A Holiday Gift Buying Guide for your GC: Latest Supply Innovations

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Online Application Engineer
November 12, 2019

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Trusted Answers

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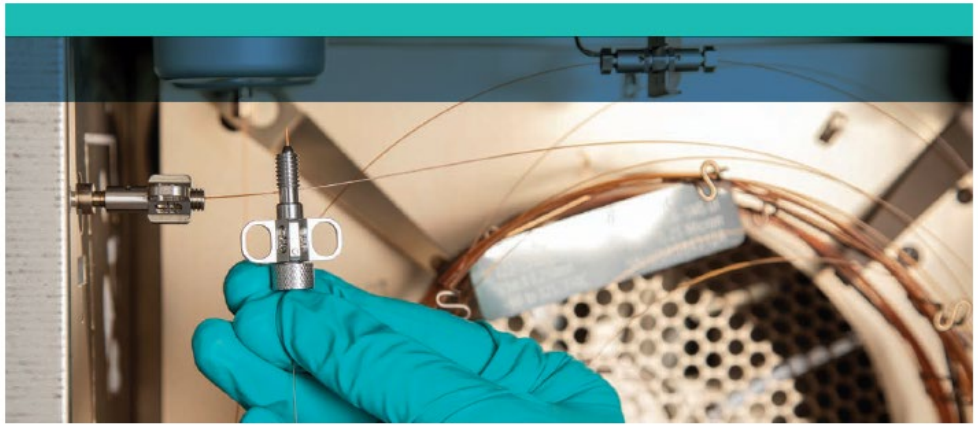
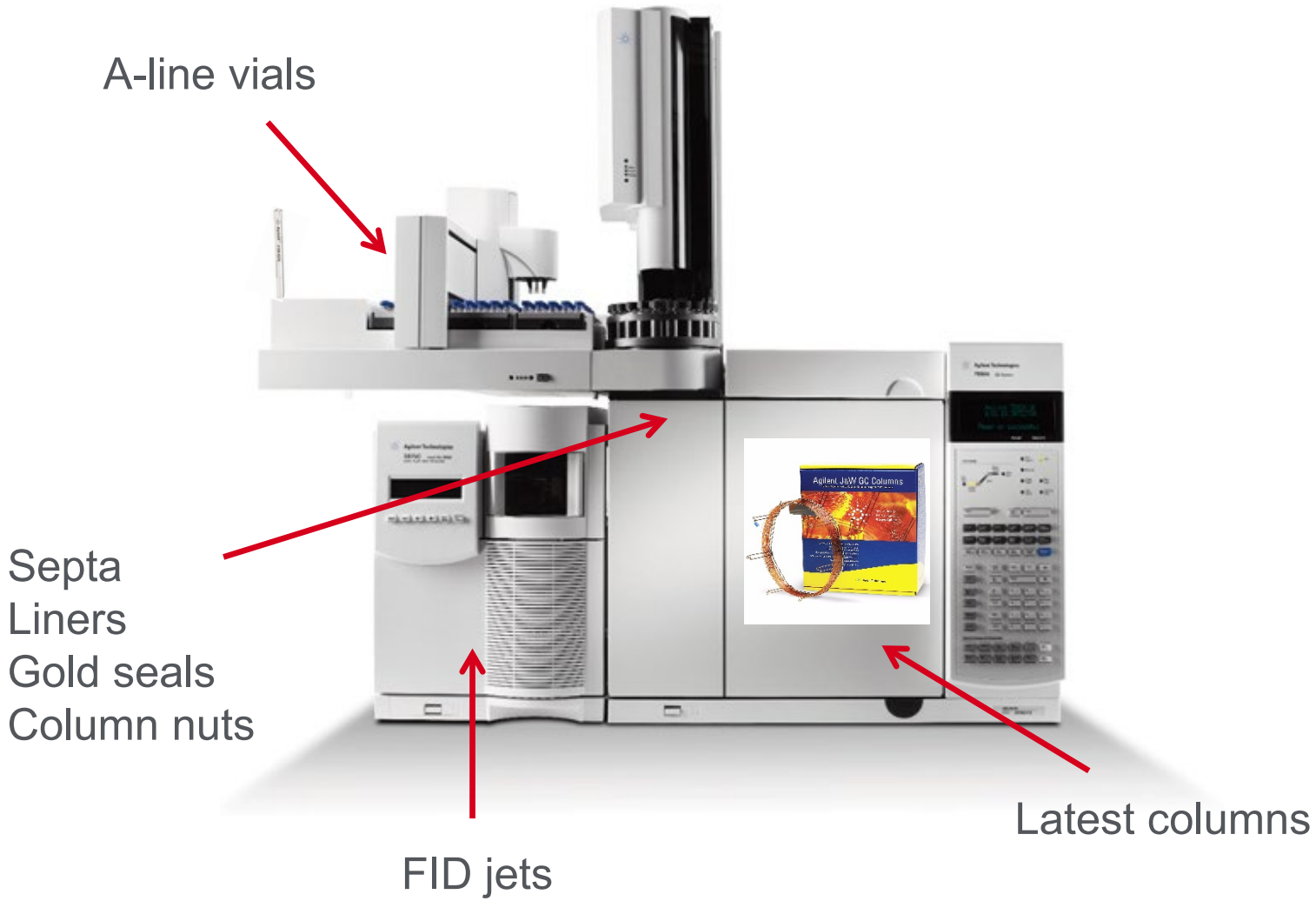


**Some restrictions apply on supplies*

An Overview of the Latest Supply Innovations

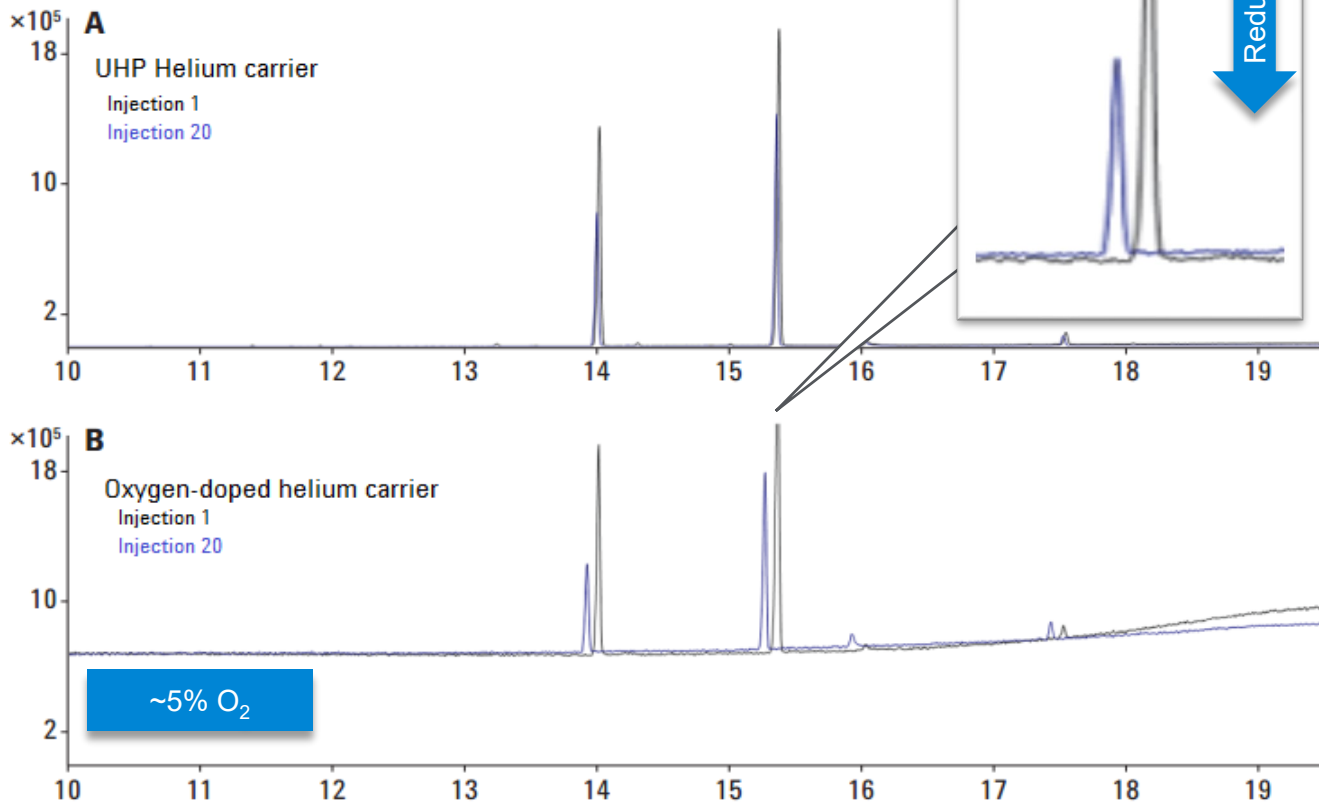
- Gas traps
- Crimpers
- Sample cleanup
- ADM Flowmeter
- Standards



Let's Talk About Gas Quality and Filters

- Oxygen in carrier gas is detrimental to GC/MS
  - Reduced response
  - Elevated background
  - Irreversible column damage
  - Impaired electron multiplier functior
  - Premature filament, liner lifetime

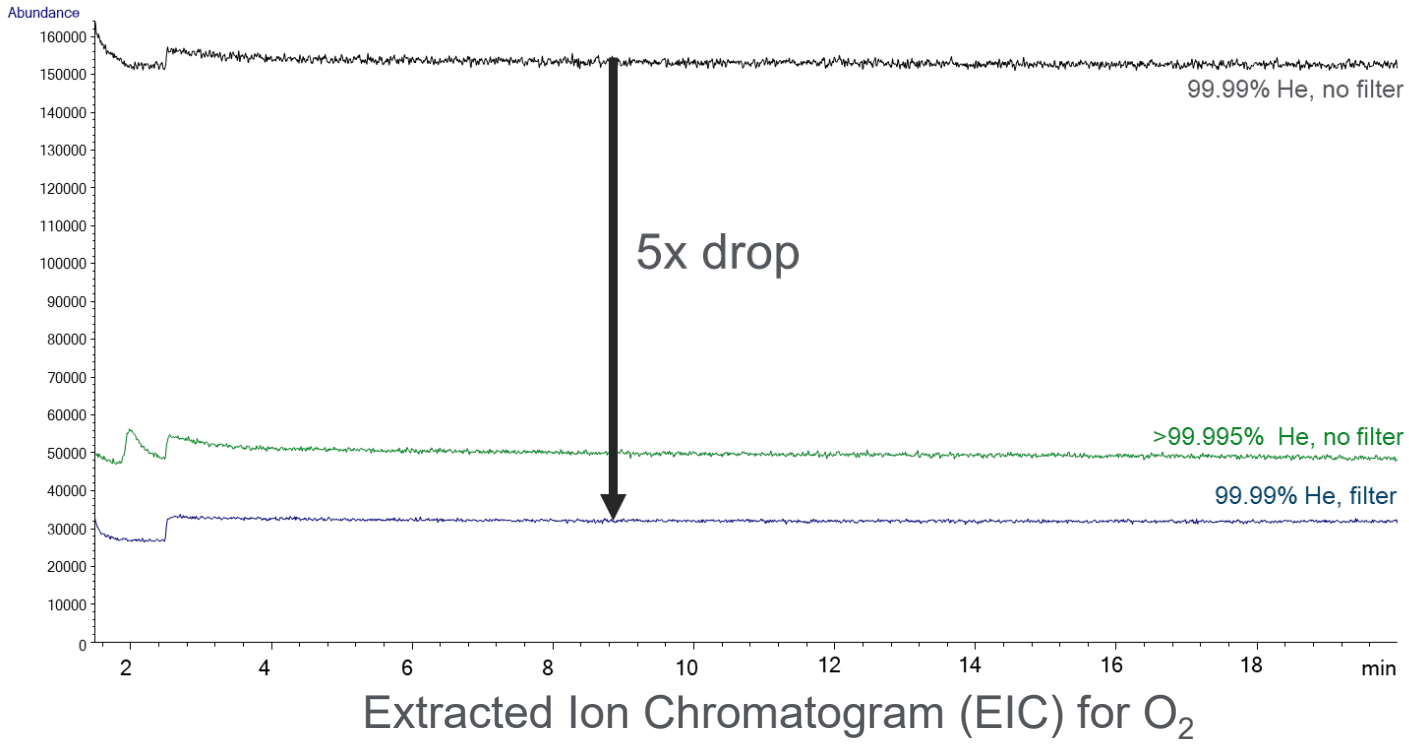
- Use UHP carrier gases
  - 99.9995% or greater
- Use Gas Clean carrier gas filters



GC/MS filter
Agilent p/n
CP17973

Let's Talk About Gas Quality and Filters

If you used lower quality gases, how much O_2 could the filter clean up?

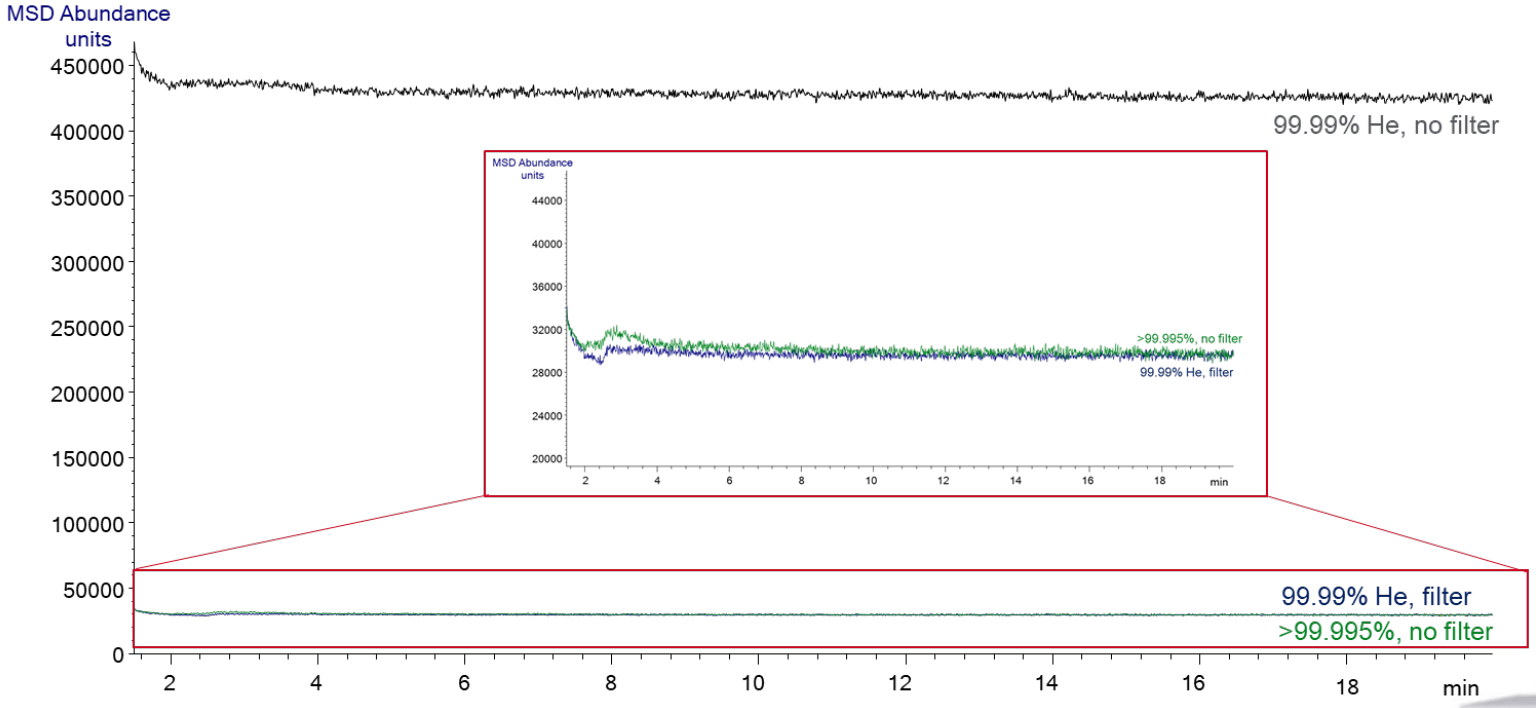


Extracted Ion Chromatogram (EIC) for O_2

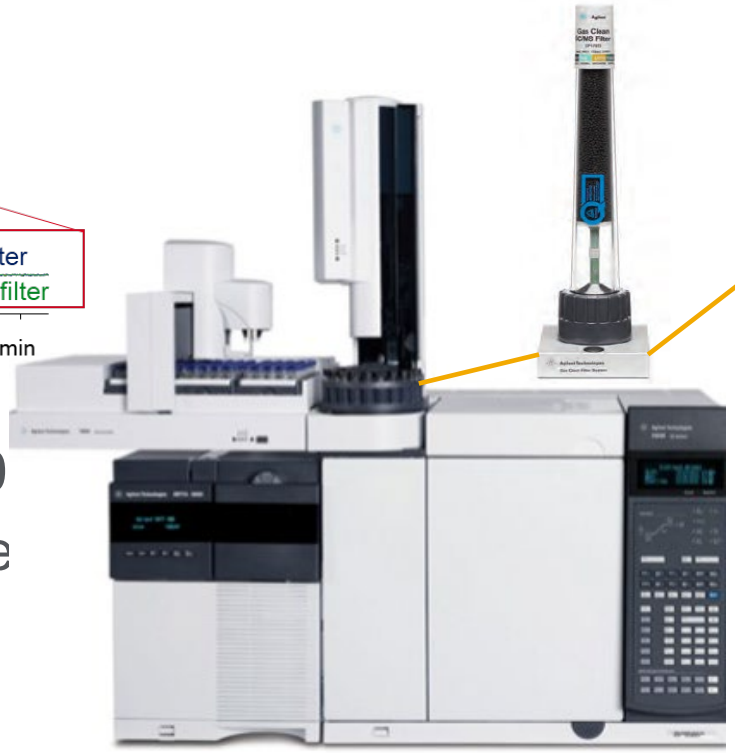
Installing (and properly purging) the Gas Clean carrier gas filter lowered the O_2 signal by a **factor of 5**.

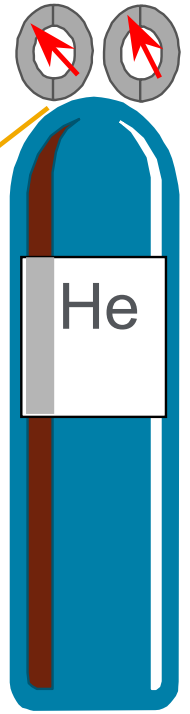
Let's Talk About Gas Quality and Filters

If you used lower quality gases, how much H_2O could the filter clean up?



