Environmental Products

Innovative Solutions, Comprehensive Support

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RESTEK

Chromatography Products

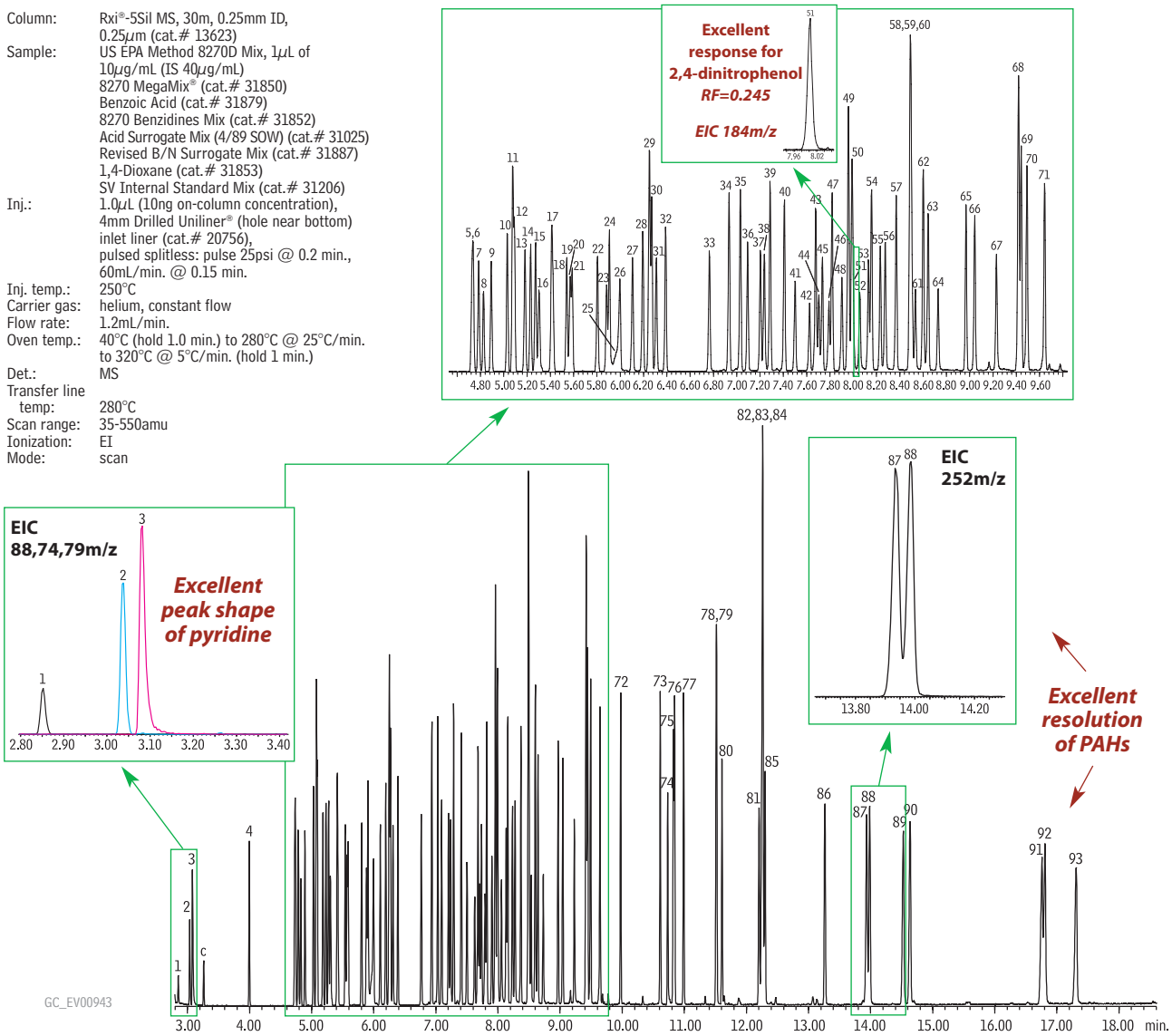
www.restek.com

Fast, Accurate Analysis of Semivolatile Compounds at Trace Levels with New Rxi®-5Sil MS Columns

- High column inertness results in lower detection limits for phenols and other active compounds.
- Excellent resolution of isomeric compounds—including benzo(b)flouranthene and benzo(k)fluoranthene—speeds up analysis times.
- Lowest bleed column on the market; reduced noise allows lower detection limits for late eluting PAHs.

Figure 1 Easily resolve semivolatiles, including PAHs, using a 30m, 0.25mm ID, 0.25µm Rxi®-5Sil MS column.

Column:	Rxi®-5Sil MS, 30m, 0.25mm ID, 0.25µm (cat.# 13623)
Sample:	US EPA Method 8270D Mix, 1µL of 10µg/mL (IS 40µg/mL) 8270 MegaMix® (cat.# 31850) Benzoic Acid (cat.# 31879) 8270 Benzidines Mix (cat.# 31852) Acid Surrogate Mix (4/89 SOW) (cat.# 31025) Revised B/N Surrogate Mix (cat.# 31887) 1,4-Dioxane (cat.# 31853) SV Internal Standard Mix (cat.# 31206)
Inj.:	1.0µL (10ng on-column concentration), 4mm Drilled Uniliner® (hole near bottom) inlet liner (cat.# 20756), pulsed splitless: pulse 25psi @ 0.2 min., 60mL/min. @ 0.15 min.
Inj. temp.:	250°C
Carrier gas:	helium, constant flow
Flow rate:	1.2mL/min.
Oven temp.:	40°C (hold 1.0 min.) to 280°C @ 25°C/min. to 320°C @ 5°C/min. (hold 1 min.)
Det.:	MS
Transfer line temp:	280°C
Scan range:	35-550amu
Ionization:	EI
Mode:	scan



1. 1,4-dioxane
2. *n*-nitrosodimethylamine
3. pyridine
c. toluene
4. 2-fluorophenol (SS)
5. phenol-d6 (SS)
6. phenol
7. aniline
8. bis(2-chloroethyl) ether
9. 2-chlorophenol
10. 1,3-dichlorobenzene
11. 1,4-dichlorobenzene-d4 (IS)
12. 1,4-dichlorobenzene
13. benzyl alcohol
14. 1,2-dichlorobenzene
15. 2-methylphenol
16. bis(2-chloroisopropyl) ether
17. 4-methylphenol/3-methylphenol
18. *n*-nitroso-di-*n*-propylamine
19. hexachloroethane
20. nitrobenzene-d5 (SS)
21. nitrobenzene
22. isophorone
23. 2-nitrophenol
24. 2,4-dimethylphenol
25. benzoic acid
26. bis(2-chloroethoxy)methane
27. 2,4-dichlorophenol
28. 1,2,4-trichlorobenzene
29. naphthalene-d8 (IS)
30. naphthalene
31. 4-chloroaniline
32. hexachlorobutadiene
33. 4-chloro-3-methylphenol
34. 2-methylnaphthalene
35. 1-methylnaphthalene
36. hexachlorocyclopentadiene
37. 2,4,6-trichlorophenol
38. 2,4,5-trichlorophenol
39. 2-fluorobiphenyl (SS)
40. 2-chloronaphthalene
41. 2-nitroaniline
42. 1,4-dinitrobenzene
43. dimethyl phthalate
44. 1,3-dinitrobenzene
45. 2,6-dinitrotoluene
46. 1,2-dinitrobenzene
47. acenaphthylene
48. 3-nitroaniline
49. acenaphthene-d10 (IS)
50. acenaphthene
51. 2,4-dinitrophenol
52. 4-nitrophenol
53. 2,4-dinitrotoluene
54. dibenzofuran
55. 2,3,5,6-tetrachlorophenol
56. 2,3,4,6-tetrachlorophenol
57. diethyl phthalate
58. 4-chlorophenyl phenyl ether
59. fluorene
60. 4-nitroanaline
61. 4,6-dinitro-2-methylphenol
62. *n*-nitrosodiphenylamine (diphenylamine)
63. 1,2-diphenylhydrazine (as azobenzene)
64. 2,4,6-tribromophenol (SS)
65. 4-bromophenyl phenyl ether
66. hexachlorobenzene
67. pentachlorophenol
68. phenanthrene-d10 (IS)
69. phenanthrene
70. anthracene
71. carbazole
72. di-*n*-butyl phthalate
73. fluoranthene
74. benzidine
75. pyrene-d10 (SS)
76. pyrene
77. *p*-terphenyl-d14 (SS)
78. 3,3'-dimethylbenzidine
79. butyl benzyl phthalate
80. bis(2-ethylhexyl) adipate
81. 3,3'-dichlorobenzidine
82. benzo(a)anthracene
83. bis(2-ethylhexyl) phthalate
84. chrysene-d12 (IS)
85. chrysene
86. di-*n*-octyl phthalate
87. benzo(b)fluoranthene
88. benzo(k)fluoranthene
89. benzo(a)pyrene
90. perylene-d12 (IS)
91. indeno(1,2,3-cd)pyrene
92. dibenzo(a,h)anthracene
93. benzo(ghi)perylene

c = contaminant

Recommended Columns

Rxi®-5Sil MS Columns (fused silica)

(Crossbond®, selectivity close to 5% diphenyl/95% dimethyl polysiloxane)

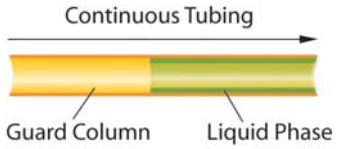
ID	df (µm)	temp. limits	length	cat. #
0.18mm	0.18	-60 to 330/350°C	20-Meter	43602
0.18mm	0.36	-60 to 330/350°C	20-Meter	43604
0.25mm	0.25	-60 to 330/350°C	30-Meter	13623
0.25mm	0.50	-60 to 330/350°C	30-Meter	13638

For additional dimensions, visit **www.restek.com/rxi** or see our catalog.

Rxi®-5Sil MS with Integra-Guard™

- Extend column lifetime.
- Inertness verified by isothermal testing.

Eliminate leaks with a built-in retention gap.



Integra-Guard™ columns are available for columns with 0.25, 0.32 or 0.53mm ID. If you don't see what you need here, contact us.

Description	qty.	cat.#
30m, 0.25mm ID, 0.25µm Rxi-5Sil MS w/5m Integra-Guard Column	ea.	13623-124
30m, 0.25mm ID, 0.25µm Rxi-5Sil MS w/10m Integra-Guard Column	ea.	13623-127
30m, 0.25mm ID, 0.50µm Rxi-5Sil MS w/5m Integra-Guard Column	ea.	13638-124
30m, 0.25mm ID, 0.50µm Rxi-5Sil MS w/10m Integra-Guard Column	ea.	13638-127

Rxi® Guard/Retention Gap Columns

- Extend column lifetime.
- Excellent inertness—obtain lower detection limits for active compounds.
- Sharper chromatographic peaks by utilizing retention gap technology.
- Maximum temperature: 360°C.

Nominal ID	Nominal OD	5-Meter
0.25mm	0.37 ± 0.04mm	10029
0.32mm	0.45 ± 0.04mm	10039

Universal Angled Press-Tight® Connectors

- Angle approximates the curvature of a capillary column, reduces strain on column-end connections.
- Deactivated Press-Tight® connectors assure better recovery of polar and nonpolar compounds.
- Fit column ODs from 0.33–0.74mm (Restek 0.1mm–0.53mm ID).

