Organic Volatile Impurities (OVI) Analysis

Rxi®-624Sil MS Columns

for USP<467> Residual Solvents analysis

NEW!

Improve system suitablility pass rates with the best resolution of acetonitrile and dichloromethane on any G43.

- Symmetric peak shape for bases provides accurate integration and unmatched sensitivity.
- High thermal stability ensures a consistent baseline, making it the only MS friendly column in its class.
- Reproducible Rxi® technology provides the column-to-column reproducibility needed in validated methods.

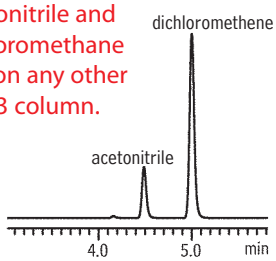
Rxi®-624Sil MS Columns (fused silica)
(midpolarity Crossbond® silarylene phase; equivalent to 6% cyanopropylphenyl/ 94% dimethyl arylene polysiloxane)

- Low bleed, high thermal stability column—maximum temperatures up to 320 °C.
- Inert—excellent peak shape for a wide range of compounds, including acidic and basic compounds.
- Selective—highly selective for residual solvents, great choice for USP<467>.
- Manufactured for column-to-column reproducibility—well-suited for validated methods.

ID	df	temp. limits	20-Meter	30-Meter	60-Meter
0.18mm	1.00µm	-20 to 300/320°C	13865		
0.25mm	1.40µm	-20 to 300/320°C		13868	
0.32mm	1.80µm	-20 to 300/320°C		13870	13872
0.53mm	3.00µm	-20 to 280/300°C		13871	

Class 2 Mix A

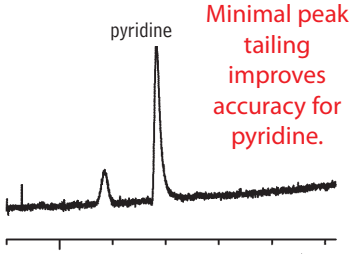
Better resolution of acetonitrile and dichloromethane than on any other G43 column.



GC_PH01116

Class 2 Mix B

Minimal peak tailing improves accuracy for pyridine.



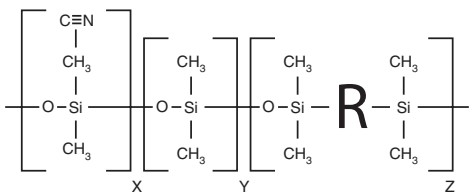
GC_PH01117

Column:	Rxi®-624Sil MS, 30m, 0.32mm ID, 1.8µm (cat.# 13870)
Inj.:	1.0mL manual headspace injection, split (3:1), 1mm split liner (cat.# 20972)
Inj. temp.:	140°C
Carrier gas:	helium, constant flow
Flow rate:	2.2mL/min.
Oven temp.:	40°C (hold 20 min.) to 240°C @ 10°C/min. (hold 20 min.)
Det:	FID @ 250°C
Hydrogen:	40mL/min.
Air:	450mL/min.
Makeup:	45mL/min.
Instrument:	Agilent 6890

Make the Switch to Rxi® columns!

Replaces: DB-624, HP-624, VF-624, BP-624, ZB-624, AT-624, 007-1301, G43R

Rxi®-624Sil MS Structure

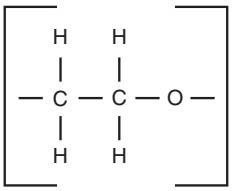


Visit **www.restek.com/ovi** for a complete product listing.

RESTEK

G16 phase

Stabilwax® Structure



similar phases

DB-WAX, DB-WAXetr, HP-Wax, HP-Innowax, Supelcowax 10, CP-Wax 52 CB

Organic Volatile Impurities (OVI) Analysis

Stabilwax® Columns (fused silica)
(polar phase; Crossbond® Carbowax® polyethylene glycol)

- Most stable polyethylene glycol (PEG) column available.
- Rugged enough to withstand repeated water injections.
- Lowest bleed PEG column on the market; long column lifetimes are assured
- Temperature range: 40 °C to 260 °C.
- Equivalent to USP G14, G15, G16, G20, and G39 phases.

