Agilent G1888 Network Headspace Sampler

Exceptional sensitivity, repeatability and productivity.

Our measure is your success.

products | applications | software | services

Agilent Technologies

Turn potential measurement obstacles into opportunities for success with Agilent's G1888 Network Headspace Sampler.

The Agilent G1888 Headspace Sampler lets you automatically introduce volatile compounds from virtually any sample matrix directly into a GC or GC/MSD system. It features an inert sample pathway for superior chemical performance without analyte degradation or loss. And its high sample capacity and increased sensitivity ensure excellent performance for a wide range of analysis.

What's more, the **G1888 Headspace Sampler (HSS)** is the perfect companion for **Agilent's NEW 7890A GC and 5975C GC/MSD system.** Together, these flagship instruments can significantly improve sensitivity and repeatability.

The Agilent G1888 Headspace Sampler enhances your analysis capabilities by allowing you to introduce volatile compounds directly into a GC or GC/MSD. Single-point ChemStation control of the HSS, GC, and detectors means increased automation and straightforward 21 CFR Part 11 compliance.

Built-in performance and reliability

From sampling... to detection... to data analysis and reporting... The G1888 is a fully integrated system that gives you unsurpassed confidence in your results. And with Agilent's **ChemStation Software**, you can store HSS parameters as part of your GC methods, ensuring data integrity every time.

Enhanced productivity

The Agilent G1888 Network Headspace Sampler eliminates tedious, potentially error-producing steps that are common with other sample-preparation techniques. So you can extract more data from your samples in less time – and at the lowest possible cost per sample.

Backed by Agilent application resources

Whether you need to analyze residual solvents in pharmaceuticals or alcohol in blood, Agilent's library of G1888 application notes can help ensure consistent results and repeatability of your measurements.

"How do I prevent high-boiling impurities from extending my analysis time – or damaging my columns?"

"What can we do to improve sensitivity for low-concentration analytes?"

A 70-sample tray and 12 heating oven positions *allow unattended overnight operation.*

Constant heating time and optimized sample overlap *ensures maximum throughput.*

A deactivated sample path *reduces carryover and minimizes sample degradation.*

An equilibration temperature of up to 230°C *expands the traditional headspace application space.*

ChemStation Software *provides full access to all method parameters, controls sample overlap, and transfers vial identification information to the final report.*

Multiple headspace-extraction (MHE) *delivers maximum sensitivity.*

Multi-line display and 19-key keypad *allow easy stand-alone operation and diagnostics.*

Pressure control of the fixed-volume sample loop *significantly improves response and retention time repeatability when used with Agilent's new 7890A GC.*

Easy switching between built-in pneumatics and GC-EPC controls *fits your GC configuration.*

Secure LAN-based instrument communication *gives you easy access to your data.*

Your choice of vials: *You can use a 10 mL or 20 mL crimp top vial. Or, you can use a convenient screw cap vial.*

The **perfect** partnership.

Dramatically improve precision, sensitivity, and throughput by combining the G1888 Headspace Sampler with Agilent's flagship 7890A GC system.

