

600 Series Methods

600 Series Methods - US EPA Clean Water Act (CWA)

US EPA Method No.	Compound Class	US EPA Method No.	Compound Class
601	Purgeable Hydrocarbons	609	Nitroaromatics/Isophorone
602	Purgeable Aromatics	610	Polycyclic Aromatic Hydrocarbons (PAHs)
603	Acrolein/Acrylonitrile	611	Haloethers
604	Phenols	612	Chlorinated Hydrocarbons
605	Benzidine/3,3'-Dichlorobenzidine	615	Chlorinated Acid Herbicides
606	Phthalate Esters	624	Purgeable Halocarbons
607	Nitrosamines	625	Semivolatiles
608	Organochlorine Pesticides and PCBs		

Method 601 (Purgeable Hydrocarbons)**VOA Purgeable Halocarbon Mix #1** (23 components)

bromodichloromethane
bromoform
carbon tetrachloride
chlorobenzene
2-chloroethyl vinyl ether
chloroform
dibromochloromethane
1,2-dichlorobenzene
1,3-dichlorobenzene
1,4-dichlorobenzene
1,1-dichloroethane
1,2-dichloroethane
2,000 μ g/mL each in P&T methanol, 1mL/ampul
cat. # 30212 (ea.)

1,1-dichloroethene
trans-1,2-dichloroethene
1,2-dichloropropane
cis-1,3-dichloropropene
trans-1,3-dichloropropene
methylene chloride
1,1,2,2-tetrachloroethane
tetrachloroethene
1,1,1-trichloroethane
1,1,2-trichloroethane
trichloroethene

Method 602 (Purgeable Aromatics)**602 Purgeable Aromatics Calibration Mix** (7 components)

benzene
chlorobenzene
1,2-dichlorobenzene
1,3-dichlorobenzene
2,000 μ g/mL each in P&T methanol, 1mL/ampul
cat. # 30035 (ea.)

1,4-dichlorobenzene
ethylbenzene
toluene

Method 603 (Acrolein/Acrylonitrile)**Acrolein/Acrylonitrile** (2 components)

acrolein
2,000 μ g/mL each in DI water, 1mL/ampul
cat. # 30600 (ea.)

Must ship overnight on ice.

Acrolein

5,000 μ g/mL in P&T methanol, 1mL/ampul
cat. # 30645 (ea.)

5,000 μ g/mL in water, 1mL/ampul
cat. # 30646 (ea.)

Acrylonitrile

2,000 μ g/mL in P&T methanol, 1mL/ampul
cat. # 30246 (ea.)

Method 604 (Phenols)**604 Phenols Calibration Mix** (11 components)

4-chloro-3-methylphenol
2-chlorophenol
2,4-dichlorophenol
2,4-dimethylphenol
2,4-dinitrophenol
2-methyl-4,6-dinitrophenol
2,000 μ g/mL each in methanol, 1mL/ampul
cat. # 31029 (ea.)

2-nitrophenol
4-nitrophenol
pentachlorophenol
phenol
2,4,6-trichlorophenol

Method 605 (Benzidine/3,3'-Dichlorobenzidine)**605 Benzidines Calibration Mix** (2 components)

benzidine
2,000 μ g/mL each in methanol, 1mL/ampul
cat. # 31030 (ea.)

3,3'-dichlorobenzidine
2,000 μ g/mL each in methylene chloride, 1mL/ampul
cat. # 31834 (ea.)

Method 606 (Phthalate Esters)**606 Phthalate Esters Calibration Mix** (6 components)

bis(2-ethylhexyl)phthalate
butyl benzyl phthalate
diethyl phthalate
2,000 μ g/mL each in methanol, 1mL/ampul
cat. # 31031 (ea.)

dimethyl phthalate
di-*n*-butyl phthalate
di-*n*-octyl phthalate

Reference Standards Search

Search by compound name, synonym, or CAS #.

Visit us at www.restek.com/reference



Method 607 (Nitrosamines)

607 Nitrosamines Calibration Mix (3 components)	
N-nitrosodimethylamine	N-nitrosodiphenylamine
N-nitroso-di- <i>n</i> -propylamine	
2,000 μ g/mL each in methanol, 1mL/ampul	
cat. # 31032 (ea.)	