Restek's polar-deactivated surface tightly binds the Carbowax® polymer and increases thermal stability, relative to competitive columns. Because of the increased stability produced by the bonding process, Stabilwax® columns exhibit long column lifetimes, even when programming repeatedly up to 260 °C. The bonding mechanism of the column also produces polar compound retention times that do not shift as is often observed on other wax-type columns. In addition, this bonding mechanism produces a column that can be rejuvenated by solvent washing.

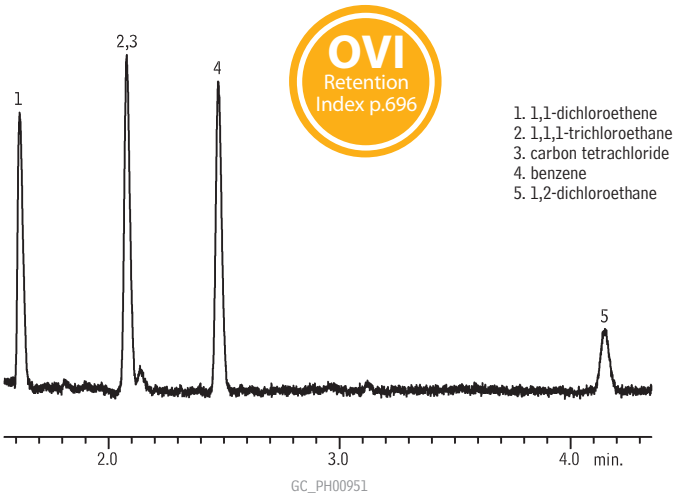
ID	df	temp. limits	30-Meter
0.32mm	0.25µm	40 to 250/260°C	10624
0.53mm	0.25µm	40 to 250/260°C	10625

For our complete listing of Stabilwax® columns, see **page 59**.

ordering note

Get the protection without the connection!
For Stabilwax® columns with built-in Integra-Guard® guard columns, see **page 35**.

Class 1 residual solvents on a Stabilwax® (G16) column.



Column:	Stabilwax®, 30m, 0.32mm ID, 0.25µm (cat.# 10624)
Sample:	USP Stock Mixture USP<467> Residual Solvents Class 1 Mix (cat.# 36279) in 20mL headspace vial (cat.# 24685), water diluent
Inj.:	headspace injection (split ratio 1:5), 2mm splitless liner IP deactivated (cat.# 20712)
Inj. temp.:	140°C
Carrier gas:	helium, constant flow
Flow rate:	2.15mL/min., 35.2cm/sec.
Oven temp.:	50°C for 20 min. to 165°C @ 6°C/min. (hold for 20 min.)
Det.:	FID @ 250°C

Headspace Conditions

Instrument:	Overbrook Scientific HT200H
Syringe temp.:	100°C
Sample temp.:	80°C
Sample equil. time.:	45 min.
Injection vol.:	1.0mL
Injection speed:	setting 8
Injection dwell:	5 sec.

free literature

Residual Solvent Analysis

Download your free copy from **www.restek.com**

lit. cat.# PHFL1018A

Organic Volatile Impurities (OVI) Analysis

Rtx®-5 Columns (fused silica)
(low polarity phase; Crossbond® 5% diphenyl/95% dimethyl polysiloxane)

- General purpose columns for drugs, solvent impurities, pesticides, hydrocarbons, PCB congeners (e.g. Aroclor mixes), essential oils, semivolatiles.
- Temperature range: -60 °C to 350 °C.
- Equivalent to USP G27 and G36 phases.

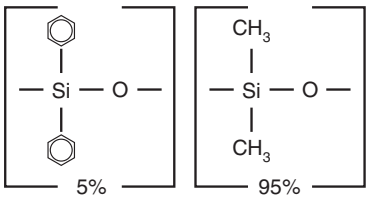
The 5% diphenyl/95% dimethyl polysiloxane stationary phase is the most popular GC stationary phase and is used in a wide variety of applications. All residual catalysts and low molecular weight fragments are removed from the Rtx®-5 polymer, providing a tight mono-modal distribution and extremely low bleed.

ID	df	temp. limits	30-Meter
0.53mm	5.00µm	-60 to 270/290°C	10279

For our complete listing of Rtx®-5 columns, see **page 50**.