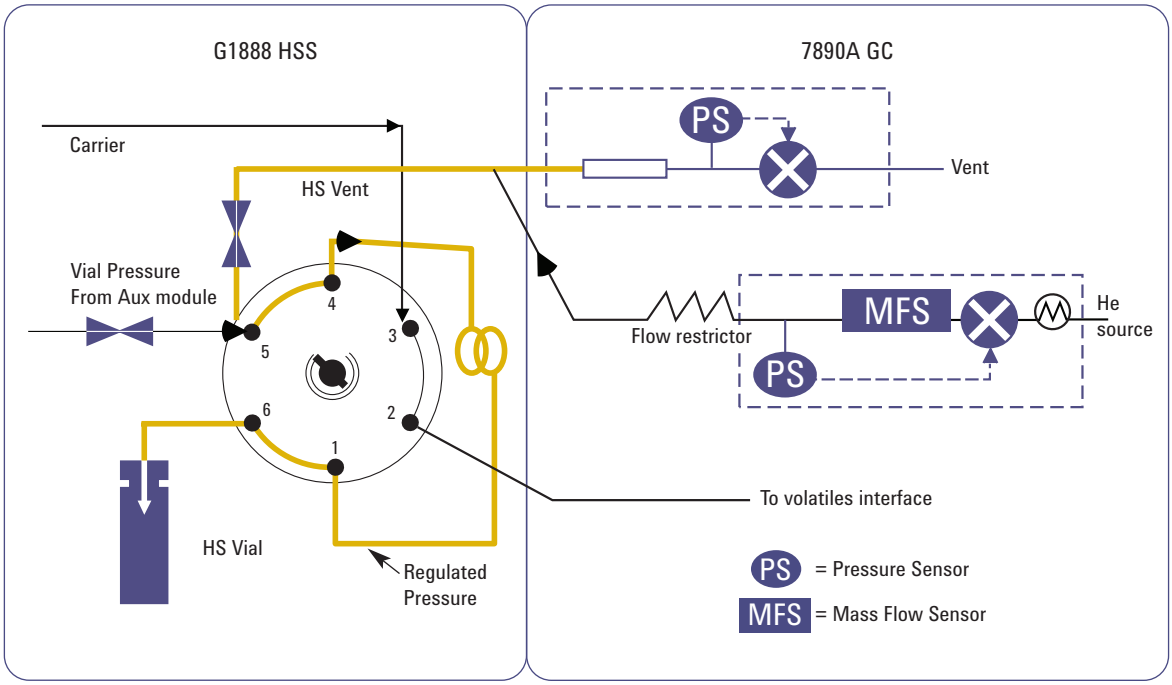
The 7890A GC features a **backpressure regulation capability** that controls atmospheric pressure variations on the HSS sample loop while **increasing area precision [%RSD] by a factor of 3-5**. What's more, improved area precision leads to more consistent results. (See figures on page 5.)

In addition, you can **double method sensitivity** by optimizing the interaction between headspace vial and sample loop pressures.

Finally, Agilent's G1888 HSS and 7890A GC work together to boost your productivity – and keep costs in check – by allowing you to…

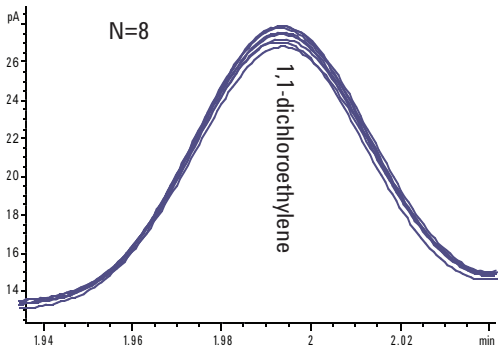
- **Reduce your analysis time** with faster oven cool-down – plus the ability to remove high-boiling solvents with the 7890A GC's backflush feature.
- Store all essential parameters in an **Agilent ChemStation chromatographic method.**
- **Quickly and easily transfer methods** directly from your 6890 Series GC to the 7890A GC.

Advanced 7890A design...



...leads to improved area and RT precision.

1,1-DICHLOROETHYLENE (8 ppm)

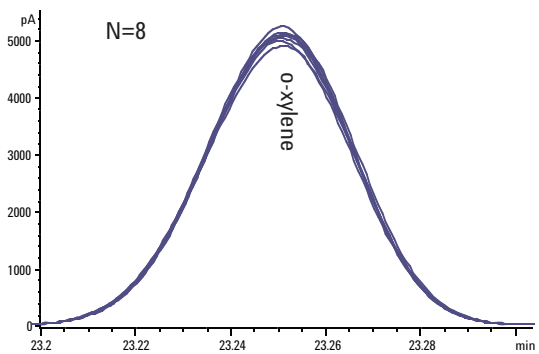


Repeatability (%RSD)	6890N GC	7890A GC*
Retention time	0.022 %	0.013 %
Area	9.8 %	**3.2 %**