Description	5-pk.	25-pk.
Deactivated Universal Angled Press-Tight Connectors	20446-261	20447-261

techtip *Inert Sample Path Increases Accuracy for Semivolatiles*

Injection port liners are designed in many configurations, four of which are commonly used for semivolatiles analysis: the single gooseneck, double gooseneck, cyclo double gooseneck, and the Drilled Uniliner® inlet liner. While all four liner types are used for 8270 analysis, we recommend the Drilled Uniliner® inlet liner when using constant flow, and the cyclo double gooseneck inlet liner with pressure pulse conditions.

The Drilled Uniliner® inlet liner is the most inert liner because the metal injection port outside the glass liner is not exposed to the sample—the sample is virtually "funneled" into the column. Also, when using the Drilled Uniliner® inlet liner, inlet seals do not need to be replaced as often, saving maintenance cost and time. The cyclo double gooseneck liner is recommended with pressure pulse conditions. Its corkscrew type sample path enhances sample vaporization and helps prevent sample contact with metal surfaces below the liner. When using a gooseneck type liner, however, routinely replacing the inlet seal below the liner is critical. Gold plated and Siltek® treated inlet seals ensure an inert sample path.

Liners shown are for Agilent instruments; liners for other instruments also are available. For a complete list of liners and seals, visit www.restek.com/liners.

Description (ID* x OD & Length)	qty./cat.#	qty./cat.#
A) Gooseneck Splitless (4.0mm x 6.5mm x 78.5mm)	ea./20798	5-pk./20799
B) Double Gooseneck Splitless (4.0mm x 6.5mm x 78.5mm)	ea./20784	5-pk./20785
C) Cyclo Double Gooseneck (4.0mm x 6.5mm x 78.5mm)	ea./20895	5-pk./20896
D) Drilled Uniliner (hole near bottom) (4.0mm x 6.3mm x 78.5mm)	ea./20756	5-pk./20771

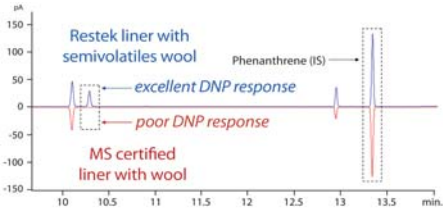
*Nominal ID at syringe needle expulsion point.

See page 9 for **Dual Vespel® Ring Inlet Seals**
Washerless, leak-tight seals for Agilent GCs!

Semivolatiles Wool

Our new deactivated wool gives excellent inertness for semivolatiles analysis. Acidic compounds are reactive and can be difficult to quantify with wool placed in the inlet liner. With the new deactivation used for this wool, the response of 2,4-dinitrophenol is excellent and an improvement over competitor deactivated wool for semivolatiles analysis. As shown in Figure 1, the response of 10ng of 2,4-dinitrophenol using the new wool in the liner is 0.21, where the competitive "MS Certified Liner" with wool shows virtually no response.

Figure 1 Response of 10ng of 2,4-dinitrophenol (DNP) compared to phenanthrene using a flame ionization detector.



To order the new Semivolatiles Wool in prepacked liners, add the corresponding suffix number to the liner catalog number.

qty.	IP Deactivated Liner with Semivolatiles Wool		Siltek Liner with Semivolatiles Wool	
each	-231.1	addl. cost	-232.1	addl. cost
5-pk.	-231.5	addl. cost	-232.5	addl. cost
25-pk.	-231.25	addl. cost	-232.25	addl. cost

Semivolatiles (cont.)

Reference Standards

EASIER calibration

8270 MegaMix® and 8270 Matrix Spike Mix include 3-methylphenol and 4-methylphenol at 1/2 x concentration of other components.

SV Internal Standard Mix

acenaphthene-d10
chrysene-d12
1,4-dichlorobenzene-d4
naphthalene-d8
perylene-d12
phenanthrene-d10

MULTI packs available

2,000µg/mL each in methylene chloride, 1mL/ampul
cat. # 31206

4,000µg/mL each in methylene chloride, 1mL/ampul
cat. # 31006

B/N Surrogate Mix (4/89 SOW)

2-fluorobiphenyl
nitrobenzene-d5
p-terphenyl-d14

MULTI packs available

1,000µg/mL each in methylene chloride, 1mL/ampul
cat. # 31024

5,000µg/mL each in methylene chloride, 1mL/ampul
cat. # 31062

5,000µg/mL each in methylene chloride, 5mL/ampul
cat. # 31086

5,000µg/mL each in methylene chloride, 10mL/ampul
cat. # 33028

Acid Surrogate Mix (4/89 SOW)

2-fluorophenol
phenol-d6
2,4,6-tribromophenol

MULTI packs available

2,000µg/mL each in methanol, 1mL/ampul
cat. # 31025

10,000µg/mL each in methanol, 1mL/ampul
cat. # 31063

10,000µg/mL each in methanol, 5mL/ampul
cat. # 31087

10,000µg/mL each in methanol, 10mL/ampul
cat. # 33029

605 Benzidines Calibration Mix

benzidine
3,3'-dichlorobenzidine

2,000µg/mL each in methanol, 1mL/ampul
cat. # 31030

2,000µg/mL each in methylene chloride, 1mL/ampul
cat. # 31834

GC/MS Tuning Mixture

benzidine
4,4'-DDT
DFTPP
pentachlorophenol

1,000µg/mL each in methylene chloride, 1mL/ampul
cat. # 31615

Restek MSD Source Nut

- 1.2mm nut bore permits easy removal of ferrules with a standard tapered-needle file (cat.# 20106).
- Made of brass to prevent thread-stripping on the transfer line.
- Design enhances ease of threading onto the transfer line and improves overall lifetime.

Description	Similar to Agilent part #	qty.	cat.#
(Detector) MSD Source Nut	05988-20066	2-pk.	20643

8270 MegaMix® (76 components)

acenaphthene
acenaphthylene
aniline
anthracene
azobenzene[1]
benzo(a)anthracene
benzo(a)pyrene
benzo(b)fluoranthene
benzo(ghi)perylene
benzo(k)fluoranthene
benzyl alcohol
benzyl butyl phthalate
bis(2-chloroethoxy)methane
bis(2-chloroethyl)ether
bis(2-chloroisopropyl)ether
bis(2-ethylhexyl)adipate
bis(2-ethylhexyl)phthalate
4-bromophenyl phenyl ether
carbazole
4-chloroaniline
4-chloro-3-methylphenol
2-chloronaphthalene
2-chlorophenol
4-chlorophenyl phenyl ether
chrysene
dibenzo(a,h)anthracene
dibenzofuran
1,2-dichlorobenzene
1,3-dichlorobenzene
1,4-dichlorobenzene
2,4-dichlorophenol
diethyl phthalate
2,4-dimethylphenol
dimethyl phthalate
di-*n*-butyl phthalate
1,2-dinitrobenzene
1,3-dinitrobenzene
1,4-dinitrobenzene
4,6-dinitro-2-methylphenol
2,4-dinitrophenol
2,4-dinitrotoluene
2,6-dinitrotoluene
di-*n*-octyl phthalate
diphenylamine[2]
fluoranthene
fluorene
hexachlorobenzene
hexachlorobutadiene
hexachlorocyclopentadiene
hexachloroethane
indeno(1,2,3-cd)pyrene
isophorone
1-methylnaphthalene
2-methylnaphthalene
2-methylphenol
3-methylphenol
4-methylphenol
naphthalene
2-nitroaniline
3-nitroaniline
4-nitroaniline
nitrobenzene
2-nitrophenol
4-nitrophenol
N-nitrosodimethylamine
N-nitroso-di-*n*-propylamine
pentachlorophenol
phenanthrene
phenol
pyrene
pyridine
2,3,4,6-tetrachlorophenol
2,3,5,6-tetrachlorophenol
1,2,4-trichlorobenzene
2,4,5-trichlorophenol
2,4,6-trichlorophenol

1,000µg/mL each in methylene chloride, 1mL/ampul*
cat. # 31850

*3-methylphenol and 4-methylphenol concentration is 500µg/mL each.
[1]1,2-diphenylhydrazine (8270-listed analyte) decomposes to azobenzene (mix component) in the injector.
[2]N-nitrosodiphenylamine (8270-listed analyte) decomposes to diphenylamine (mix component) in the injector.

8270 Matrix Spike Mix (76 components)

MULTI packs available

Same list as 8270MegaMix above

200µg/mL each in methanol:methylene chloride (80:20), 5mL/ampul**
cat. # 31687

200µg/mL each in methanol:methylene chloride (80:20), 10mL/ampul**
cat. # 33073

**3-methylphenol and 4-methylphenol concentration is 100µg/mL each.

Recommended GC Columns for Other Applications

Organophosphorus Pesticides

Rtx®-OPPesticides/Rtx®-OPPesticides2 (proprietary Crossbond® phases)

- Application-specific columns for organophosphorus pesticides; best column combination for US EPA Method 8141A.
- Low bleed—ideal for GC/FPD, GC/NPD, or GC/MS analyses.
- Stable to 330°C.

Using computer modeling software, we created two stationary phases for separating the 55 organophosphorus pesticides (OPP) listed in EPA Method 8141A. Separation is improved, and analysis time is significantly reduced, compared to other columns. The extended upper temperature limit of these phases (330°C) allows analysts to bake out the high molecular weight contamination typically associated with pesticide samples. The low bleed columns are a perfect match for sensitive detection systems.

Rtx®-OPPesticides Columns (fused silica)

ID	df (µm)	temp. limits	length	cat. #
0.25mm	0.40	-20 to 310/330°C	30-Meter	55239
0.32mm	0.50	-20 to 310/330°C	30-Meter	11239
0.53mm	0.83	-20 to 310/330°C	30-Meter	11240

Rtx®-OPPesticides2 Columns (fused silica)

ID	df (µm)	temp. limits	length	cat. #
0.18mm	0.20	-20 to 310/330°C	20-Meter	11244
0.25mm	0.25	-20 to 310/330°C	30-Meter	11243
0.32mm	0.32	-20 to 310/330°C	30-Meter	11241
0.53mm	0.50	-20 to 310/330°C	30-Meter	11242

PCB Congeners

Rtx®-PCB (proprietary Crossbond® phase)

- Unique polymer for PCBs analysis by GC/ECD or GC/MS.
- Alternate selectivity for other semivolatiles.
- Low polarity; inert to active compounds.
- Stable to 340°C.

ID	df (µm)	temp. limits	length	cat. #
0.18mm	0.18	30°C to 320/340°C	20-Meter	41302
0.18mm	0.18	30°C to 320/340°C	40-Meter	41303
0.18mm	0.18	30°C to 320/340°C	60-Meter	41304
0.25mm	0.25	30°C to 320/340°C	30-Meter	13223
0.25mm	0.25	30°C to 320/340°C	60-Meter	13226
0.32mm	0.50	30°C to 320/340°C	30-Meter	13239

Rxi®-XLB (low polarity proprietary phase)

- General purpose columns exhibiting extremely low bleed. Ideal for many GC/MS applications, including pesticides, PCB congeners or (e.g.) Aroclor mixes, PAHs.
- Unique selectivity.
- Temperature range: 30°C to 360°C.

similar **phases**

DB-XLB, VF-Xms

ID	df (µm)	temp. limits	length	cat. #
0.10mm	0.10	30 to 340/360°C	10-Meter	43701
0.18mm	0.18	30 to 340/360°C	20-Meter	43702
0.25mm	0.10	30 to 340/360°C	15-Meter	13705
0.25mm	0.10	30 to 340/360°C	30-Meter	13708
0.25mm	0.25	30 to 340/360°C	15-Meter	13720
0.25mm	0.25	30 to 340/360°C	30-Meter	13723
0.25mm	0.25	30 to 340/360°C	60-Meter	13726
0.25mm	0.50	30 to 340/360°C	30-Meter	13738
0.25mm	1.00	30 to 340/360°C	15-Meter	13750
0.25mm	1.00	30 to 340/360°C	30-Meter	13753

Brominated Flame Retardants

Rtx®-1614 Columns (fused silica)
(5% phenyl methyl)

- Optimized for PBDE analysis by EPA Method 1614.
- Short column option elutes BDE-209 3 times faster.
- Unique deactivation gives higher BDE-209 response, compared to DB-5HT columns, for greater analytical sensitivity.
- Exceeds EPA Method 1614 resolution criteria for BDE-49 and BDE-71.

