RESTEK®

Pure Chromatography



30 YEARS

1985–2015

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World-Class Certified

10 CRITICAL STEPS

Whether it's a stock, off-the-shelf reference standard or a one-of-a-kind, custom-formulated solution, there are 10 critical steps that Restek takes to separate our certified reference materials (CRMs) from the competition. For every CRM produced in Restek's ISO-accredited labs, we always:

1 Review Customer & Method Requirements

To determine which organic reference standards we should develop as stock products, Restek experts closely monitor government regulations and methods from around the globe and also actively engage with our customers and distributors. Once a product is chosen based on regulatory changes, customer needs, and our 20+ years of experience, a veteran Restek chemist formulates a stable standard containing an ideal mix of compounds and concentrations. All formulations are then subjected to a thorough review of accuracy, compatibility, and solubility by a second chemist.

2 Verify Compatibility & Stability

All raw materials used in our reference standards are held to strict purity criteria, and compound compatibility is scrutinized during both formulation and review. We also conduct on-going, long-term stability and short-term shipping stability studies in accordance with ISO Guide 34 and ISO Guide 35 to ensure reliability and accurate shelf-life reporting.

3 Characterize Raw Materials Thoroughly

Restek's Quality Control (QC) lab confirms the chemical identity and purity of mixture components and solvents using one or more of the following techniques: GC-FID, HPLC, GC-ECD, GC-MS, LC-MS, refractive index, and melting point.

4 Calibrate Analytical Balances

All analytical balances are verified at seven mass levels daily using NIST* traceable weights and are also calibrated yearly by an ISO/IEC 17025:2005–accredited provider to guarantee accurate measurement.

5 Deactivate Glassware & Ampuls

Restek® reference standards are prepared using Class A volumetric flasks and/or Class A pipettes. Ampuls and vials used in preparation and packaging are deactivated to prevent the loss of target analytes.

6 Maintain ISO Accreditation

In 2011, the reference standard manufacturing and QC testing laboratories in Restek's state-of-the-art Bellefonte, PA, facility earned ISO Guide 34 and ISO/IEC 17025 accreditation. These accreditations—in addition to ISO 9001 registration, which we have maintained since 1994—serve as recognition that Restek and our labs meet the world-class quality standards established by the International Organization for Standardization (ISO). On-site manufacturing as well as raw material, qualitative, and quantitative analyses are completed in these ISO-accredited labs. *Restek's ISO-accredited labs offer a full line of both stock and custom CRMs.*

* National Institute of Standards and Technology

What are Certified Reference Materials (CRMs)?

A CRM from Restek is in an exclusive subset of reference standards that meets the following set of strict criteria defined under ISO Guide 34 and ISO/IEC 17025:

- Made of raw materials characterized via qualified methods on qualified instruments.
- Produced in an ISO-accredited lab under documented procedures.
- Falls under the manufacturer's scopes of accreditation.

To learn more about Restek's ISO quality credentials and to view our certificates (including scopes of accreditation), visit **www.restek.com/iso**

Reference Materials (CRMs)

7 Offer a Variety of Documentation

Restek exclusively offers three levels of fully ISO-compliant documentation for our CRMs, and most stock CRMs come with quantitative-level documentation.

Gravimetric: Product supplied with the gravimetric records listing purity of each material used, calculated concentration, and a unique lot number.

Qualitative (Certificate of Composition): A sample withdrawn from the packaged units is tested by the appropriate technique to verify mixture composition. Product supplied with a certificate of composition showing a chromatogram of the standard with each peak identified, raw material purity, and gravimetric concentration.

Quantitative (Certificate of Analysis): A sample of the packaged unit is analyzed in triplicate and the peak areas are statistically compared to a previous lot (if available) or a second lot. A detailed data pack is available at **www.restek.com/documentation** containing gravimetric documentation, all quantitative assay raw data, exact amount of each raw material used, total volume prepared, and statistics. Test results for raw material purity and identification are available upon request.

Documentation for all of your stock and custom Restek® CRMs is a few clicks away at **www.restek.com/documentation**

8 Package Securely & Label Clearly

Every Restek® CRM is placed in durable, high-quality packaging for dock-to-door protection. Labeling provides critical storage, safety, and shelf life information in an easy-to-read format—and now features bar-coded GHS labeling for added safety and easier compliance.