Method 608 (Organochlorine Pesticides & PCBs)

608 Calibration Mix (16 components)	
aldrin	dieldrin
α -BHC	endosulfan I
β -BHC	endosulfan II
δ -BHC	endosulfan sulfate
γ -BHC (lindane)	endrin
4,4'-DDD	endrin aldehyde
4,4'-DDE	heptachlor
4,4'-DDT	heptachlor epoxide (isomer B)
200 μ g/mL each in hexane:toluene (1:1), 1mL/ampul	
cat. # 32022 (ea.)	

Organochlorine Pesticide System Evaluation Mix (2 components)

4,4'-DDT	200 μ g/mL	endrin	100 μ g/mL
In methyl <i>tert</i> -butyl ether, 1mL/ampul			
cat. # 32417 (ea.)			

608 Complete Kit

Contains 1mL each of these mixtures.
 32022: 608 Calibration Mix
 32006: Aroclor 1016
 32007: Aroclor 1221
 32008: Aroclor 1232
 32009: Aroclor 1242
 32010: Aroclor 1248
 32011: Aroclor 1254
 32012: Aroclor 1260
 32005: toxaphene
 32021: chlordane (technical)

cat. # 32060 (kit)



Please see page 469 for individual Aroclor, toxaphene, and chlordane information.

Method 609 (Nitroaromatics/Isophorone)

609 Nitroaromatics & Isophorone Calibration Mix (4 components)	
2,4-dinitrotoluene	2,6-dinitrotoluene
isophorone	nitrobenzene
2,000 μ g/mL each in hexane, 1mL/ampul	
cat. # 31033 (ea.)	

600 Series Methods

Method 615 (Chlorinated Acid Herbicides)

Herbicide Surrogate**Free Acid Form**

2,4-dichlorophenylacetic acid (DCAA)

200 μ g/mL in methanol, 1mL/ampul

cat. # 32049 (ea.)

1,000 μ g/mL in acetone, 1mL/ampul

cat. # 32439 (ea.)

Derivatized Form

2,4-dichlorophenyl acetic acid methyl ester (DCAA methyl ester)

200 μ g/mL in hexane, 1mL/ampul

cat. # 32050 (ea.)

Herbicide Mix #1 (7 components)**Free Acid Form**

2,4-D

2,4-DB

2,4,5-T

2,4,5-TP

200 μ g/mL each in methanol, 1mL/ampul

cat. # 32054 (ea.)

dicamba

dichlorprop

dinoseb

Derivatized Form

2,4-D methyl ester

2,4-DB methyl ester

2,4,5-T methyl ester

2,4,5-TP methyl ester

200 μ g/mL each in hexane, 1mL/ampul

cat. # 32055 (ea.)

dicamba methyl ester

dichlorprop methyl ester

dinoseb methyl ether

Herbicide Mix #2**Free Acid Form**

dalapon

1,000 μ g/mL in acetonitrile, 1mL/ampul

cat. # 32432 (ea.)

1,000 μ g/mL in methanol, 1mL/ampul

cat. # 32253 (ea.)

2,000 μ g/mL in methanol, 1mL/ampul

cat. # 32056 (ea.)

Derivatized Form

dalapon methyl ester

2,000 μ g/mL in hexane, 1mL/ampul

cat. # 32057 (ea.)

1,000 μ g/mL in methanol, 1mL/ampul

cat. # 32254 (ea.)

Herbicide Mix #3 (2 components)**Free Acid Form**

MCPP

20,000 μ g/mL each in methanol, 1mL/ampul

cat. # 32058 (ea.)

MCPP

Derivatized Form

MCPP methyl ester

MCPP methyl ester

20,000 μ g/mL each in hexane, 1mL/ampul

cat. # 32059 (ea.)

also available

Additional chlorinated acid herbicides mixes:

see Method 555, **page 463**and Method 8321, **page 484**

Method 624 (Purgeable Halocarbons)

Volatiles MegaMix®, EPA Method 624 (26 components)

benzene	1,1-dichloroethene
bromodichloromethane	<i>trans</i> -1,2-dichloroethene
bromoform	1,2-dichloropropane
carbon tetrachloride	<i>cis</i> -1,3-dichloropropene
chlorobenzene	<i>trans</i> -1,3-dichloropropene
2-chloroethyl vinyl ether	ethylbenzene
chloroform	methylene chloride
dibromochloromethane	1,1,2,2-tetrachloroethane
1,2-dichlorobenzene	tetrachloroethene
1,3-dichlorobenzene	toluene
1,4-dichlorobenzene	1,1,1-trichloroethane
1,1-dichloroethane	1,1,2-trichloroethane
1,2-dichloroethane	trichloroethene
2,000 μ g/mL each in P&T methanol, 1mL/ampul	
	cat. # 30497 (ea.)