ID	df (µm)	temp. limits	length	cat. #
0.25mm	0.10	-60 to 330/360°C	15-Meter	10296
0.25mm	0.10	-60 to 330/360°C	30-Meter	10295

Dioxin and Furans

Rtx®-Dioxin2 (proprietary Crossbond® phase)

- Isomer specificity for 2,3,7,8-TCDD and 2,3,7,8-TCDF achieved with one GC column.
- Thermally stable to 340°C for longer lifetime.
- Unique selectivity for toxic dioxin and furan congeners allows use as a primary or confirmation GC column.
- Excellent confirmation column for 2,3,7,8-TCDF.
- Replaces cyano-based phases, such as 2330, 2340, or 225.

ID	df (µm)	temp. limits	length	cat. #
0.18mm	0.18	20°C to 340°C	40-Meter	10759
0.25mm	0.25	20°C to 340°C	60-Meter	10758

did you know?

Chromatograms for Restek products are easy to find online. You can search our applications library for specific compounds, or view the applications for specific columns directly from their product pages at **www.restek.com**

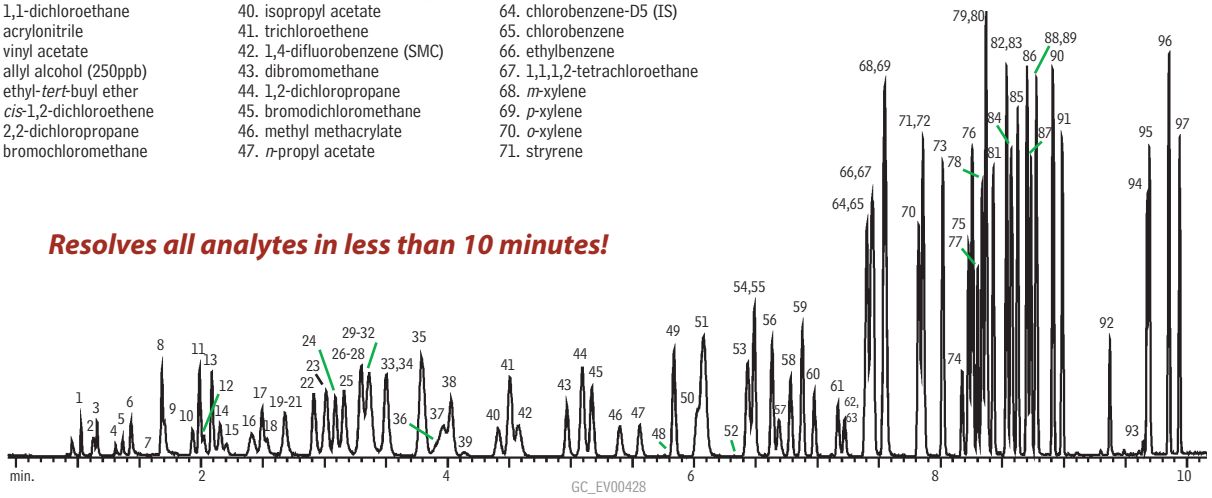
Increase Sample Throughput for Volatiles with Rtx®-VMS Column

- Unique selectivity resolves EPA Method 8260B compounds in less than 10 minutes.
- High thermal stability improves quantification of high boiling point volatiles.
- Ideal for purge and trap systems with mass spec detectors.

Figure 1 Excellent resolution of bromomethane and chloroethane, as well as challenging isomer pairs like 2-/4-chlorotoluene, on the Rtx®-VMS column.

1. dichlorodifluoromethane
2. chloromethane
3. vinyl chloride
4. bromomethane
5. chloroethane
6. trichlorofluoromethane
7. ethanol (2500ppb)
8. 1,1-dichloroethene
9. carbon disulfide (40ppb)
10. allyl chloride
11. methylene chloride
12. acetone
13. *trans*-1,2-dichloroethene
14. methyl *tert*-butyl ether
15. *tert*-butyl alcohol (100ppb)
16. diisopropyl ether
17. 1,1-dichloroethane
18. acrylonitrile
19. vinyl acetate
20. allyl alcohol (250ppb)
21. ethyl-*tert*-buyl ether
22. *cis*-1,2-dichloroethene
23. 2,2-dichloropropane
24. bromochloromethane
25. chloroform
26. ethyl acetate
27. carbon tetrachloride
28. methyl acrylate
29. propargyl alcohol (500ppb)
30. dibromofluoromethane (SMC)
31. tetrahydrofuran
32. 1,1,1-trichloroethane
33. 2-butanone
34. 1,1-dichloropropene
35. benzene
36. pentafluorobenzene (IS)
37. *tert*-amyl-methyl ether
38. 1,2-dichloroethane
39. isobutyl alcohol (500ppb)
40. isopropyl acetate
41. trichloroethene
42. 1,4-difluorobenzene (SMC)
43. dibromomethane
44. 1,2-dichloropropane
45. bromodichloromethane
46. methyl methacrylate
47. *n*-propyl acetate
48. 2-chloroethanol (2500ppb)
49. *cis*-1,3-dichloropropene
50. toluene-d8 (SMC)
51. toluene
52. pyridine (250ppb)
53. tetrachloroethene
54. 4-methyl-2-pentanone
55. *trans*-1,3-dichloropropene
56. 1,1,2-trichloroethane
57. ethyl methacrylate
58. dibromochloromethane
59. 1,3-dichloropropane
60. 1,2-dibromoethane
61. *n*-butyl acetate
62. 2-hexanone
63. 2-picoline (250ppb)
64. chlorobenzene-D5 (IS)
65. chlorobenzene
66. ethylbenzene
67. 1,1,1,2-tetrachloroethane
68. *m*-xylene
69. *p*-xylene
70. *o*-xylene
71. stryrene
72. bromoform
73. isopropylbenzene
74. 4-bromo-1-fluorobenzene (SMC)
75. bromobenzene
76. *n*-propylbenzene
77. 1,1,2,2-tetrachloroethane
78. 2-chlorotoluene
79. 1,3,5-trimethylbenzene
80. 1,2,3-trichloropropane
81. 4-chlorotoluene
82. *tert*-butylbenzene
83. pentachloroethane
84. 1,2,4-trimethylbenzene
85. *sec*-butylbenzene
86. *p*-isopropyltoluene
87. 1,3-dichlorobenzene
88. 1,4-dichlorobenzene-d4 (IS)
89. 1,4-dichlorobenzene
90. *n*-butylbenzene
91. 1,2-dichlorobenzene
92. 1,2-dibromo-3-chloro-propane
93. nitrobenzene (250ppb)
94. hexachlorobutadiene
95. 1,2,4-trichlorobenzene
96. naphthalene
97. 1,2,3-trichlorobenzene

Resolves all analytes in less than 10 minutes!



Column:	Rtx®-VMS, 20m, 0.18mm ID, 1.00µm (cat.# 49914)
Conc.:	10ppb in 5mL of RO water unless otherwise noted; ketones at 2.5X
Concentrator:	Tekmar LSC-3100 Purge and Trap
Trap:	Vocarb 3000 (type K)
Purge:	11 min. @ 40mL/min. (ambient temperature)
Dry purge:	1 min. @ 40mL/min.
Desorb preheat:	245°C
Desorb:	250°C for 2 min., flow 40mL/min.
Bake:	260°C for 8 min.
Interface:	0.53mm ID Silcosteel® tubing transfer line 1:40 split at injection port. 1mm ID liner.
Oven temp.:	50°C (hold 4 min.) to 100°C @ 18°C/min. (hold 0 min.) to 230°C @ 40°C/min. (hold 3 min.)
Carrier gas:	helium @ ~1.0mL/min. constant flow Adjust dichlorodifluoromethane to a retention time of 1.03 min. @ 50°C.
Detector:	Agilent 5973 MSD
Scan range:	35-300amu

[1]A.L. Hilling and G. Smith, Environmental Testing & Analysis, 10(3), 15-19, 2001.

Recommended Columns

Rtx®-VMS Columns (fused silica)
(proprietary Crossbond® phase)

ID	df (µm)	temp. limits	length	cat. #
0.18mm	1.00	-40 to 240/260°C	20-Meter	49914
0.25mm	1.40	-40 to 240/260°C	30-Meter	19915

free literature

Optimizing the Analysis of Volatile Organic Compounds **lit. cat.# 59887A**

Rtx®-VMS Capillary Columns **lit. cat.# 59209A**

Analysis of Trace Oxygenates in Petroleum-Contaminated Wastewater, Using Purge-and-Trap/GC/MS (US EPA Methods 5030B & 8260) **lit. cat.# 59856**

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

Reference Standards

8260 Internal Standard Mix

chlorobenzene-d5
1,4-dichlorobenzene-d4
1,4-difluorobenzene
pentafluorobenzene

2,500µg/mL each in P&T methanol, 1mL/ampul
cat. # 30074

8260A Surrogate Mix

4-bromofluorobenzene
dibromofluoromethane
1,2-dichloroethane-d4
toluene-d8

2,500µg/mL each in P&T methanol, 1mL/ampul
cat. # 30240

8260 Surrogate Mix

4-bromofluorobenzene
dibromofluoromethane
toluene-d8

2,500µg/mL each in P&T methanol, 1mL/ampul
cat. # 30073

8260B MegaMix® Calibration Mix (76 components)

Please visit us online for compound list.

2,000µg/mL each in P&T methanol, 1mL/ampul
cat. # 30633

502.2 Calibration Mix #1 (gases)

bromomethane
chloroethane
chloromethane
dichlorodifluoromethane (CFC-12)
trichlorofluoromethane (CFC-11)
vinyl chloride

200µg/mL each in P&T methanol, 1mL/ampul
cat. # 30439

2,000µg/mL each in P&T methanol, 1mL/ampul
cat. # 30042

8260B Matrix Spike Mix

benzene
chlorobenzene
1,1-dichloroethene
toluene
trichloroethylene

2,500µg/mL each in P&T methanol, 1mL/ampul
cat. # 30479

8240/8260 System Performance Check Mix

bromoform
chlorobenzene
chloromethane
1,1-dichloroethane
1,1,2,2-tetrachloroethane

2,000µg/mL each in P&T methanol, 1mL/ampul
cat. # 30075

Vials

Accuform® Micro-Vials with Screw Threads

- Two sizes available.
- Tapered for high recovery of contents.
- Work with Mininert® sampling valves.

Description	Screw Thread Size	qty.	cat.#
1.0mL Micro-Vial, Accuform Borosilicate Glass, Screw Thread, Graduated, Open Top Closure (attached)	13mm–425	12-pk.	21050
3.0mL Micro-Vial, Accuform Borosilicate Glass, Screw Thread, Graduated, Open Top Closure (attached)	20mm–400	12-pk.	21051

Visit **www.restek.com/enviro**
for more environmental standards & accessories.

Reduce Dead Volume, Contamination, & Cold Spots

The injection port can be a source of dead volume, which is especially problematic when dealing with a sample in the gas phase. The severity of the problem is determined by a combination of the inside diameter of the injection port liner and the total desorb flow through the port. To reduce dead volume in the injection port, use a 1mm ID inert split liner. Always be sure to use insulation where the transfer line attaches to the inlet line, since this is a cold spot that will condense high molecular weight analytes.

