ms Ultra Inert capillary column and Ultra Inert inlet liner with wool resolved the targeted OP pesticides and provided excellent peak shape for the polar pesticides. As a result, we achieved more reliable quantitation at low levels.

Resolution of 16 organophosphorus pesticides with an Agilent J&W DB-35ms Ultra Inert column



GC/FPD chromatogram of a 100 ng/mL matrix-matched organophosphorus pesticide standard with analyte protectant analyzed on an Agilent J&W DB-35ms Ultra Inert, 30 m x 0.25 mm, 0.25 µm capillary GC column (p/n 122-3832UI).

Peak identification:

1. Methamidophos
2. Acephate
3. Omethoate
4. Diazinon
5. Dimethoate
6. Pirimiphos-methyl
7. Parathion-methyl
8. Malathion
9. Chlorpyrifos
10. Fenitrothion
11. Parathion
12. Fenthion
13. Methidathion
14. Carbophenthion
15. Triphenyl-phosphate*
16. Azinphos-methyl
17. Azinphos-ethyl

*Surrogate standard

Applications

Environmental:

Meet Present and Future Demands for Speed, Accuracy, and Productivity

Whether you're quantifying pesticide residue in water, analyzing soil contaminants, or measuring atmospheric impurities, environmental analysis must be done more reliably, more efficiently, and with higher-quality data than ever. Agilent Inert Flow Path solutions let you address these challenges head-on. An inert flow path helps you achieve excellent peak shapes for problematic compounds—plus reliable quantitation at low levels. So you can get the right answers the ***first*** time.

US EPA Method 8270 test for active semivolatiles

US EPA Method 8270 is widely used to determine the concentration of semivolatile organic compounds in environmental matrices. Many of these compounds contain a mix of acids, bases, and neutrals. This test is challenging, due to interactions between analytes and flow path surfaces. In this evaluation, the test mix included difficult compounds in the 8270 method.

Conditions:

Column 1:	Agilent J&W DB-UI 8270D Ultra Inert, 20 m × 0.18 mm, 0.36 µm (p/n 121-9723)
Column 2:	1.0 m × 0.15 mm id deactivated fused silica tubing (p/n 160-1625-10)
Carrier:	Helium, constant flow 1.58 mL/min set at 40 °C
Oven:	40 °C (2.5 min), 25 °C/min to 320 °C (4.8 min)
Inlet:	S/SL 1 µL pulsed splitless, 300 °C, 44 psi pulse to 1.4 min, purge flow 50 mL/min at 1.42 min, gas saver off
Inlet liner:	Agilent Ultra Inert single taper with wool (p/n 5190-2293)
	MSD, 325 °C transfer line, 300 °C source, 150 °C quad, 30-550 AMU range
GC/MSD:	Agilent 7890 Series GC/5975C Series GC/MSD
Sampler:	Agilent 7683B automatic liquid sampler (5.0 µL syringe, p/n G4513-80206)
Aux EPC:	2 psi with 5 mL/min bleed during run
Backflush:	Post-run 3.5 min at 75 psi aux EPC, 2 psi inlet pressure

Flow path supplies:

Vials:	Amber silanized screw top vials (p/n 5183-2072)
Vial caps:	Blue screw caps (p/n 5185-5820)
Vial inserts:	250 µL glass/polymer feet (p/n 5181-8872)
Syringe:	5 µL (p/n 5181-1273)
Septum:	Advanced Green (p/n 5183-4759)
Inlet liner:	Ultra Inert single taper (p/n 5190-3162)
Gold seal:	Ultra Inert gold seal with washer (p/n 5190-6144)
Ferrules:	0.4 mm id short, 85/15 vespel/graphite (p/n 5181-3323)
CTF fittings:	Internal nut (p/n G2855-20530)
CTF ferrules:	UltiMetal Plus Flexible Metal ferrules, 0.25 mm id columns (p/n G3188-27501)
Magnifier:	20× magnifier loop (p/n 430-1020)

See application note *Semivolatile Analysis with Specially Designed Agilent J&W DB-UI 8270D Columns* (5991-0250EN)



US EPA Method 8270 semivolatiles test

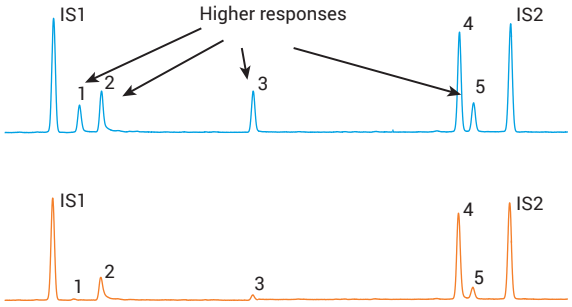
Ultra Inert inlet liners with wool are perfect for high-throughput analyses of environmental samples. The glass wool traps nonvolatiles present in the samples, preventing residue buildup.

The Ultra Inert deactivation also gives the wool a highly inert surface so recovery of active analytes like 2,4-DNP is not compromised.

See application note *Semivolatile Analysis with Specially Designed Agilent J&W DB-UI 8270D Columns* (5991-0250EN)

Semivolatiles suitability

Agilent Inert Flow Path



Peak identification:

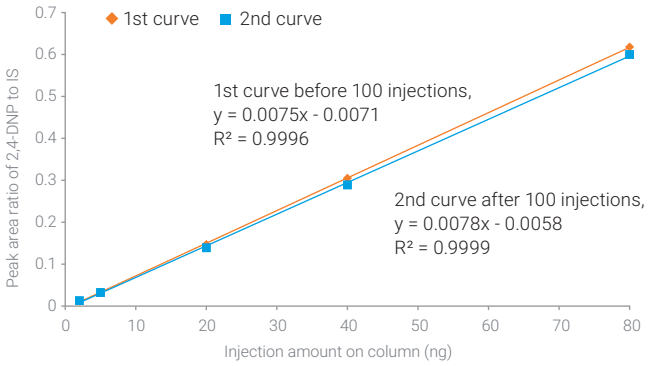
1. 2,4-Dinitrophenol
2. 4-Nitrophenol
3. 4,6-Dinitro-2-methylphenol
4. 4-Aminobiphenyl
5. Pentachlorophenol

IS1. Acenaphthene-d10
IS2. Phenanthrene-d10

An Agilent Inert Flow Path provides high responses for sensitive acidic compounds, such as semivolatile 2,4 DNP. A standard flow path, similarly configured, shows activity and adsorption.