624 Internal Standard Mix (3 components)

bromochloromethane	1,4-dichlorobutane
2-bromo-1-chloropropane	
1,500 μ g/mL each in P&T methanol, 1mL/ampul	
	cat. # 30023 (ea.)

624 Surrogate Standard Mix (3 components)

4-bromofluorobenzene	pentafluorobenzene
fluorobenzene	
2,000 μ g/mL each in P&T methanol, 1mL/ampul	
	cat. # 30243 (ea.)

Surrogate Standard (2 components)

4-bromofluorobenzene	α,α,α -trifluorotoluene
2,500 μ g/mL each in P&T methanol, 1mL/ampul	
	cat. # 30484 (ea.)

624 Calibration Mix #1 (gases) (5 components)

bromomethane	trichlorofluoromethane (CFC-11)
chloroethane	vinyl chloride
chloromethane	
2,000 μ g/mL each in P&T methanol, 1mL/ampul	
	cat. # 30020 (ea.)

624 Calibration Mix #2 (12 components)

benzene	1,1-dichloroethene
carbon tetrachloride	1,2-dichloropropane
chlorobenzene	methylene chloride
2-chloroethyl vinyl ether	tetrachloroethene
dibromochloromethane	1,1,2-trichloroethane
1,1-dichloroethane	trichloroethene
2,000 μ g/mL each in P&T methanol, 1mL/ampul	
	cat. # 30021 (ea.)

624 Calibration Mix #3 (14 components)

bromodichloromethane	<i>trans</i> -1,2-dichloroethene
bromoform	<i>cis</i> -1,3-dichloropropene
chloroform	<i>trans</i> -1,3-dichloropropene
1,2-dichlorobenzene	ethylbenzene
1,3-dichlorobenzene	1,1,2,2-tetrachloroethane
1,4-dichlorobenzene	toluene
1,2-dichloroethane	1,1,1-trichloroethane
2,000 μ g/mL each in P&T methanol, 1mL/ampul	
	cat. # 30022 (ea.)

Method 624 (Purgeable Halocarbons) cont'd

624 Complete Kit

Contains 1mL each of these mixtures.

30020: 624 Calibration Mix #1

30021: 624 Calibration Mix #2

30022: 624 Calibration Mix #3

30023: 624 Internal Standard Mix

30243: 624 Surrogate Standard Mix

cat. # 30244 (kit)



624 Kit

Contains 1mL each of these mixtures.

30020: 624 Calibration Mix #1

30021: 624 Calibration Mix #2

30022: 624 Calibration Mix #3

30023: 624 Internal Standard Mix

cat. # 30055 (kit)



Individual VOA Surrogate and Internal Standards for EPA Methods

Volume is 1mL/ampul. Concentration is $\mu\text{g}/\text{mL}$.

Compound	Solvent	Conc.	cat.# (ea.)
benzene-d6	PTM	2,000	30025
2-bromochlorobenzene	PTM	2,000	30228
4-bromochlorobenzene	PTM	2,000	30230
bromochloromethane	PTM	2,000	30225
2-bromo-1-chloropropane	PTM	2,000	30226
4-bromofluorobenzene	PTM	2,000	30026
chlorobenzene-d5	PTM	2,000	30223
1-chloro-2-fluorobenzene	PTM	2,000	30040
1,2-dichlorobenzene-d4	PTM	2,000	30049
1,4-dichlorobutane	PTM	2,000	30227
1,2-dichloroethane-d4	PTM	2,000	30027
1,4-difluorobenzene	PTM	2,000	30032
ethylbenzene-d5	PTM	2,000	30028
ethylbenzene-d10	PTM	2,000	30029
fluorobenzene	PTM	2,000	30030
pentafluorobenzene	PTM	2,000	30031
toluene-d8	PTM	2,000	30224
α,α,α -trifluorotoluene	PTM	2,000	30048