9 Protect Product Quality After Opening

To help preserve the integrity of our CRMs after they are opened, we include a deactivated screw-top vial (cat.# 24640) with each stock reference standard <5 mL for worry-free transfer and reliable temporary storage.

10 Manage Warehouse Inventory

To ensure the inventory is available when it's needed, Restek continually analyzes and maintains inventory of more than 1,500 catalog standards as well as multiple lots of the most commonly requested calibration standards. We pull inventory months before its expiration date to eliminate inadvertent delivery of expired or nearly expired reference standards.

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Reference Standards

Single-Component Solutions



Compound	CAS #	Solvent	Conc.	cat.#
Acenaphthene	83-32-9	M	1,000	31267
Acenaphthylene	208-96-8	M	1,000	31268
Acetaldehyde-2,4-DNPH	1019-57-4	ACN	100	33074
Acetone	67-64-1	Neat		30012
Acetone	67-64-1	PTM	5,000	30245
Acetonitrile	75-05-8	DMSO	2.05 mg/mL	36281
Acetonitrile	75-05-8	PTM	1,000	30495
Acetophenone	98-86-2	PTM	5,000	30621
Acifluorfen	50594-66-6	M	1,000	32255
Acifluorfen methyl ester	50594-67-7	M	1,000	32256
Acrolein	107-02-8	PTM	5,000	30645
Acrolein	107-02-8	W	5,000	30646
Acrylamide	79-06-1	M	1,000	30494
Acrylonitrile	107-13-1	PTM	2,000	30246
Alachlor	15972-60-8	M	1,000	32204
Aldrin	309-00-2	M	1,000	32205
Allyl chloride	107-05-1	PTM	2,000	30248
Alprazolam	28981-97-7	PTM	1,000	34042
4-Amino-2,6-dinitrotoluene	19406-51-0	ACN	1,000	31671
Aminomethyl phosphonic acid (AMPA)	1066-51-9	W	100	32428
Ammelide	645-93-2	DEA:W (20:80)	1,000	33249
Ammeline	645-92-1	DEA:W (20:80)	1,000	33250
Amobarbital	64-43-7	PTM	1,000	34028
d-Amphetamine	51-63-8	PTM	1,000	34020
tert-Amyl alcohol	75-85-4	PTM	10,000	30631
tert-Amyl ethyl ether (TAEE)	919-94-8	PTM	2,000	30617
tert-Amyl methyl ether (TAME)	994-05-8	PTM	2,000	30629
5-α-Androstane	438-22-2	D	2,000	31065
Aniline	62-53-3	M	1,000	31470
Anthracene	120-12-7	A	1,000	31269
Anthracene-d10	1719-06-08	D	2,000	31037
Anthracene (5 mL)	120-12-7	ACN	100	33264
Antifoam agent for purge-and-trap	N/A	Neat	1 mL	31822
Aprobarbital	77-02-1	PTM	1,000	34029
Aramite	140-57-8	H	2,000	31624

Compound	CAS #	Solvent	Conc.	cat.#
Aroclor 1016	12674-11-2	H	1,000	32006
Aroclor 1016	12674-11-2	I	200	32064
Aroclor 1016	12674-11-2	TO	500 mg/kg	32076
Aroclor 1221	11104-28-2	H	1,000	32007
Aroclor 1221	11104-28-2	I	200	32065
Aroclor 1232	11141-16-5	H	1,000	32008
Aroclor 1232	11141-16-5	I	200	32066
Aroclor 1242	53469-21-9	H	1,000	32009
Aroclor 1242	53469-21-9	I	200	32067
Aroclor 1242	53469-21-9	TO	500 mg/kg	32082
Aroclor 1242	53469-21-9	TO	50 mg/kg	32081
Aroclor 1248	12672-29-6	H	1,000	32010
Aroclor 1248	12672-29-6	I	200	32068
Aroclor 1254	11097-69-1	H	1,000	32011
Aroclor 1254	11097-69-1	I	200	32069
Aroclor 1254	11097-69-1	TO	500 mg/kg	32086
Aroclor 1254	11097-69-1	TO	50 mg/kg	32085
Aroclor 1260	11096-82-5	H	1,000	32012
Aroclor 1260	11096-82-5	I	200	32070
Aroclor 1260	11096-82-5	TO	500 mg/kg	32088
Aroclor 1260	11096-82-5	TO	50 mg/kg	32087
Aroclor 1262	37324-23-5	H	1,000	32409
Aroclor 1268	11100-14-4	H	1,000	32410
Atrazine	1912-24-9	A	1,000	32208
Atrazine-d5	163165-75-1	ACN	100	31984
Aviation gas (5 mL)	8006-69-1	PTM	50,000	30208
Aviation gas	8006-69-1	PTM	50,000	30207
Azobenzene	103-33-3	D	1,000	31496
Barbital	57-44-3	PTM	1,000	34030
Bentazon	25057-89-0	M	1,000	32257
Benzaldehyde	100-52-7	D	2,000	33017
Benzene	71-43-2	DMSO	10 mg/mL	36282
Benzene	71-43-2	D	250	35262
Benzene	71-43-2	PTM	2,000	30249
Benzene-d6	1076-43-3	PTM	2,000	30025

