Featured Application: *Alkylfurans on LPGC Rxi-624 Sil MS*

Fast Analysis of Alkylfurans by LPGC-MS

- 2.3x faster than conventional GC-MS analysis.
- Reduces helium usage by 72% compared to conventional GC-MS methods.
- Rxi-624Sil MS kits are factory connected with a proven leak-free connector making LPGC as simple as a column change.

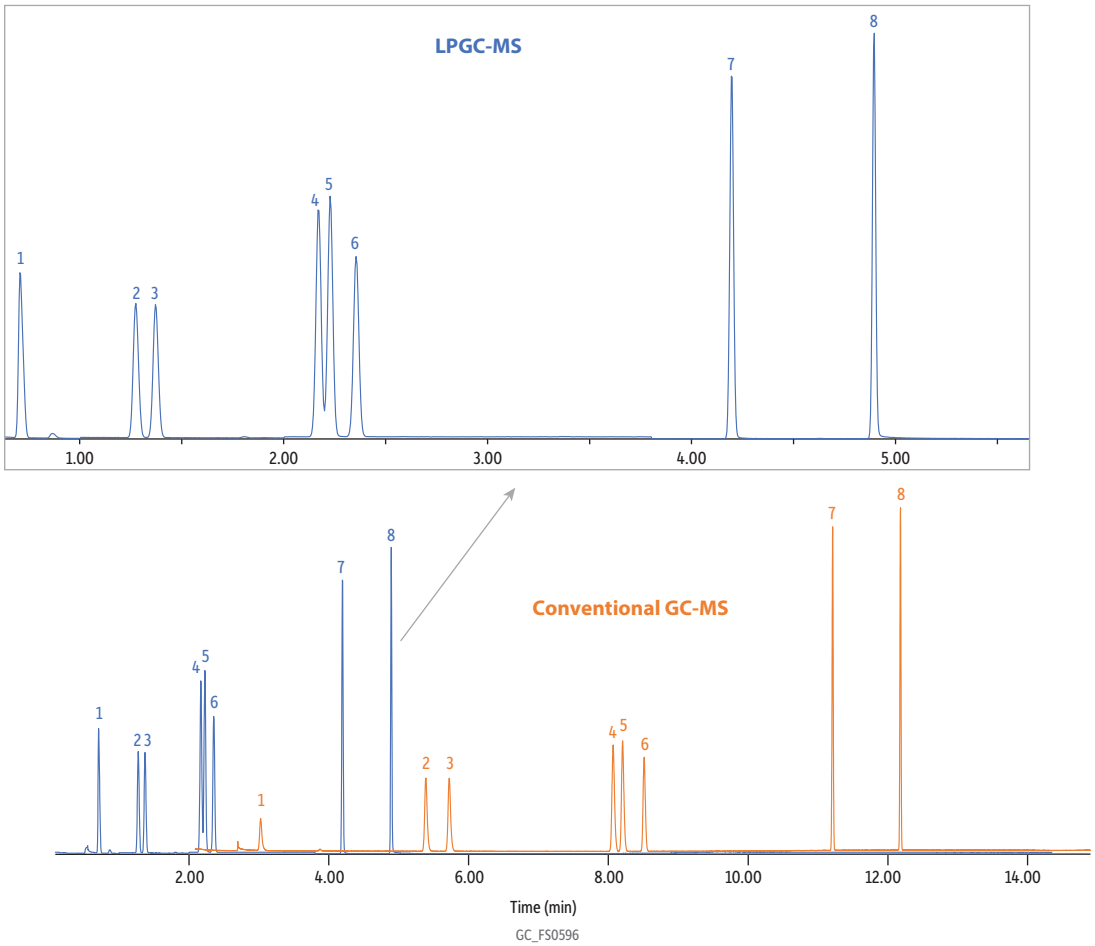
A known toxin in food products generated through the processes of heat or sterilization, alkylfurans are an important class of compounds in food safety testing. These potential carcinogens are a global health concern and are commonly analyzed by static headspace or solid phase microextraction coupled with GC-MS. Laboratories analyzing for alkylfurans in food products often work with a high volume of diverse sample types that can make conventional GC-MS analysis costly and time-consuming. Additionally, there are several critical separations that can be troublesome and difficult to resolve.