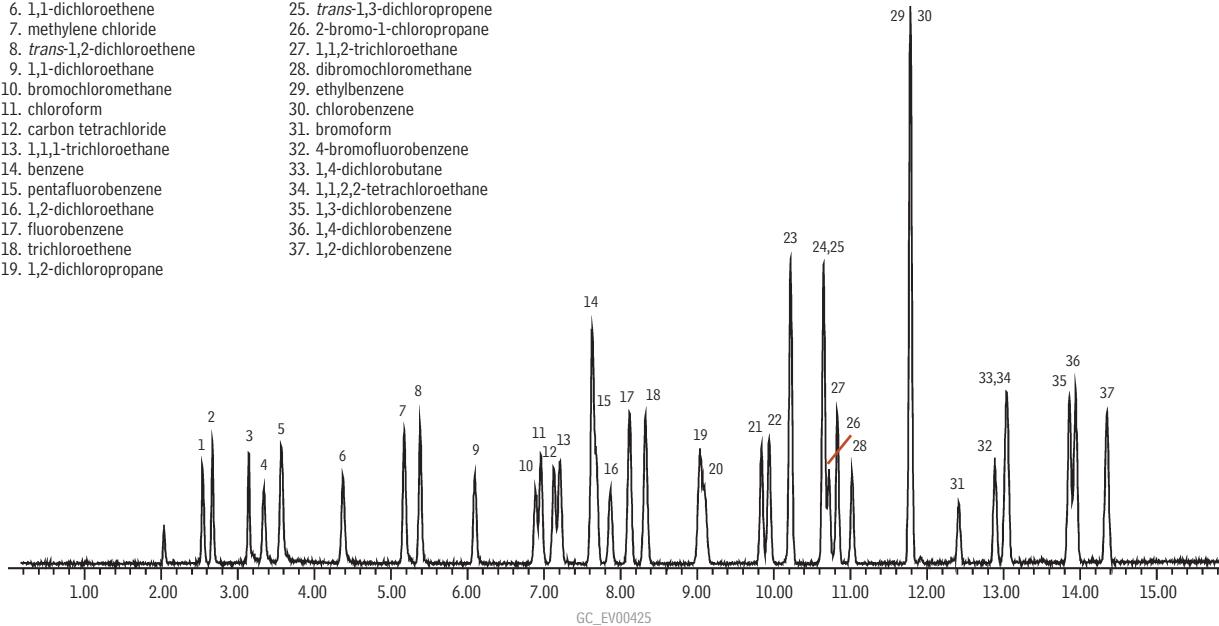
PTM = Purge & trap grade methanol

EPA Method 624 on an Rtx®-VMS column.

- | | |
|-------------------------------------|---------------------------------------|
| 1. chloromethane | 20. bromodichloromethane |
| 2. vinyl chloride | 21. 2-chloroethyl vinyl ether |
| 3. bromomethane | 22. <i>cis</i> -1,3-dichloropropene |
| 4. chloroethane | 23. toluene |
| 5. trichlorofluoromethane | 24. tetrachloroethene |
| 6. 1,1-dichloroethene | 25. <i>trans</i> -1,3-dichloropropene |
| 7. methylene chloride | 26. 2-bromo-1-chloropropane |
| 8. <i>trans</i> -1,2-dichloroethene | 27. 1,1,2-trichloroethane |
| 9. 1,1-dichloroethane | 28. dibromochloromethane |
| 10. bromochloromethane | 29. ethylbenzene |
| 11. chloroform | 30. chlorobenzene |
| 12. carbon tetrachloride | 31. bromoform |
| 13. 1,1,1-trichloroethane | 32. 4-bromofluorobenzene |
| 14. benzene | 33. 1,4-dichlorobutane |
| 15. pentafluorobenzene | 34. 1,1,2,2-tetrachloroethane |
| 16. 1,2-dichloroethane | 35. 1,3-dichlorobenzene |
| 17. fluorobenzene | 36. 1,4-dichlorobenzene |
| 18. trichloroethene | 37. 1,2-dichlorobenzene |
| 19. 1,2-dichloropropane | |

Our Rtx®-VMS capillary GC column is optimized for EPA Method 624!

See page 100 for more information.



Column: Rtx®-VMS, 30m, 0.25mm ID, 1.40 μm (cat#19915)
 Conc.: 20 ppb in 5mL of RO water
 Concentrator: Tekmar LSC-3000 Purge and Trap
 Trap: Vocarb 3000 (type K)
 Purge: 11 min. @ 40mL/min. (ambient temperature)
 Dry purge: 1 min. @ 40mL/min. (MCS bypassed using SilcoSteel® tubing)
 Desorb preheat: 245°C
 Desorb: 250°C for 2 min., Flow 10mL/min.
 Bake: 260°C for 8 min.