Extracted Ion Chromatogram (EIC) for H_2O



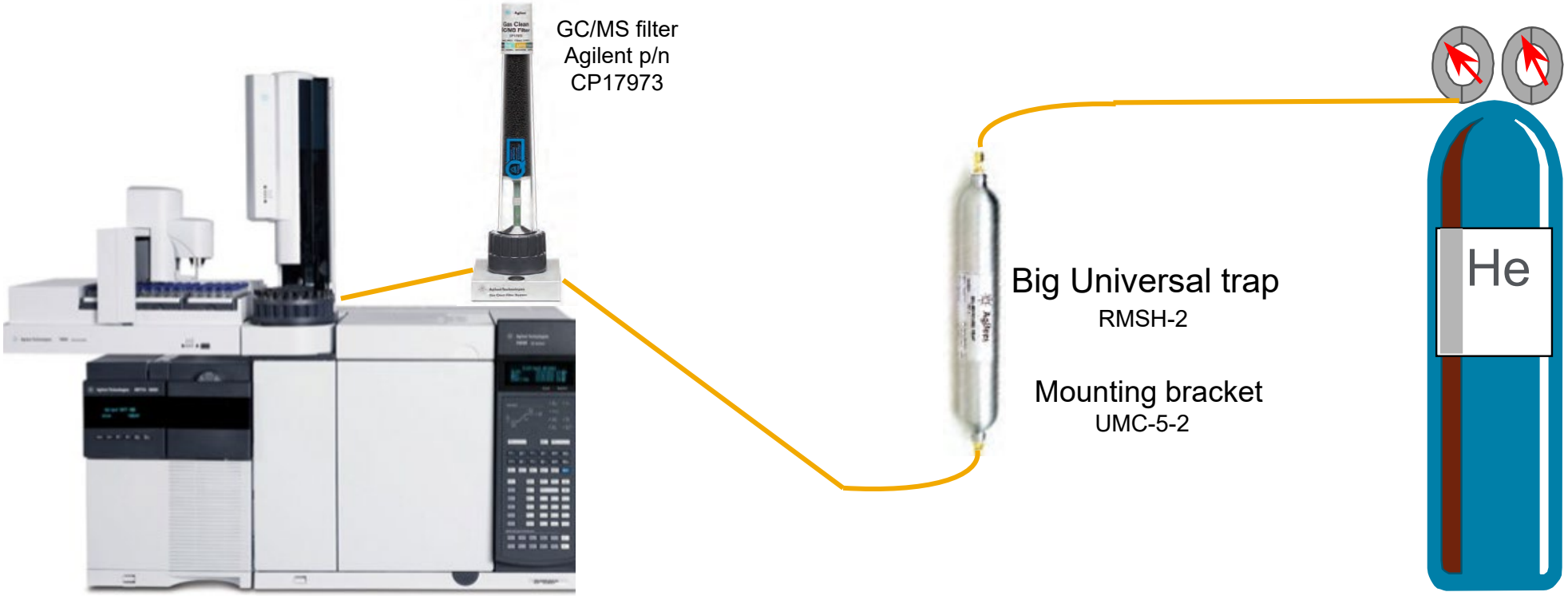


Gas Clean filter lowered the H_2O signal by a **factor >10**

You can further increase Gas Clean and column lifetime by installing the universal filter before the Gas Clean filter.

Let’s Talk About Gas Quality and Filters

If lower quality gases were used, how much background could the filter clean up?



- Install the Universal trap vertically – use the mounting bracket(s)
- Extend the lifetime of your Gas Clean (indicating) filter **and** your column

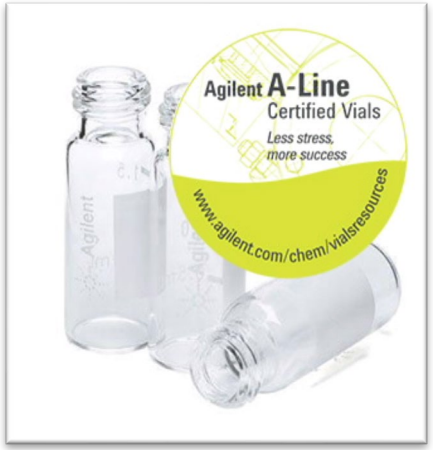
New Agilent A-Line Electron Crimpers and Decappers

- More vials crimped per battery charge
- Increased crimping speed when compared to previous models
- Lighter weight means less hand strain and effort
- OLED screen for easier viewing interface
- More efficient charging
- New motor life is significantly longer leading to extended productivity

https://www.agilent.com/en/products/lab-supplies/chromatography-spectroscopy/vials-closures/crimpers-decappers-accessories

Vials

- Choose high-quality vials and caps
  - Poorly constructed vial septa → siloxanes → bleed peaks
  - Low-quality vial → leach contaminants into sample
  - Choose the right cap/septa for your solvent



	High performance septa	Thin PTFE	PTFE/Silicone*	PTFE/Silicone/PTFE*	PTFE/Red rubber	Flouroelastomer	Butyl
Temperature range	40 °C to 300 °C**	Up to 260 °C	–40 °C to 200 °C	–40 °C to 200 °C	–40 °C to 90 °C	–40 °C to 260 °C	–50 °C to 150 °C
Use for multiple injections	No	No	Yes	Yes	No	No	No
Price	More expensive	Very economical	Economical	Most expensive	Very economical	Economical	Economical
Resistance to coring	Excellent	None	Excellent	Excellent	None	None	None
Recommended for storage	No	No	Yes	Yes	No	No	No
Best for	High temperature headspace applications	Superior chemical inertness, short cycle times, and single injections	Most common HPLC and GC analyses, not as resistant to coring as P/S/P	Superior performance for ultra trace analysis, repeat injections, and internal standards	Chlorosilanes, more economical option for single injections	Chlorinated solvents, higher temperatures	Organic solvents, acetic acids, impermeable to gases

* Agilent silicone is platinum cured (versus peroxide cured), making it more inert and less likely to interact with samples.
** For up to 1 hour.

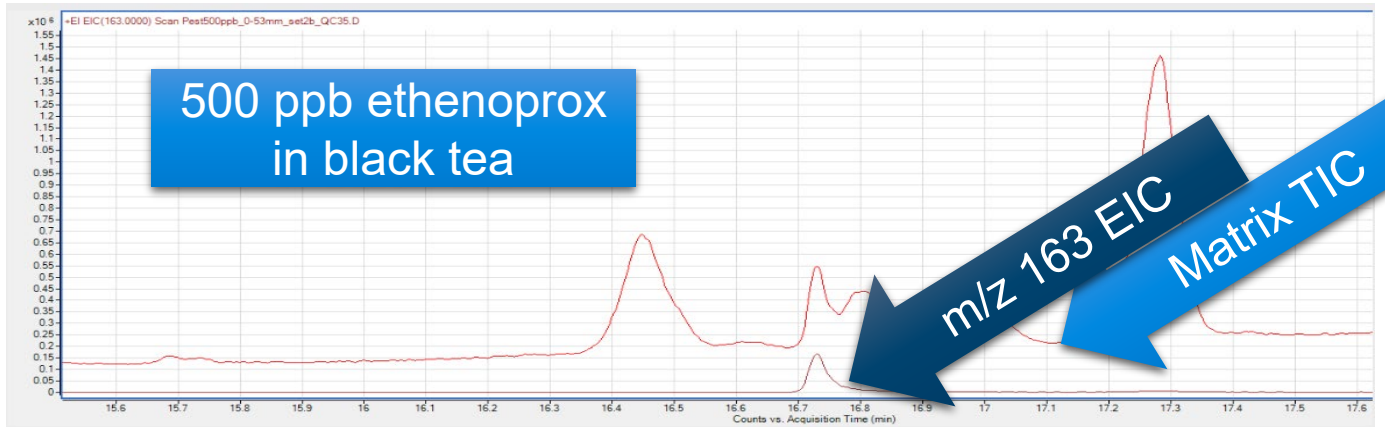
ADM Flow Meter: Easy No-Return Recalibration

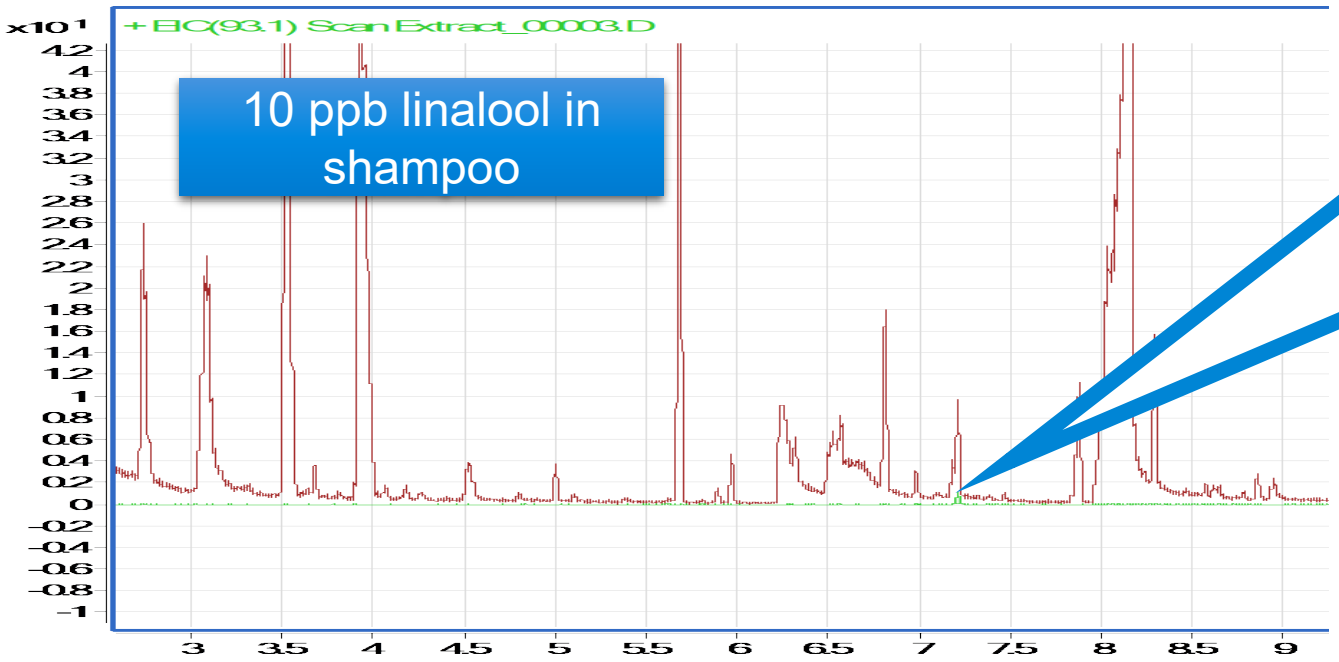
- Replaceable calibration cartridge
- Automatic notification of cartridge replacement
- Ergonomic and robust design
- Universal 3AA or USB power
- USB connects to Web interface for added functionality
- Easy to view OLED Screen
- Kickstand

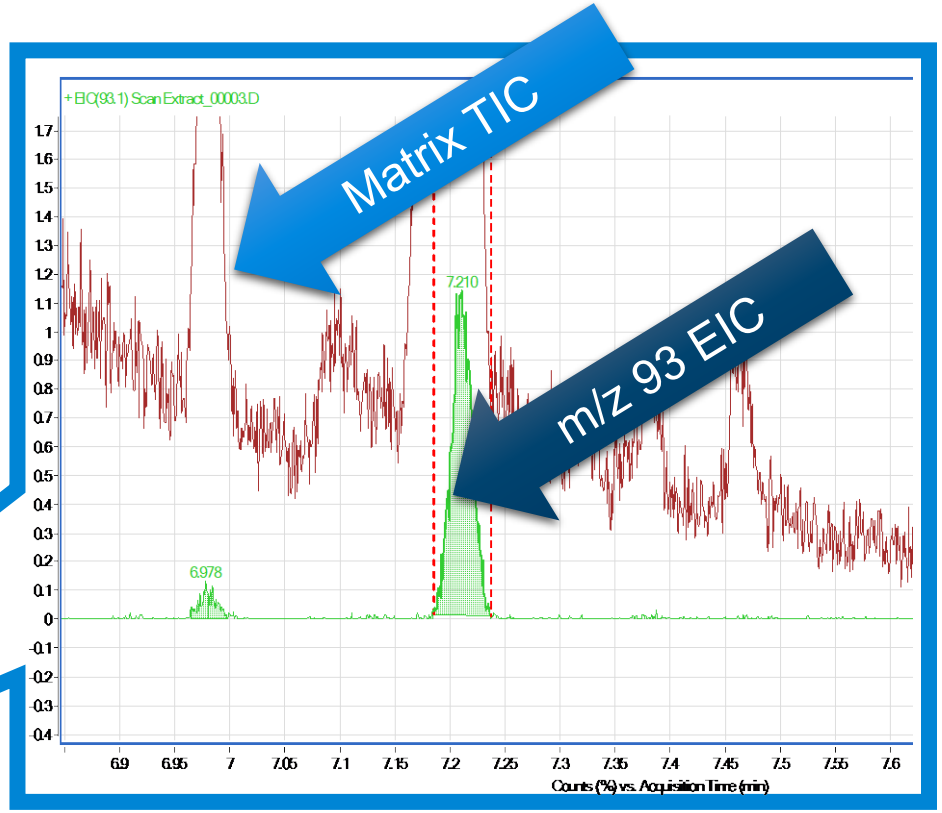
Technical overview 5991-7685EN

The Matrix

If your target ions are buried beneath matrix peaks, it might be time to trim the column or do sample cleanup



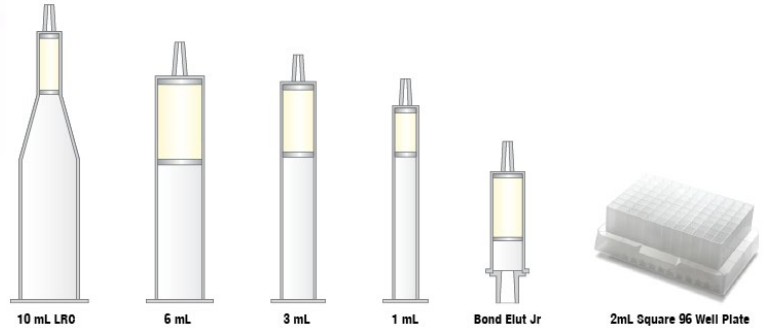




(or improve your sample cleanup)

How Did it Become Contaminated in the First Place?

Offline Options for Sample Matrix Removal



Bond Elut Solid Phase Extraction cartridges and plates

QuEChERS

Captiva EMR-Lipid filtration cartridges and plates

Captiva syringe filters

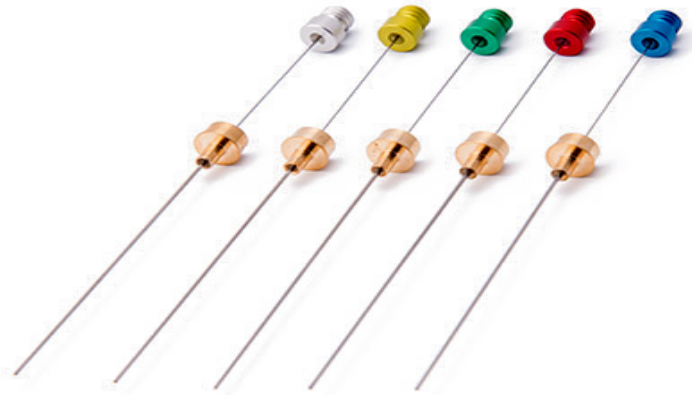
Filter vials

Synthetic Chem Elut S

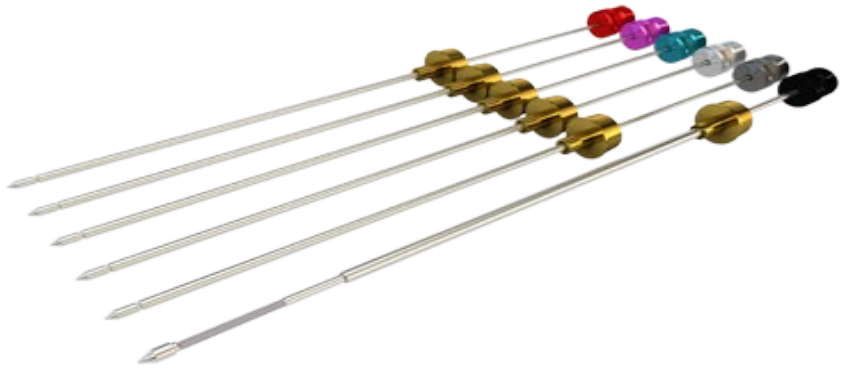
SPME Fiber and Arrow Offering from Agilent

Solid Phase Microextraction (SPME)

- Environmental analyses of water samples
- Odor analyses (ppt)
- Flavor analyses of food products
- Forensic analyses of arson/explosives samples
- Toxicology analyses: blood alcohol or drugs in urine/serum
- Surfactants, other industrial applications
- Trace analysis in food
- Drugs and pharmaceuticals
- Herbicides/pesticides
- Medical diagnostics
- Trace impurities in polymers and solid samples
- Solvent residues in raw materials
- Explosives



SPME fibers

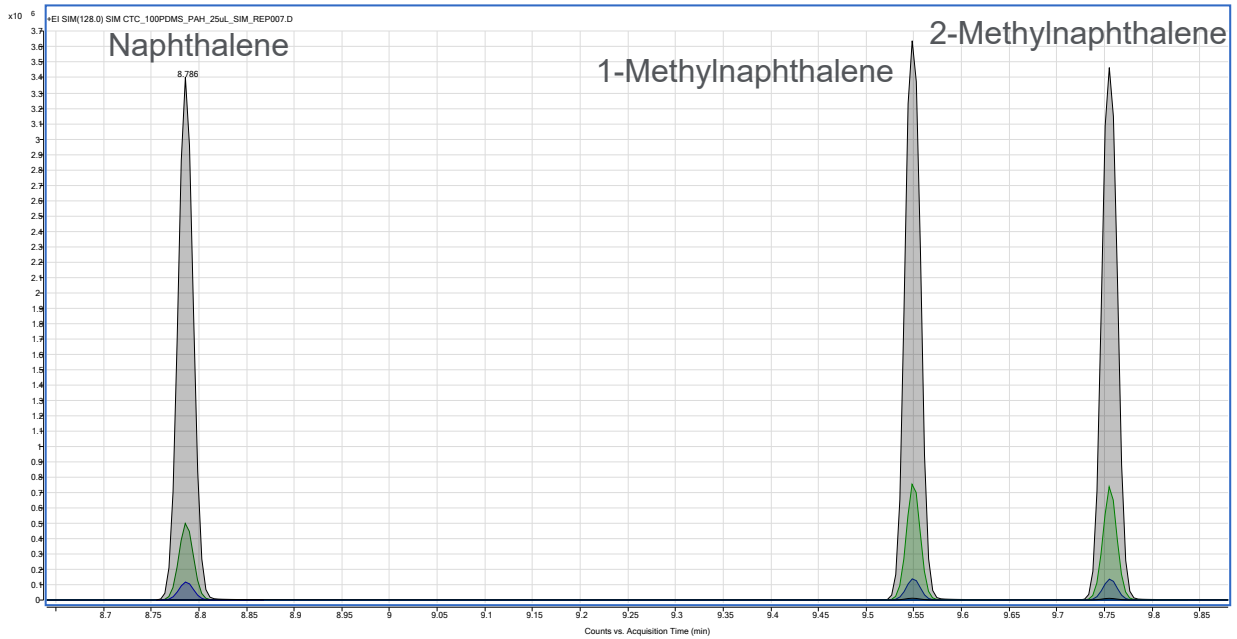


SPME arrows

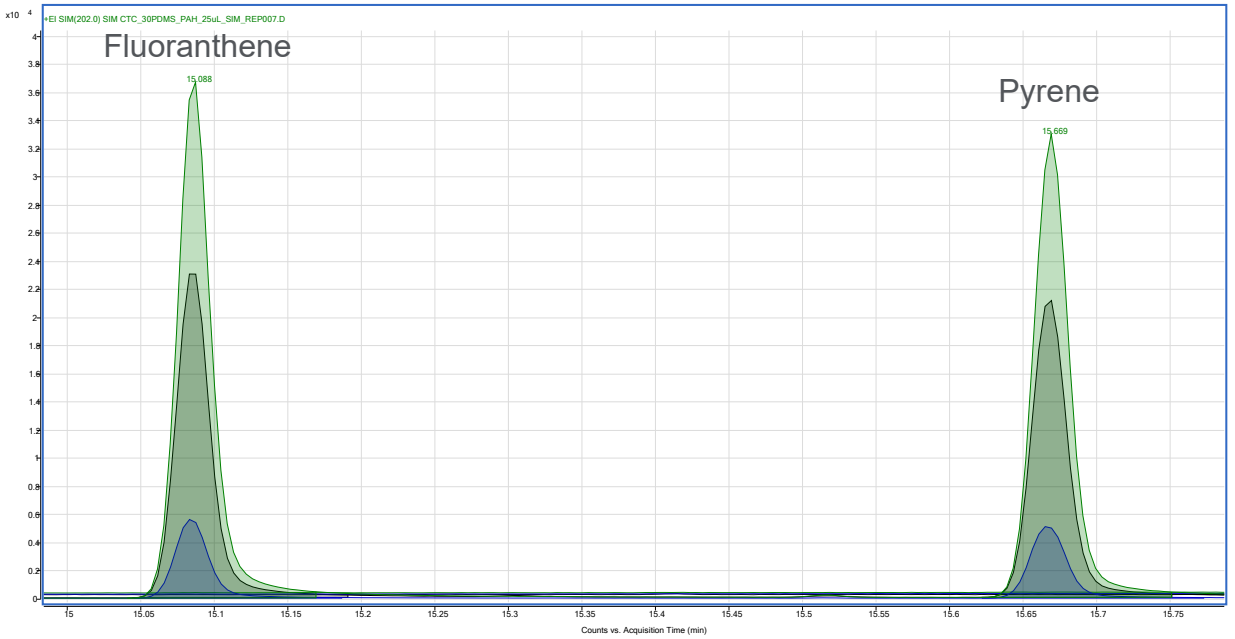
Examination of Lower Molecular Weight PAHs in Drinking Water Using Agilent PDMS SPME Fibers

Polycyclic aromatic hydrocarbons (PAHs) are a large class of organic compounds containing two or more fused aromatic rings. PAHs are considered compounds of concern by every environmental organization; their concentration in water is strictly regulated.