We developed a novel method to significantly cut down on extended analysis times with our new Rxi-624Sil MS low-pressure GC (LPGC) column kit. This unique column setup lowers the pressure inside the column, allowing for drastic reductions in analysis time and helium usage. Analyzing eight common alkylfurans on the LPGC Rxi-624 Sil MS kit (cat.# 11804), analysis time was reduced from ~12 minutes to ~5 minutes compared to the conventional GC method (see Figure 1 below). Additionally, good resolution was achieved for the critical separations of 2-methylfuran and 3-methylfuran (Peak 2 and Peak 3) along with 2,3-dimethylfuran and 2,5-dimethylfuran (Peak 5 and Peak 6).

A simple column change can lead to significant gains for food safety labs analyzing a high volume of samples. Utilizing a LPGC column significantly reduces analysis time allowing for increased sample throughput while conserving helium. Each of our factory-coupled LPGC kits are individually tested, so you can have the assurance of a leak-free connection. To learn more about the LPGC technique, visit **www.restek.com/lpgc**

Figure 1: Fast GC-MS Analysis of Alkylfurans on LPGC Rxi-624Sil MS

- **LPGC-MS is 2.3x faster and uses 72% less helium compared to conventional GC-MS.**



Peaks	tR (30 m)	tR (LPGC)	Conc. (ppm)	Quan. Ion	Qual. Ion
1. Furan	3.03	0.71	10	68	39
2. 2-Methylfuran	5.393	1.276	10	82	53
3. 3-Methylfuran	5.727	1.374	10	82	53
4. 2-Ethylfuran	8.072	2.172	10	81	96
5. 2,5-Dimethylfuran	8.208	2.23	10	95	81
6. 2,3-Dimethylfuran	8.515	2.357	10	95	81
7. 2-Butylfuran	11.21	4.199	10	81	124
8. 2-Pentylfuran	12.179	4.896	10	81	138

Column	See notes
Standard/Sample	Custom furans standard
Diluent:	Methanol (PT)
Conc.:	10 µg/mL
Injection	
Inj. Vol.:	1 µL split (split ratio 100:1)
Liner:	Topaz, Precision inlet liner, 4.0 mm x 6.3 x 78.5 (cat.# 23305)
Inj. Temp.:	250 °C
Carrier Gas	He
Detector	MS
Mode:	SIM
Transfer Line Temp.:	280 °C
Analyzer Type:	Quadrupole
Source Temp.:	230 °C
Quad Temp.:	150 °C
Tune Type:	PFTBA
Ionization Mode:	EI
Instrument	Agilent 7890B GC & 5977A MSD
Sample Preparation	The sample was put in a 2 mL short-cap, screw-thread vial (cat.# 21143) and capped with a short-cap, screw-vial closure (cat.# 24495).
Notes	**Conventional (30 m) Analysis:** Column: Rxi-624Sil MS, 30 m, 0.25 mm ID, 1.4 µm (cat.# 13868) Temp. program: 35 °C (hold 3 min) to 75 °C at 8 °C/min to 280 °C at 25 °C/min (hold 5 min) Flow: 1.4 mL/min **LPGC-MS Analysis:** Column: LPGC Rxi-624Sil MS column kit, includes 10 m x 0.32 mm ID x 1.8 µm Rxi-624Sil MS analytical column and 5 m x 0.15 mm ID Rxi restrictor factory connected via SilTite connector(cat.# 11804) Temp. program: 35 °C (hold 1 min) to 75 °C at 16 °C/min (hold 0 min) to 280 °C at 35 °C/min (hold 5 min) Flow: 0.9 mL/min The injections were performed on different instruments under different head pressures, resulting in different analyte responses. A furan/alkylfurans multicomponent standard (cat.# 33334) is now available.