Split Liners for Agilent GCs

ID* x OD & Length	qty. / cat.#	qty. / cat.#
1mm Split 1.0mm x 6.3mm x 78.5mm	ea. / 20972	5-pk. / 20973

*Nominal ID at syringe needle expulsion point.

Transfer lines often are the first place contamination occurs. When the response factor for bromoform fails the method criteria, changing the transfer line is the first step to getting the system working again. Replace your transfer line with our Siltek® deactivated tubing, for optimum performance.

Siltek®/Sulfinert® Treated Coiled 304 Grade Stainless Steel Tubing—P&T Transfer Line

Our most popular grade of tubing. Recommended for:

- Purge & trap applications.
- Gas delivery systems.
- Lower pressures.
- Replacing nickel transfer lines.

Ideal for transfer lines

OD	ID	cat.#	5-24 ft.	25-199 ft.
1/16" (1.59mm)	0.040" (1.02mm)	22505		

Precleaned Volatile Organic Analyte (VOA) Sampling Vials

- Container, liner and closure cleaned and assembled; each case is lot numbered.
- Clear or amber.
- Open top caps.
- Teflon® faced 0.125" silicone septa.

Description	Screw-Thread Size	qty.	cat.#
20mL Clear Pre-Cleaned VOA Vials	24mm-400	72-pk.	21798
20mL Amber Pre-Cleaned VOA Vials	24mm-400	72-pk.	21799
40mL Clear Pre-Cleaned VOA Vials	24mm-400	72-pk.	21796
40mL Amber Pre-Cleaned VOA Vials	24mm-400	72-pk.	21797
Replacement Septa for 20, 40 & 60mL Vials and 250mL Bottles (24mm Teflon-lined 0.125" silicone septa)		100-pk.	24694

Mininert® Precision Sampling Valves for Vials

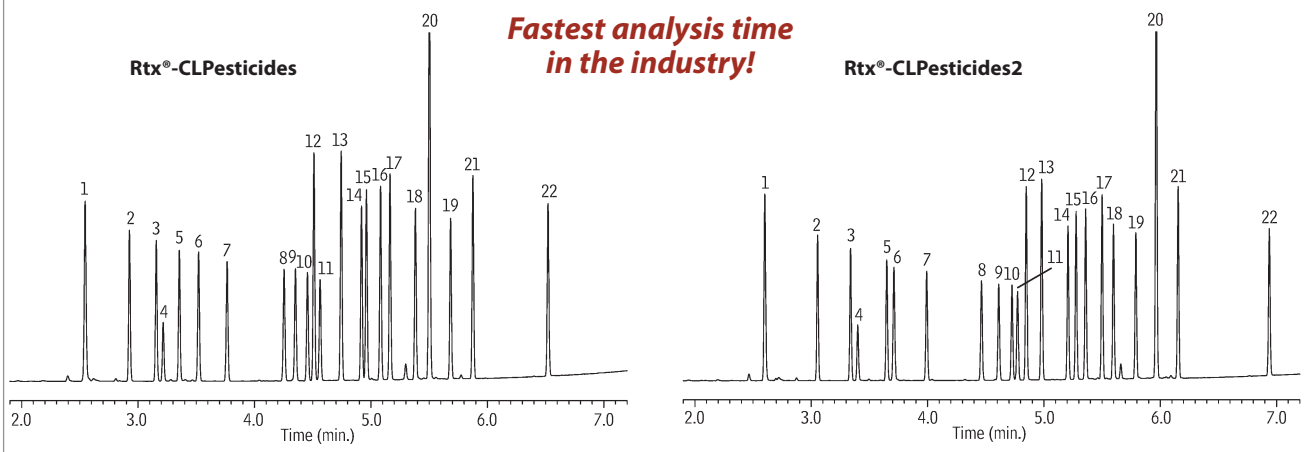
Mininert® valves are very convenient for repetitive sampling and limit content exposure to the silicon septum. Models are available for screw-cap and crimp-top vials. The crimp-top valve for 20mm ID glassware slides into the neck of the vial. Turn the threaded flange to secure a tight fit.

Description	Thread Size	qty.	cat.#
13mm Mininert Screw Cap	13mm–425	12-pk.	24900
15mm Mininert Screw Cap	15mm–425	12-pk.	24901
18mm Mininert Screw Cap	18mm–400	12-pk.	24902
20mm Mininert Screw Cap	20mm–400	12-pk.	24903
24mm Mininert Screw Cap	24mm–400	12-pk.	24904
20mm Mininert Crimp Top	—	12-pk.	24905
Replacement Septa	—	50-pk.	24906
Septum Insertion Tool	—	ea.	24907

Fully Resolve Chlorinated Pesticides in only 7 Minutes Using Rtx®-CLPesticides and Rtx®-CLPesticides2 Columns

- Fastest analysis time in the industry—collect up to 6 runs per hour with 3 minute cooldown times.
- Minimize downtime for column changes; install once and analyze multiple ECD methods, including EPA methods 504, 505, 508, 515, 608, 615, 8011, 8081, and 8151.
- Reduce sample handling; acquire quantitative and confirmation data from a single injection.

Figure 1 New, faster run conditions give excellent response and resolution for all US EPA Method 8081 chlorinated pesticides.



Columns:	Rtx®-CLPesticides, 30m, 0.32mm ID, 0.32µm (cat.# 11141) and Rtx®-CLPesticides2, 30m, 0.32mm ID, 0.25µm (cat.# 11324) with 5m x 0.32mm ID Rxi® deactivated guard tubing (cat.# 10039), connected using Deactivated Universal "Y" Press-Tight® connector (cat.# 20405-261)
Sample:	Organochlorine Pesticide Mix AB #2, 8-80µg/mL each component in hexane/toluene (cat.# 32292), Pesticide Surrogate Mix, 200µg/mL each component in acetone (cat.# 32000)
Inj.:	1.0µL splitless (hold 0.3 min.), 4mm single gooseneck inlet liner (cat.# 20799)
Inj. temp.:	250°C
Carrier gas:	helium, constant flow
Linear velocity:	60cm/sec. @ 120°C
Oven temp.:	120°C to 200°C @ 45°C/min. to 230°C @ 15°C/min. to 330°C (hold 2 min.) @ 30°C/min.
Det.:	ECD @ 330°C

1. 2,4,5,6-tetrachloro-*m*-xylene (SS)
2. α-BHC
3. γ-BHC
4. β-BHC
5. δ-BHC
6. heptachlor
7. aldrin
8. heptachlor epoxide (isomer B)
9. γ-chlordane
10. α-chlordane
11. endosulfan I
12. 4,4'-DDE
13. dieldrin
14. endrin
15. 4,4'-DDD
16. endosulfan II
17. 4,4'-DDT
18. endrin aldehyde
19. endosulfan sulfate
20. methoxychlor
21. endrin ketone
22. decachlorobiphenyl (SS)

Recommended Columns

Rtx®-CLPesticides Columns (fused silica)

ID	df (µm)	temp. limits	length	cat. #
0.18mm	0.18	-60 to 310/330°C	20-Meter	42102
0.25mm	0.25	-60 to 320/340°C	30-Meter	11123
0.32mm	0.32	-60 to 320/340°C	30-Meter	11141
0.53mm	0.50	-60 to 300/320°C	30-Meter	11140

Rtx®-CLPesticides2 Columns (fused silica)

ID	df (µm)	temp. limits	length	cat. #
0.18mm	0.14	-60 to 310/330°C	20-Meter	42302
0.25mm	0.20	-60 to 320/340°C	30-Meter	11323
0.32mm	0.25	-60 to 320/340°C	30-Meter	11324
0.53mm	0.42	-60 to 300/320°C	30-Meter	11340

Siltek® Guard Columns

ID	length	cat. #
0.25mm	5-Meter	10026
0.32mm	5-Meter	10027
0.53mm	5-Meter	10045

also **available**

Florisil® SPE Cartridges. See page 19 for details.

free literature

Analyze Chlorinated Pesticides, PCBs, and Chlorinated Herbicides Using Rtx®-CLPesticides and Rtx®-CLPesticides2 Fused Silica Columns **lit. cat.# EVFL1013**

CarboPrep™ SPE Cleanup of Method 8081A Chlorinated Pesticides **lit. cat.# 59110**

Florisil® SPE Cleanup for Organochlorine Pesticides and PCBs **lit. cat.# 59562A**

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

Increase Sample Throughput Using Dual Analytical Columns and a "Y" Connector Union

SAVE MONEY WITH KITS!

Most laboratories confirm the compound identification obtained on one column with a second column of different selectivity. This is best achieved by making a single injection onto a guard column, which is connected to two analytical columns using a "Y" splitter. This allows data to be collected from both columns simultaneously, allowing samples to be processed without waiting for the confirmation result.

Rtx®-CLPesticides Column Kits

0.25mm ID Rtx®-CLPesticides Kit: cat.# 11199 (kit)

Includes	cat. #
30-Meter, 0.25mm ID, 0.25µm	11123
30-Meter, 0.25mm ID, 0.20µm	11323
Universal Angled "Y" Press-Tight Connector	20403
5-Meter, 0.25mm ID Siltek Guard Column	10026

0.32mm ID Rtx®-CLPesticides Kit: cat.# 11196 (kit)

Includes	cat. #
30-Meter, 0.32mm ID, 0.32µm	11141
30-Meter, 0.32mm ID, 0.25µm	11324
Universal Angled "Y" Press-Tight Connector	20403
5-Meter, 0.32mm ID Siltek Guard Column	10027

0.53mm ID Rtx®-CLPesticides Kit: cat.# 11197 (kit)

Includes	cat. #
30-Meter, 0.53mm ID, 0.50µm	11140
30-Meter, 0.53mm ID, 0.42µm	11340
Universal Angled "Y" Press-Tight Connector	20403
5-Meter, 0.53mm ID Siltek Guard Column	10045

Recommended Liners for Agilent GCs

ID* x OD & Length	qty.	cat.#
		
Gooseneck Splitless (4mm) w/Wool		
4.0mm x 6.5mm x 78.5mm	ea.	22405
4.0mm x 6.5mm x 78.5mm	5-pk.	22406
4.0mm x 6.5mm x 78.5mm	25-pk.	22407
		
Cyclo Double Gooseneck (4mm)		
4.0mm x 6.5mm x 78.5mm	ea.	20895
4.0mm x 6.5mm x 78.5mm	5-pk.	20896
4.0mm x 6.5mm x 78.5mm	25-pk.	20997
		
Open-top Uniliner w/Wool		
4.0mm x 6.3mm x 78.5mm	ea.	22272
4.0mm x 6.3mm x 78.5mm	5-pk.	22273

*Nominal ID at syringe needle expulsion point.

Siltek® Deactivation

- Maximizes the inertness of the sample pathway.
- Minimizes breakdown.
- Low bleed.
- Thermally stable.

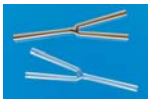
Add the corresponding suffix number to the liner catalog number.

qty.	Siltek Liner		Siltek Liner w/Wool	
each	-214.1	addl. cost	-213.1	addl. cost
5-pk.	-214.5	addl. cost	-213.5	addl. cost
25-pk.	-214.25	addl. cost	-213.25	addl. cost

"Y" Connectors

"Y" connectors are available in both metal and glass. Glass connectors offer the best chromatography, but are prone to leaks. To eliminate leaks, we developed the SeCure™ "Y" connector, which takes advantage of our Press-Tight® connector and adds mechanical strength to hold the columns in place. A second connector, the MXT™ "Y"-Union, is available for fused silica columns.