5994-1301EN



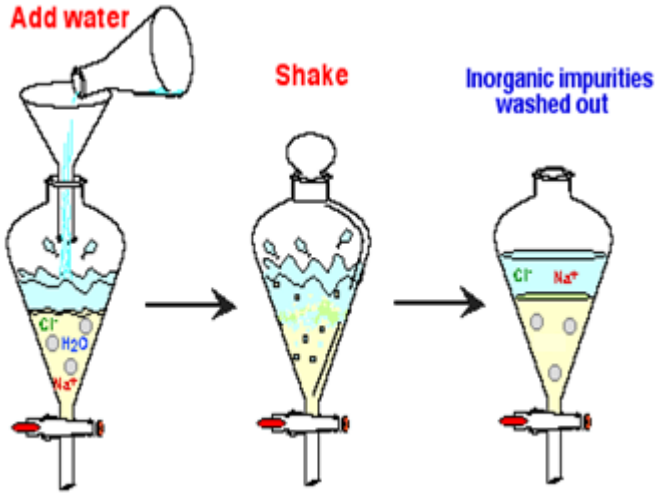
SIM chromatogram of naphthalenes with PDMS fibers (black trace = 100 µm; green trace = 30 µm; blue trace = 7 µm)



SIM chromatogram of fluoranthene and pyrene with PDMS fibers (black trace = 100 µm; green trace = 30 µm; blue trace = 7 µm)

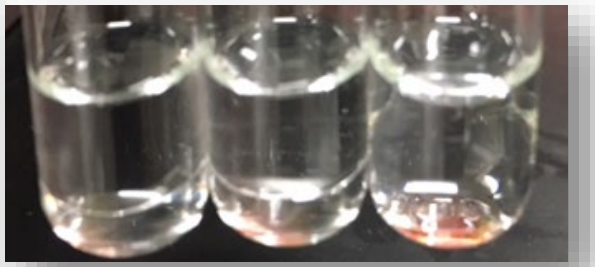
Liquid/Liquid Extraction (LLE)

- LLE has been successfully used as a method of sample preparation for many years.
- It separates the more organic solvent soluble compounds from the more water-soluble compounds using water immiscible organic solvents.
- It can remove many interfering substances like salts
- Modulating pH can selectively extract or eliminate specific compound types.



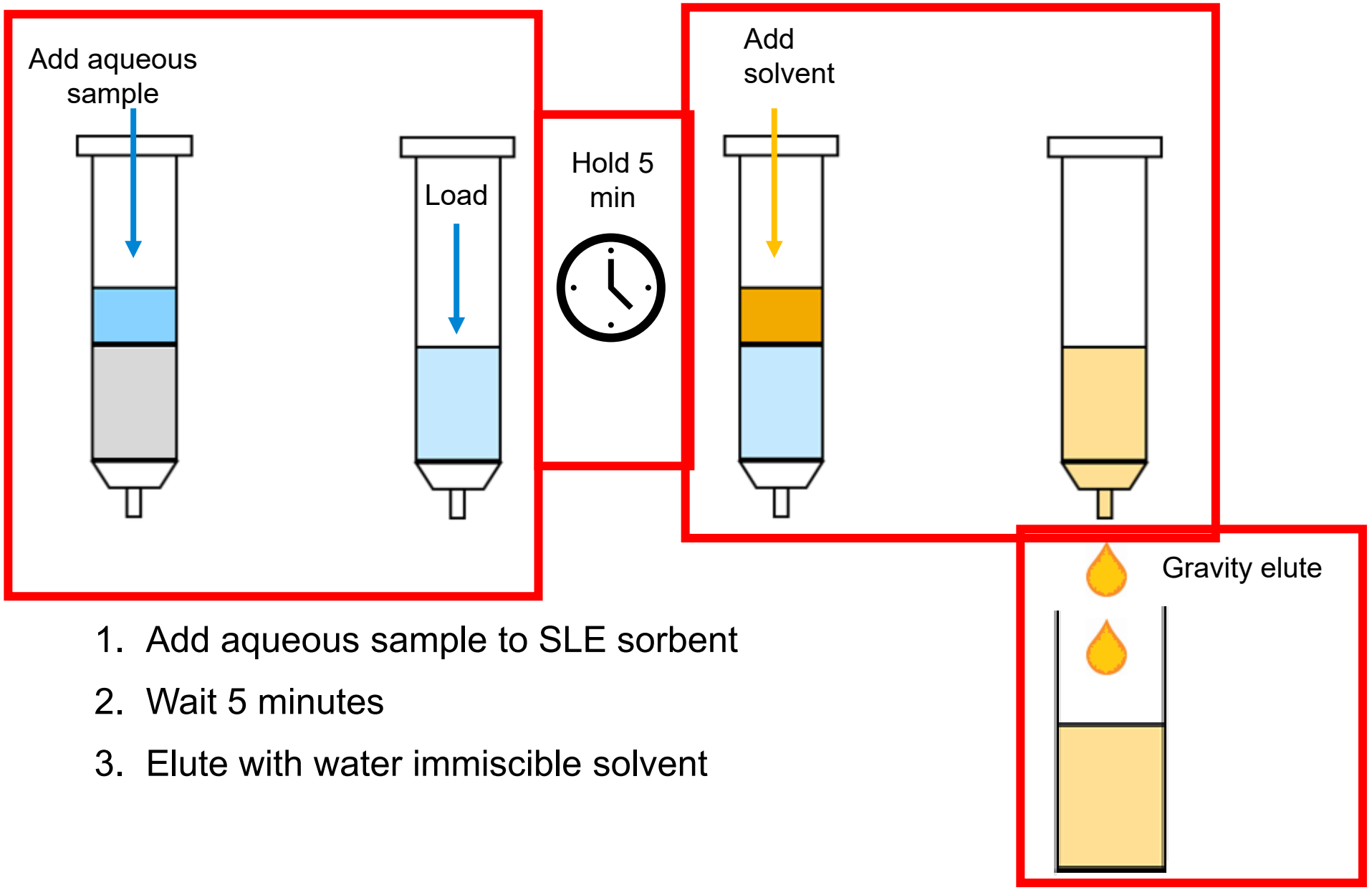
Drawbacks of Liquid/Liquid Extraction

- LLE does have drawbacks
  - Inconsistent results from one analyst to another
    - Shaking time
    - Shaking motion
    - Determination of where to cut between layers
  - Emulsions
  - Labor intensive
  - Quite tedious with small sample sizes (<5 mL)
  - Challenging with large numbers of samples
  - Difficult to automate for large numbers of samples



How many of these problems can be fixed with Solid Supported Liquid Extraction?

How Does SLE Work?



1. Add aqueous sample to SLE sorbent
2. Wait 5 minutes
3. Elute with water immiscible solvent

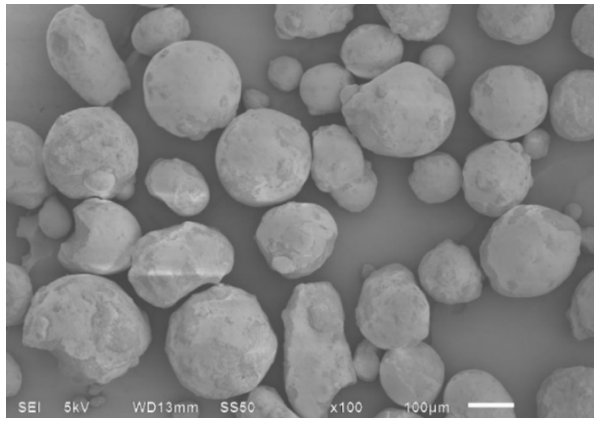
What is SLE Sorbent?

- There are two types of SLE media
  - Diatomaceous earth (DE) based products like our Chem Elut brand of SLE products
    - A mined fossil diatom material, which is heterogeneous and inconsistent from one mine to the next

Diatomaceous Earth in Chem Elut

- ✗ Naturally occurring; mined
- ✗ Broad particle size distribution
- ✗ Supplier reliability issues
- ✗ Poor lot-to-lot consistency

  - Synthetic media we use in Chem Elut S
    - Controlled synthesis to be consistent batch after batch

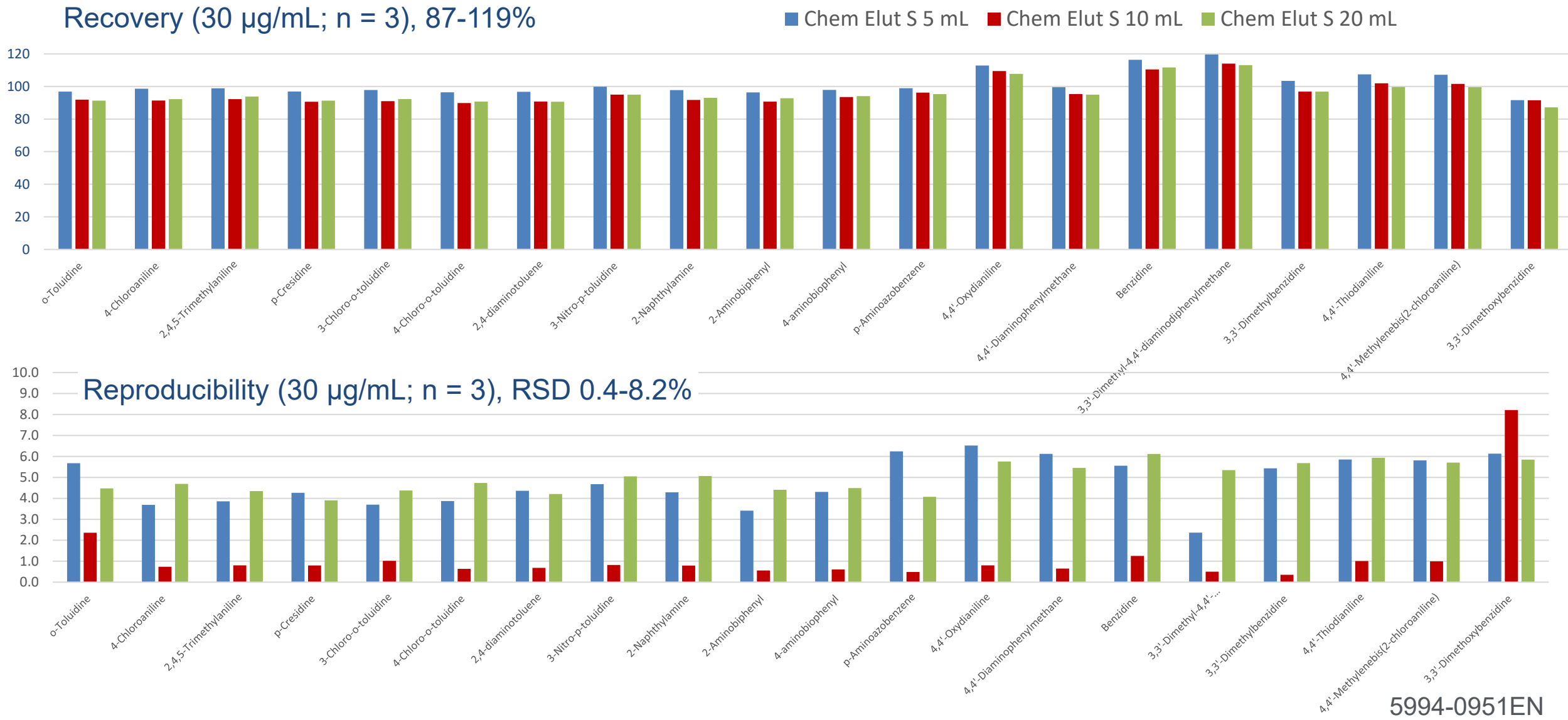


Synthetic SLE sorbent

- ✓ Large scale synthesis
- ✓ Narrow particle size distribution
- ✓ Reliable supplier
- ✓ Controlled manufacturing

Chem Elut S – 15 Minute Hold Time

Large scale format comparison with aromatic amines



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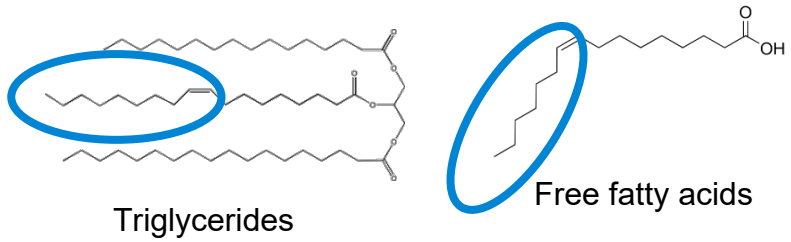
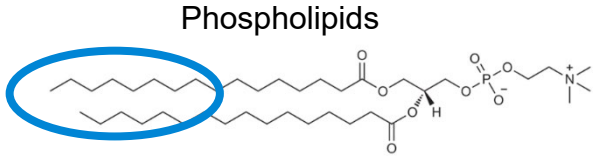
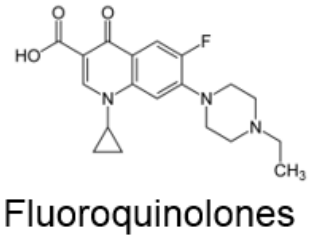
Enhanced Matrix Removal: Agilent Captiva EMR-Lipid

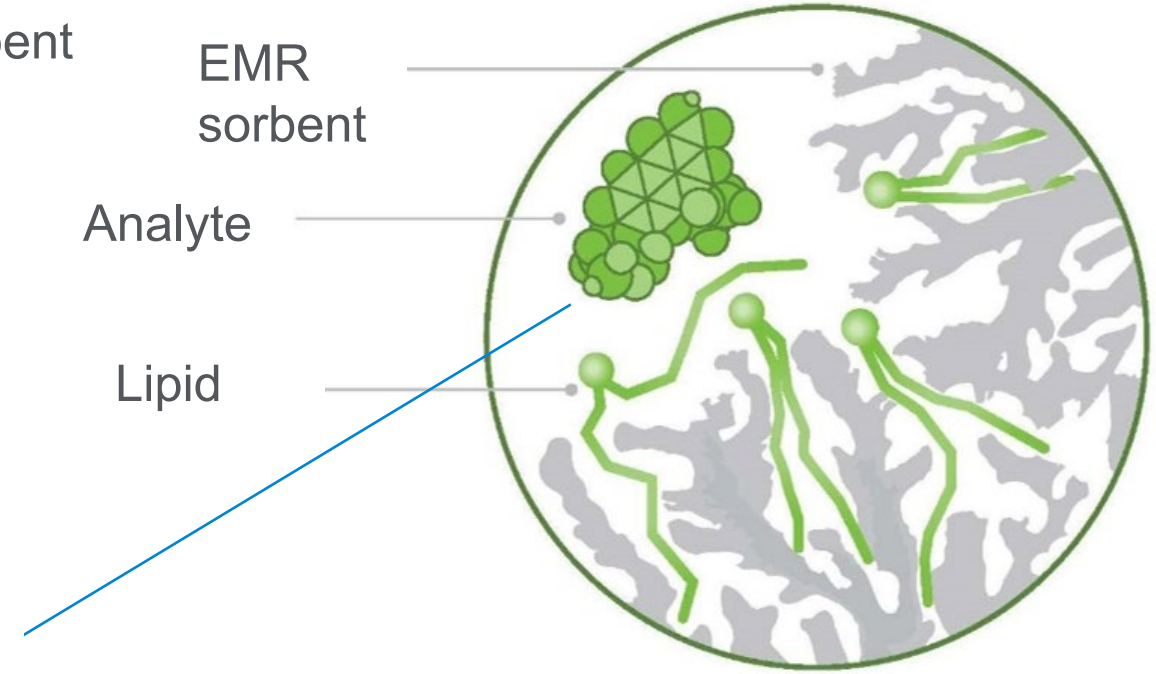
EMR-Lipid sorbent technology effectively traps lipids through two mechanisms:

- Size exclusion – unbranched hydrocarbon chains (lipids) enter the sorbent; bulky analytes do not
- Sorbent chemistry – lipid chains that enter the sorbent are trapped by hydrophobic interactions