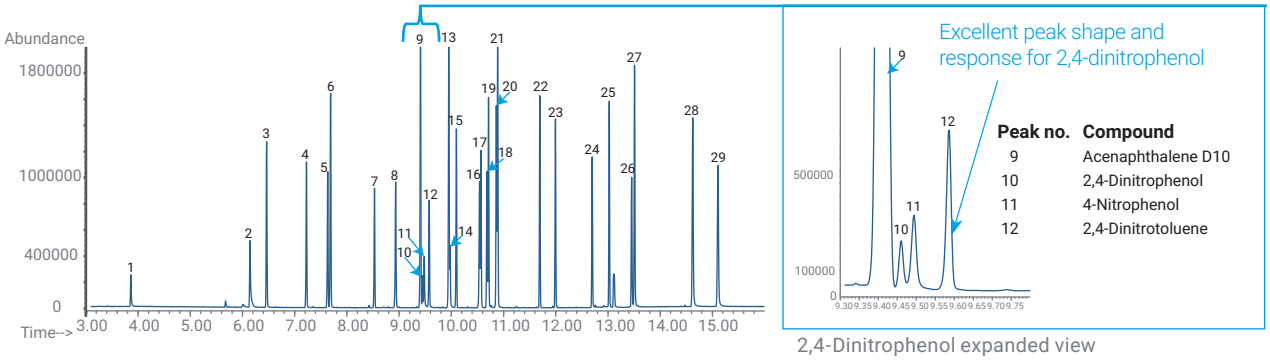
Excellent linearity of calibration curves and reliable durability for active semivolatile compound

2,4-DNP calibration curves before and after 100 injections using Agilent Inert Flow Path components



Improved deactivation provides excellent linearity over an extensive calibration range (2 to 80 ng) for active compounds such as 2,4-dinitrophenol.

10 ng/µL semivolatile checkout standard on an Agilent J&W DB-UI 8270D Ultra Inert, 20 m x 0.18 mm, 0.36 µm capillary GC column using an Ultra Inert inlet liner with wool.



2,4-Dinitrophenol expanded view

1. N-Nitrosodimethylamine
2. Aniline
3. 1,4-Dichlorobenzene-d4
4. Isophorone
5. 1,3-Dimethyl-2-nitrobenzene
6. Naphthalene
7. Hexachlorocyclopentadiene
8. Mevinphos
9. Acenaphthene-d10
10. 2,4-Dinitrophenol
11. 4-Nitrophenol
12. 2,4-Dinitrotoluene
13. Fluorene
14. 4,6-Dinitro-2-methyl phenol
15. Trifluralin
16. Simazine
17. Atrazine
18. Pentachorophenol
19. Terbufos
20. Chlorothanlonil
21. Phenanthrene-d10
22. Aldrin
23. Heptachlor epoxide
24. Endrin
25. 4,4'-DDT
26. 3,3'-Dichlorobenzidine
27. Chrysene d-12
28. Benzo[b]fluoranthene
29. Perylene-d12

Chromatogram of a 29-component mix on an Agilent J&W DB-UI 8270D Ultra Inert, 20 m x 0.18 mm, 0.36 µm capillary GC column (p/n 121-9723).

Optimized volatile organic compound analysis using Agilent's VOC application solution

In many regions of the world, the primary method for VOC analysis of drinking water is based on US EPA Method 524.2 and 8260B. The Agilent 5977B GC/MS has a successful legacy of implementing these methods going back many years. Requirements for lower levels of detection drive this analysis, and so new and improved technologies play a significant part in its success.

The Agilent VOC solution optimizes instrument setup and conditions by incorporating Ultra Inert technology, updated software, and method setup tips. That means you can get the highest level of sensitivity, robustness, and stability while meeting all required method quality control elements.

For comprehensive VOC method and instrument configuration details, see application note *Volatile Organic Compound Analysis Using Agilent Purge and Trap* (5991-0029EN).

Conditions:

GC acquisition	
GC/MS:	Agilent 7890/5977B
Column:	Agilent J&W DB-624 Ultra Inert, 20 m x 0.18 mm, 1.0 µm (p/n 121-1324UI)
Oven:	35 °C for 4 min, 15 °C/min to 240 °C for 0.3333 min (run time 18 min)
Front split/splitless inlet:	He, split 150:1 at 200 °C
Septum purge flow:	5 mL/min
Thermal aux 2 (MSD transferline)	
Temperature:	250 °C
Initial temperature:	35 °C
Constant flow:	0.7 mL/min
MS acquisition	
Solvent delay:	1.05 min
Scan:	Low mass 35.0, high mass 260.0
MS zones:	MS source: 250 °C; MS quad: 200 °C
Sampler conditions:	Atomx
Method:	Method 524_5 mL—VOCARB
Sample volume:	5.0 mL
Sweep sample time:	0.25 min
Sweep sample flow:	100 mL/min
Sparge vessel heater/temperature:	OFF/20 °C
Purge:	11.0 min, 40 mL/min, 20 °C
Dry purge time:	2.00 min
Dry purge flow:	100 mL/min
Desorb preheat temperature:	245 °C
Desorb time/flow:	4.00 min/100 mL per min
Desorb temperature:	250 °C

Agilent VOC kit (p/n G7022A)

Description	Part No.
6 mm drawout plate (inert) for Agilent 5973 and Agilent 5975 MSD Inert EI ion source	G2589-20045
DB-624UI column (20 m × 0.18 mm, 1.0 µm film)	121-1324UI
Straight-through 1.0 mm Ultra Inert straight 1 mm id liner	5190-4047
Tekmar VOCARB 3000 (#K) Trap	5188-8820
Agilent GC/MS VOC application kit disk with application note, kit instructions, instrument methods, and applicable technical notes	G7022-60001

Confidently detect compounds at trace levels and comply with global regulations for environmental monitoring