Volume is 1 mL/ampul unless otherwise noted. Concentration is µg/mL unless otherwise noted.



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Compound	CAS #	Solvent	Conc.	cat.#
Benzidine	92-87-5	M	1,000	31441
Benz(a)anthracene	56-55-3	M	1,000	31270
Benzo(a)pyrene	50-32-8	A	1,000	31271
Benzo(b)fluoranthene	205-99-2	A	1,000	31272
Benzo(ghi)perylene	191-24-2	D	1,000	31273
Benzo(k)fluoranthene	207-08-9	A	1,000	31274
Benzoguanamine	91-76-9	pyridine	1,000	33251
Benzoic acid	65-85-0	D	2,000	31879
Benzoic acid	65-85-0	M	1,000	31415
Benzoylecgonine	519-09-5	PTM	1,000	34016
Benzphetamine	5411-22-3	PTM	1,000	34022
Benzyl benzoate	120-51-4	H	5,000	31847
α-BHC	319-84-6	M	1,000	32206
β-BHC	319-85-7	A	1,000	32209
δ-BHC	319-86-8	M	1,000	32217
γ-BHC (lindane)	58-89-9	M	1,000	32226
Bis(2-ethylhexyl)adipate	103-23-1	M	1,000	31449
Bis(2-ethylhexyl)phthalate	117-81-7	D	1,000	31420
Bromazepam	1812-30-2	PTM	1,000	34043
Bromobenzene	108-86-1	PTM	2,000	30250
2-Bromobutanoic acid	80-58-0	MTBE	2,000	31881
2-Bromobutyrate	3196-15-4	MTBE	2,000	31882
2-Bromochlorobenzene	694-80-4	PTM	2,000	30228
4-Bromochlorobenzene	106-39-8	PTM	2,000	30230
1-Bromo-2-chloroethane	107-04-0	PTM	2,000	30469
Bromochloromethane	74-97-5	PTM	2,000	30225
2-Bromo-1-chloropropane	3017-95-6	PTM	2,000	30226
Bromodichloromethane	75-27-4	PTM	2,000	30251
4-Bromo-3,5-dimethylphenyl-N-methylcarbamate (BDMC)	672-99-1	M	100	32274
1-Bromo-4-fluorobenzene (BFB)	460-00-4	PTM	2,000	30026
1-Bromo-4-fluorobenzene (BFB)	460-00-4	PTM	2,500	30067
1-Bromo-4-fluorobenzene (BFB)	460-00-4	PTM	5,000	30003
1-Bromo-4-fluorobenzene (BFB)	460-00-4	PTM	10,000	30082
Bromoform	75-25-2	PTM	2,000	30252
Bromomethane	74-83-9	PTM	2,000	30253
1-Bromo-2-nitrobenzene	577-19-5	A	1,000	32279
2-Bromopropionic acid	598-72-1	MTBE	1,000	31653
Butabarbital	125-40-6	PTM	1,000	34031
Butachlor ESA sodium salt		M	100	33202
1,3-Butadiene	106-99-0	PTM	2,000	30622
Butalbital	77-26-9	PTM	1,000	34032
1,4-Butanediol	110-63-4	M	1,000	34078
(s)-(-)-1,2,4-Butanetriol	42890-76-6	pyridine	1,000	33024
(s)-(-)-1,2,4-Butanetriol (5 mL)	42890-76-6	pyridine	1,000	33032
1-Butanol	71-36-3	PTM	50,000	30474
tert-Butanol (TBA)	75-65-0	PTM	50,000	30470
tert-Butanol-d9	25725-11-5	PTM	20,000	30618
2-Butanone (MEK)	78-93-3	PTM	5,000	30254
γ-Butyrolactone (GBL)	96-48-0	ACN	1,000	34077
Caffeine	58-08-2	W	5	31804
Caffeine	58-08-2	W	25	31803
Caffeine	58-08-2	W	125	31802
Caffeine	58-08-2	W	250	31801
Caffeine	58-08-2	W	500	31800
Caffeine	58-08-2	M	1,000	34084
Cannabichromene (CBC)	20675-51-8	PTM	1,000	34092
Cannabidiol (CBD)	13956-29-1	PTM	1,000	34011
Cannabidiolic Acid (CBDA)	1244-58-2	ACN	1,000	34094
Cannabigerol (CBG)	25654-31-3	PTM	1,000	34091
Cannabinol (CBN)	521-35-7	PTM	1,000	34010
ε-Caprolactam	105-60-2	D	2,000	31833
Carbaryl-d7	362049-56-7	ACN	100	31985
Carbazole	86-74-8	D	1,000	31836
Carbazole	86-74-8	M	1,000	31430
Carbendazim	10605-21-7	M	100	31981
Carbon disulfide	75-15-0	PTM	2,000	30258
Carbon tetrachloride	56-23-5	DMSO	20 mg/mL	36283
Carbon tetrachloride	56-23-5	PTM	2,000	30259
Chloral hydrate	302-17-0	ACN	1,000	30609