Improvement by a factor of ~3

* Conditions (7890 GC): Backpressure Regulation: 5 PSI
Headspace Vial Pressure: 20 PSI

O-XYLENE (195 ppm)



Repeatability (%RSD)	6890N GC	7890A GC*
Retention time	0.002 %	0.001 %
Area	7.0 %	**1.9 %**

Improvement by a factor of ~4

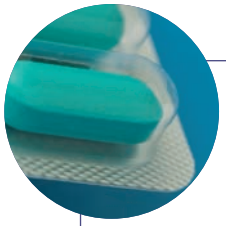
* Conditions (7890 GC): Backpressure Regulation: 5 PSI
Headspace Vial Pressure: 20 PSI

Whether your application is pharmaceutical, food safety, environmental, or forensic...

Agilent's automated G1888 Headspace Sampler helps you achieve superior data – and superior confidence in your results.

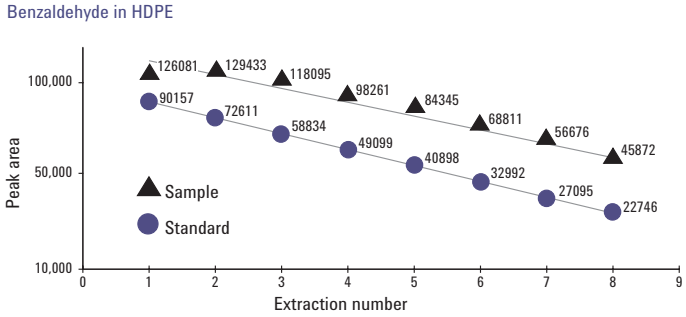
The tendency of analytes to react with the instrument sample path can impede their detection at very low levels. The G1888 Headspace Sampler eliminates this problem with its nonreactive, nonadsorptive sample flow path from the point of sampling through injection. This significantly reduces carryover – a common problem with older instrumentation.

The following examples demonstrate how the flexibility of the G1888 HSS allows use in multiple applications.

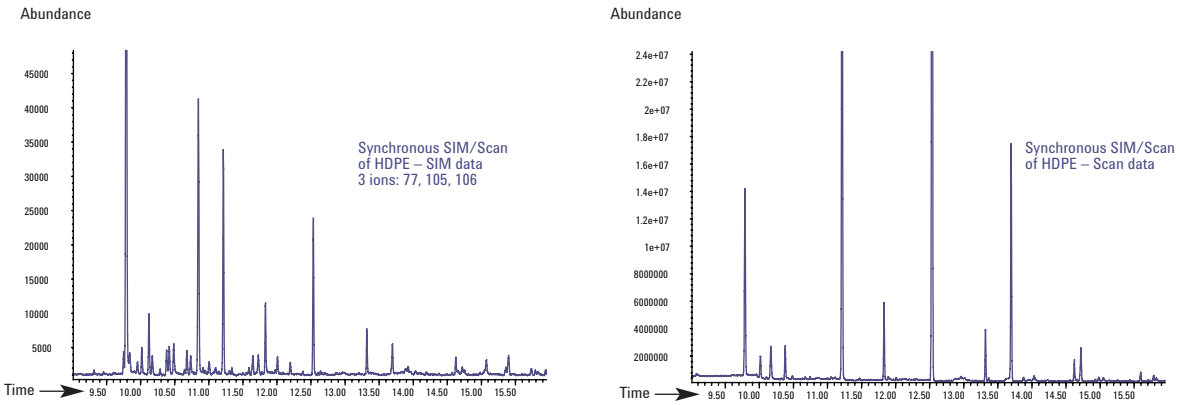


Extractable and Leachables In Packaging Materials

Multiple Headspace Extraction (MHE) and the 5975 Series GC/MSD enable detailed characterization of pharmaceutical packaging materials from risk assessment of extractables to identification of unknowns – all in a single method.