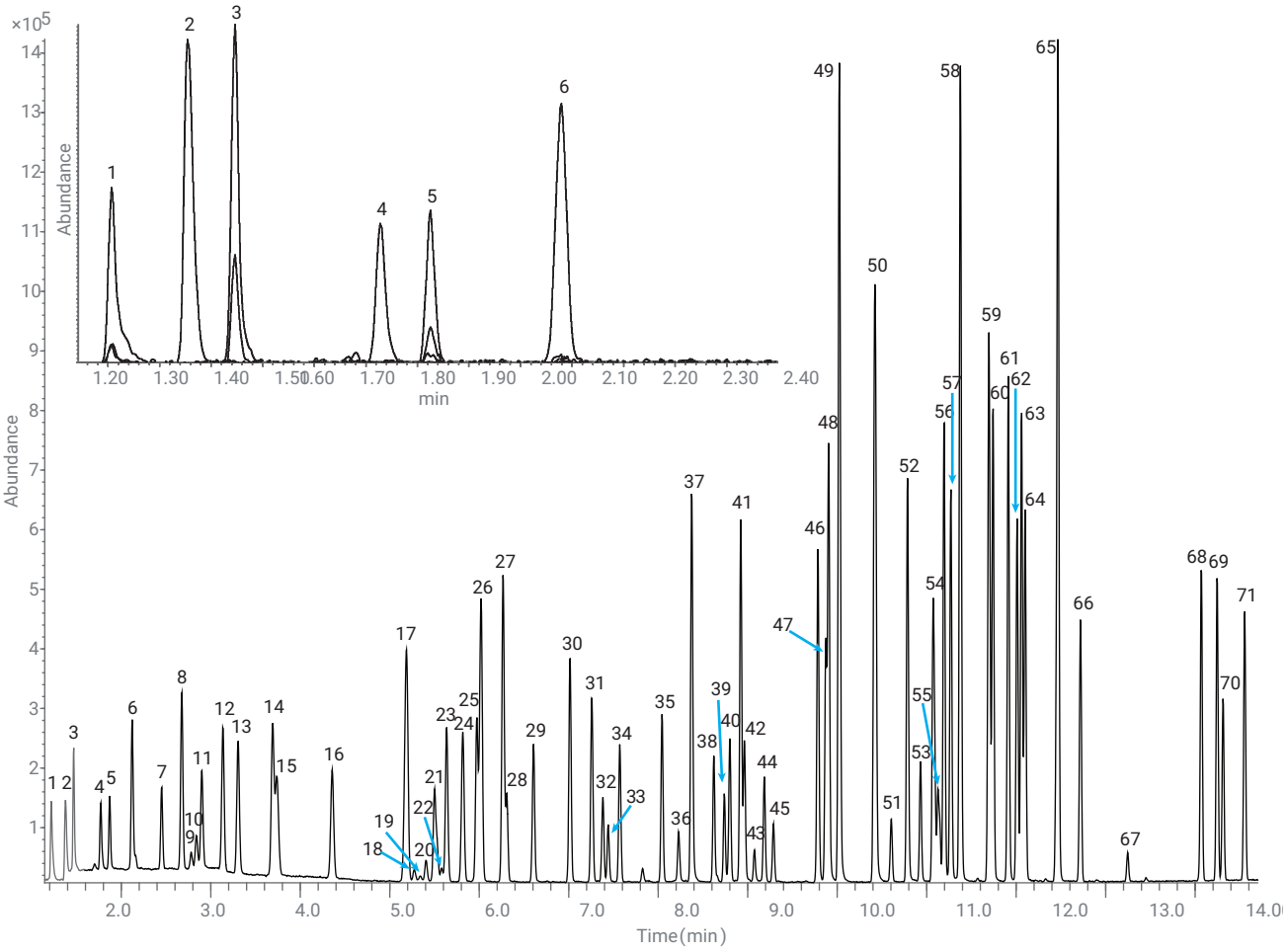
Created for environmental labs, this brochure demonstrates how Agilent J&W GC columns deliver low column bleed and the lowest column activity for sensitive, trace-level applications.

Get more information on Agilent's leading products for environmental analysis: DB-CLP1, DB-CLP2, DB-UI8270D, DB-624UI, Select PAH, and more. Also highlighted are Agilent Ultra Inert GC liners—great companion tools with Agilent J&W Ultra Inert GC columns for trace-level analysis.

View *Agilent J&W GC Columns for Environmental Applications brochure* (**5990-5873EN**)

Also view *Agilent GC/MS Workflow Consumables Quick Reference Guide for Volatile Organic Compounds in Water* (**5994-0345EN**)

EPA Method 524.2 Volatiles ICAL standard



Total ion chromatogram of method 524.2 ICAL standard. Inset: extracted ion chromatogram of the gases from left to right: dichlorodifluoromethane (*m/z* 85), chloromethane (*m/z* 50), vinyl chloride (*m/z* 62), bromomethane (*m/z* 94), chloroethane (*m/z* 64), and trichlorofluoromethane(*m/z* 101) in order of their elution. For a detailed list of compound identification, see *Optimized Volatile Organic Compound Analysis Using Agilent VOC Application Solution* (5991-0896EN).



Installing an Agilent Gas Clean filter removes contaminants, ensuring the highest-quality gas flows through the system and maintaining flow path inertness and integrity. Highly sensitive indicators provide maximum instrument protection.
www.agilent.com/chem/gasclean

Forensic Toxicology: Make Sure Your Data Can Withstand the Toughest Scrutiny

In the forensic toxicology field, both lives and professions depend on the accuracy of your results. This is true whether you're screening for drugs or checking a crime scene for explosive residue. To complicate matters, the continuing emergence of new drugs and toxins can increase your list of target compounds by hundreds every year.

An inert flow path, obtained with the Agilent Ultra Inert and UltiMetal solutions, delivers the selectivity and sensitivity you need for excellent peak shapes and consistent recovery of low-level analytes. The inert flow path split/splitless inlet with treated seal and weldments prevents adsorption or degradation, while Ultra Inert inlet liners with wool capture nonvolatiles, and help transfer active analytes of interest onto the Ultra Inert column.

Hint: For GC-compatible compounds, you can significantly reduce sample preparation and cleanup by using GC/MS in SIM/Scan mode with electron impact ionization (EI).

Basic drugs of abuse

Heavy-matrix samples (such as plasma or urine extracts) deteriorate the performance of the analytical column and detector. Deterioration shortens column life and increases the need for MS source maintenance. You can overcome this problem by using inlet liners with wool to protect the entire GC/MS system. However, if these liners are poorly deactivated, they might cause adsorption or decomposition of target analytes.

The Agilent Ultra Inert deactivation process significantly improves the efficacy and robustness of glass wool deactivation, allowing you to use liners with glass wool in GC/MS analysis of basic drugs of abuse. For this test, flow path inertness was evaluated using Agilent Forensic Toxicology checkout standards. These standards included 28 popular and difficult basic drugs.

Test conditions:

Column:	Agilent J&W DB-5MS Ultra Inert, 15 m x 0.25 mm, 0.25 µm (p/n 122-5512UI)
Sample:	5 ppm GC/MS forensic toxicology checkout mixture (p/n 5190-0471)
Injection:	1 µL splitless at 280 °C (hold 0.75 min)
Oven:	100 °C (0.5 min) to 325 °C at 20 °C/min and hold 2.5 min.
Detector:	Agilent 5975C MSD

Flow path supplies:

Vials:	Amber screw cap (p/n 5182-0716)
Vial caps:	Blue screw cap (p/n 5182-0717)
Vial inserts:	150 µL glass with polymer feet (p/n 5183-2088)
Septum:	Advanced Green nonstick 11 mm (p/n 5183-4759)
Ferrules:	0.4 mm id, 85/15 vespel/graphite (p/n 5181-3323)
Capillary flow technology:	Ultimate Union (p/n G3182-61580), internal nut (p/n G2855-20530); UltiMetal Flexible Metal ferrule, (p/n G3188-27501)
Inlet seal:	Ultra Inert gold seal with washer (p/n 5190-6144)
Inlet liners:	Agilent Ultra Inert deactivated single taper splitless liner with wool (p/n 5190-2293)

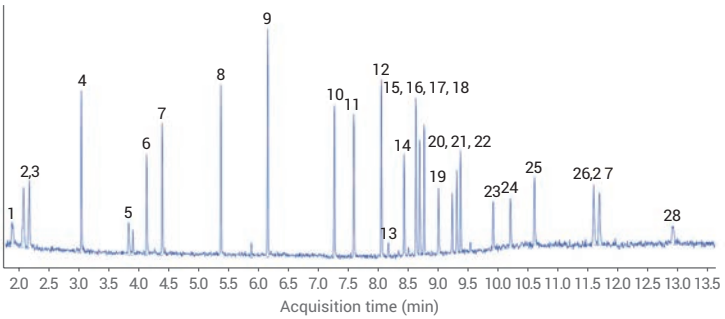
For Forensic Use.