Universal "Y" Press-Tight® Connectors



Description	ea.	3-pk.
Universal "Y" Press-Tight Connector	20405	20406
Deactivated Universal "Y" Press-Tight Connector	20405-261	20406-261
Siltek Treated Universal "Y" Press-Tight Connector	20485	20486

SeCure™ "Y" Connector Kits

The most secure connector available!

Kits include: SeCure™ "Y" connector body, 3 knurled nuts, "Y" Universal Press-Tight® union, 3 ferrules.

Ferrules Fit Column ID	qty.	cat.#
0.18/0.25/0.28mm	kit	20276
0.32mm	kit	20277
0.45/0.53mm	kit	20278

MXT™ "Y"-Union Connector Kits for Fused Silica Columns

Each kit contains the MXT™ union, three 1/32-inch nuts and three one-piece fused silica adaptors.

Description	qty.	cat.#
For 0.25mm ID Fused Silica Columns	kit	21389
For 0.32mm ID Fused Silica Columns	kit	21388
For 0.53mm ID Fused Silica Columns	kit	21387

Dual Vespel® Ring Inlet Seals for Agilent GCs

restek **innovation!**

Washerless, leak-tight seals for Agilent GCs

21246

0.8mm ID Dual Vespel Ring Inlet Seal	2-pk.	10-pk.
Gold-Plated	21240	21241
Siltek Treated	21242	21243
1.2mm ID Dual Vespel Ring Inlet Seal	**2-pk.**	**10-pk.**
Gold-Plated	21246	21247
Siltek Treated	21248	21249

Organochlorine Pesticides *(cont'd)*

Reference Standards and Sample Preparation

Organochlorine Pesticide Resolution Check Mix (with surrogates) (22 components)

aldrin	10µg/mL	endosulfan I	10
a-BHC	10	endosulfan II	20
b-BHC	10	endosulfan sulfate	20
d-BHC	10	endrin	20
g-BHC (lindane)	10	endrin aldehyde	20
a-chlordane	10	endrin ketone	20
g-chlordane	10	heptachlor	10
decachlorobiphenyl (SS)	20	heptachlor epoxide (isomer B)	10
dieldrin	20	methoxychlor	100
4,4'-DDD	20	2,4,5,6-tetrachloro-m-xylene (SS)	10
4,4'-DDE	20		
4,4'-DDT	20		

In hexane:toluene, 1mL/ampul
cat. # 32454

Organochlorine Pesticide Mix AB #1

(20 components)

aldrin	dieldrin
α-BHC	endosulfan I
β-BHC	endosulfan II
δ-BHC	endosulfan sulfate
γ-BHC (lindane)	endrin
α-chlordane	endrin aldehyde
γ-chlordane	endrin ketone
4,4'-DDD	heptachlor
4,4'-DDE	heptachlor epoxide (isomer B)
4,4'-DDT	methoxychlor

200µg/mL each in hexane:toluene (1:1), 1mL/ampul
cat. # 32291

Florisil® Cartridge Check Standard

2,4,5-trichlorophenol
1,000µg/mL in acetone, 1mL/ampul
cat. # 32017

Sodium Sulfate

- Ideal for removing water from sample extracts.
- Requires activation before use.
- Packaged in recloseable 5kg buckets.

Description	qty.	cat.#
Sodium Sulfate, 60 mesh	5kg	26204

Florisil® PR

- Pesticide residue grade.
- Each lot certified to meet AOAC method requirements.
- Packaged in glass containers.

Description	qty.	cat.#
Florisil PR, 60/100 mesh	500gms	26135

Pesticide Surrogate Mix

decachlorobiphenyl 2,4,5,6-tetrachloro-*m*-xylene
200µg/mL each in acetone, 1mL/ampul
cat. # 32000

Technical Chlordane, Toxaphene Solutions

Volume is 1mL/ampul. Concentration is µg/mL.

Compound	Solvent	µg/mL	cat.#
chlordane (technical)	H	1,000	32021
toxaphene	I	5,000	32071

H = hexane I = isooctane

PCB Kit #1

32006: Aroclor 1016
32007: Aroclor 1221
32008: Aroclor 1232
32009: Aroclor 1242
32010: Aroclor 1248
32011: Aroclor 1254
32012: Aroclor 1260
1,000µg/mL each in hexane, 1mL/ampul
cat. # 32089

Organochlorine Pesticide System Evaluation Mix

4,4'-DDT 200µg/mL endrin 100µg/mL
In methyl *tert*-butyl ether, 1mL/ampul
cat. # 32417

CarboPrep™ SPE Cartridges

- Perfect for pesticide residue extract cleanup.
- Wide range of selectivity for analytes, metabolites, and degradation products.
- Rapid sampling flow rates; maximum capacity for contaminant cleanup.
- Controlled manufacturing improves cleanliness and ensures reproducible performance.

SPE Cartridge	Tube Volume, Bed Weight	qty.	cat#
CarboPrep 90	3mL, 250mg	50-pk.	26091

Granulated Activated Copper

- Convenient form for removing sulfur from environmental extracts.
- Acidified and activated—ready for use.

Description	qty.	cat.#
Granulated Activated Copper, 30 mesh	1kg	26136

Resprep™ SPE Cartridges: Normal Phase

Hydrophilic (polar) adsorbents used to extract hydrophilic analytes from nonpolar matrices, such as organic solvents (e.g., polar contaminants from sample extracts).

	3mL/500mg (50-pk.)	6mL/500mg (30-pk.)	6mL/1000mg (30-pk.)	6mL/1000mg (100-pk.)	15mL/2g (100-pk.)
Florisil (EPA SW 846 methods and CLP protocols)	24031 24032*	— 26086**	24034 26085**	26205 —	26228 —
Silica (EPA SW 846 methods)	24035 24036*	— —	24038 —	— —	— —

*Teflon frits
**Glass tubes with Teflon frits

Gas Purification Essentials

Restek Super-Clean Gas Filters

- High-purity output ensures 99.9999% pure gas (at max. flow of 2L/min.).
- "Quick connect" fittings for easy, leak-tight cartridge changes.
- Glass inside to prevent diffusion; polycarbonate housing outside for safety.
- All traps measure 10⅝" x 1¾" (27 x 4.4 cm).
- Each base plate unit measures 4" x 4" x 1⅞" (10.2 x 10.2 x 4.8 cm).

Table I Each Super-Clean gas filter provides high-purity outlet gas.

Type of Filter	Outlet Gas Quality (%)	Maximum Pressure/ Maximum Flow Rates	Use for:	Indicator Color Change	Capacity H_2O (g)	Capacity O_2 (mL)	Capacity Hydrocarbons (g)	Estimated Lifetime (years)
Moisture cat.# 22028	>99.9999	11 bar 159psi/ 7 L/min.	Inert carrier gas Air Hydrogen	Yellow/orange to clear	7.2	—	—	>2
Oxygen cat.# 22029	>99.9999	11 bar 159psi/ 7 L/min.	Inert carrier gas	Green to grey	NA	1,000	—	>2
Hydrocarbons cat.# 22030	>99.9999	11 bar 159psi/ 7L/min.	Inert carrier gas Air Hydrogen	No indicator	NA	—	12[3]	>2
Fuel Gas[1] cat.# 22022	>99.9999	11 bar 159psi/ 7L/min.	Inert carrier gas Air Hydrogen	Yellow/orange to clear	3.5	—	24[3]	>1.5
Triple[2] cat.# 22020	>99.9999	11 bar 159psi/ 7L/min.	Inert carrier gas	Yellow/orange to clear Green to grey	1.8	500	4[3]	>1
Helium Specific[2] cat.# 21982	>99.9999	11 bar 159psi/ 7L/min.	Helium	Yellow/orange to clear Green to grey	1.8	500	—	>1

[1]Removes hydrocarbons, moisture. [2]Removes hydrocarbons, moisture, oxygen. [3]As *n*-butane.

did you **know**?

All Restek Super-Clean gas filter cartridges (except hydrocarbon filter cat.# 22030) feature easy-to-read indicators. The indicator code is shown on every trap so there is no confusion about when to replace it.

Restek Super-Clean Gas Filter Kits and Replacements

22020

21982

22025

Description	qty.	cat.#
Carrier Gas Cleaning Kit (includes mounting base plate, ⅛" inlet/outlet fittings, and oxygen/moisture/hydrocarbon Triple Gas Filter)	kit	22019
Fuel Gas Purification Kit (includes mounting base plate, ⅛" inlet/outlet fittings, and hydrocarbon/moisture Fuel Gas Filter)	kit	22021
Ultra-High Capacity Hydrocarbon Filter	ea.	22030
Ultra-High Capacity Moisture Filter	ea.	22028
Ultra-High Capacity Oxygen Filter	ea.	22029
Replacement Triple Gas Filter (removes oxygen, moisture and hydrocarbons)	ea.	22020
Replacement Fuel Gas Filter (removes moisture and hydrocarbons)	ea.	22022
Helium-Specific Carrier Gas Cleaning Kit (includes mounting base plate, ⅛" inlet/outlet fittings, and oxygen/moisture/hydrocarbon Helium-Specific Filter)	kit	21983
Replacement Helium-Specific Gas Filter (removes oxygen, moisture and hydrocarbons)	ea.	21982
Gas Filter Bundle Kit (includes one Triple Gas Filter, cat.#22020 and two Fuel Gas Filters, cat.# 22022)	kit	22031
Replacement O-Rings for Cartridge Base Plates	20-pk.	22023

All traps measure:
10⅝" x 1¾" (27 x 4.4 cm)
Each base plate unit measures:
4" x 4" x 1⅞"
(10.2 x 10.2 x 4.8 cm)

22023

Restek Filter Base Plates

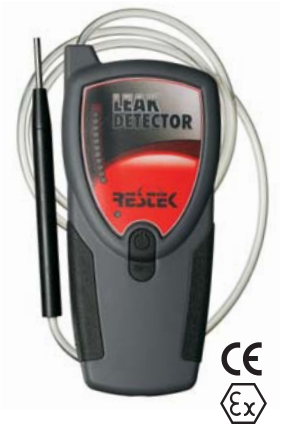
- Standard base plate fittings are ⅛". To adapt to ¼", order ⅛" to ¼" tube-end unions.
- Base plates fit all Super-Clean gas filters listed.

Description	Brass qty.	Brass cat.#	Stainless Steel qty.	Stainless Steel cat.#
Single-Position Filter Base Plate	ea.	22025	ea.	22344
2-Position Filter Base Plate	ea.	22026	ea.	22345
3-Position Filter Base Plate	ea.	22027	ea.	22346

22026

22027

GC Essentials



Restek Electronic Leak Detector

Why have a small leak turn into a costly repair? Protect your analytical column by using a Restek Leak Detector. Backed by a 1-year warranty, the new Restek Leak Detector sets an industry standard for performance and affordability in hand-held leak detectors.

Leak Detector Facts

Detectable gases:	helium, nitrogen, argon, carbon dioxide, hydrogen
Battery:	Rechargeable Ni-MH internal battery pack (6 hours normal operation)
Operating Temp. Range:	32°-120°F (0°-48°C)
Humidity Range:	0-97%
Warranty:	one year
Certifications:	CE, Ex, Japan
Compliance:	WEEE, RoHS

Limits of Detection

Gas	Minimum Detectable Leak Rate (atm cc/sec.)	Indicating LED Light Color
Helium	1.0×10^{-5}	Red
Hydrogen*	1.0×10^{-5}	Red
Nitrogen	1.4×10^{-3}	Yellow
Argon	1.0×10^{-4}	Yellow
Carbon Dioxide	1.0×10^{-4}	Yellow

22657

22658

Description	qty.	cat.#
Leak Detector with Hard-Sided Carrying Case and Universal Charger Set (US, UK, European, Australian)	ea.	22839
Soft-Side Storage Case	ea.	22657
Small Probe Adaptor	ea.	22658

Avoid using liquid leak detectors on a GC! Liquids can be drawn into the system.
*Caution: The Restek Electronic Leak Detector is designed to detect trace amounts of hydrogen in a noncombustible environment. It is NOT designed for determining leaks in a combustible environment. A combustible gas detector should be used for determining combustible gas leaks under any condition. The Restek Electronic Leak Detector may be used for determining trace amounts of hydrogen in a GC environment only.