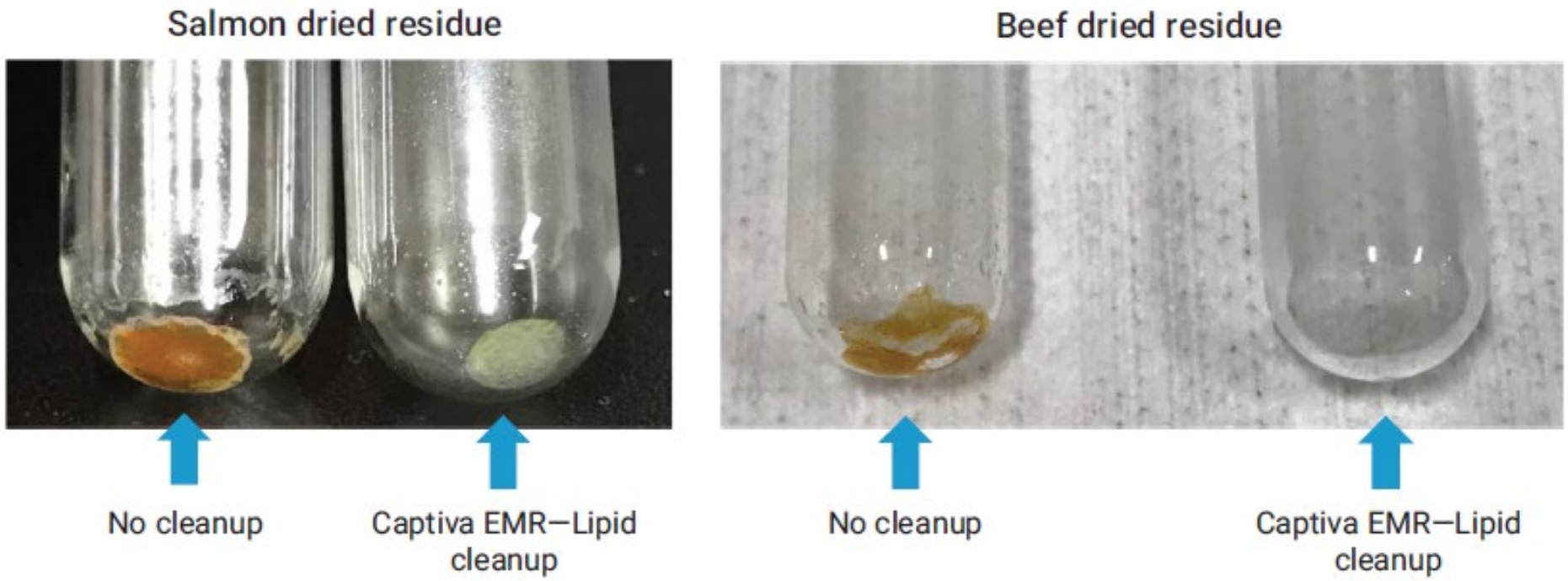






Determination of 19 Polycyclic Aromatic Hydrocarbon Compounds in Salmon and Beef

Using Captiva EMR-Lipid cleanup by GC/MS/MS



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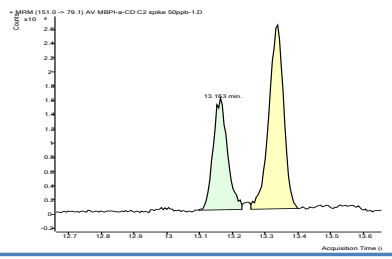
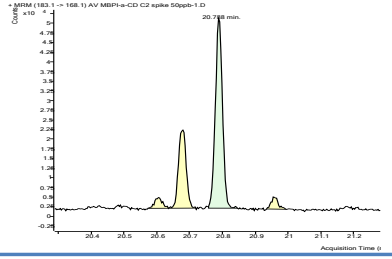
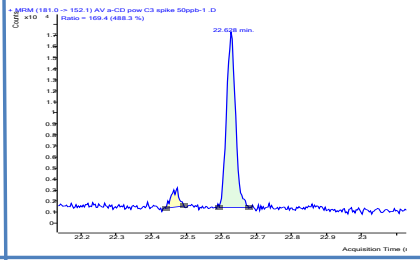
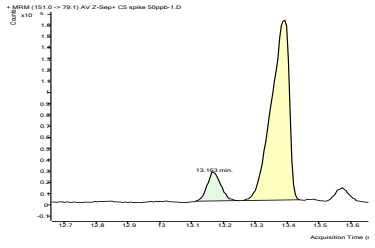
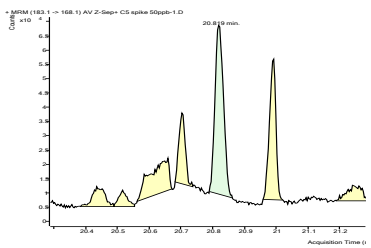
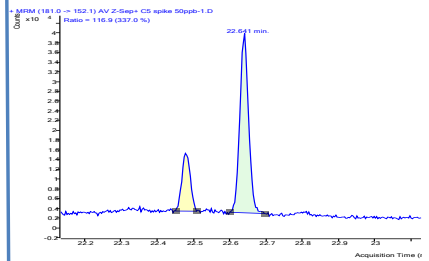
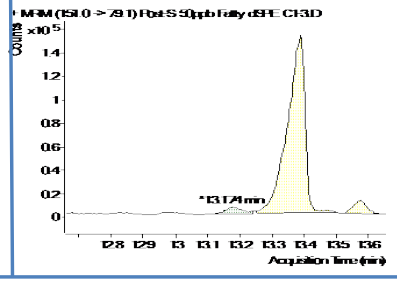
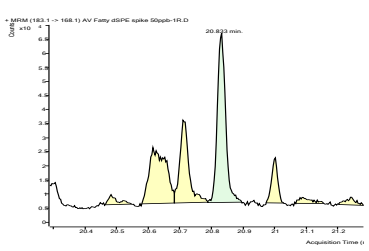
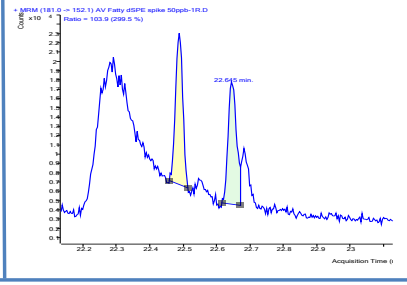
Captiva EMR-Lipid Cleanup Improves Analytes S/N Ratio and Integration Accuracy on GC/MS(/MS)

Pesticide	Captan	Permethrin	Deltamethrin
EMR-Lipid cleanup			
Zirconia sorbent cleanup			
C18/PSA cleanup			

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ULTRA Scientific is Now Part of Agilent Technologies

Agilent ULTRA Chemical Standards have:

- Best in class online search, compare, and ordering capabilities
- Rapid shipping: 99.9% of orders dispatched within 24 to 48 hours
- Custom solutions
- Sample preparation materials, columns, supplies, instrumentation, and reference materials from a single source
- Rigorously tested and manufactured under ISO 9001, ISO 17025, and Guide 34 certifications

You can calibrate with confidence and maximize accuracy

An Overview of the Latest Supply Innovations

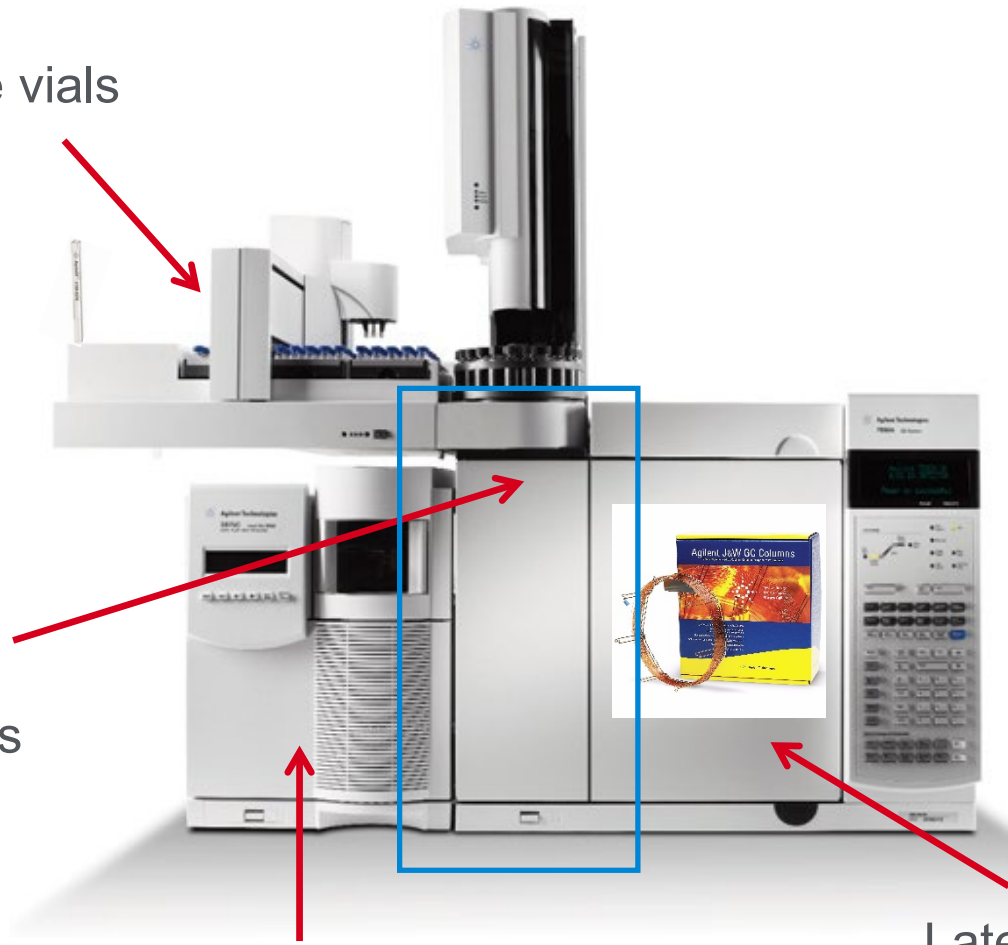
Gas traps

Crimpers

Sample cleanup

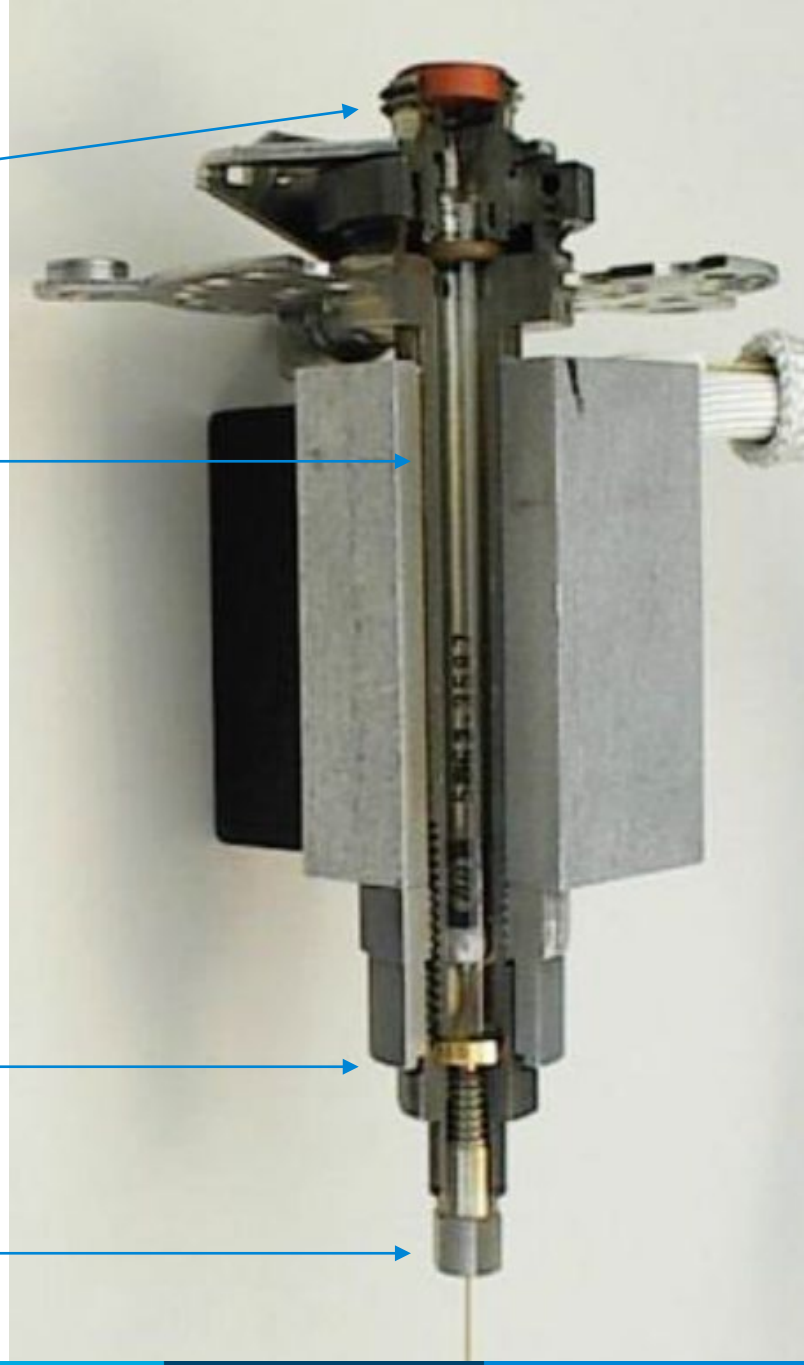
ADM Flowmeter

Standards



Inlet

- Injection efficiency:
  - Main function of the inlet is to produce a narrow sample band at the head of the column
  - One of the most important aspects to any high-resolution GC method
- Must be reproducible
- The liner volume must be large enough to accommodate the solvent's phase transformation into a vapor (backflash)
- Most chromatography problems are "front-end" related
- Many consumables to replace: septa, liner, gold seal
- Inlet body must be cleaned/solvent rinsed periodically (**no steel brushes, please**)



30+ Years of R&D Focused on Surface Deactivation

Two unique chemistries were developed to treat the surfaces in a GC flow path.

UltiMetal Plus

- Inorganic vapor deposition in Middelburg
- CFT device
- Ultimate union
- Flexible metal ferrule
- Inlet welding
- Detector parts
- GC tubing

Ultra Inert

- Organic vapor deposition
  - Ultra Inert inlet liners
  - Ultra Inert gold seals
- Unique proprietary deactivation process
  - UI columns

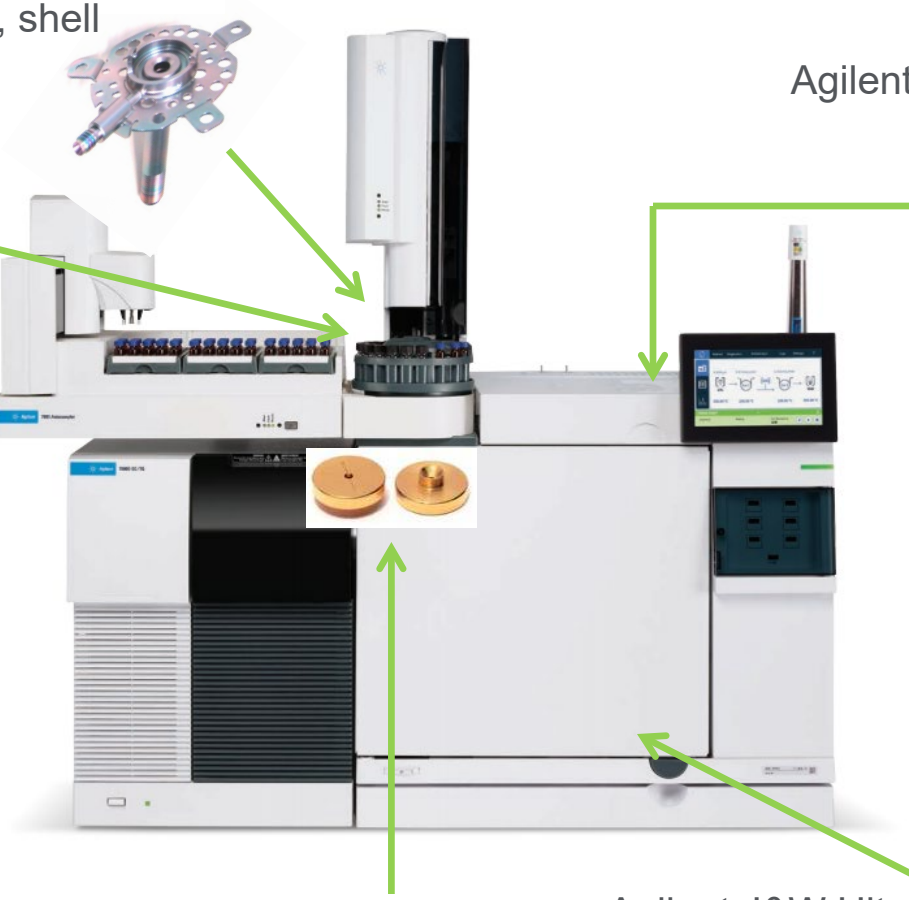
Agilent Inert Flow Solution

Agilent UltiMetal Plus inlet weldment, shell and transfer lines

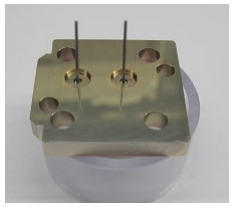
Agilent Ultra Inert inlet liner

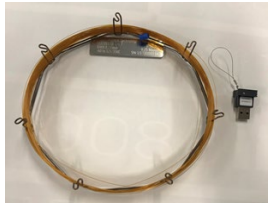
Agilent UltiMetal Plus ferrules

Agilent UltiMetal Plus capillary flow technology devices, Ultimate union



Agilent UltiMetal Plus– TCD, FPD, NPD/FID jets



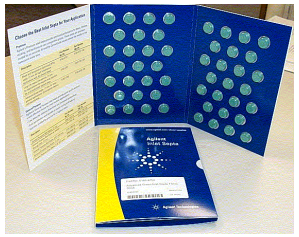


Agilent J&W Ultra Inert GC column

Agilent Ultra Inert gold seal

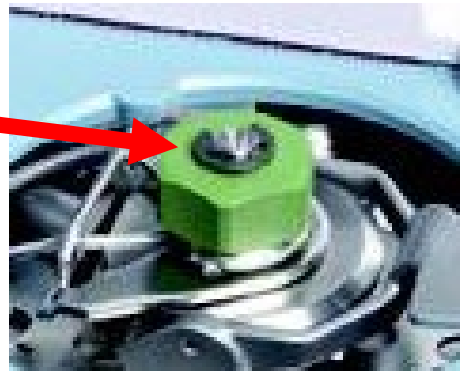
5990-8532EN brochure

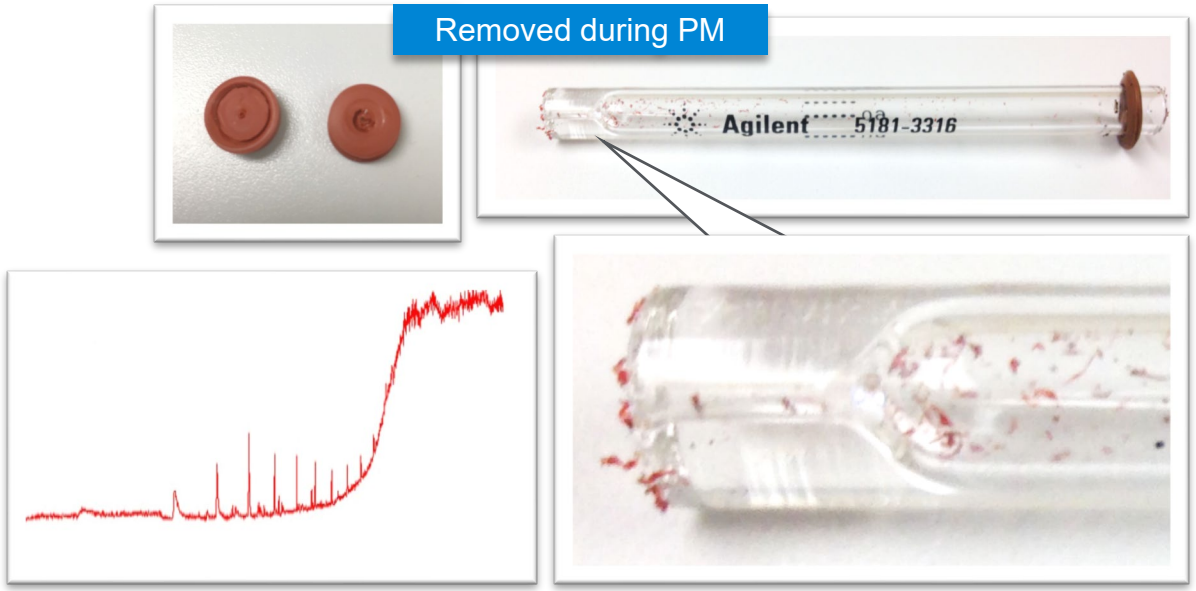
Septa



- Typical cost of one premium septum (list), $1.25
- Typical cost of one GC column, 30 m x 0.25 mm id, $450
- Proactively change inlet septa
- Agilent packing eliminates contamination of septa
- “CenterGuide septa” puts less train on syringe compared to solid septa
- Do not overtighten septum nut; septum can begin to “bulge” out
- Should tighten nut until c-clamp on top stops turning, then ½ to ¾ turn more