Semi-logarithmic plot of the MHE raw data for benzaldehyde in cryo-milled HDPE enables worst-case evaluation of extractable(s) concentration.



Simultaneously acquired SIM and Scan data allow quantification of known extractables and full-scan library searching in only one acquisition.

Residual Solvents in Pharmaceutical Products

USP <467>

GC

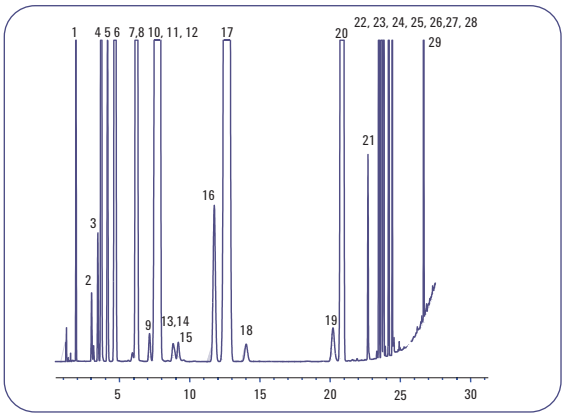
Column: DB-624, 30 m x 0.45 mm x 2.55 µm
Carrier: Helium, 9 mL/min
Oven: 35ºC (20 min) to 250ºC (15 min) at 25º C/min
Injection: Volatiles interface, 160ºC, split 2:1

Headspace

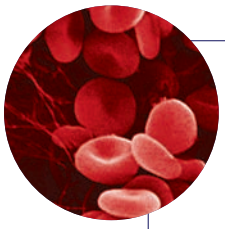
Loop size: 1 mL
Oven temp: 85°C
Loop temp: 100°C
Transfer line temp: 120°C
Vial pressure: 14.0 psig
Equilibration time: 30 min, low shake

Sample

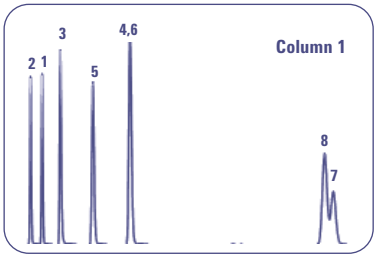
ICH Class 1 and 2 solvents

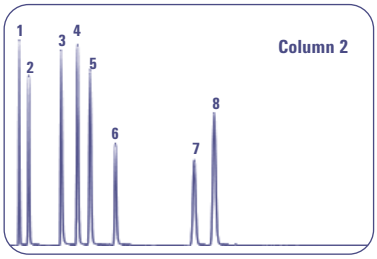


1. Methanol
2. 1,1 Dichloroethylene
3. Acetonitrile
4. Methylene chloride
5. Trans 1,2 dichloroethene
6. Hexane
7. Cis 1,2 dichloroethene
8. Nitrobenzene (co-elute with 7)
9. Trichloromethane
10. Carbon tetrachloride
11. Cyclohexane (co-elute with 10 & 12)
12. 1,1,1 Trichloroethane (co-elute with 10 & 11)
13. Benzene
14. 1,2 dimethoxyethane
15. 1,2 dichloroethane
16. Trichloroethylene
17. Methyl cyclohexane
18. 1,4 dioxane
19. Pyridine
20. Toluene
21. 2 hexanone
22. Chlorobenzene
23. Ethylbenzene
24. DMF
25. M-xylene
26. P-xylene
27. O-xylene
28. N,N dimethylacetamide
29. Tetralin



Dual Column Blood Alcohol Analysis





GC

Oven: 35°C isothermal
Inlet: Split/splitless at 150°C

A two-hole ferrule was used to connect both columns to the same inlet

Column I: DB-ALC1
30 m x 0.32 mm x 1.8 µm
Column II: DB-ALC2
30 m x 0.32 mm x 1.2 µm