NEW Restek ProFLOW 6000 Electronic Flowmeter

The ProFLOW 6000 is an electronic device capable of measuring bidirectional volumetric flow for most gases. Real-time measurements can be made for various types of flow paths, including continually changing gas types.

State-of-the-art features include:

- Measures volumetric flow for most gases across a range of 0.5-500 mL/min.
- NIST traceable calibration.
- Explosion-proof rating for flammable and explosive gases.
- Accuracy of ± 2% of flow or ± 0.05 mL/min., whichever is greater.
- Over-range indicator.
- Auto shut-off feature.
- Use as a bench-top or hand-held unit.
- Ergonomic design and side grips for comfort.
- Measures most gas types.
- Convenient carrying/storage case included.
- CE and Ex certified.
- Uses 2AA batteries.
- Data output via USB port.
- Re-calibration service available.
- 1-year warranty.

Coming soon!

Visit **www.restek.com/flowmeter** for details.

Description	qty.	cat.#
Restek ProFLOW 6000 Electronic Flowmeter (hard-sided storage case included)	ea.	22656
Soft-Side Storage Case	ea.	22657

GC Essentials

Vespel®/Graphite Ferrules

- 60%/40% Vespel®/graphite blend, offering the best combination of sealing and ease of workability.
- Seal with minimal torque, reusable, and preferred for vacuum and high-pressure uses.
- Stable to 400°C.
- Recommended for mass spec transfer lines.

Graphite Ferrules

- Preconditioned to eliminate out-gassing.
- High-purity, high-density graphite.
- Smoother surface and cleaner edges than conventional graphite ferrules.
- Contain no binders that can off-gas or adsorb analytes.
- Stable to 450°C.

Capillary Ferrules—For 1/16-Inch Compression-Type Fittings

Ferrule ID	Fits Column ID	qty.	Graphite	Vespel/Graphite
0.3mm	< 0.18mm	10-pk.	20233	20275
0.4mm	0.18/0.25/0.28mm	10-pk.	20200	20211
0.4mm	0.18/0.25/0.28mm	50-pk.	20227	20229
0.5mm	0.32mm	10-pk.	20201	20212
0.5mm	0.32mm	50-pk.	20228	20231
0.6mm	0.28mm**	10-pk.	—	20232
0.8mm	0.45/0.53mm	10-pk.	20202	20213
0.8mm	0.45/0.53mm	50-pk.	20224	20230
1.0mm	0.75mm*	10-pk.	21058	24912
1.2mm	0.75mm	10-pk.	—	—
1.6mm	1.00mm*	10-pk.	21060	—

*For micropacked columns. **For 0.28mm MXT columns.

Compact Ferrules

For Agilent 5890/6890/6850/7890 GCs

Ferrule ID	Fits Column ID	qty.	Graphite	Vespel/Graphite
0.4mm	0.25/0.28mm	10-pk.	20250	20238
0.4mm	0.25/0.28mm	50-pk.	20251	20239
0.5mm	0.32mm	10-pk.	21007	20248
0.5mm	0.32mm	50-pk.	21008	20249
0.8mm	0.45/0.53mm	10-pk.	20252	20263
0.8mm	0.45/0.53mm	50-pk.	20253	20264

Viton® O-Rings for Agilent GCs

- Fit split (6.3mm OD) or splitless (6.5mm OD) liners.

Description	Max. temp.	Similar to Agilent part #	qty.	cat.#
Viton O-Rings for Agilent GCs	250°C	5188-5365	25-pk.	20377

Encapsulated Ferrules—For 1/16-Inch Compression Fittings

Reusable!

- Reusable—will not deform and stick in fittings.
- Less torque needed to seal ferrule.
- Restek's unique blend of graphite minimizes fragmentation and outgassing.

Ferrule ID	Fits Column ID	qty.	cat.#
0.4mm	0.25mm	10-pk.	21036
0.5mm	0.32mm	10-pk.	21037
0.8mm	0.53mm	10-pk.	21038

Ferrule Removal Kit

The tapered tools in this kit have teeth designed to grip and remove fused silica adaptor ferrules that have become stuck in the fitting. Each kit has two tools: one for removing 1/32-inch adaptor ferrules and one for removing 1/16-inch adaptor ferrules.

Description	Valco #	qty.	cat.#
Ferrule Removal Kit	FRK1	kit	20146

Ceramic Scoring Wafer

- Four straight scoring edges for cutting fused silica tubing and four serrated edges for cutting MXT® metal capillary columns.
- Sure-grip handle included.

Description	qty.	cat.#
Ceramic Scoring Wafers	5-pk.	20116

Hot Swap Capillary Column Nuts

- No more burned fingers!
- No more downtime waiting for injector parts to cool down.

Description	qty.	cat.#
For "compact" Agilent-style ferrules.		
Hot Swap Capillary Column Nut	ea.	22348
For standard 1/16"-type ferrules.		
Hot Swap Capillary Column Nut	ea.	22347

GC Essentials

Super Septa!

- Precision molded.
- Preconditioned and ready to use.
- Packaged in precleaned jars.

Note: Due to the injection port temperatures at the septum nut, Restek recommends using only BTO septa in Thermo Scientific instruments.

Restek Septa

Thermolite® Septa
- Usable to 340°C inlet temperature.
- Excellent puncturability.

IceBlue® Septa
- Usable to 250°C inlet temperature.
- General-purpose septa.
- Excellent puncturability.
- Ideal for SPME.

BTO® Septa
- Usable to 400°C inlet temperature.
- CenterGuide™ design—requires less force for initial penetration.

Septum Diameter	25-pk.	50-pk.	100-pk.
Thermolite Septa			
5mm (3/16")	27120	27121	27122
6mm (1/4")	27123	27124	27125
7mm	27126	27127	27128
8mm	27129	27130	27131
9mm	27132	27133	27134
9.5mm (3/8")	27135	27136	27137
10mm	27138	27139	27140
11mm (7/16")	27141	27142	27143
11.5mm	27144	27145	27146
12.5mm (1/2")	27147	27148	27149
17mm	27150	27151	27152
Shimadzu Plug	27153	27154	27155
IceBlue Septa			
9mm		27156	27157
9.5mm (3/8")		27158	27159
10mm		27160	27161
11mm (7/16")		27162	27163
11.5mm		27164	27165
12.5mm (1/2")		27166	27167
17mm		27168	27169
Shimadzu Plug		27170	27171
BTO Septa			
5mm CenterGuide		27100	27101
6mm (1/4")		27102	27103
9mm CenterGuide		27104	27105
9.5mm (3/8")		27106	27107
10mm		27108	27109
11mm (7/16") CenterGuide		27110	27111
11.5mm CenterGuide		27112	27113
12.5mm (1/2") CenterGuide		27114	27115
17mm CenterGuide		27116	27117
Shimadzu Plug		27118	27119

The Claw and The Claw Holder Kit

- Easily removes hot liners from injection ports.
- 4mL vials (not included) can be replaced when dirty.

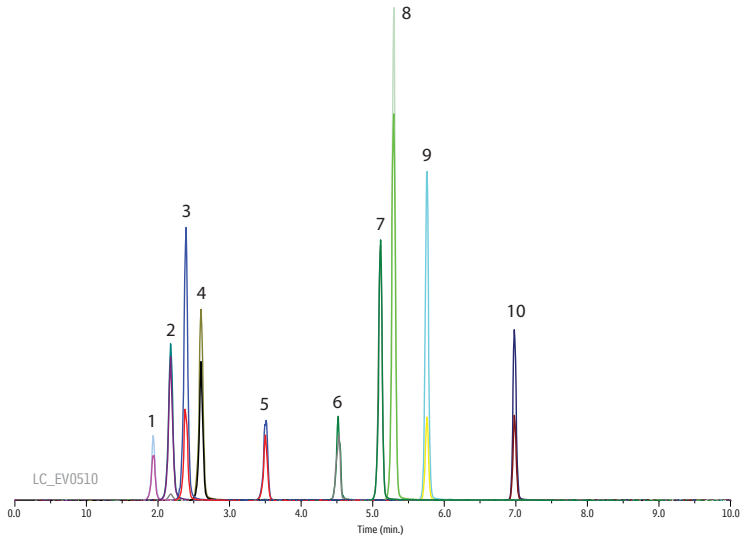
Never again will you burn your fingers removing a hot injection port liner. The Claw safely and cleanly removes liners, O-rings, or other small objects from the injection port. You can then place the hot objects in a clean 4mL vial situated in the Claw holder until ready for reuse.

Description	qty.	cat. #
The Claw	ea.	26261
The Claw Holder Kit (includes The Claw and holder)	kit	26262
4.0mL Clear Vial, White Graduated Marking Spot	100-pk.	24658

Ultra II™ Carbamate HPLC Column Cuts Analysis Time in Half

- Analyze more samples per hour, compared to a C18.
- Separates target carbamates in 7 minutes.
- High quality reference standards also available.

Figure 1 Carbamate pesticides on an Ultra II™ Carbamate column.



Peaks	RT (min.)	Transition 1	Transition 2
1. Aldicarb sulfone	1.9	223.1 → 86.1	223.1 → 148.0
2. Aldicarb sulfoxide	2.2	207.1 → 132.1	207.1 → 89.1
3. Oxamyl	2.4	237.1 → 72.1	237.1 → 90.1
4. Methomyl	2.6	163.1 → 88.1	163.1 → 106.0
5. 3-Hydroxycarbofuran	3.5	238.1 → 163.1	238.1 → 181.2
6. Aldicarb	4.5	208.1 → 116.0	208.1 → 88.9
7. Propoxur	5.1	210.1 → 111.0	210.1 → 168.1
8. Carbofuran	5.3	222.1 → 165.2	222.1 → 123.0
9. Carbaryl	5.8	202.1 → 145.1	202.1 → 127.1
10. Methiocarb	7.0	226.1 → 169.2	226.1 → 121.0

Column	Ultra II™ Carbamate (cat.# 9611312)
Dimensions:	100 mm x 2.1 mm ID
Particle Size:	3 µm
Pore Size:	100 Å
Temp.:	35 °C
Sample	531.1 Carbamate Pesticide Calibration Mixture (cat.# 32273)
Diluent:	acetonitrile
Conc.:	100 ppb each pesticide
Inj. Vol.:	5 µL
Mobile Phase	
A:	10 mM NH_4OAc in water
B:	10 mM NH_4OAc in methanol

Time (min.)	%B
0	10
1	10
8	90
10	90
11	10

Flow:	0.5 mL/min.
Detector	Applied Biosystems/MDS Sciex LC/MS/MS
Model #:	4000 QTRAP™ LC/MS/MS system
Ion Source:	TurboIonSpray®
Ion Mode:	ESI+
Ion Spray Voltage:	5 kV
Gas 1:	40 psi (275.8 kPa)
Gas 2:	60 psi (413.7 kPa)
Source Temp.:	500 °C
Instrument	Applied Biosystems/MDS Sciex LC/MS/MS System

Looking for a chromatogram?
Search our extensive online library at
www.restek.com

Recommended Column

Ultra II™ Carbamate Columns

Physical Characteristics:

particle size: 3µm or 5µm, spherical
pore size: 100Å
carbon load: 15%
endcap: no
pH range: 2.5 to 7.5
temperature limit: 80°C

3µm Column	cat. #
50mm, 2.1mm ID	9611352
100mm, 2.1mm ID	9611312
50mm, 4.6mm ID	9611355
5µm Column	**cat. #**
250mm, 4.6mm ID	9611575

For post-column derivatization/fluorescence detection applications for a 4.6mm ID column the total system dead volume, including the post-column reactor, must be less than 650µL. For standard post-column reactor systems, we recommend a 250mm x 4.6mm, 5µm column. Contact Restek technical service or your Restek representative for more information.