GC Interface: 1:10 split at injection port. 1mm ID liner.
 GC: Agilent 6890
 Oven temp.: 40°C (hold 4 min.) to 95°C @ 24°C/min. (hold 3 min.), to 210°C @ 40°C/min. (hold 6 min.)
 Carrier gas: helium @ ~1mL/min. constant flow
 Adjust dichlorodifluoromethane to a retention time of 2.54 min. @ 40°C
 Detector: Agilent 5973 MSD
 Scan range: 25-300 amu

600 Series Methods

Method 625 (Semivolatiles)

Semivolatiles MegaMix[®], EPA**Method 625** (54 components)

acenaphthene
acenaphthylene
anthracene
benzo(a)anthracene
benzo(a)pyrene
benzo(b)fluoranthene
benzo(ghi)perylene
benzo(k)fluoranthene
benzyl butyl phthalate
bis(2-chloroethoxy)methane
bis(2-chloroethyl)ether
bis(2-chloroisopropyl)ether
bis(2-ethylhexyl)phthalate
4-bromophenyl phenyl ether
4-chloro-3-methylphenol
2-chloronaphthalene
2-chlorophenol
4-chlorophenyl phenyl ether
chrysene
dibenz(a,h)anthracene
1,2-dichlorobenzene
1,3-dichlorobenzene
1,4-dichlorobenzene
2,4-dichlorophenol
diethylphthalate
2,4-dimethylphenol
dimethylphthalate
di-n-butylphthalate
4,6-dinitro-2-methylphenol
2,4-dinitrophenol
2,4-dinitrotoluene
2,6-dinitrotoluene
di-n-octylphthalate
diphenylamine*



1,000 μ g/mL each in methylene chloride, 1mL/ampul
cat. # 31829 (ea.)

*Listed as an "additional compound" in Method 625 (listed compound N-nitrosodiphenylamine decomposes to MegaMix component diphenylamine). The six other "additional compounds" are components in other Restek reference mixes used for Method 625: benzidine is included in cat.# 31030 (page 464); β -BHC, δ -BHC, endosulfan I, endosulfan II, endrin are in cat.# 32291 (page 472) and cat. # 32415 (page 473).

**625 Kit**

Because most laboratories do not routinely analyze pesticides, PCBs, toxaphene, and chlordane in their calibration mixtures for Method 625, these mixtures are not included in the 625 Kit. They may be purchased separately or in the 608 Complete Kit.

See page 465.

Contains 1mL each of these mixtures.

31029: 604 Phenols Mix
31030: 605 Benzidines Mix
31031: 606 Phthalate Esters Mix
31032: 607 Nitrosamines Mix
31033: 609 Nitroaromatics/Isophorone Mix
31011: 610 PAH Mix (SV Calibration Mix #5)
31034: 611 Haloethers Mix
31035: 612 Chlorinated Hydrocarbons Mix
cat. # 31036 (kit)



Kit components described on pages 464–465.

Individual Semivolatile Surrogate and Internal Standards for EPA Methods

Volume is 1mL/ampul. Concentration is μ g/mL.

Compound	Solvent	Conc.	cat.# (ea.)
anthracene-d10	D	2,000	31037
decafluorobiphenyl	D	2,000	31041
decafluorobiphenyl	A	1,000	31855
4,4'-dibromobiphenyl	D	2,000	31039
4,4'-dibromooctafluorobiphenyl	D	2,000	31040
2-fluorobiphenyl	D	2,000	31091
1-fluoronaphthalene	D	2,000	31092
2-fluorophenol	D	2,000	31047
naphthalene-d8	D	2,000	31043
nitrobenzene-d5	D	2,000	31044
pentafluorophenol	D	2,000	31048
phenanthrene-d10	D	2,000	31045
phenol-d6	D	2,000	31049
pyridine-d5	D	2,000	31046
p-terphenyl-d14	D	1,000	31828
2,4,6-tribromophenol	M	1,000	31401

A = acetone; D = methylene chloride; M = methanol

SV Internal Standard Mix (6 components)

acenaphthene-d10	naphthalene-d8
chrysene-d12	perylene-d12
1,4-dichlorobenzene-d4	phenanthrene-d10
Each	15-pk.
2,000 μ g/mL each in methylene chloride, 1mL/ampul	
31206	31206.15
4,000μg/mL each in methylene chloride, 1mL/ampul	
31006	31006.15
	31006.25

Antifoam Agent for Purge & Trap Samples

Foam generated as purge gas passes through a sample can enter the analytical trap, and possibly the GC column. Our silica-containing antifoam agent is effective over a wide pH range, and will not conflict with chromatography of target analytes.