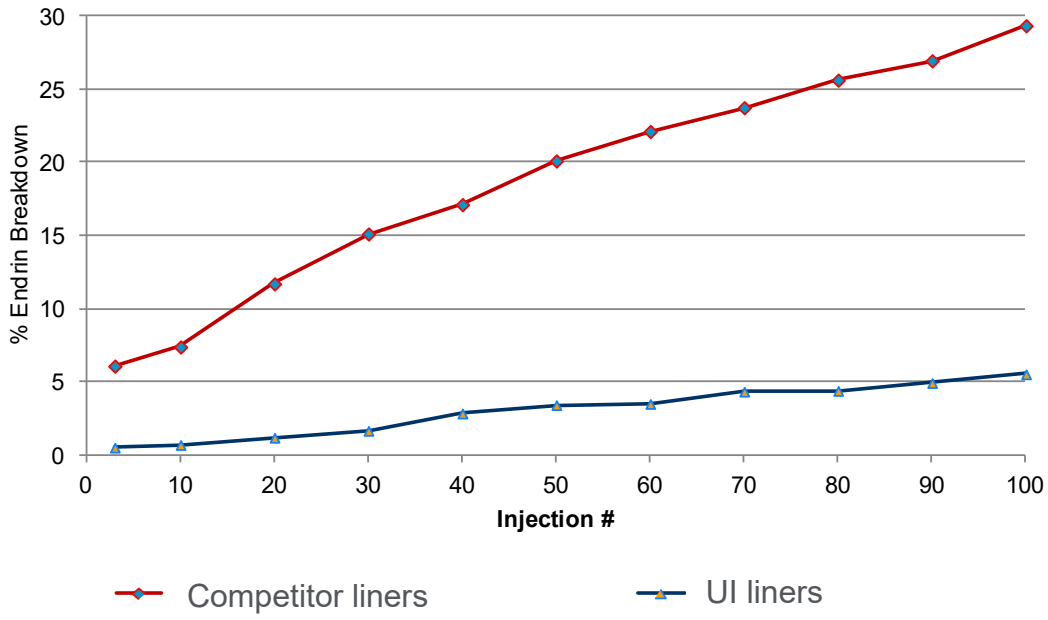
Septum nut





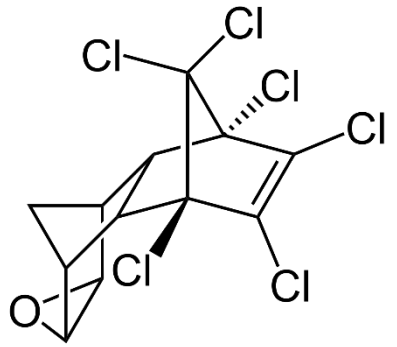
Ultra Inert Inlet Liners

1. Ultra Inert deactivated inlet liners provide higher response for sensitive compounds
2. Ultra Inert **glass wool liners** deliver benefits of glass wool without loss of active compounds
3. QC tested and certified for consistent performance



Productivity

Touchless packaging with pre-installed O-ring: quick and easy hassle free installation



Agilent Assurance

UI liner lot QC with demanding test probes (dinitrophenol and others)

Assurance of consistent performance

Label for p/n, batch, and lot testing

Traceability

Deactivation lot number is on certificate

- Liner lot number (and part number) etched on glass

Packaging, Ease, and Productivity

Individual liner

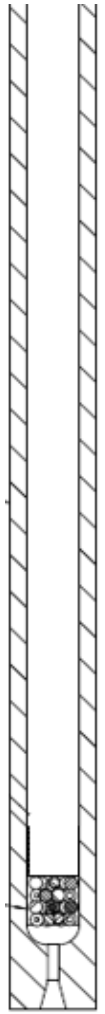
Convenient 5/pk in
Touchless packaging

25/pk in Touchless
dispenser
High throughput

100/pk, bulk, blister
(no O-ring)
High throughput

What's New? Glass Wool Alternative Liners

Ultra Inert liners with sintered glass frits



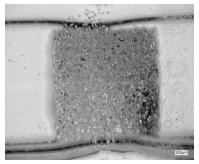
Low frit single taper liner

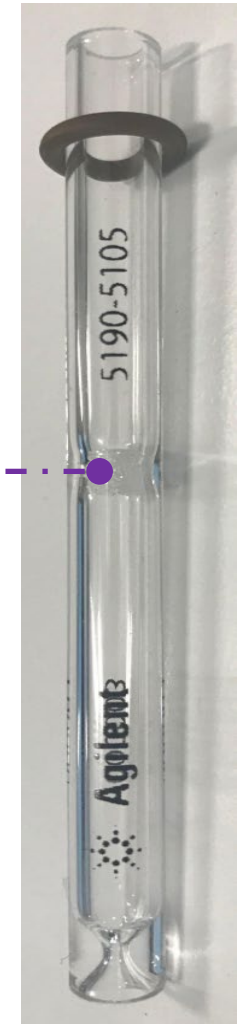
- Designed for dedicated splitless analyses
- Ideal for SVOCs and OC/OP pesticides

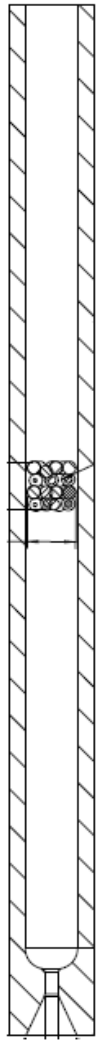
- General purpose split/splitless liner
- Ideal for basic drugs analysis

Mid frit single taper liner

Porous glass frit





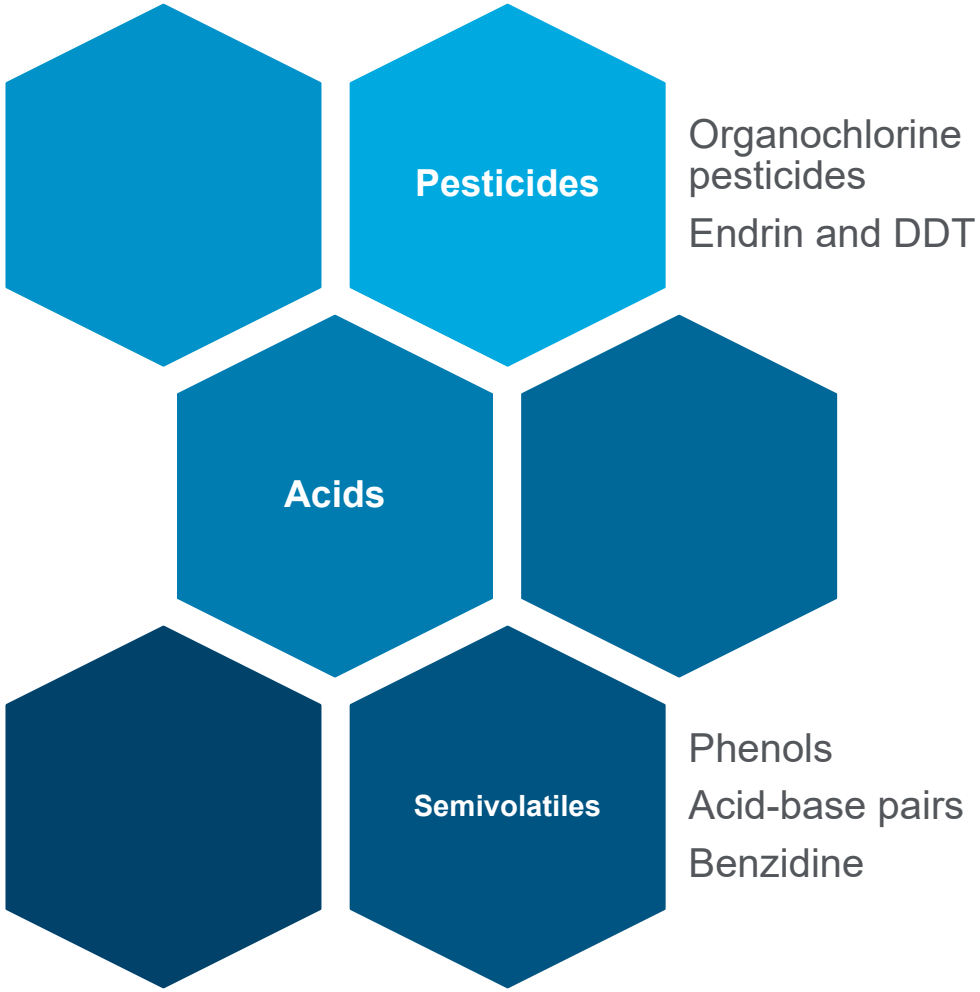


Modern Day Solution: The Glass-Frit

Substituting glass wool for a sintered glass frit provides equivalent vaporization properties while enhancing performance consistency and quality

The Benefits of the Glass Frit

Dislodged glass wool fibers expose active sites that interact with sensitive analytes



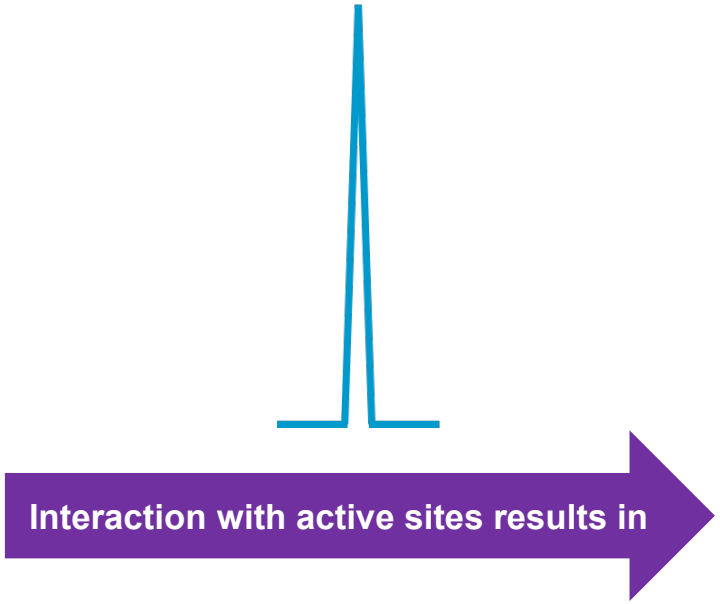
Organochlorine pesticides

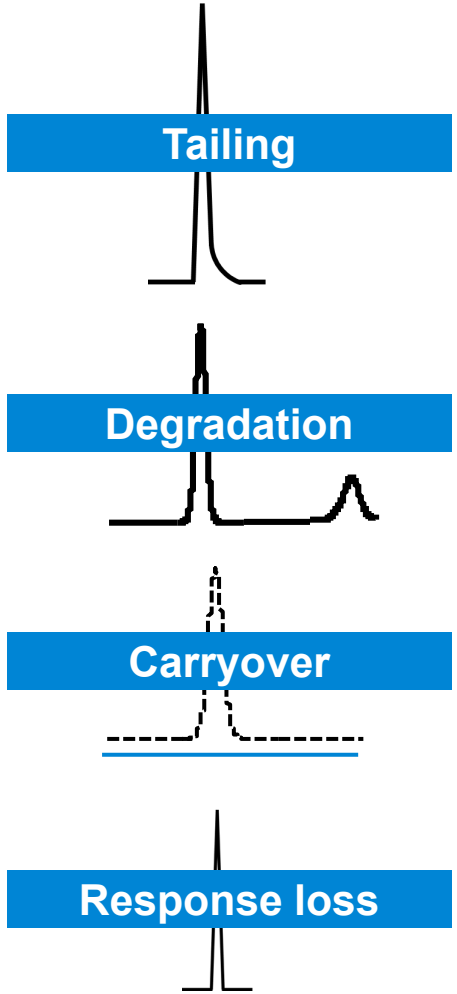
Endrin and DDT

Phenols

Acid-base pairs

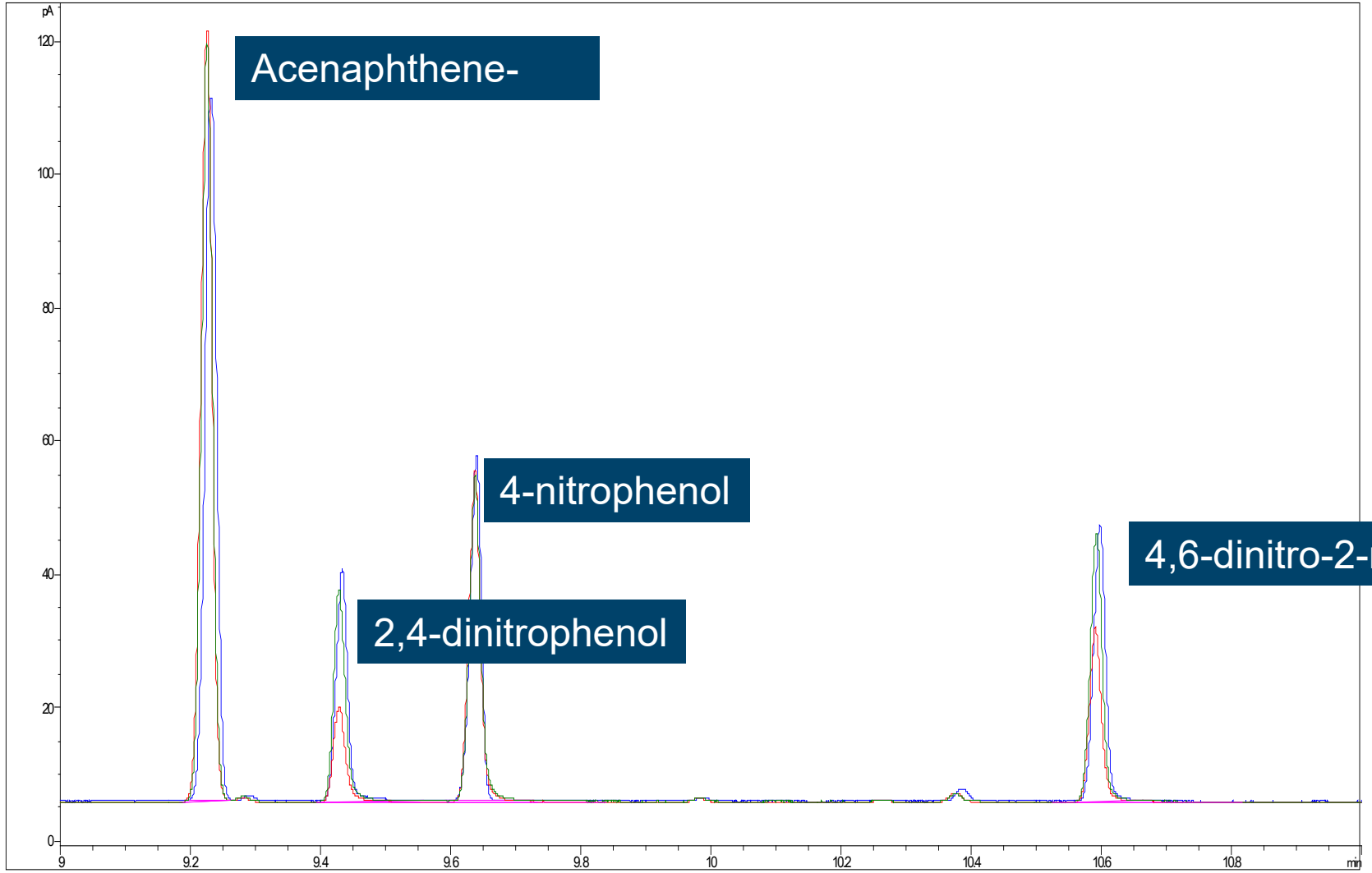
Benzidine





8270 Chromatogram Overlay – Phenols/Low Frit Liner

Low frit liner gives excellent response and peak shape for tricky analytes like phenols

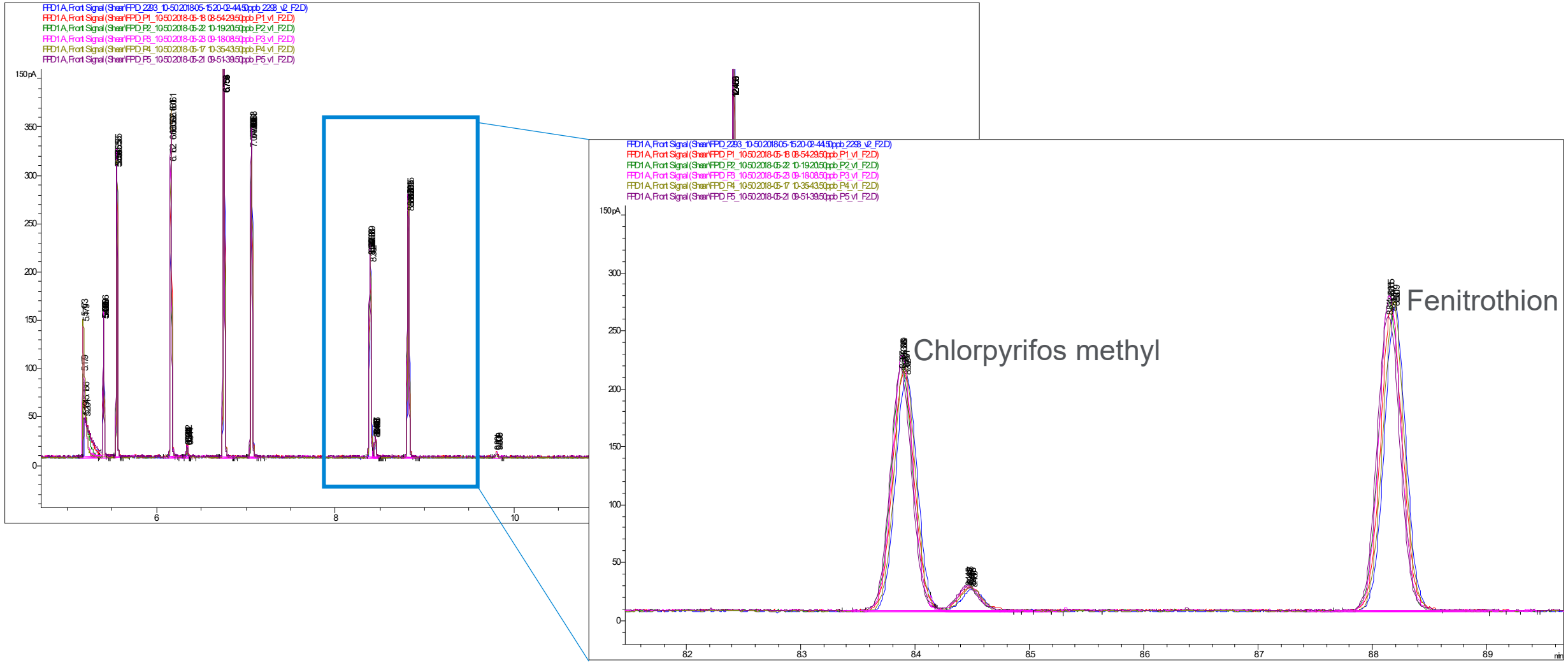


Blue = Initial injection
Red = After 100 matrix injections
Green = After liner replacement

5 ppm, 1 µL splitless injection
FID detector

Pesticides by FPD

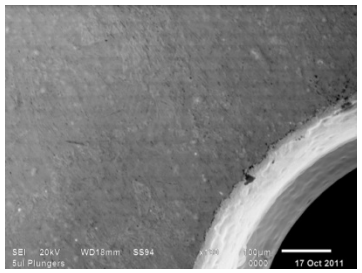
Results for fritted liner indicate highly inert, consistent response



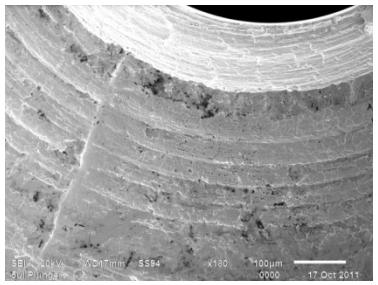
Agilent UI Gold Seal: Deactivated Gold Surface

- Soft gold plating is essential for proper sealing
- Ultra Inert chemistry blocks active sites (gold is **not** inert)
- Smooth surface doesn't leak (injection molded)
- Part numbers 5190-6144 ea. 5190-6145, 10/pk.