Drugs of abuse test

We performed a GC/MS analysis on a complex Forensic Toxicology standard at 5 ng on-column using an Agilent Ultra Inert single taper splitless liner with wool. Peak shapes and responses demonstrate a high degree of inertness in both the liner and wool, preventing analyte adsorption and decomposition.

Forensic analysis of drugs of abuse using Agilent J&W DB-5ms Ultra Inert high-efficiency column on the 8890 GC system



TIC of mixed drug injection (20:1 split of 5 ug/ml, full scan range *m/z* 40-500). See 5994-0486EN for details.

Note that the peak shapes for these very active analytes are sharp and symmetrical—even at relatively low levels–facilitating good quantification and demonstrating the value of system inertness.

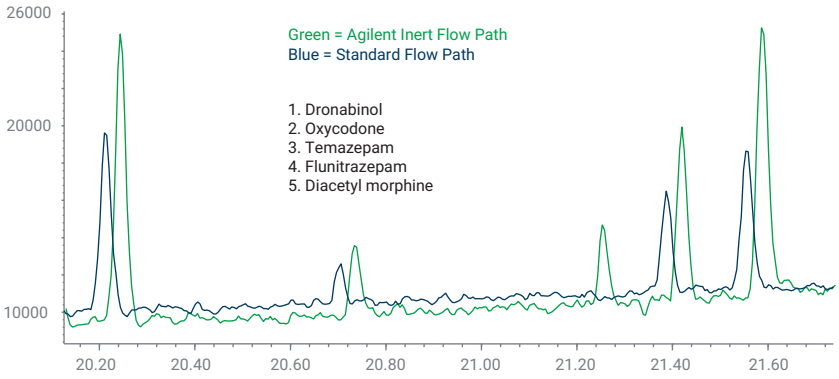
Index	Compound	RT	Index	Compound	RT	Index	Compound	RT
1.	d-Amphetamine	1.85	11.	Cocaine	7.68	20.	Temazepam	9.33
2.	Phentermine	2.05	12.	Proadifen	8.14	21.	Flunitrazepam	9.41
3.	Methamphetamine	2.14	13.	Oxazepam	8.26	22.	Heroin	9.47
4.	Nicotine	3.03	14.	Codeine	8.53	23.	Nitrazepam	10.02
5.	MDA	3.83	15.	Lorazepam	8.61	24.	Clonazepam	10.31
6.	MDMA	4.14	16.	Diazepam	8.73	25.	Alprazolam	10.72
7.	MDEA	4.40	17.	Hydrocodone	8.79	26.	Verapamil	11.71
8.	Meperidine	5.40	18.	THC	8.86	27.	Strychnine	11.81
9.	Phencyclidine	6.19	19.	Oxycodone	9.10	28.	Trazodone	13.04
10.	Methadone	7.35						



Better peak shape and higher response for active drugs

Here, inlet and consumable inertness during MSD were compared using the same Agilent J&W HP-5ms HP-5ms Ultra Inert column. Always install inert components to reduce inlet activity and avoid significant signal loss—or total analyte adsorption.

Drugs of abuse overlay 500 ppb complete flow path comparison



An UltiMetal Plus Inert flow path split/splitless inlet, Ultra Inert liner with wool, and Ultra Inert gold seal prevent the adsorption and loss of active analytes.

Column:	Agilent J&W HP-5ms UI 30 m x 0.25 mm, 0.25 µm (p/n 19091S-433UI)
Oven:	100 °C 4 min hold, 10°/min to 280 °C, 6 °/min to 300 °C (4.67 min hold)
Carrier:	Helium 52.7 cm/s (2 mL/min) set at 100 °C, EPC-Constant Flow
Inlet:	Pulsed Splitless 35 PSI pulse until 0.73 min, 0.75 min purge 50 mL/min, gas saver 20, mL/min at 2 min
Inlet liner:	Ultra Inert with wool/standard single taper liner with wool (p/n 5190-3165)
Gold seal:	UI gold seal/standard gold seal (p/n 5190-6144)
Detector:	MSD scan mode *m/z* 40 to 450; source temperature: 230 °C; quad temperature: 150 °C; transfer line: 310 °C

For Forensic Use.

Applications

Agilent Inert Flow Path Library

Food

Comprehensive Analysis of FAMEs, Fatty Acids, and Triglycerides (5991-8763EN)

Improving the Analysis of 37 Fatty Acid Methyl Esters (5991-8706EN)

A Comparison Study of the Analysis of Volatile Organic Acids and Fatty Acids (5991-9223EN)

Analysis of Omega 3 and Omega 6 FAMEs in Fish Oil and Animal Fat Using an Agilent J&W DB-FATWAX Ultra Inert GC Column (5991-8744EN)

Ultra Inert (UI) Wool Liner Performance Using an Agilent J&W DB-35ms UI Column (5990-8235EN)

Analysis of Pesticides in Food by GC/MS/MS Using the Ultra Inert Liners with Wool (5990-7706EN)

Organophosphorus Residues in Olive Oil by GC/FPD with Agilent J&W DB-35ms Ultra Inert (5990-7722EN)

Organophosphorus Pesticides in Apple Matrix by GC/MS/FPD Using an Agilent J&W DB-35ms Ultra Inert GC Column (5990-7165EN)

Agilent J&W DB-624 Ultra Inert Capillary Column's Utility in Screening Distilled Spirits by GC/MS Static Headspace (5991-0659EN)

Analysis of Trace Amounts of Volatile Organic Acids Using the Agilent J&W DB-624UI GC Column (5991-0845EN)

Screen Beer by GC/MS Static Headspace with the Agilent J&W DB-624 Ultra Inert Capillary Column (5991-1136EN)

Endrin and DDT Breakdown Using an Inert Flow Path Equipped Agilent 7890A GC (5991-1862EN)

Improved GC/MS Analysis of Tomato Pesticides with Agilent Deactivated Fused Silica Tubing (5991-5974EN)

Analysis of Distilled Spirits Using Agilent J&W DB-WAX Ultra Inert Capillary GC Column (5991-6638EN)

Analysis of Glycols in Toothpaste Using Agilent J&W DB-WAX Ultra Inert Capillary GC Column (5991-6637EN)

Analysis of Lavender Essential Oil by Agilent J&W DB-WAX Ultra Inert Capillary GC Columns (5991-6635EN)