G27 phase

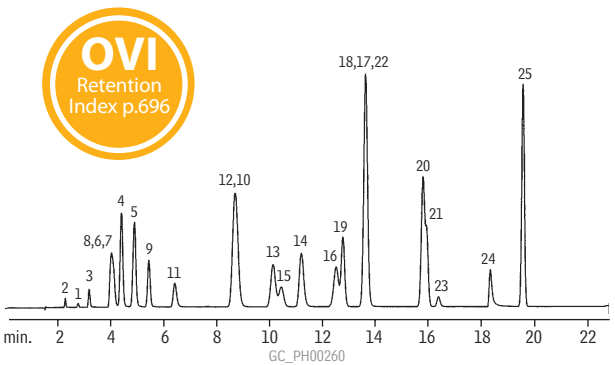
Rtx®-5 Structure



similar phases

DB-5, HP-5, HP-5MS, Ultra-2, SPB-5, Equity-5, MDN-5

Organic volatile impurities on an Rtx®-5 (Rtx®-G27) column.



Rtx®-5 (Rtx®-G27) with 5m phenylmethyl Integra-Guard® guard column, 30m, 0.53mm ID, 5.0µm (cat.# 10279-126)

1. ethylene oxide
2. methanol
3. ethanol
4. diethyl ether
5. 1,1-dichloroethene
6. acetone
7. isopropanol
8. acetonitrile
9. methylene chloride
10. *n*-hexane
11. *n*-propanol
12. methyl ethyl ketone
13. ethyl acetate
14. tetrahydrofuran
15. chloroform
16. 1,1,1-trichloroethane
17. carbon tetrachloride
18. benzene
19. 1,2-dichloroethane
20. heptane
21. trichloroethylene
22. *n*-butanol
23. 1,4-dioxane
24. pyridine
25. toluene

Inj.:	Headspace injection of common solvents for pharmaceutical processing. Prepared to equal about 500ppm in the bulk pharmaceutical. Samples shaken and heated at 90°C for 15 minutes, 1mL headspace injection.
Oven temp.:	35°C (hold 10 min.) to 100°C @ 5°C/min., to 240°C @ 25°C/min. (hold 5 min.)
Inj./det. temp.:	220°C/240°C
FID sensitivity:	1.05 x 10^{-11} AFS
Carrier gas:	helium, 35cm/sec. set @ 35°C
Split ratio:	2:1

Organic Volatile Impurities (OVI) Analysis

Rtx®-G27 Column (fused silica with 5-meter Integra-Guard® guard column)
(Crossbond® 5% diphenyl/95% dimethyl polysiloxane)

- Application-specific columns for residual solvents in pharmaceutical products. Meet all requirements of USP <467>.
- Analytical column with Integra-Guard® guard column eliminates connecting problems and leaks.
- Rtx®-G27 stable to 290 °C.

Some USP <467> methods require the use of a guard column. Our Integra-Guard® integrated guard column system makes it easy to comply.

ID	df	temp. limits	30-Meter with 5-Meter, 0.53mm ID Integra-Guard Guard Column
0.53mm	5.00µm	-60 to 270/290°C	10279-126

Rtx®-G43 Column (fused silica with 5-meter Integra-Guard® guard column)
(Crossbond® 6% cyanopropylphenyl/94% dimethyl polysiloxane)

- Application-specific columns for residual solvents in pharmaceutical products. Meet all requirements of USP <467>.
- Analytical column with Integra-Guard® guard column eliminates connecting problems and leaks.
- Rtx®-G43 stable to 240 °C.

Some USP <467> methods require the use of a guard column. Our Integra-Guard® integrated guard column system makes it easy to comply.

ID	df	temp. limits	30-Meter with 5-Meter, 0.53mm ID Integra-Guard Guard Column
0.53mm	3.00µm	-20 to 240°C	16085-126

USP
Pharmaceutical Standards
See **pages 527-528**.

free
literature

A Technical Guide for Static Headspace Analysis Using GC

Download your free copy from **www.restek.com**

lit. cat.# 59895A

Diane Thompson, Customer Service

Restek Customer Service

In the U.S.

Call: 800-356-1688 (ext. 3) or 814-353-1300 (ext. 3)

Monday–Friday 8:00 a.m.–6:00 p.m. ET

Fax: 814-353-1309—24-hours a day

Online: www.restek.com—24-hours a day

Outside the U.S.

Contact your Restek representative:
Refer to our list on pages 4-5 or visit our website at www.restek.com