5190-6149, 50/pk.



Agilent MIM seal



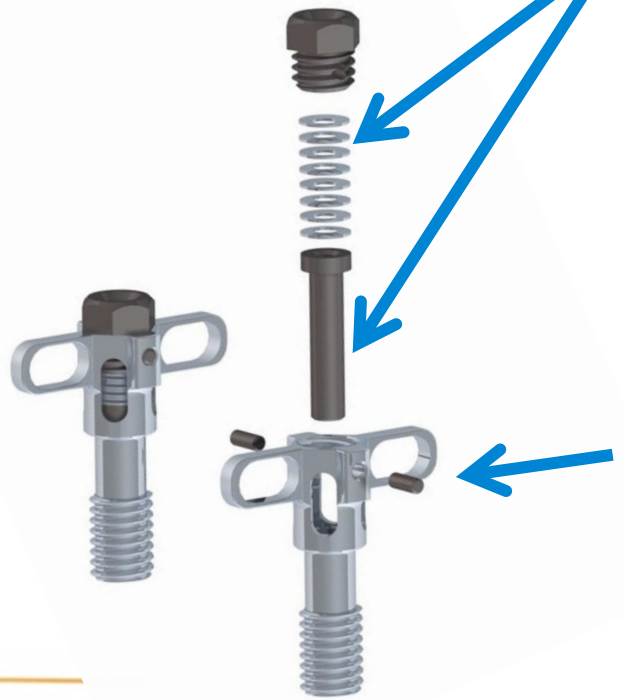
Competitor's machined seal

Reliable ppb and ppt measurements require attention to the little things

Column Installation: Self-Tightening Column Nut

For inlet or detector

For mass spectrometry transfer line

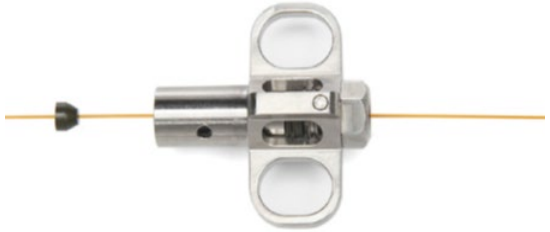


- Spring driven piston continuously presses against ferrule
- Automatically retightens when ferrule shrinks
- No leaks, no downtime, no frustration
- Wing design for finger tightening
- No tools needed
- No polymer materials for durability
- Compatible with **only** short graphite
- Vespel ferrules

Increasing Ease of Use Through Continued Innovation: Self-Tightening Nuts

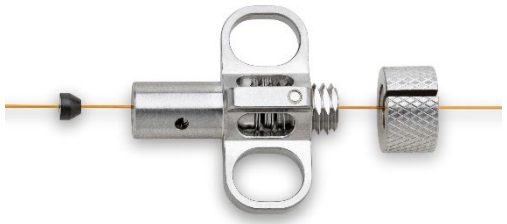
For GC inlet or detector

Innovating for the next generation



For mass spectrometry transfer line

Innovating for the next generation

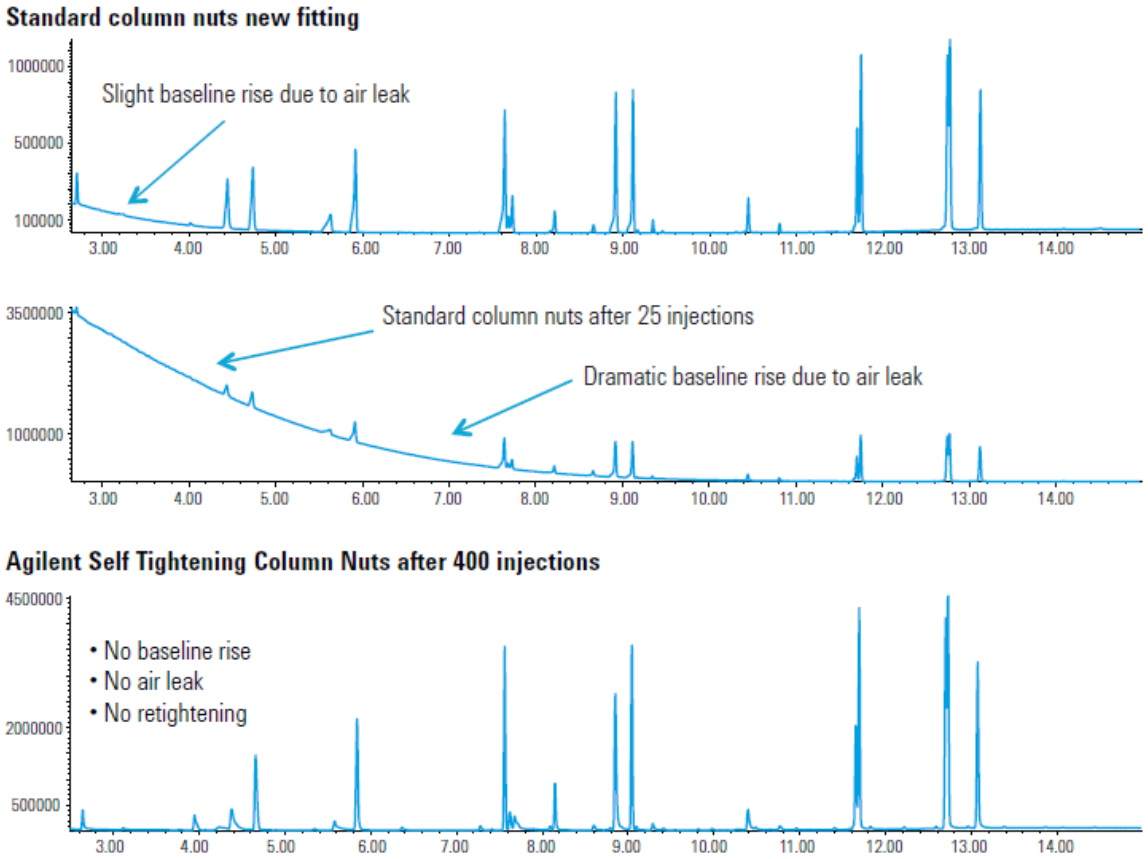


- Easier and faster to install
- Collar holds column in place
- Single-hand installation into inlet
- No tools needed

Self-Tightening Nuts: No leaks, No Downtime, No Frustration

- Spring-driven piston continuously presses against ferrule
- Automatically retightens when ferrule shrinks
- Wing design for finger tightening
- No tools needed

Part Number	Description
G3440-81013	Column Nut, Collared Self-Tightening MSD
G3440-81011	Column nut, Collared Self Tightening Inlet/Detect
G3440-81012	Collar for Self Tigthening Nut



400 injections

An Overview of the Latest Supply Innovations

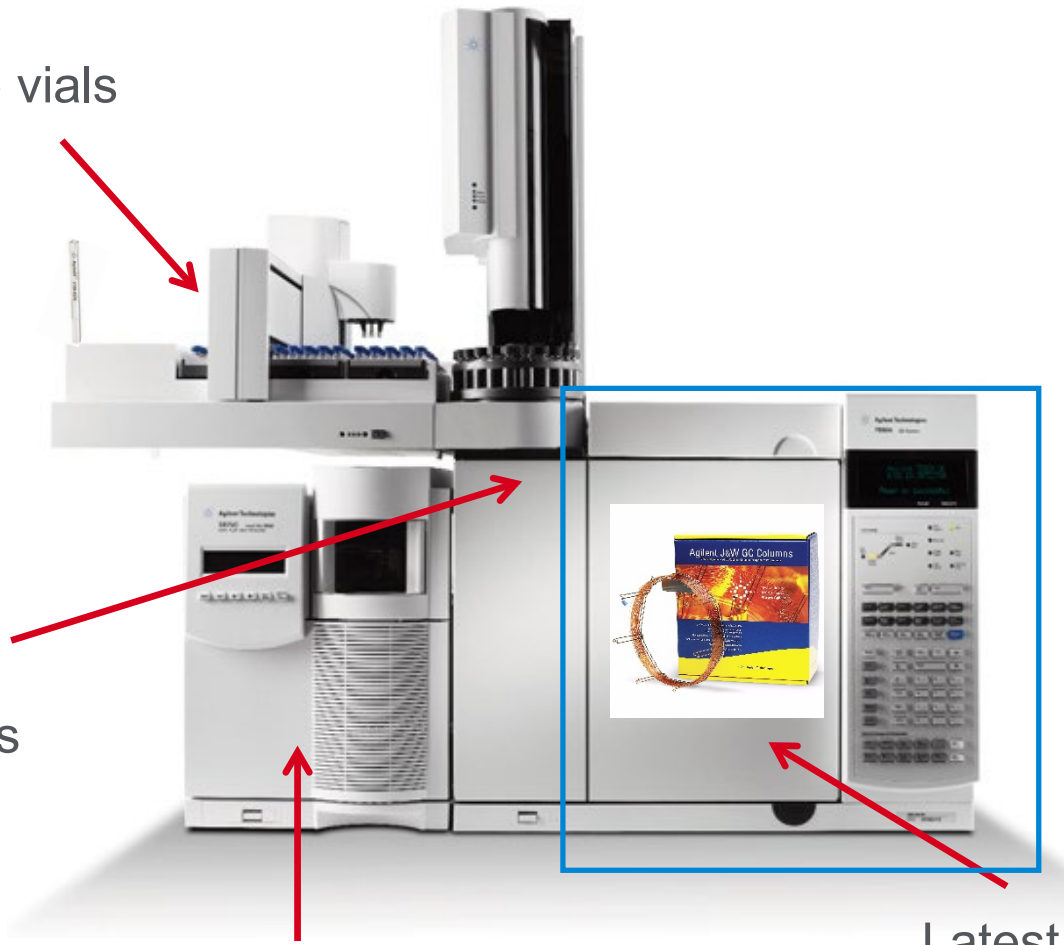
Gas traps

Crimpers

Sample cleanup

ADM Flowmeter

Standards



Agilent J&W Column Portfolio- DB, HP, CP, VF

Low Polarity			Mid Polarity			High Polarity		
CP-Sil 2	DB & HP-1MS UI	DB & HP-5MS UI	DB-XLB	DB-225MS	DB-ALC1	HP-88	DB-WAX	DB-WAX UI
DB-MTBE	DB & HP1-MS	DB & HP5-MS	VF-XMS	DB-225	DB-Dioxin	CP-Sil 88	DB-WAX ETR	DB-HeavyWAX
CP-Select CB MTBE	VF-1MS	VF-5MS	DB-35MS UI	CP-Sil 43 CB	DB-200	DB-23	HP-INNOWax	DB-FATWAX UI
	DB & HP-1	DB & HP-5	DB & VF-35MS	VF-1701 MS	VF-200MS	VF-23 MS	VF-WAX MS	
	CP-Sil 5 CB	CP-Sil 8 CB	DB & HP-35	DB-1701	DB-210		CP-WAX 57 CB	
	Ultra 1	Ultra 2	DB & VF-17MS	CP-Sil 19 CB	DX-4		DB & HP-FFAP	
	DB-1HT	VF-DA	DB-17	HP-Blood Alcohol			DB-WAX FF	
	DB-2887	DB-5.625	HP-50+	DB-ALC2			CP-FFAP CB	
	DB-Petro/PONA	DB & VF-5HT	DB-17HT	DX-1			CP-WAX 58 FFAP CB	
	CP-Sil PONA CB	CP-Sil PAH CB	DB-608				CP-WAX 52 CB	
	DB-HT SimDis	Select Biodiesel	DB-TPH				CP-WAX 51	
	CP-SimDis	SE-54	DB-502.2				CP-Carbowax 400	
	CP-Volamine		HP-VOC				Carbowax 20M	
	Select Mineral Oil		DB-VRX				HP-20M	
	HP-101		DB-624				CAM	
	SE-30		VF-624MS				CP-TCEP	
			CP-Select 624 CB					
			DB-1301					
			VF-1301MS					
			CP-Sil 13 CB					

Agilent J&W columns have over 50 different stationary phase offerings

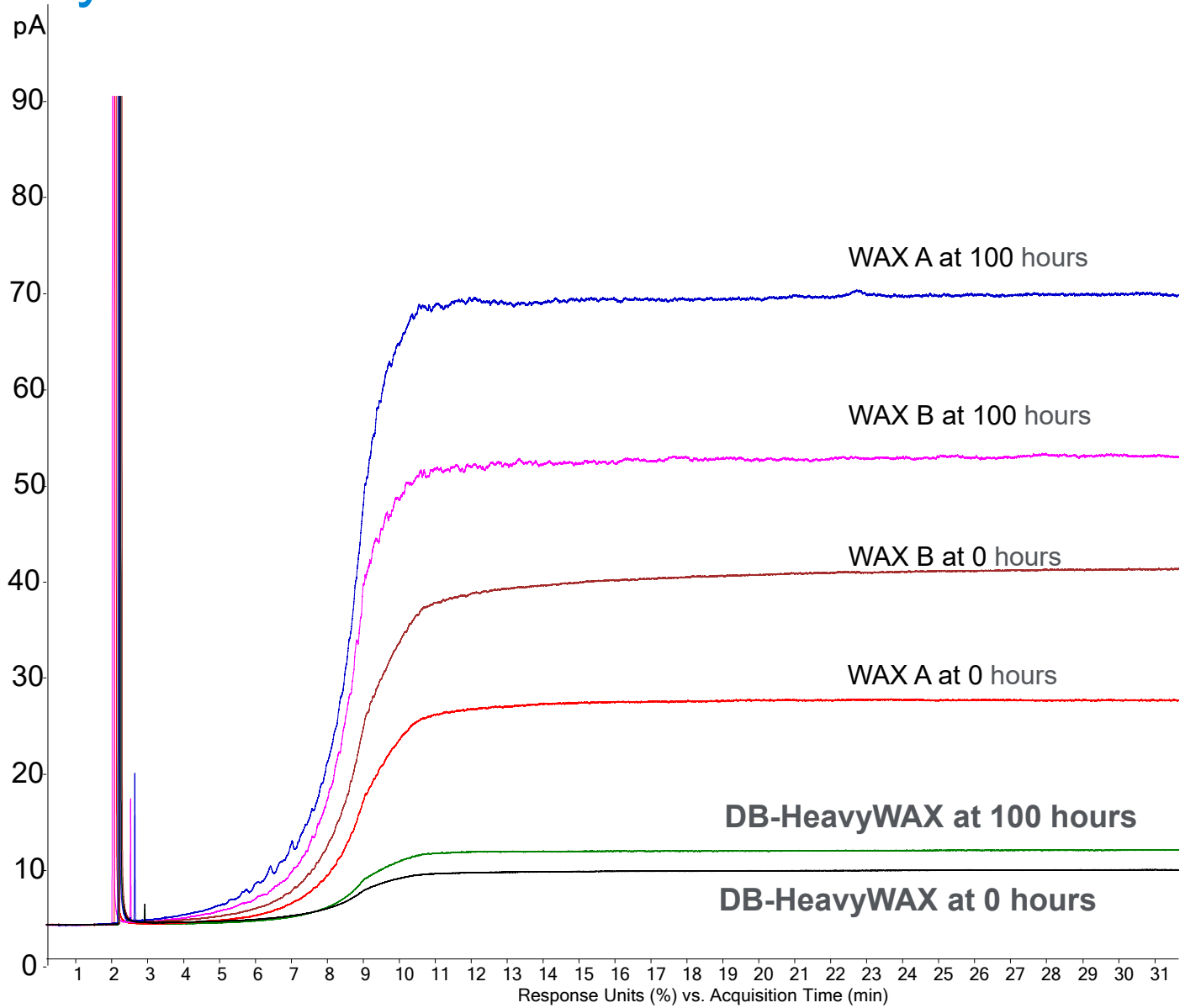
Introducing DB-HeavyWAX

- WAX column with increased MAOT compared to existing columns on the market
  - 280 °C isothermal and 290 °C programmed
- Provides increased thermal stability
- Has a low bleed level

Advantages

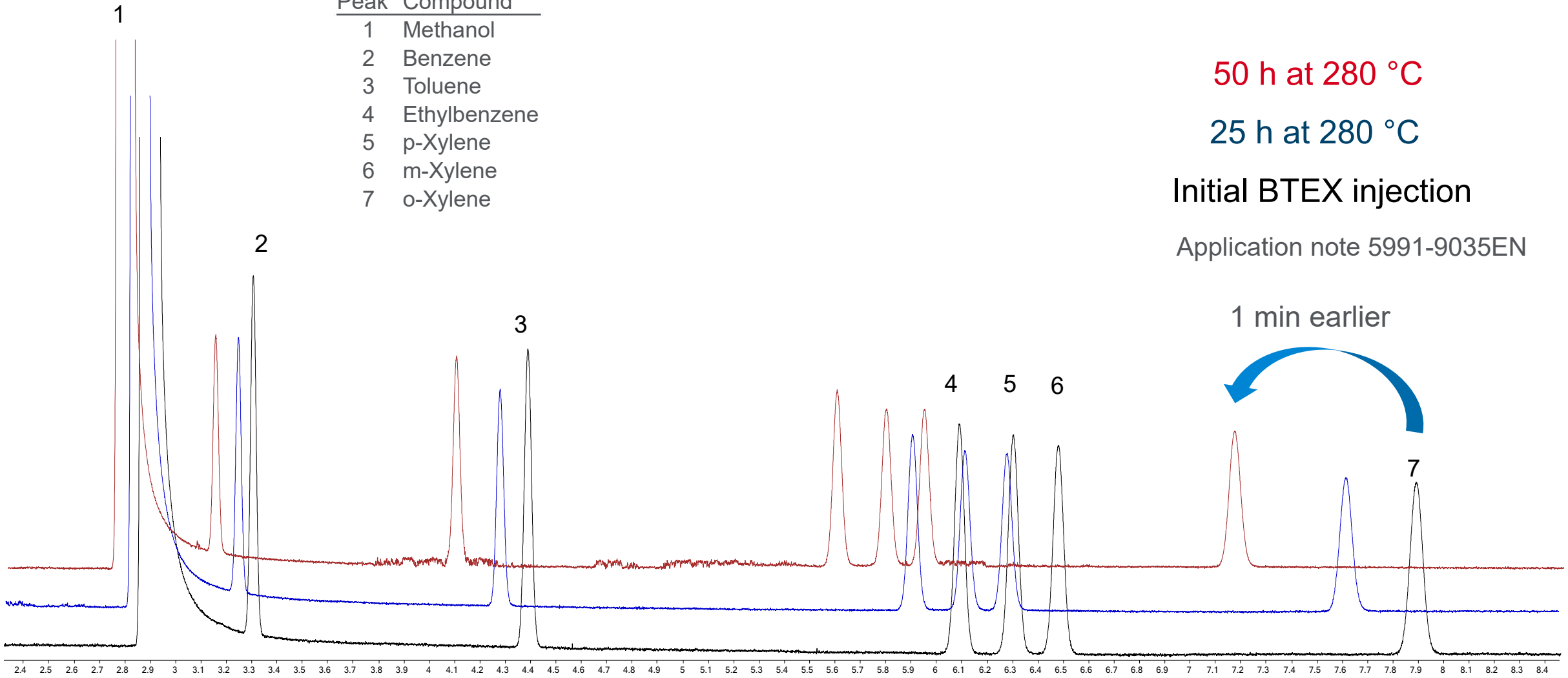
General GC	GC/MS	GC×GC
• Shorter runtimes when late eluters are present • Better S/N ratio, improved detection • Better thermal stability • Faster column bake-out	• Desire for “zero” bleed • Avoid MS contamination by column bleed for longer system uptime and column lifetime • Improve detection limit	• Extended scope of compounds