Environmental

Volatile Organic Compounds in Water: Agilent GC/MS Workflow Consumables Quick Reference Guide (5994-0345EN)

Evaluation of the Ultra Inert Liner Deactivation for Active Compounds Analysis by GC (5990-7380EN)

Analysis of Semivolatiles by GC/FID Using the Ultra Inert Inlet Liners with Wool (5990-7381EN)

Sub µg/L Level Analysis of Chlorinated Pesticide and Herbicide Analysis in Water by GC/µECD Using Agilent J&W DB-35ms UI GC Column (5990-9735EN)

Plaguicides Using Agilent J&W HP-1ms Ultra Inert and Agilent J&W DB-1301 Capillary GC Columns (5990-4352EN)

Determination of Haloacetic Acids in Water by GC/µECD Using Agilent J&W DB-35ms Ultra Inert and DB-XLB Columns (5990-8765EN)

PBDE Analysis Using an Agilent J&W DB-5ms Ultra Inert GC Column (5990-5651EN)

PAH Analysis Using an Agilent J&W DB-5ms Ultra Inert Capillary GC Column (5990-5652EN)

Volatile Organic Compound [VOC] Analysis via Purge and Trap: Success with VOC Analysis Using the Agilent 5975C Mass Selective Detector [MSD] **(5991-0029EN)**

Semivolatile Analysis with Specially Designed Agilent J&W DB-UI 8270D Columns (5991-0250EN)

Evaluating Inert Flow Path Components and Entire Flow Path for GC/MS/MS Pesticide Analysis (5991-1860EN)

Quantitative and Repeatability Analysis of Trace Level Pesticides in Plantation Food by GC/MS/MS (5990-9317EN)

Optimized Method Development of Large Volume Injection for GC/MS/MS of Food Pesticides (5991-1196EN)

Better Pesticide Analysis with Agilent Ultimate Plus Tubing (5991-5404EN)

Analyze Semivolatiles with Agilent Ultimate Plus Tubing (5991-5441EN)

Forensic toxicology

Agilent J&W Ultra Inert GC Columns and Agilent Standards for Blood Alcohol Analysis (5991-7781EN)

The Determination of Blood Alcohol Concentration Using J&W DB-BAC1 Ultra Inert and DB-BAC2 Ultra Inert Columns (5991-8206EN)

Forensic Analysis of Blood Alcohol Concentration Using the Agilent 8860 GC with Agilent J&W DB-BAC1 UI and Agilent J&W DB-BAC2 UI Columns and the Agilent 7697A Headspace Sampler (5994-0443EN)

Forensic Analysis of Drugs of Abuse with the Agilent 8890 GC (5994-0486EN)

Agilent Intuvo 9000 GC Analyzer for Blood Alcohol Concentration: Technology Advantage (5991-8461EN)

Agilent Inert Flow Path Enhancements Improve Drugs of Abuse Testing (5991-1859EN)

Analysis of Drugs of Abuse by GC/MS Using the Ultra Inert Inlet Liners with Wool (5990-7596EN)

Fast and Comprehensive Doping Agent Screening in Urine by Triple Quadrupole GC/MS (5990-7234EN)

Analyze Drugs of Abuse with Agilent Ultimate Plus Tubing (5991-5303EN)

More Ultra Inert application and technical notes

DB-624 UI Ultra Inert GC Capillary Column for Challenging Industrial Applications (5991-5197EN)

Analysis of Carcinogenic Tobacco-Specific Nitrosamines in Mainstream Cigarette Smoke Using an Agilent J&W DB-35ms Ultra Inert GC Column (5990-8849EN)

Addressing Concerns in QC Tests for GC Columns (5990-9961EN)

Residual Solvent Analysis with Specifically Designed and Tested Agilent J&W DB-Select 624UI <467> Columns (5991-0616EN)

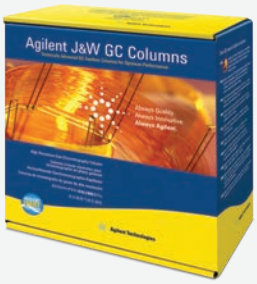
Agilent Ultimate Plus Deactivated Fused Silica Tubing (5991-5142EN)

Evaluation of Agilent Ultimate Plus Fused Silica Tubing for Active Compounds (5991-5914EN)

Pharmaceutical application

Residual solvent testing of process intermediates, excipients, and formulated drug products provides an important safeguard to ensure the safety of pharmaceutical products worldwide. Changes to United States Pharmacopeia (USP) General Chapter <467> Residual Solvents are closely aligned with International Committee on Harmonization (ICH) Q3C Guidelines for Residual Solvents. Both groups have taken a toxicity/dosage-based approach to assess the risk that these solvents or organic volatile impurities (OVIs) present to the public. The analysis is typically conducted by static headspace with FID detection using a thick film G43-based stationary phase.

Agilent J&W DB-Select 624UI <467> GC columns are designed specifically for United States Pharmacopoeia Method <467>.



For more details, consult these application notes:

- *Residual Solvent Analysis with a Specifically Designed and Tested Agilent J&W DB-Select 624UI for USP <467> Column* (5991-0616EN)
- *Lower Detection Limits and Quantify Trace-Level Organic Volatile Impurities* (5991-0552EN)
- *Satisfy Requirements for Residual Solvent Analysis* (5991-8659EN)
- *Satisfy Requirements for Residual Solvent Analysis Agilent J&W DB-Select 624 Ultra Inert for <467> and DB-WAX Ultra Inert Capillary GC Columns* (5991-7531EN)
- *USP 467 ANALYSIS OF RESIDUAL SOLVENTS Technology Advantage: Agilent Intuvo 9000 GC with HS* (5991-8032EN)

Ensure a Lifetime of Peak Instrument Performance and Maximum Productivity

As the world's chromatography leader, Agilent is uniquely positioned to offer industry-leading GC supplies and sample preparation products. All supplies are engineered or selected by our experienced design teams, manufactured to our demanding specifications, and tested under strict conditions.

Inert flow path accessory kit

This all-in-one kit contains the components you need to upgrade your existing split/splitless inlet to an inert flow path split/splitless inlet. Includes inlet weldment, shell weldment, Ultra Inert gold seal, and Ultra Inert splitless liner.

MS analyzed vial kits stop unknown peaks from impacting your results

Agilent vial kits eliminate the possibility of vials being the source of contamination, giving you greater confidence in your results and eliminating the need to pretest or rerun samples because of unexpected peaks. All kits include a certificate of analysis that details critical physical dimensions, as well as fully traceable LC/MS and GC/MS signal traces.

Maintain a leak-free seal even after hundreds of injections

Get a tight connection—without expensive upgrades or adapters with Agilent Self-Tightening column nuts. This innovative spring-driven piston continuously presses against the short graphite/polyimide ferrule—maintaining a leak-free seal. It is especially well suited for oxygen-sensitive detectors, such as MS and ECD. Tight column connections help reduce background noise and produce reliable results. They also save time, due to not needing to retighten fittings.