Trident HPLC Guard Cartridges

Ultra II Carbamate	qty.	cat. #
10 x 2.1mm ID	3-pk.	961150212
10 x 4.0mm ID	3-pk.	961150210
20 x 2.1mm ID	2-pk.	961150222
20 x 4.0mm ID	2-pk.	961150220

Trident Direct Guard Cartridge System

Description	qty.	cat.#
10mm guard cartridge holder without filter	ea.	25083
20mm guard cartridge holder with filter	ea.	25086

Reference Standards

531.1 Carbamate Pesticide Calibration Mixture

(10 components)

aldicarb
aldicarb sulfone
aldicarb sulfoxide
carbaryl (Sevin)
carbofuran
3-hydroxycarbofuran
methiocarb
methomyl
oxamyl
propoxur (Baygon)

100µg/mL each in methanol, 1mL/ampul
cat. # 32273

531.2 Carbamate Pesticide Calibration Mixture

(11 components)

aldicarb
aldicarb sulfone
aldicarb sulfoxide
carbaryl (Sevin)
carbofuran
3-hydroxycarbofuran
methiocarb
methomyl
1-naphthol
oxamyl
propoxur (Baygon)

100µg/mL in acetonitrile, 1mL/ampul
cat. # 32435

Internal Standard

4-bromo-3,5-dimethylphenyl-N-methylcarbamate (BDMC)
100µg/mL in methanol, 1mL/ampul
cat. # 32274

531.1 Performance Check Mix

aldicarb sulfoxide	100µg/mL	3-hydroxycarbofuran	2
BDMC	10	methiocarb	20

In methanol, 1mL/ampul
cat. # 32275

Acetonitrile-Free PAH Analysis using Methanolic Mobile Phase

- Pinnacle® II PAH column baseline resolves PAHs in 23 minutes using methanol or 18 minutes using acetonitrile.
- Manufactured and tested under tight quality specifications to ensure performance with both methanol and acetonitrile.
- UHPLC format also available, 1.9µm Pinnacle® DB PAH column separates target analytes in just 4 minutes!

Figure 1 Pinnacle® II PAH columns fully resolve target PAHs using either methanol- or acetonitrile-based mobile phases.

A. Save money using a methanolic mobile phase…

1. naphthalene
2. acenaphthylene
3. acenaphthene
4. fluorene
5. phenanthrene
6. anthracene
7. fluoranthene
8. pyrene
9. benzo(a)anthracene
10. chrysene
11. benzo(b)fluoranthene
12. benzo(k)fluoranthene
13. benzo(a)pyrene
14. benzo(ghi)perylene
15. dibenzo(a,h)anthracene
16. indeno(1,2,3-cd)pyrene

* contaminant

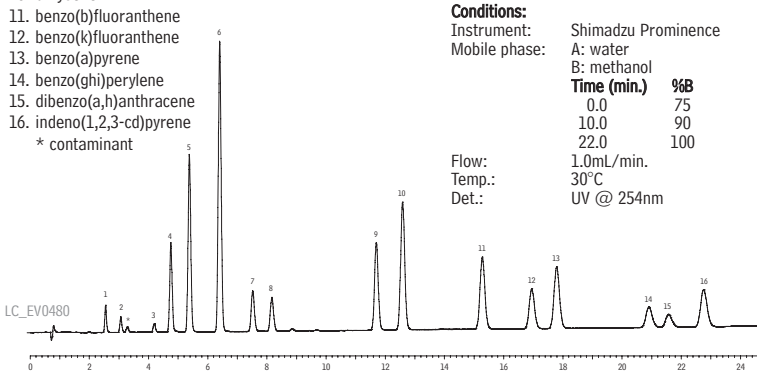
Sample:
Inj.: 10µL
Conc.: 10µg/mL each component
Sample diluent: methanol

Column: **Pinnacle® II PAH**
Cat.#: 9219463
Dimensions: 150mm x 3.2mm
Particle size: 4µm
Pore size: 110Å

Conditions:
Instrument: Shimadzu Prominence
Mobile phase: A: water
B: methanol

Time (min.)	%B
0.0	75
10.0	90
22.0	100

Flow: 1.0mL/min.
Temp.: 30°C
Det.: UV @ 254nm



B. …or save time using an acetonitrile-based mobile phase.

Peak List:	Retention Time
1. naphthalene	6.19
2. acenaphthylene	7.16
3. 1-methylnaphthalene	7.78
4. 2-methylnaphthalene	8.17
5. acenaphthene	8.46
6. fluorene	8.82
7. phenanthrene	9.64
8. anthracene	10.39
9. fluoranthene	11.22
10. pyrene	11.75
11. benzo(a)anthracene	13.55
12. chrysene	13.91
13. benzo(j)fluoranthene	14.92
14. benzo(b)fluoranthene	15.27
15. benzo(k)fluoranthene	15.82
16. benzo(a)pyrene	16.35
17. dibenzo(a,h)anthracene	17.10
18. benzo(ghi)perylene	17.67
19. indeno(1,2,3-cd)pyrene	17.99

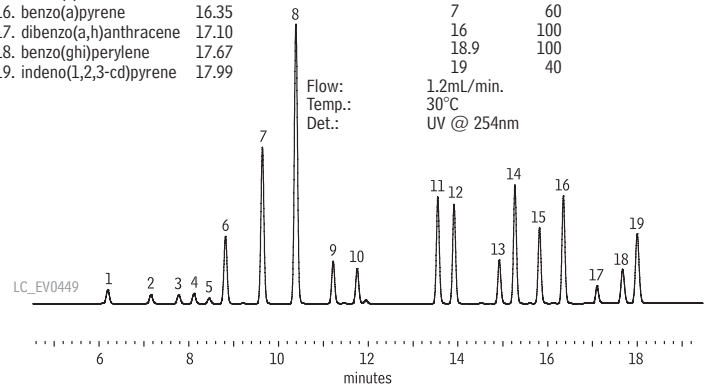
Sample:
Inj.: 10µL
Conc.: 20µg/mL each component
Sample diluent: acetonitrile

Column: **Pinnacle® II PAH**
Cat.#: 9219463
Dimensions: 150mm x 3.2mm
Particle size: 4µm
Pore size: 110Å

Conditions:
Instrument: Shimadzu Prominence HPLC
Mobile phase: A: purified water
B: acetonitrile

Time (min.)	%B
0	40
7	60
16	100
18.9	100
19	40

Flow: 1.2mL/min.
Temp.: 30°C
Det.: UV @ 254nm



Recommended Columns

Pinnacle® II PAH Columns

Physical Characteristics:
particle size: 4µm, spherical
pore size: 110Å
endcap: fully endcapped
pH range: 2.5 to 10
temperature limit: 80°C

4µm Column	cat. #
150mm, 3.2mm ID	9219463
250mm, 4.6mm ID	9219475

Pinnacle II PAH Guard Cartridges	qty.	cat. #
10 x 2.1mm	3-pk.	921950212
10 x 4.0mm	3-pk.	921950210
20 x 2.1mm	2-pk.	921950222
20 x 4.0mm	2-pk.	921950220

Pinnacle® DB PAH UHPLC Columns

Physical Characteristics:
particle size: 1.9µm
pore size: 140Å
endcap: yes
pH range: 2.5 to 7.5
temperature limit: 80°C

1.9µm Column	cat. #
30mm, 2.1mm ID	9470232
50mm, 2.1mm ID	9470252
100mm, 2.1mm ID	9470212

Reference Standards

EPA Method 8310 PAH Mixture (18 components)

acenaphthene
acenaphthylene
anthracene
benzo(a)anthracene
benzo(a)pyrene
benzo(b)fluoranthene
benzo(ghi)perylene
benzo(k)fluoranthene
chrysene
dibenzo(a,h)anthracene
fluoranthene
fluorene
indeno(1,2,3-cd)pyrene
1-methylnaphthalene
2-methylnaphthalene
naphthalene
phenanthrene
pyrene

500µg/mL each in acetonitrile, 1mL/ampul
cat. # 31841

EPA Method 8310 Quality Control Check

(18 components)

acenaphthene	100µg/mL	dibenzo(a,h)anthracene	10
acenaphthylene	100	fluoranthene	10
anthracene	100	fluorene	100
benzo(a)anthracene	10	indeno(1,2,3-cd)pyrene	10
benzo(a)pyrene	10	1-methylnaphthalene	100
benzo(b)fluoranthene	10	2-methylnaphthalene	100
benzo(ghi)perylene	10	naphthalene	100
benzo(k)fluoranthene	5	phenanthrene	100
chrysene	10	pyrene 10	

In acetonitrile, 1mL/ampul
cat. # 31843

EPA Method 8310 Surrogate Standard

decafluorobiphenyl
1,000µg/mL in acetonitrile, 1mL/ampul
cat. # 31842

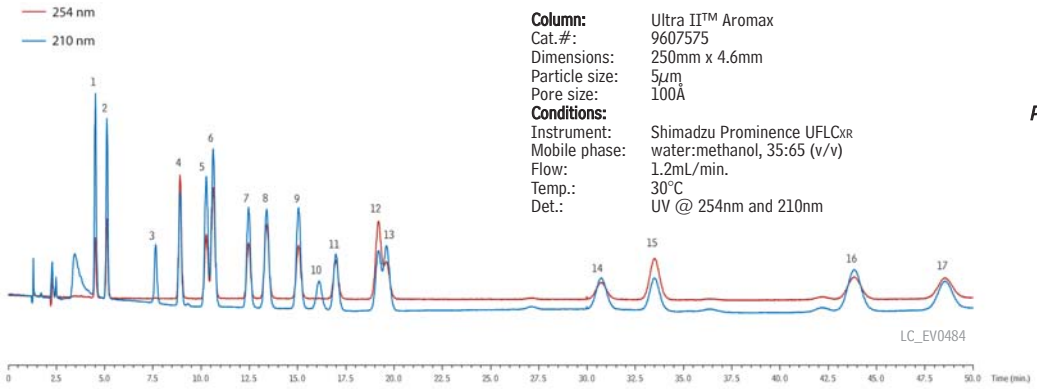
free literature

Environmental HPLC Applications, Columns, Reference Materials
lit. cat.# 59741A
Download your free copy from **www.restek.com**

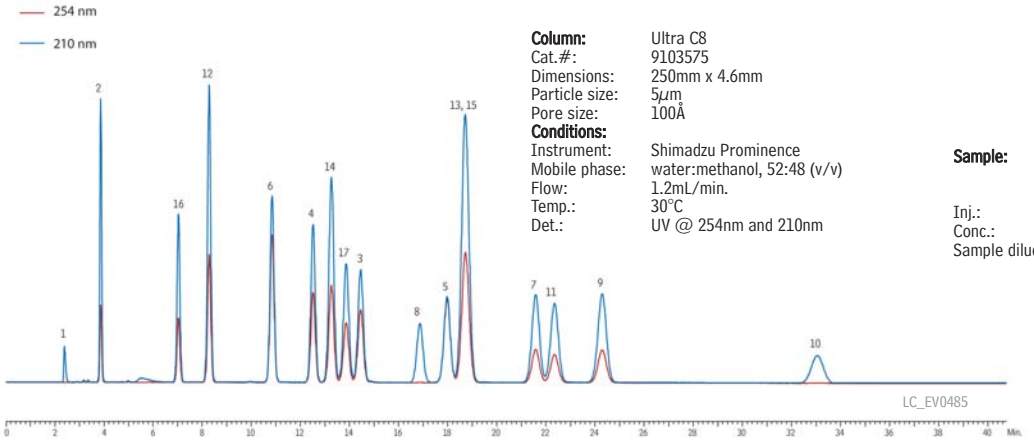
New Column Options for Reliable Separation of Explosives

- Excellent separation of target explosives.
- Eliminate false positives for tetryl and other difficult compounds.
- Save time with isocratic analyses—no time-consuming equilibrations.