Bleed Summary at 280 °C Over 100 Hours



Thermal Stability and Retention Time Shifting for a Traditional WAX Phase

Peak	Compound
1	Methanol
2	Benzene
3	Toluene
4	Ethylbenzene
5	p-Xylene
6	m-Xylene
7	o-Xylene



50 h at 280 °C

25 h at 280 °C

Initial BTEX injection

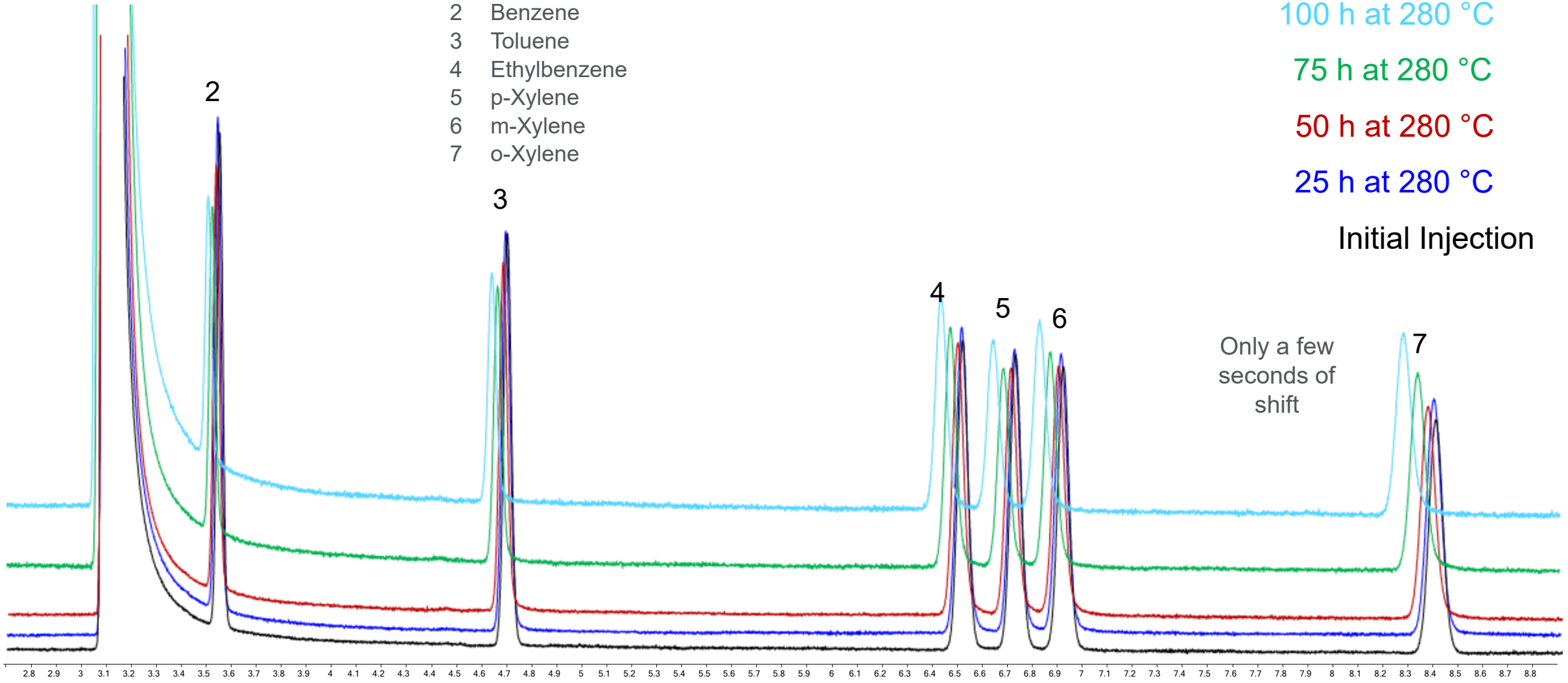
Application note 5991-9035EN

1 min earlier

DB-HeavyWAX

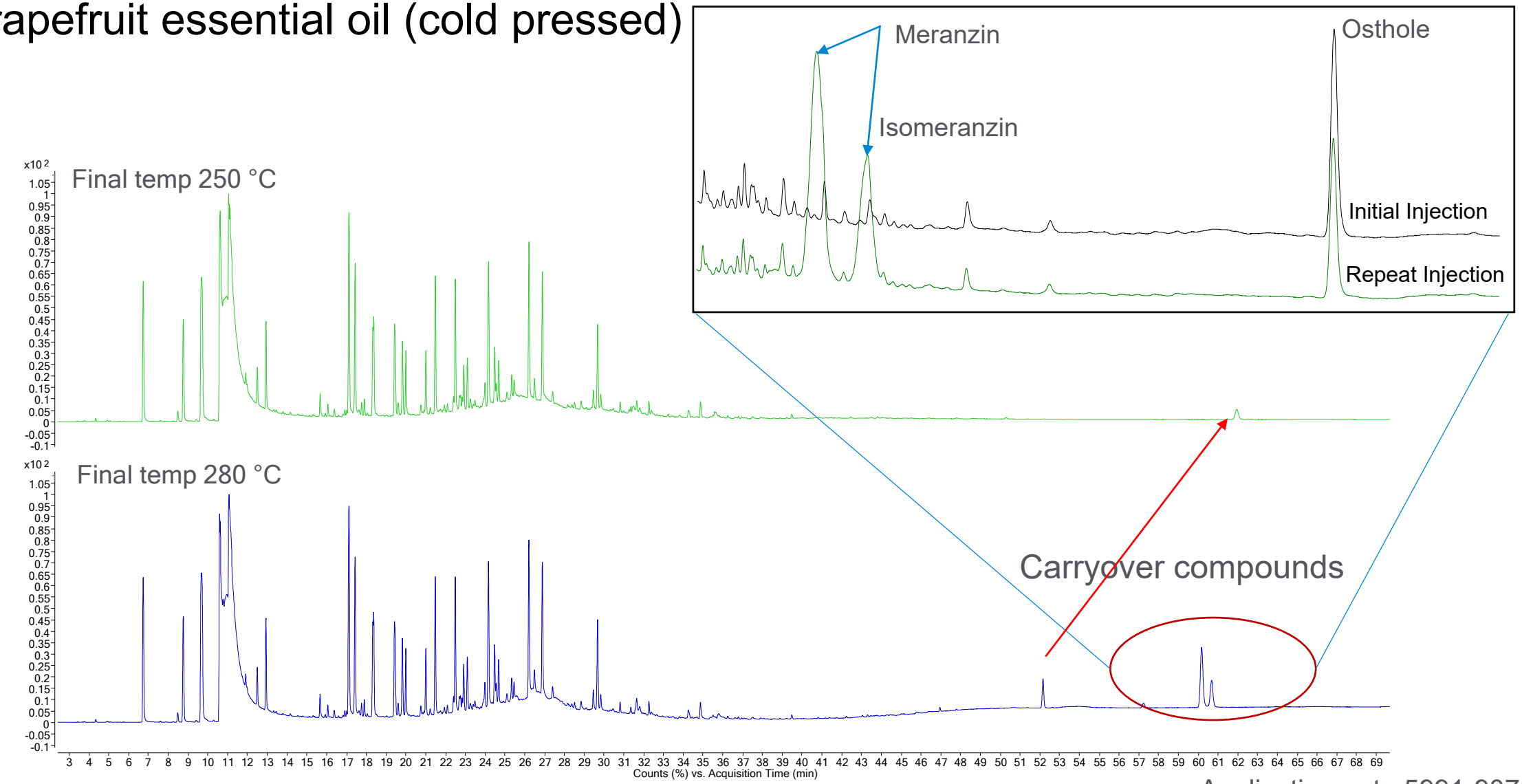
Application note 5991-9035EN

Peak	Compound
1	Methanol
2	Benzene
3	Toluene
4	Ethylbenzene
5	p-Xylene
6	m-Xylene
7	o-Xylene



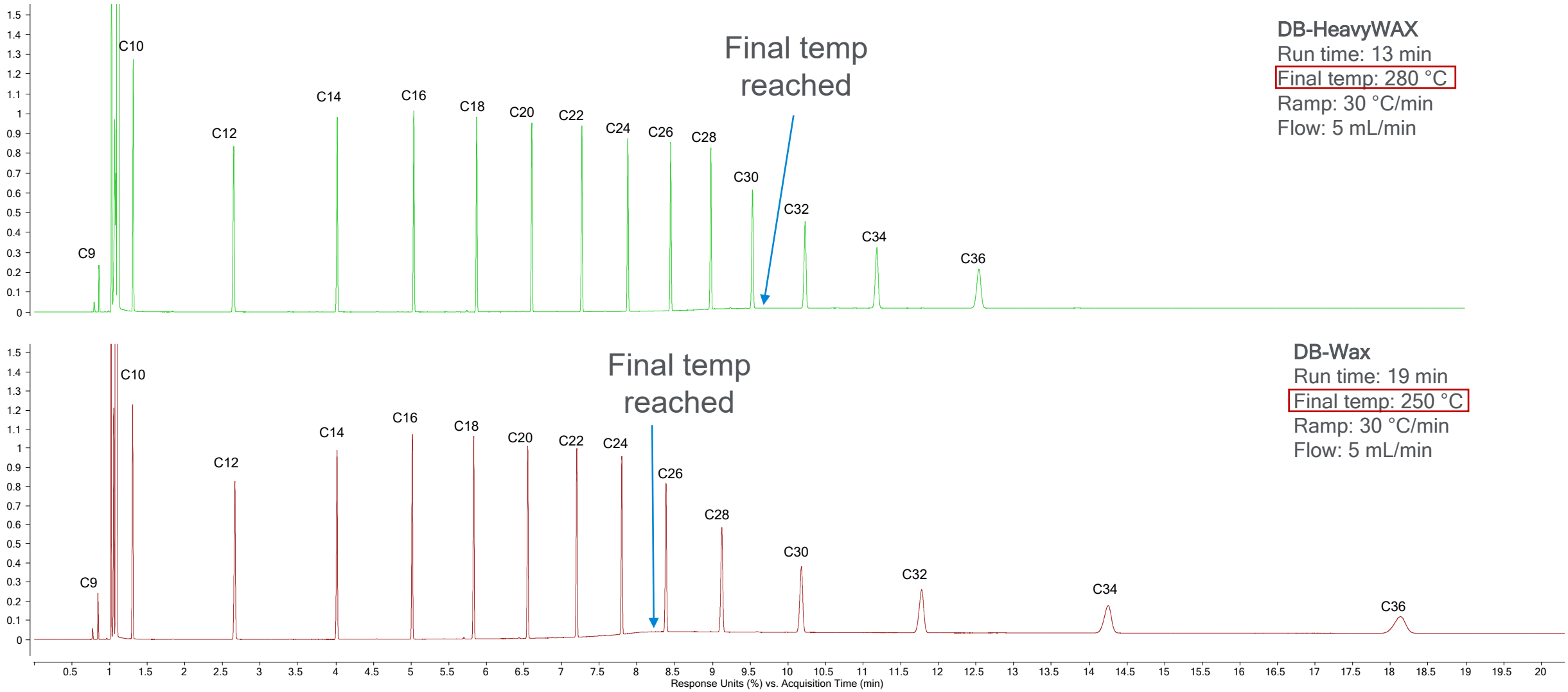
Higher Final Temperatures Mean Earlier Elution of Heavy Compounds, Sharper Late Eluting Peaks, and Reduced Carryover

Pink grapefruit essential oil (cold pressed)

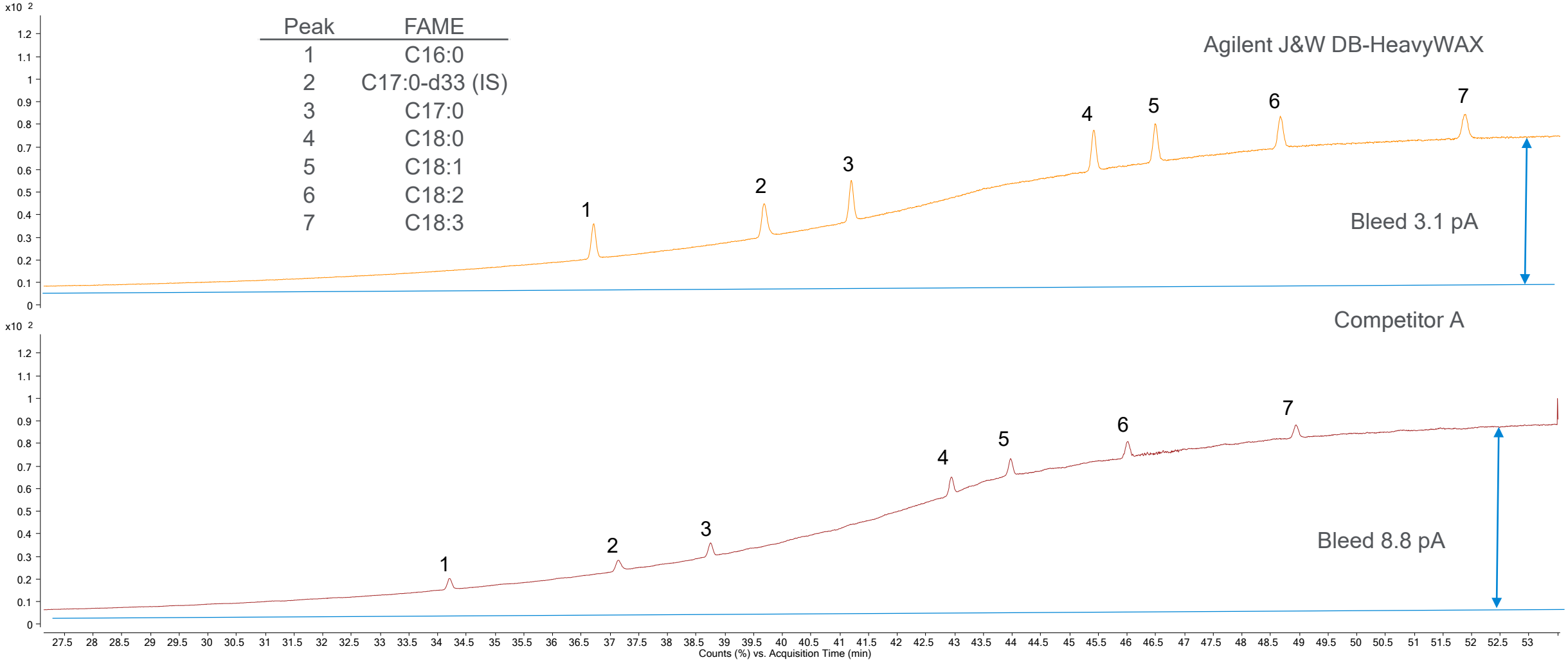


Application note 5991-9078EN

Better Peak Shape and Decreased Runtime



Bleed Reductions for FAMEs in Biodiesel (IP-585) Using a DB-HeavyWAX, 60 m x 0.25 mm x 0.50 µm

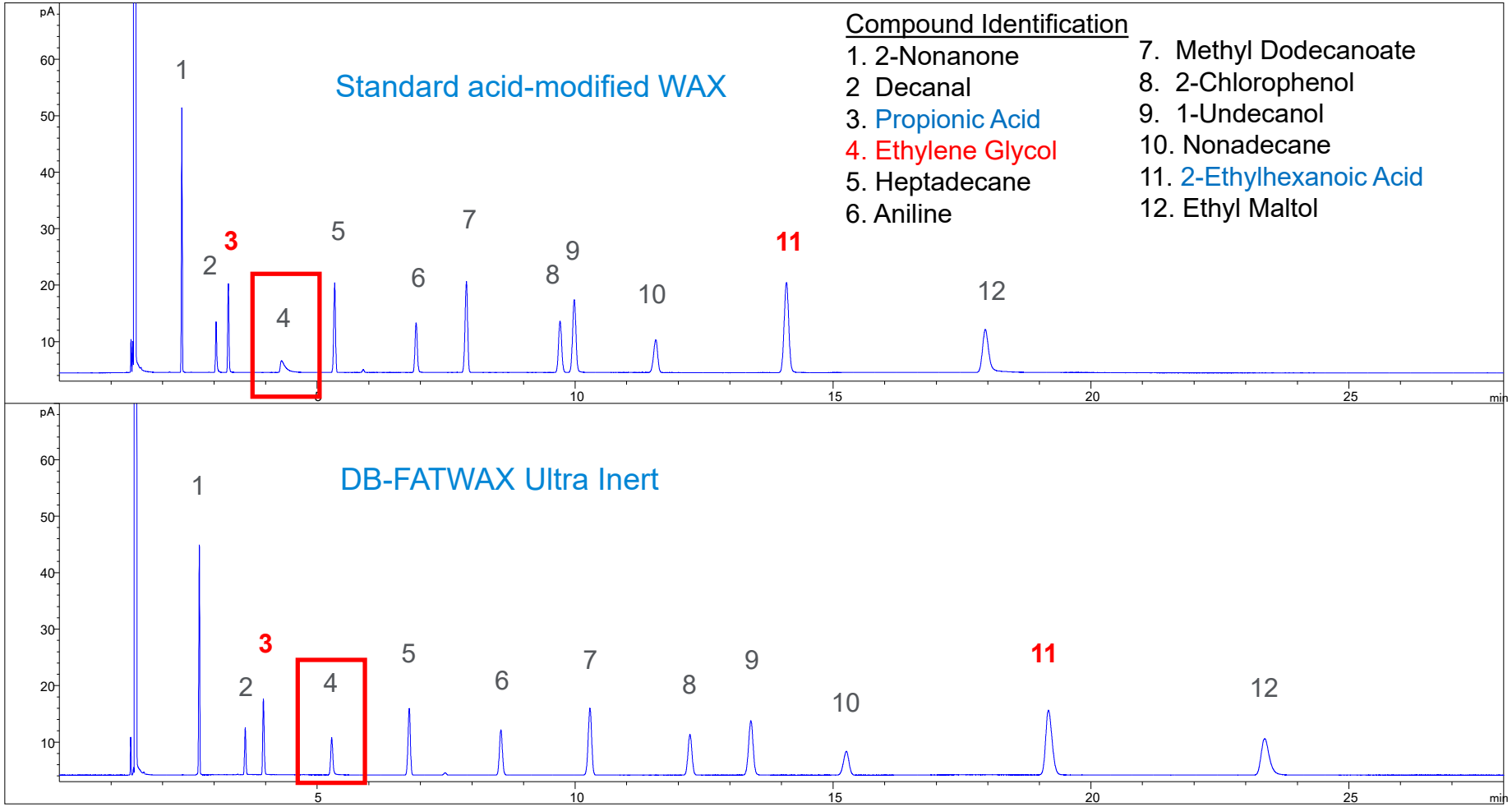


DB-FATWAX UI Provides the Desired Inertness and Thermal Stability to Separate Challenging Organic Acids and Fatty Acids

- Great need in the food, forensic, and cosmetic industries to monitor the content of free and natural occurring fatty acids.
- Analysis of underivatized organic acids and free acids is desirable to eliminate the problems associated with derivatization, extraction, and cleanup procedures
- Volatile organic acids and fatty acids are difficult to quantify accurately by standard WAX columns. These acids often elute as tailing or poorly resolved peaks. For some acids, adsorption can become irreversible.
- Normally:
  - Fatty acids are derivatized to the methyl ester (FAME)
  - Free fatty acids are analyzed using acid-deactivated WAX columns. The acid modifier, nitroterephthalic acid, however, reduces thermal stability, operating temperature and reacts with humidity, reducing column life.