Agilent Self-Tightening column nut

Premium nonstick septa

Other suppliers coat their septa with foreign substances, such as powder, to prevent sticking. However, this coating can accumulate inside split vent lines and interfere with your analysis of active analytes.

Agilent nonstick septa are plasma coated, which eliminates chemical bleed and contamination from foreign substances. They are also delivered in blister packs to keep each septum clean and ready for use. Your GC system will maintain its integrity, stay cleaner, and require less maintenance. (Always remember to change septa often to prevent leakage.)



Agilent premium inlet septa

Blue Line autosampler syringes

Designed to support the productivity features of the 7693 autosampler, Agilent Blue Line autosampler syringes come in a range of volumes and configurations to suit your application.



Agilent Blue Line autosampler syringes

Bulk GC supplies

Ideal for high use labs, our bulk supplies provide the same quality and consistency of Agilent GC supplies in convenient and economical packaging:

- Ultra Inert inlet liners in 100 packs
- Ultra Inert gold seals in 10 and 50 packs
- Nonstick septa in 400 packs

Expert service and support

For confident analysis and a productive GC workflow, you need the support of a true service partner. Agilent has a wealth of experience in maximizing the uptime, accuracy, and efficiency of GC instruments. Agilent CrossLab provides specialized support for all major instrument brands, and our dedicated service specialists help you tackle your most challenging GC applications.

Sample preparation: Reliable and accurate results with fewer repeated samples

Only Agilent offers a complete line of sample preparation products for GC and GC/MS analysis across the full spectrum of instrumentation.

Agilent sample preparation products help you move easily from sample to successful analytical result. You can:

- Extend instrument performance with Captiva filtration.
- Reduce costs and save time with Bond Elut QuEChERS kits.
- Achieve lower detection limits with Bond Elut silica and polymeric SPE products.

To learn more about Agilent sample preparation solutions, please visit www.agilent.com/chem/sampleprep



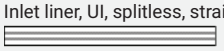
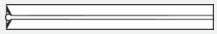
Agilent Bond Elut QuEChERS

Stock up now, and always ensure your most inert flow path, visit www.agilent.com/chem/GCsupplies

Ordering Information

Agilent Ultra Inert inlet liners and touchless packaging

High inertness, productivity, and reproducibility

Description	Volume (µL)	ID (mm)	1/pk	5/pk	25/pk	100/pk*
Splitless Inlet Liners						
Single taper, Ultra Inert liner 	900	4	5190-2292	5190-3162	5190-3166	5190-3170
Single taper, Ultra Inert liner with glass wool 	900	4	5190-2293	5190-3163	5190-3167	5190-3171
Double taper, Ultra Inert liner 	800	4	5190-3983	5190-4007		
Dimpled 	200	2	5190-2297	5190-4006		
Splitless, UI, fritted liner, low 	870	4	5190-5112	5190-5112-005	5190-5112-025	
Inlet liner, UI, splitless, straight 	250	2	5190-6168			
Split Inlet Liners						
Straight, Ultra Inert liner with glass wool	990	4	5190-2294	5190-3164	5190-3168	5190-3172
Low pressure drop, Ultra Inert liner with glass wool 	870	4	5190-2295	5190-3165	5190-3169	5190-3173
Inlet liner, universal, UI, mid-frit 	870	4	5190-5105	5190-5105-005	5190-5105-025	
SPME, Headspace Injection						
Straight Ultra Inert liner for SPME 	35	0.75	5190-4048			
Straight, Ultra Inert liner 	65	1	5190-4047			

Each liner ships with a preinstalled, nonstick O-ring.
**The 100/pk is not in the touchless packaging. O-rings must be purchased separately.*

Agilent Ultra Inert Direct Connect liners

Maximum recovery and minimal decomposition

Description	5/pk
DC dual taper with hole	5190-7011
DC wool, top hole	5190-7012
DC wool, with bottom hole	5190-7020

Each liner ships with a preinstalled, nonstick O-ring.

Agilent Ultra Inert gold seals and washers

A smooth, leak-free surface for active analytes

Description	1/pk	10/pk	50/pk
Inert gold seal and washer	5190-6144	5190-6145	5190-6149

Agilent UltiMetal Plus and gold-plated Flexible Metal ferrules
No column breakage, no leaks, no activity

Description	Unit	Part No.
UltiMetal Plus Flexible Metal ferrule with 0.4 mm id For fused silica tubing 0.1-0.25 mm id	10/pk	G3188-27501
UltiMetal Plus Flexible Metal ferrule with 0.5 mm id For fused silica tubing 0.32 mm id	10/pk	G3188-27502
UltiMetal Plus Flexible Metal ferrule with 0.8 mm id For fused silica tubing 0.45-0.53 mm id	10/pk	G3188-27503
UltiMetal Plus Flexible Metal ferrule with no hole To plug capillary flow technology fittings	10/pk	G3188-27504
UltiMetal Plus Flexible Metal ferrule Use with 0.25 mm and 0.32 mm UltiMetal column tubing	10/pk	G3188-27505
UltiMetal Plus Flexible Metal ferrule Use with 0.53 mm UltiMetal column tubing	10/pk	G3188-27506
Gold-plated Flexible Metal ferrule with 0.4 mm id For fused silica tubing 0.1-0.25 mm id	10/pk	G2855-28501
Gold-plated Flexible Metal ferrule with 0.5 mm id For fused silica tubing 0.32 mm id	10/pk	G2855-28502
Gold-plated Flexible Metal ferrule with 0.8 mm id For fused silica tubing 0.45 - 0.53 mm id	10/pk	G2855-28503
Gold-plated Flexible Metal ferrule Use with 0.25 and 0.32 mm UltiMetal column tubing	10/pk	G2855-28505
Gold-plated Flexible Metal ferrule Use with 0.53 mm UltiMetal column tubing	10/pk	G2855-28506

Agilent Inert Flow Path upgrade kit
The components you need, all in one place

Description	Part No.
Complete Agilent Inert Flow Path upgrade kit	G3970A
Capillary inlet shell weldment assembly, UltiMetal Plus treated	G3452-60570
Insert weldment, UltiMetal Plus treated	G3452-60586
Ultra Inert gold seal	5190-6144
Ultra Inert single taper splitless liner with wool	5190-2293
UltiMetal ferrules for 0.25 mm id fused silica columns, 10/pk	G3188-27501
Self-Tightening column nut, inlet/detector nut	G3440-81011
Self-Tightening column nut, MSD	G3440-81013

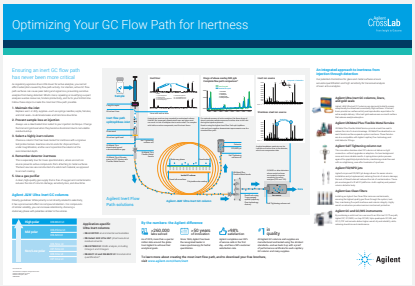
Additional flow path supplies
Expand the capabilities of your inert flow path

Description	Part No.
Purged Ultimate Union assembly, inert	G3186-60581
3-way splitter with makeup gas, inert	G3183-60501
Ultimate Union kit, UltiMetal Plus deactivated	G3182-60581
Compact Deans switch manifold assembly, UltiMetal Plus treated	G2855-60501
Compact splitter with makeup gas, inert	G3180-60501

Four easy ways to create your inert flow path:

1. Request **Option 114** when you purchase either the Agilent 7890B GC or 8890 GC system.
2. Add an Inert Flow Path Split/ Splitless Inlet to your 7890 with accessory **p/n G3453B**. For the 8890, order **p/n G3549A***.
3. Upgrade a 7890 Split/Splitless Inlet with inert components (**p/n G3970A**).
4. Purchase individual Inert Flow Path components separately, as needed.