Figure 1 Ultra II™ Aromax columns separate all 17 target compounds and can be used alone (MS) or with a confirmation column (UV).



Column: Ultra II™ Aromax
Cat.#: 9607575
Dimensions: 250mm x 4.6mm
Particle size: 5µm
Pore size: 100Å
Conditions:
Instrument: Shimadzu Prominence UFLCXR
Mobile phase: water:methanol, 35:65 (v/v)
Flow: 1.2mL/min.
Temp.: 30°C
Det.: UV @ 254nm and 210nm



Column: Ultra C8
Cat.#: 9103575
Dimensions: 250mm x 4.6mm
Particle size: 5µm
Pore size: 100Å
Conditions:
Instrument: Shimadzu Prominence
Mobile phase: water:methanol, 52:48 (v/v)
Flow: 1.2mL/min.
Temp.: 30°C
Det.: UV @ 254nm and 210nm

Peak list and sample for both chromatograms

1. HMX
2. RDX
3. nitroglycerin
4. nitrobenzene
5. 4-amino-2,6-dinitrotoluene
6. 3,5-dinitroaniline
7. 2-nitrotoluene
8. 2-amino-4,6-dinitrotoluene
9. 3-nitrotoluene
10. PETN
11. 4-nitrotoluene
12. 1,3-dinitrobenzene
13. 2,6-dinitrotoluene
14. tetryl
15. 2,4-dinitrotoluene
16. 1,3,5-trinitrobenzene
17. 2,4,6-trinitrotoluene

Sample: Nitroaromatics and Nitramine Explosives by HPLC, EPA 8330B (cat.# 33204)
Inj.: 10µL
Conc.: 10µg/mL each component
Sample diluent: methanol

Recommended Columns

Ultra II™ Aromax Columns (USP L11)

Physical Characteristics:

particle size: 2.2µm, 3µm or 5µm, spherical
pore size: 100Å
carbon load: 17%
endcap: fully endcapped
pH range: 2.5 to 7.5
temperature limit: 80°C

5µm Column	cat. #
250mm, 4.6mm ID	9607575

Ultra C8 Columns (USP L7)
Excellent for a wide range of analyses

Physical Characteristics:

particle size: 3µm or 5µm, spherical
pore size: 100Å
carbon load: 12%
endcap: fully endcapped
pH range: 2.5 to 7.5
temperature limit: 80°C

5µm Column	cat. #
250mm, 4.6mm ID	9103575

Reference Standards

Nitroaromatics and Nitramine Explosives by HPLC, EPA 8330B* (17 components)

2-amino-4,6-dinitrotoluene
4-amino-2,6-dinitrotoluene
3,5-dinitroaniline
1,3-dinitrobenzene
2,4-dinitrotoluene
2,6-dinitrotoluene
HMX
nitrobenzene
nitroglycerin
2-nitrotoluene
3-nitrotoluene
4-nitrotoluene
PETN
RDX
tetryl
1,3,5-trinitrobenzene
2,4,6-trinitrotoluene

1,000µg/mL each in acetonitrile, 1mL/ampul
cat. # 33204

8330 Surrogate*

1,2-dinitrobenzene
1,000µg/mL in methanol, 1mL/ampul
cat. # 31453

8330 Internal Standards*

3,4-dinitrotoluene
1,000µg/mL in methanol, 1mL/ampul
cat. # 31452

* Available in US only.

Go to
www.restek.com
for more
Ultra II™ HPLC columns
and standards.

Sample Preparation

Syringe Filters with Luer Lock Inlet

- Variety of filter types, porosities, and diameters.
- Color coded for easy identification.
- Polypropylene housing.
- Reusable storage container.
- Quantity break pricing, for greater savings.

Cut costs, not corners!
Top quality filters at low prices!

Cellulose Acetate, Nylon, PVDF - hydrophilic applications

PTFE - hydrophobic applications, resistant to acids and bases, used mostly with non-aqueous samples

Size	Porosity	Color	qty.	cat.#	1-4 packs	5-9 packs	10 or more packs
Cellulose Acetate							
13mm	0.22µm	green	100-pk.	26156			
13mm	0.45µm	blue	100-pk.	26155			
25mm	0.22µm	green	100-pk.	26158			
25mm	0.45µm	blue	100-pk.	26157			
Nylon							
13mm	0.22µm	yellow	100-pk.	26146			
13mm	0.45µm	pink	100-pk.	26147			
25mm	0.22µm	yellow	100-pk.	26148			
25mm	0.45µm	pink	100-pk.	26149			
PTFE (polytetrafluoroethylene)							
13mm	0.22µm	purple	100-pk.	26142			
13mm	0.45µm	orange	100-pk.	26143			
25mm	0.22µm	purple	100-pk.	26144			
25mm	0.45µm	orange	100-pk.	26145			
PVDF (polyvinyldifluoride)							
13mm	0.22µm	brown	100-pk.	26150			
13mm	0.45µm	red	100-pk.	26151			
25mm	0.22µm	brown	100-pk.	26152			
25mm	0.45µm	red	100-pk.	26153			

Extraction Cell Parts for ASE® 200 Systems, Manufacturer's Design

- Choose original equipment-equivalent stainless steel, or Siltek® deactivation for improved inertness.
- Inner surfaces polished, for easier cleaning.
- Caps include frit, washer, PTFE O-ring, and threaded insert.

Perfect for EPA SW-846 Method 3545 Pressurized Fluid Extraction (PFE)

Description	Similar to Dionex part #	Stainless Steel qty.	Stainless Steel cat.#	Siltek® Treated qty.	Siltek® Treated cat.#
Extraction Cell Body for ASE 200, 1mL	054973	ea.	26110	ea.	26111
Extraction Cell Body for ASE 200, 5mL	054974	ea.	26112	ea.	26113
Extraction Cell Body for ASE 200, 11mL	048820	ea.	26114	ea.	26115
Extraction Cell Body for ASE 200, 22mL	048821	ea.	26098	ea.	26099
Extraction Cell Body for ASE 200, 33mL	048822	ea.	26116	ea.	26117
Replacement Extraction Cell End Caps for ASE 200	049450	2-pk.	26096	2-pk.	26097
Cap Inserts for ASE 200		2-pk.	26166		
Replacement Frits for ASE 200	049453	10-pk.	26100	10-pk.	26101

Description	Similar to Dionex part #	qty.	cat.#
Snap Rings for Caps for ASE 200	049456	10-pk.	26184
Funnel for ASE 200	056958	ea.	26180
PTFE O-Rings for ASE 200 & ASE 300 Caps	049457	100-pk.	26187
Viton O-Rings for ASE 200 & ASE 300 Caps	056325	50-pk.	26188

PEEK™ Washers for ASE® 200 Systems

Description	Similar to Dionex part #	qty.	cat.#
PEEK Washers for ASE 200	049454	12-pk.	25256
		48-pk.	25257
		250-pk.	26120
	Buy in bulk and save!	1,000-pk.	26229

20mm Filters for ASE® 200 Extraction Cells

Description	Similar to Dionex part #	qty.	cat.#
Cellulose Filters for ASE 200	049458	100-pk.	26118
Cellulose Filters for ASE 200	049458	1,000-pk.	26190
Glass Fiber Filters for ASE 200	047017	100-pk.	26119

Sample Preparation

Sodium Sulfate

- Ideal for removing water from sample extracts.
- Requires activation before use.
- Packaged in recloseable 5kg buckets.

Anhydrous sodium sulfate is the most common drying agent used to remove moisture from sample extracts. We package our 60 mesh material in recloseable buckets.

Description	qty.	cat.#
Sodium Sulfate	5kg	26204

Ottawa Sand

- Sample medium for matrix spikes and laboratory control blanks.
- Packaged in convenient 5kg buckets.

Description	qty.	cat.#
Ottawa Sand	5kg	26137

Diatomaceous Earth

- Improves extraction efficiency.
- Adsorbs moisture from samples.

Diatomaceous earth is used as a filter aid to improve extraction efficiency of densely packed soils, such as clays. By mixing the sample with diatomaceous earth, recoveries can be improved and excess moisture can be absorbed. We package our 30/40 mesh material in a convenient 1kg quantity.

Description	Similar to Dionex part #	qty.	cat.#
Diatomaceous Earth, 30/40 mesh	062819	1kg	26033

Resprep™ SPE Cartridges: Normal Phase

Hydrophilic (polar) adsorbents used to extract hydrophilic analytes from nonpolar matrices, such as organic solvents (e.g., polar contaminants from sample extracts).

	3mL/500mg (50-pk.)	6mL/500mg (30-pk.)	6mL/1000mg (30-pk.)	6mL/1000mg (100-pk.)	15mL/2g (100-pk.)
Florisil (EPA SW 846 methods and CLP protocols)	24031 24032*	— 26086**	24034 26085**	26205 —	26228 —
Silica (EPA SW 846 methods)	24035 24036*	— —	24038 —	— —	— —

*Teflon frits **Glass tubes with Teflon frits

All cartridges are manufactured using high density polypropylene and have polyethylene frits unless otherwise noted.

Method Specific SPE Cartridges

These cartridges have been specifically designed to provide consistent and reproducible results for the method or application stated.

Description	Applications	Tube Volume, Bed Weight	qty.	cat.#
Massachusetts EPH	Extraction of hexane-extractable petroleum hydrocarbons from soil and waste samples. Specially treated to reduce contaminants and increase capacity. Silica packing.	20mL, 5g	20-pk.	26065
EPA Method 521	For use in EPA Method 521: Nitrosamines in Drinking Water. This method calls for large volume injection and CI/MS/MS. Activated charcoal packing for NDMA.	6mL, 2g	30-pk.	26032
EPA Method 548.1	Extraction of endothal from aqueous samples. Weak anion exchange resin (BioRex 5) packing.	6mL	30-pk.	26063
Ultra Quat SPE	For use in HPLC analysis of paraquat/diquat, as an alternative to EPA 549.2. For an HPLC column developed specifically for this application, see our Ultra HPLC columns at www.restek.com.	6mL, 500mg	30-pk.	25499
EPA Method 552.1	Extraction of haloacetic acids from aqueous samples. Strong anion exchange resin (Ag 1x8) packing.	1mL	100-pk.	26064
EPA Method 8321 (AH SPE)	For use in HPLC analysis of phenoxy acid herbicides.	6mL, 500mg	30-pk.	26029
Organo Tin	High-capacity clean-up of butyl and phenyl tin compounds from soil, water, and biota.	60mL	16-pk.	24049
RDX	Extraction of explosive compounds (similar to EPA Method 8095 and 8330 list) from water samples.	6mL, 500mg	30-pk.	26093

Lit. Cat.# EVFL1192

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ISO 9001:2000 cert.# FM80397