Headspace

Oven: 60°C
Vial equilibration time: 15 min

Sample

5 µl of 0.08 g/dL standard mix in 10 ml vial

1. Acetaldehyde
2. Methanol
3. Ethanol
4. Acetone
5. 2-Propanol
6. Acetonitrile
7. Ethyl Acetate
8. Methyl-Ethyl Ketone

Volatile Organic Compounds In Water

GC

Column: DB-VRX
20 m x 0.18 mm x 1.0

Headspace

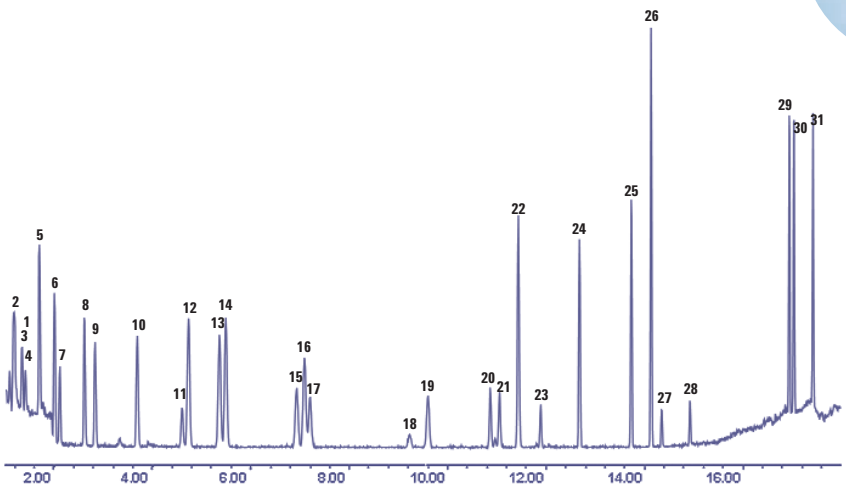
Oven temp: 75ºC
Equilibration time: 20 min

MSD

Scan range: 45-260 amu

Sample

40 ppb, EPA 624 standard,
5 ml water in 10 ml vial,
2 grams NaCl added



Protect your investment with **Agilent's industry-leading supplies.**

Agilent supplies are engineered with the same reliability you expect from Agilent instruments – and they are designed to work with Agilent GC and GC/MS systems. What's more, Agilent supplies are designed for fast, easy replacement, so you can get your system running again quickly.

Stop problems **before** they start with Agilent's Lab Monitor & Diagnostic Software.

Agilent's automated **Lab Monitor & Diagnostic Software** monitors single or multiple Agilent GC and GC/MSD systems in real time – and around the clock.

The software also performs diagnostic routines... keeps track of injections, hours of operation and other parameters... and tells you when it's time for basic maintenance tasks. So you can maximize your uptime and fix potential problems **before** your results go bad.

The Agilent Value Promise – **10 years of guaranteed value.**

The promise guarantees you at least ten years use of your HSS from the date of purchase, or Agilent will credit you with the residual value of the system when you upgrade to an Agilent replacement system.

Agilent Service Guarantee

Should your Agilent instrument require service while covered by an Agilent service agreement, we guarantee repair or we will replace your instrument for free. No other company offers you this level of commitment to keeping your laboratory running at maximum productivity.

For more information about Agilent's G1888 Network Headspace Sampler and 7890A Gas Chromatograph, visit us online at **www.agilent.com/chem.**

Call toll free: **1 800 227 9770**, option 1 (in the US and Canada).

Or contact your **local Agilent Representative** or **Agilent Authorized Distributor**.

Don't forget to stock up on essential Agilent supplies to ensure a lifetime of peak instrument performance. Visit our Online Store at **www.agilent.com/chem/store**.

Printed in USA May 25, 2007
5989-6491EN

Agilent Technologies