**Contact your local Agilent representative for more information.*



Learn how to optimize your flow path for inertness, so you can achieve the ultralow detection levels today's demanding analyses require.

Order your **free poster** today at www.agilent.com/chem/uiorder

Agilent J&W Ultra Inert GC columns and Ultimate Plus fused silica tubing

Engineered for excellent column inertness and longevity

Ultra Inert 1ms GC columns

ID (mm)	Length (m)	Film (µm)	Part No.
DB-1ms Ultra Inert			
0.18	20	0.18	121-0122UI
0.25	15	0.25	122-5512UI
	30	0.25	122-0132UI
	60	0.25	122-0162UI
0.32	15	0.25	123-0112UI
	30	0.25	123-0132UI
HP-1ms Ultra Inert			
0.18	20	0.18	19091S-677UI
0.25	15	0.25	19091S-931UI
	30	0.25	19091S-933UI
		0.50	19091S-633UI
		1.00	19091S-733UI
0.32	15	0.25	19091S-911UI
	25	0.52	19091S-612UI
	30	0.25	19091S-913UI
		1.00	19091S-713UI

Ultra Inert 35ms GC columns

ID (mm)	Length (m)	Film (µm)	Part No.
DB-35ms Ultra Inert			
0.18	20	0.18	121-3822UI
0.25	15	0.25	122-3812UI
	30	0.25	122-3832UI
0.32	30	0.25	123-3832UI

Ultra Inert 5ms GC columns

ID (mm)	Length (m)	Film (µm)	Part No.
DB-5ms Ultra Inert			
0.18	20	0.18	121-5522UI
		0.36	121-5523UI
0.25	15	0.25	122-5512UI
		1.00	122-5513UI
	25	0.25	122-5522UI
	30	0.25	122-5532UI
			122-5532UI-KEY*
		0.50	122-5536UI
		1.00	122-5533UI
	50	0.25	122-5552UI
	60	0.25	122-5562UI
		1.00	122-5563UI
0.32	30	0.25	123-5532UI
		0.50	123-5536UI
		1.00	123-5533UI
	60	1.00	123-5563UI
HP-5ms Ultra Inert			
0.18	20	0.18	19091S-577UI
0.25	15	0.25	19091S-431UI
			19091S-431UI-KEY*
	30	0.25	19091S-433UI
			19091S-433UI-KEY*
		0.50	19091S-133UI
		1.00	19091S-233UI
	60	0.25	19091S-436UI
0.32	30	0.25	19091S-413UI
		1.00	19091S-213UI

**For 8890 GC only.*

DB 624 Ultra Inert GC columns

ID (mm)	Length (m)	Film (µm)	Part No.
DB-624 Ultra Inert			
0.18	20	1.00	121-1324UI
0.25	30	1.40	122-1334UI
	60	1.40	122-1364UI
0.32	30	1.80	123-1334UI
	60	1.80	123-1364UI
0.53	30	3.00	125-1334UI
	75	3.00	125-1374UI
DB-Select 624 Ultra Inert for <467> GC columns			
0.25	30	1.40	122-0334UI
	60	1.40	122-0364UI
0.32	30	1.80	123-0334UI
	60	1.80	123-0364UI
0.53	30	3.00	125-0334UI

Ultimate Plus deactivated fused silica tubing

ID (mm)	Length (m)	Part No.
0.12	6	CP801206
0.15	5	CP801505
	10	CP801510
0.18	5	CP801805
	6	CP801806
	10	CP801810
0.25	5	CP802505
	10	CP802510
	30	CP802530
0.32	5	CP803205
	10	CP803210
	30	CP803230
0.53	5	CP805305
	6	CP805306
	10	CP805310
	30	CP805330

DB-WAX Ultra Inert GC columns

ID (mm)	Length (m)	Film (µm)	Part No.
0.18	20	0.18	121-7022UI
		0.30	121-7023UI
0.20	25	0.20	128-7022UI
0.25	15	0.25	122-7012UI
	30	0.25	122-7032UI
		0.50	122-7033UI
	60	0.25	122-7062UI
		0.50	122-7063UI
0.32	15	0.25	123-7012UI
	30	0.25	123-7032UI
		0.50	123-7033UI
	60	0.25	123-7062UI
		0.50	123-7063UI
0.53	15	1.00	125-7012UI
	30	0.25	125-7031UI
		1.00	125-7032UI
	60	0.50	125-7037UI
		1.00	125-7062UI

DB-FATWAX Ultra Inert GC columns

ID (mm)	Length (m)	Film (µm)	Part No.
0.18	20	0.18	G3909-63002
0.25	30	0.25	G3903-63008
	30	0.25	G3909-63003
0.32	30	0.25	G3903-63009
	30	0.25	G3909-63004

DB 8270D Ultra Inert GC columns

ID (mm)	Length (m)	Film (µm)	Part No.
0.18	20	0.36	121-9723
0.25	30	0.25	122-9732
	30	0.50	122-9736

DB-BAC1 Ultra Inert and DB-BAC2 Ultra Inert GC columns

ID (mm)	Length (m)	Film (µm)	Part No.
DB-BAC1 Ultra Inert			
0.32	20	1.80	123-9334UI
	30	1.80	123-9334UI-INT
0.53	30	3.00	125-9334UI
DB-BAC2 Ultra Inert			
0.32	30	1.20	123-9434UI
	30	1.20	123-9434UI-INT
0.53	30	2.00	125-9434UI

Gas supplies

Gas Clean Filters	Part No.
Gas Clean FID filter kit (includes 4 filters for carrier gas and detector gases, 1/8”)	CP736530
Gas Clean kit for 8890 and 8860 (includes carrier gas filter, 1/8" connection unit with mounting bracket, and Gas Clean sensor)	CP179880
Replacement Filters	**Part No.**
Gas Clean carrier gas filter	CP17973
Gas Clean oxygen filter	CP17970
Gas Clean moisture filter	CP17971
Gas Clean hydrocarbon filter	CP17972

Detector jets

Description	Part Number
FID jet, universal fit, 0.011 inch id	5200-0176
FID jet, universal fit, 0.018 inch id	5200-0177
FID jet, universal fit, 0.030 inch id	5200-0178
NPD jet, universal fit, 0.011 inch id	5200-0179



Ultra Inert inlet liners for other manufacturer's instruments in your lab

Agilent liners perform seamlessly with a variety of instruments, regardless of make or model

Below is a sample of the Ultra Inert liner part numbers for specific instrument vendors.