Neat, 1mL/ampul

cat. # 31822 (ea.)

No data pack available.

**also available**

Try Restek's Rx[®]-5Sil MS columns for EPA Methods 625 and 8270. Guaranteed for low GC/MS bleed, excellent phenol response, and the resolution needed to quantify critical pairs and structural isomers.

See **page 87** for more information.

Tuning Mixtures

VOA Tuning Compound

4-bromofluorobenzene

5,000 μ g/mL in P&T methanol, 1mL/ampul

cat. # 30003 (ea.)

SV Tuning Compound

decafluorotriphenylphosphine (DFTPP)

2,500 μ g/mL in methylene chloride, 1mL/ampul

cat. # 31001 (ea.)

PFTBA (MS Tuning Compound)

perfluorotributylamine (PFTBA)

Neat, 1mL/ampul

cat. # 30482 (ea.)

Neat, 1g

cat. # 33027 (ea.)

No data pack available.

GC/MS Tuning Mixture (4 components)

benzidine decafluorotriphenylphosphine (DFTPP)

4,4'-DDT pentachlorophenol

1,000 μ g/mL each in methylene chloride, 1mL/ampul

cat. # 31615 (ea.)

Technical Chlordane, Toxaphene Solutions

Volume is 1mL/ampul. Concentration is μ g/mL.

Compound	Solvent	Conc.	cat.# (ea.)
chlordane (technical)	H	1,000	32021
chlordane (technical)	I	5,000	32072
chlordane (technical)	M	2,000	32016
toxaphene	H	1,000	32005
toxaphene	I	5,000	32071
toxaphene	M	2,000	32015

H = hexane; I = isoctane; M = methanol

Aroclor Solutions

Volume is 1mL/ampul. Concentration is μ g/mL unless otherwise noted.

Compound	Solvent	Conc.	cat.# (ea.)
Aroclor 1016	H	1,000	32006
Aroclor 1016	I	200	32064
Aroclor 1016	TO	50mg/kg	32075
Aroclor 1016	TO	500mg/kg	32076
Aroclor 1221	H	1,000	32007
Aroclor 1221	I	200	32065
Aroclor 1221	TO	50mg/kg	32077
Aroclor 1221	TO	500mg/kg	32078
Aroclor 1232	H	1,000	32008
Aroclor 1232	I	200	32066
Aroclor 1232	TO	50mg/kg	32079
Aroclor 1232	TO	500mg/kg	32080
Aroclor 1242	H	1,000	32009
Aroclor 1242	I	200	32067
Aroclor 1242	TO	50mg/kg	32081
Aroclor 1242	TO	500mg/kg	32082
Aroclor 1248	H	1,000	32010
Aroclor 1248	I	200	32068
Aroclor 1248	TO	50mg/kg	32083
Aroclor 1248	TO	500mg/kg	32084
Aroclor 1254	H	1,000	32011
Aroclor 1254	I	200	32069
Aroclor 1254	TO	50mg/kg	32085
Aroclor 1254	TO	500mg/kg	32086
Aroclor 1260	H	1,000	32012
Aroclor 1260	I	200	32070
Aroclor 1260	TO	50mg/kg	32087
Aroclor 1260	TO	500mg/kg	32088
Aroclor 1262	H	1,000	32409
Aroclor 1268	H	1,000	32410
Aroclor 1016/1260	H	1,000	32039
Aroclor 1016/1260	I	200	32299
Aroclor 1016/1260	A	400	32456

A = acetone; H = hexane; I = isoctane; TO = transformer oil (PCB-free)

also available

For a complete listing of solutions of individual environmental compounds, please see **pages 443-448**.

Custom Reference Standards Quotes

Visit us at www.restek.com/solutions



Restek's Learning Network

Sign up for our widely acclaimed seminars today!

Visit www.restek.com/seminars

Restek training seminars are full-day courses presented in an engaging multimedia format. They are equally valuable to beginning chromatographers, those who have moderate experience and want a better understanding of the subject matter, and those interested in the "best practices" and latest technologies. **No sales pitch is presented**, just the facts on how to make your chromatography results better. Visit www.restek.com/seminars for more information.