Comparison Between Acid-Modified WAX and DB-FATWAX UI After 50 h at 250 ºC

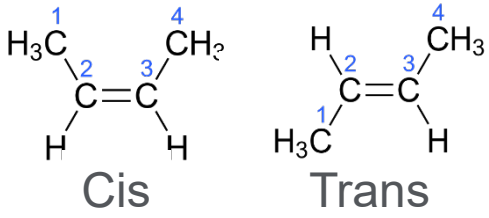
DB-FATWAX Ultra Inert shows superior inertness and thermal stability compared to acid-modified WAX



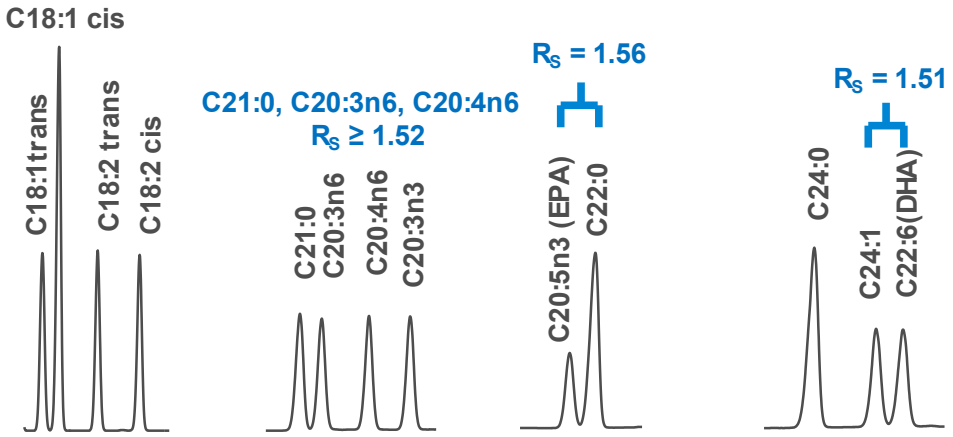
DB-FastFAME
20 m x 0.18 mm x 0.20 µm

Column	Agilent J&W DB-FastFAME, 20 m x 0.18 mm, 0.20 µm
Gas	**Hydrogen**, 28 psi, constant pressure mode
Inlet	Split/splitless, 250 °C, split ratio 50:1
Oven	80 °C (0.5 min), 65 °C/min to 175 °C, 10 °C/min to 185 °C (0.5 min), 7 °C/min to 230 °C
FID	280 °C, hydrogen: 40 mL/min; air: 400 mL/min; make-up gas: 25 mL/min.
Injection	1 µL

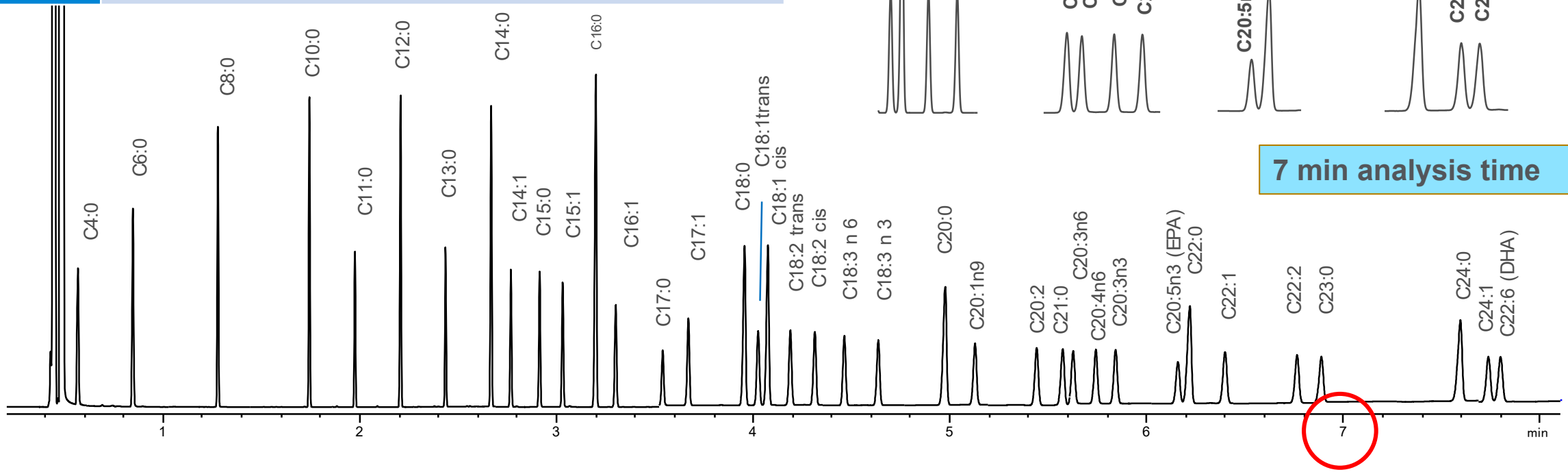
Strong interaction between cis isomers and the dipoles of the cyano propyl ligands. That allows the trans to elute after the cis isomers.



$R_S \geq 1.95$ for cis/trans isomers



7 min analysis time



Introducing the Agilent 8890 GC System

Flexible and expandable to meet your needs today and tomorrow

Future-proof: Ready for anything

- Powerful next generation electronic architecture
- Expanded smart-connected functionality
- Full suite of inlets, detectors, and accessories, CFT, Deans switch, backflush, GC x GC, dual simultaneous injection
- Six valves, eight heated zones, plus LVO
- Generation 6 precision EPC
- Smart keys
- 7-inch color touch display

Agilent 8890 GC System

Smart-connected GC

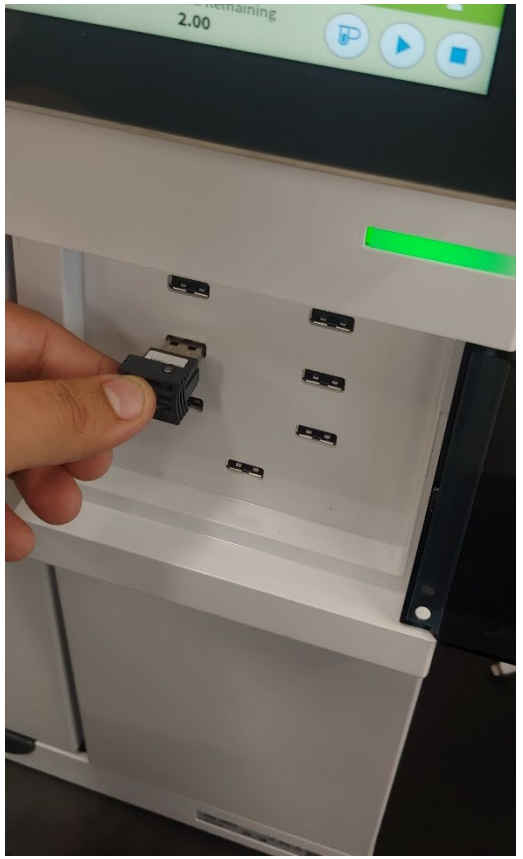
Modern intuitive interface

- 7-inch color touch screen
  - Configuration
  - Status
  - Methods
  - Sequence info
  - Troubleshooting, diagnostics, and help
- Real-time chromatographic evaluation
  - Blank evaluation
  - Detector evaluation

GC Columns with Smart Key (for the Agilent 8890 GC only)

For immediate identification and usage monitoring of your GC column

- Available with the Agilent 8890 GC only
- Can track use of a GC column
- Smart key contains GC column information, including:
  - Part and serial numbers
  - Number of injections/runs
  - Time at/above temperature limits
  - Date installed
  - Temperature limits – GC columns
    - If more than one column is installed, the temperature is determined by lowest column smart key installed (DB-WAX vs DB-5)
  - Column length/trimming done in “column maintenance mode” in software and rewritten to the smart key
  - S/N of last instrument installed if it was in an 8890 GC

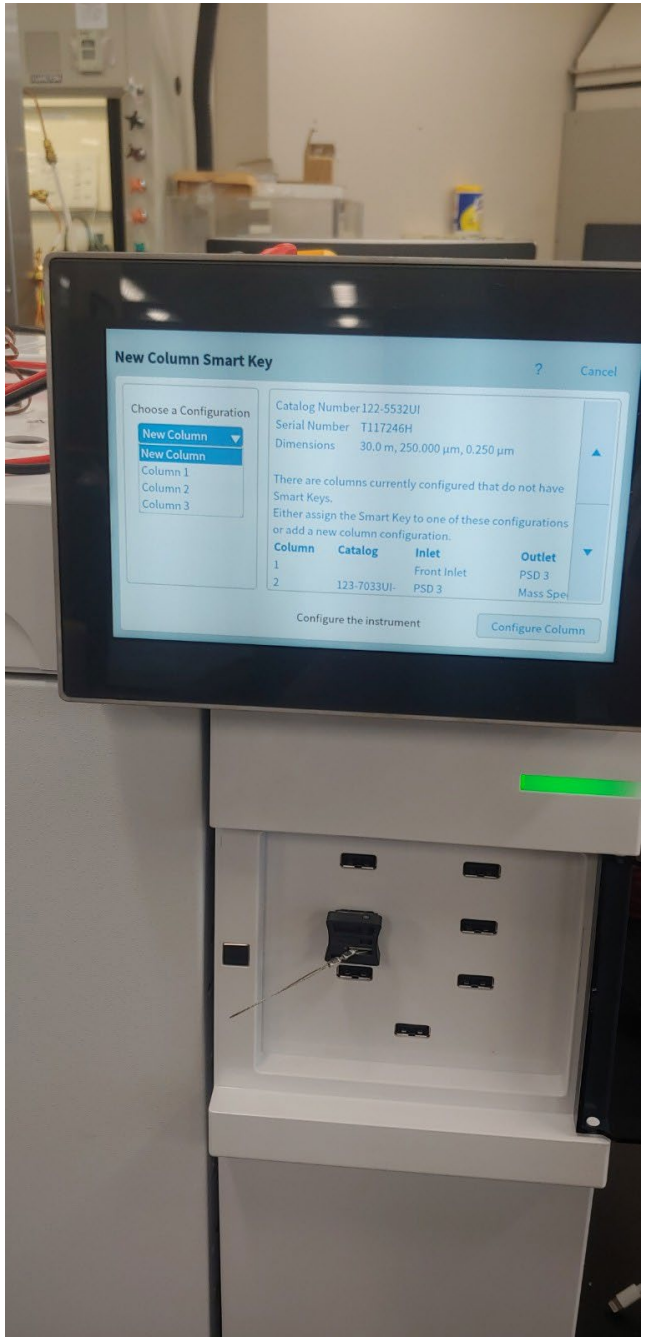


GC Columns with Smart Key

Feature, advantages, and benefits

Feature	Advantage	Benefit	Economic Benefit
Smart key included with the GC column p/n must include “KEY” Designation example *122-5532UI-KEY*	1. Reduce possible errors of manual input of method parameters 2. Optimized maintenance schedules with usage tracking	1. Better data quality as the system is aware of the configuration Ease-of use 2. Ability to better plan preventive maintenance before issues occur	1. Ease-of-use, no risk of faulty information in GC, fewer reruns 2. Limited downtime as preventive maintenance is easier to plan

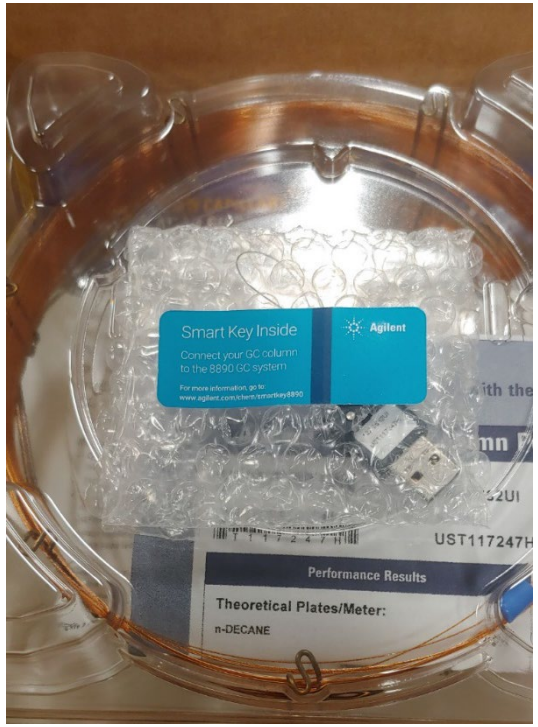
	Literature	Web page
1	Agilent 8890 GC brochure	https://www.agilent.com/cs/library/brochures/brochure-gc-8890-5994-0476en-agilent.pdf
2	Smart key product page (not for ordering smart keys)	www.Agilent.com/chem/smartkey8890
3	Instruction sheet	https://www.agilent.com/cs/library/instructionsheet/public/insert-smart%20key-8890-5994-0700en-agilent.pdf



GC Columns with Smart Key

Smart key clarifications

- It is not a USB flash drive. It comes already programmed from the factory with specific information about the GC column that it belongs to
- It is not tethered to the GC column, neither is connected through it with WIFI or Bluetooth.



Expanding the Intuvo Column Family

Key features

- VF-, CP-, and Select- applications specific: 24 new phases and 39 new part numbers
- New Intuvo column dimension: 0.15 mm id to add to our 0.18 mm id for a greater range of high-efficiency columns
- We now have PLOT columns
- Custom column options

PDMS	5% Phenyl	WAX	Specialty	Siloxane/ Cyanopropyl	PLOT
VF-1ms	VF-5ms	CP-WAX 52 CB	CP-Volamine	VF-17ms	HP-PLOT Q
CP-Sil 5 CB	CP-Sil 8 CB	VF-WAXms	Select Mineral Oil	VF-1701ms	HP-PLOT Al2O3 S
	CP-Sil 8 CB for Amines	CP-WAX 57 CB	Select PAH	VF-Xms	
		CP-WAX 58 FFAP	Select Low Sulfur	VF-624ms	
		CP-Wax for Volamine	Select-FAME	CP-Select 624 CB	
			CP-Sil 88 for FAME	CP-Sil 88	
			CP-TAP	VF-200ms	

An Overview of the Latest Supply Innovations

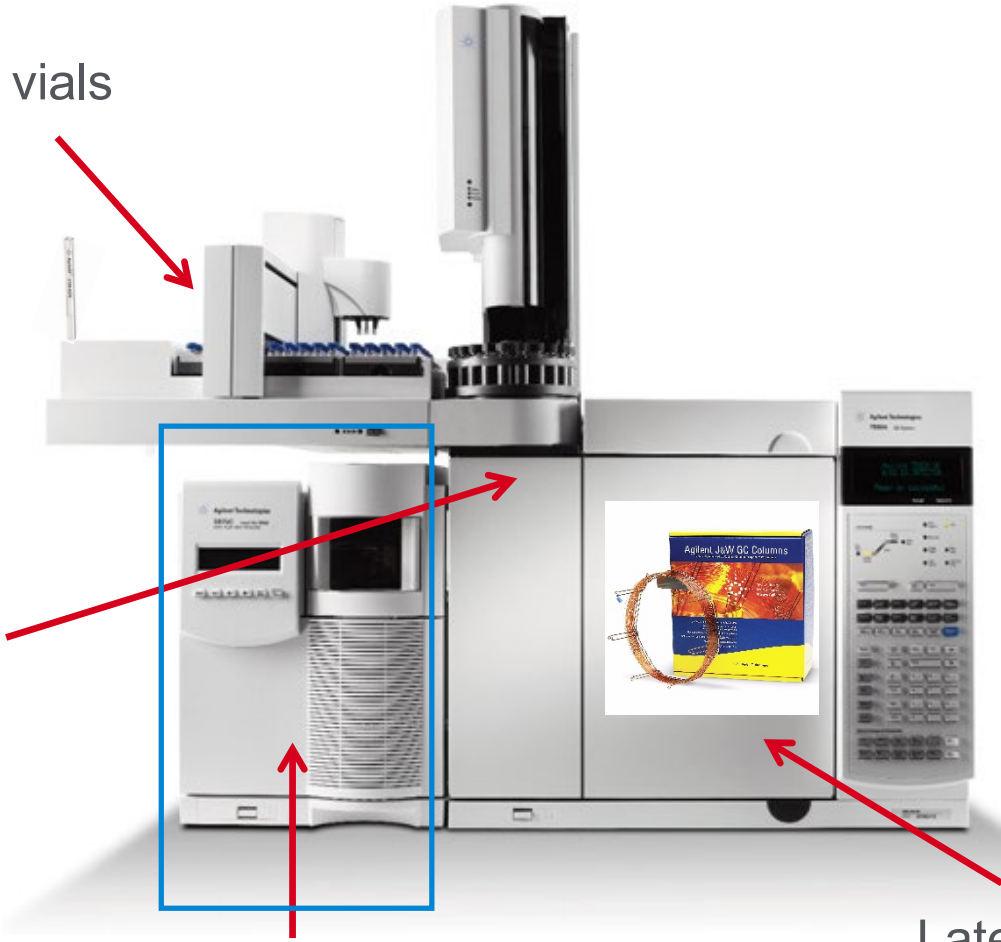
Gas traps

Crimpers

Sample cleanup

ADM Flowmeter

Standards



New Agilent Universal Fit GC Detector Jets

- Easier column installation and jet replacement reducing the risk of column damage
- Lubricant free threads reducing the risk of contamination
- Made of strong material reducing the risk of deforming
- Universally fits in both capillary column and packed column (adaptable) FID detectors

Previous Jets				New Universal Fit Jets			
Previous Jet PN	**Jet Orifice ID (inch/mm)**	**Jet Length (inch/mm)**	**Fit of Detector Fitting Type**	**New Jet PN (use for re-order)**	**Jet Orifice ID (inch/ mm)**	**Jet Length (inch / mm)**	**Fit of Detector Fitting Type**
19244-80560	*0.011 / 0.29*	*2.4 / 62*	*FID, Adaptable*	5200-0176	0.011 / 0.29	1.2 / 31	FID, Capillary & Adaptable
G1531-80560	*0.011 / 0.29*	*1.7 / 43*	*FID, Capillary*				
18710-20119	*0.018 / 0.47*	*2.5 / 64*	*FID, Adaptable*	5200-0177	0.018 / 0.47	1.2 / 31	FID, Capillary & Adaptable
19244-80620	*0.018 / 0.47*	*2.4 / 62*	*FID, Adaptable*				
G1531-80620	*0.018 / 0.47*	*1.7 / 43*	*FID, Capillary*				
18789-80070	*0.030 / 0.76*	*2.5 / 64*	*FID, Adaptable*	5200-0178	0.030 / 0.76	1.2 / 31	FID, Capillary & Adaptable
G1534-80580	*0.011 / 0.29*	*2.0 / 52*	*NPD, Capillary*	5200-0179	0.011 / 0.29	1.6 / 40	NPD, Capillary & Adaptable
G1534-80590	*0.011 / 0.29*	*2.8 / 71*	*NPD, Adaptable*				

Upcoming GC Seminars

How to combat the Helium Shortage: Making the Switch from Helium to Hydrogen or Nitrogen Carrier Gas	December 5, 2019	11:00am ET/8:00am PT
Optimizing Conditions for GC/MS Analyses	January 23, 2020	11:00am ET/8:00am PT
Plunge Deep into the World of Syringes: Simplifying GC Syringes and Sample Introduction	February 27, 2020	11:00am ET/8:00am PT
An Agilent Guide to SPME Analysis	March 26, 2020	11:00am ET/8:00am PT

Have an idea for a topic? Let us know.

Contact Agilent Chemistries and Supplies Technical Support

1-800-227-9770 option 3, option 3:

Option 1 for GC and GC/MS columns and supplies

Option 2 for LC and LC/MS columns and supplies

Option 3 for sample preparation, filtration, and QuEChERS

Option 4 for spectroscopy supplies

Option 5 for chemical standards

Available in the USA and Canada 8–5, all time zones

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