Featured Products

Analytical Column	Maintenance & Accessories
	
LPGC Rxi-624Sil MS Column (cat.# 11804)	**Topaz Precision Inlet Liner,** 4.0 mm x 6.3 x 78.5, for Agilent GCs, w/Quartz Wool, Premium Deactivation, 5-pk. (cat.# 23305) **GC Accelerator Oven Insert Kit,** for Agilent 5890, 6890, 7890, and 8890 GCs (cat.# 23849)

LPGC Rxi-624 Sil MS Column Kit

- 2.3x faster analysis of phthalates with 72% less helium consumption.
- Factory-coupled, leak-free kit makes setup as simple as a column change.
- Ideal for speeding up GC-MS and GC-MS/MS methods.

Cat.#	Includes	Units
11804	10 m x 0.32 mm ID x 1.8 µm Rxi-624 Sil MS analytical column and 5 m x 0.15 mm ID Rxi restrictor factory connected via SilTite connector	ea.

Topaz Precision Inlet Liner

Topaz GC inlet liners feature revolutionary technology and inertness to deliver you the next level of True Blue Performance:

- **Deactivation**—unbelievably low breakdown for accurate and precise low-level GC analyses.
- **Reproducibility**—unbeatable manufacturing controls and QC testing for superior reliability across compound classes.
- **Productivity**—unparalleled cleanliness for maximized GC uptime and lab throughput.
- **100% Satisfaction**—if a liner doesn't perform to your expectations, we will replace it or credit your account.

Patented

Cat.#	Product Name	Units
23305	Topaz, Precision inlet liner, 4.0 mm x 6.3 x 78.5, for Agilent GCs, w/quartz wool, premium deactivation	5-pk.

GC Accelerator Oven Insert Kit

for Agilent 5890, 6890, 7890, and 8890 instruments

- GC Accelerator kit installs easily without damaging the GC column or interfering with the MS interface.

Description	Instrument	qty.	cat.#
GC Accelerator Oven Insert Kit	for Agilent 5890, 6890, 7890, and 8890 instruments	kit	23849

If using a 120 V GC oven, a GC Accelerator oven insert kit (cat.# 23849) may be needed to meet aggressive ramp rates.

Related Products

Vials and Caps

Cat.#	Product Name	Units
21143	Short-Cap Vial with Grad Marking Spot, 9-425 Screw-Thread, 2.0 mL, 9 mm, 12 x 32 (vial only), Amber	1000-pk.
24495	Short Screw Caps, Polypropylene, Screw-Thread, PTFE/Silicone/PTFE Septa, Black, Preassembled, 2.0 mL, 9 mm	100-pk.

Headspace Syringes

Cat.#	Product Name	Units
26552	Syringe, Hamilton 1001 (1 mL/N/23/2"/5pt), High Dynamic (HD) Headspace, for CTC CombiPAL Autosampler	ea.
26553	Syringe, Hamilton 1002 (2.5 mL/N/23/2"/5pt), High Dynamic (HD) Headspace, for CTC CombiPAL Autosampler	ea.
25664	Syringe, Hamilton 1005 (5 mL/N/23/2"/5pt), High Dynamic (HD) Headspace, for CTC CombiPAL Autosampler	ea.
26555	Syringe, Hamilton 1001 (1 mL/N/26/2"/5pt), High Dynamic (HD) Headspace, for CTC CombiPAL Autosampler	ea.
26556	Syringe, Hamilton 1002 (2.5 mL/N/26/2"/5pt), High Dynamic (HD) Headspace, for CTC CombiPAL Autosampler	ea.

Smart SPME Arrow

Cat.#	Product Name	Units
28903-1	PAL Smart SPME Arrow 1.10 mm: Carbon-WR/PDMS, Phase Thickness 120 um, Phase Length 20 mm, Light Blue, ea.	ea.

Looking for furan/alkylfuran standards?

A furan/alkylfurans multicomponent standard (cat.# 33334) is now available.

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Pure Chromatography

Questions? Contact us or your local Restek representative (www.restek.com/contact-us).

www.restek.com

Lit. Cat.# GNFA4238A-UNV