Agilent UI liners for Bruker/Varian
Liners for 1177 Split/Splitless Injector Ports

	Description	ID (mm)	OD (mm)	Length (mm)	Volume (µL)	Unit	Agilent Ultra Inert Deactivation	Similar to OEM Part No.
Split Liners								
	Straight-through	4.0	6.3	78.5	1000	5/pk	8004-0156	RT207732145 SG092007
	With frit, gooseneck	4.0	6.3	78.5	1000	5/pk	8004-0158	RT210462145

Agilent UI liners for PerkinElmer
Liners for AutoSystem, AutoSystem XL, Clarus Systems

	Description	ID (mm)	OD (mm)	Length (mm)	Volume (µL)	Unit	Agilent Ultra Inert Deactivation	Similar to OEM Part No.
Splitless Liners								
	Straight	2.0	6.2	92.1	300	5/pk	8003-0162	N6101372
Split Liners								
	Straight	4.0	6.2	92.1	1110	5/pk	8003-0160	

Agilent UI liners for Shimadzu
Liners for 2014 Systems

	Description	ID (mm)	OD (mm)	Length (mm)	Volume (µL)	Unit	Agilent Ultra Inert Deactivation	Similar to OEM Part No.
Splitless Liners								
	Straight-through	2.6	5.0	95	500	5/pk	8001-0151	220-94767-00
Split Liners								
	Straight-through	3.4	5.0	95	860	5/pk	8001-0153	

Agilent UI liners for Thermo Scientific
Liners for Trace, Focus Systems

	Description	ID (mm)	OD (mm)	Length (mm)	Volume (µL)	Unit	Agilent Ultra Inert Deactivation	Similar to OEM Part No.
Splitless Liners								
	Single taper	3.0	8.0	105		5/pk	8002-0154	45350032
Split Liners								
	Straight	5.0	8.0	105	2000	5/pk	8002-0151	45350030

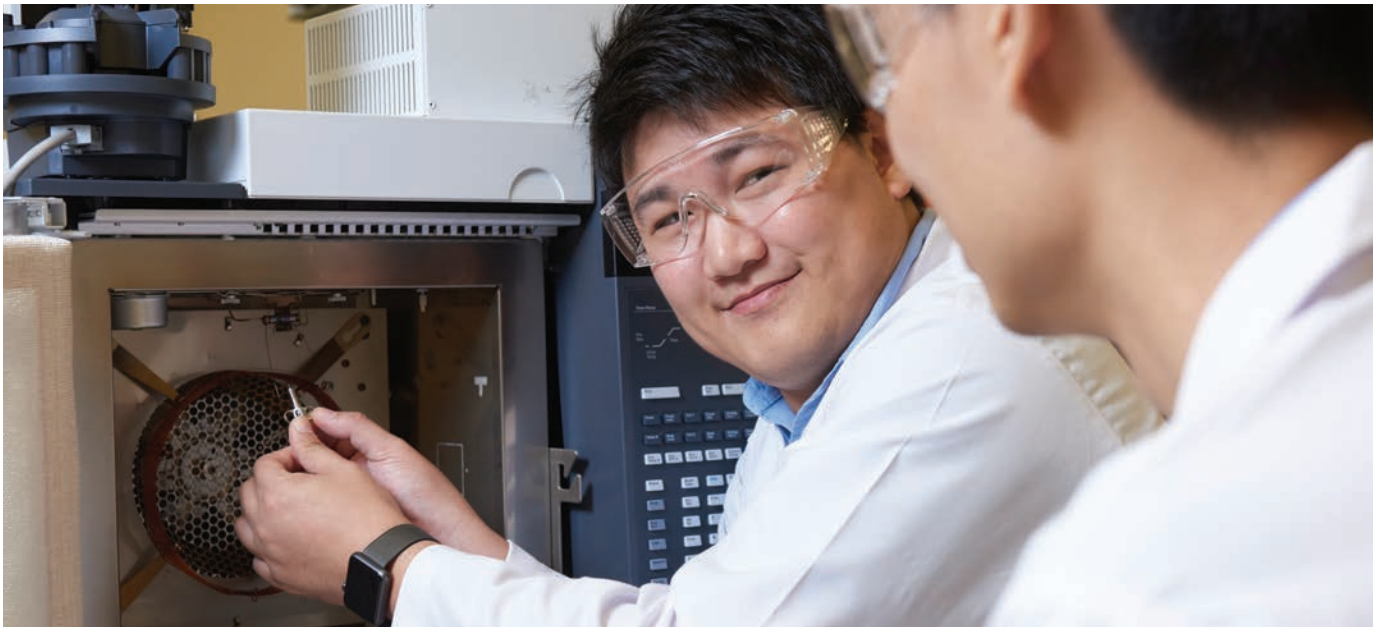
The cross references to the original equipment manufacturer (OEM) part numbers listed here serve as a recommendation that the Agilent CrossLab products are viable alternatives. Agilent CrossLab products are compatible with the corresponding OEM instruments, although the Agilent CrossLab products may sometimes have slightly different designs, compared to the OEM counterparts.

An Agilent Inert Flow Path is a *Must* for Active Analytes

The increasing need for high-sensitivity analyses of harmful substances is placing new demands on GC methods. Agilent is committed to helping you analyze difficult, active compounds—even at trace levels—by giving you the tools needed to ensure an inert flow path.

- **Agilent Ultra Inert inlet liners**
  Deliver a robust, reproducible, and reliable inert flow path—with or without glass wool.
- **Agilent J&W Ultra Inert GC columns and Ultimate Plus deactivated fused silica tubing**
  Push the industry standards for consistent column inertness and exceptionally low bleed for MS UI columns.
- **Agilent GC and GC/MS instruments**
  Bring together all the elements for trace-level analysis, dramatically improving MS resolution, spectral integrity, and detection limits.
- **Agilent-engineered supplies**
  Prevent adsorption or degradation to help you maintain the integrity of your results.
- **Ultra Inert gold seals and inert flow path split/splitless inlet**
  Reduce analyte loss due to contact with hot metal surfaces.
- **Gold-plated Flexible Metal ferrules with capillary flow technology devices**
  Allows you to improve your results using techniques such as backflushing, heart-cutting, flow splitting, and Deans switching—*without* the fear of leaks or activity.

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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.

Learn more about Agilent CrossLab, and see examples of insight that leads to great outcomes, at www.agilent.com/crosslab

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