Compound	CAS #	Solvent	Conc.	cat.#
Chlordane	57-74-9	H	1,000	32021
Chlordane	57-74-9	I	5,000	32072
Chlordane	57-74-9	M	2,000	32016
cis-Chlordane	5103-71-9	M	1,000	32207
trans-Chlordane	5103-74-2	M	1,000	32227
Chlordiazepoxide	438-41-5	PTM	1,000	34044
4-Chloroaniline	106-47-8	D	2,000	31211
Chlorobenzene	108-90-7	DMSO	1.8 mg/mL	36284
Chlorobenzene	108-90-7	PTM	2,000	30261
Chlorobenzene-d5	3114-55-4	PTM	2,000	30223
Chlorobenzilate	510-15-6	M	1,000	32211
Chloroethane	75-00-3	PTM	2,000	30263
2-Chloroethanol	107-07-3	PTM	2,000	30264
2-Chloroethyl vinyl ether	110-75-8	PTM	2,000	30265
1-Chloro-2-fluorobenzene	348-51-6	PTM	2,000	30040
1-Chloro-4-fluorobenzene	352-33-0	PTM	2,500	30066
Chloroform	67-66-3	DMSO	0.3 mg/mL	36285
Chloroform	67-66-3	PTM	2,000	30266
Chloromethane	74-87-3	PTM	2,000	30267
2-Chloronaphthalene	91-58-7	M	1,000	31284
4-Chloro-3-nitrobenzotrifluoride	121-17-5	A	1,000	32282
1-Chlorooctadecane	3386-33-2	D	10,000	31098
1-Chlorooctane	111-85-3	PTM	10,000	30084
Chloroprene	126-99-8	PTM	5,000	30238
Chlorpyrifos	2921-88-2	M	1,000	32212
Chrysene	218-01-9	A	1,000	31275
Clobazam	22316-47-8	PTM	1,000	34045
Clonazepam	1622-61-3	PTM	1,000	34046
Cocaethylene	529-38-4	ACN	1,000	34066
Cocaine	53-21-4	PTM	1,000	34015
Codeine	76-57-3	PTM	1,000	34000
Cotinine	486-56-6	M	1,000	34086
Creosote oil	8001-58-9	D	50,000	31838
Cyanazine	21725-46-2	A	1,000	32215
Cyanuric acid	108-80-5	DEA:W (20:80)	1,000	33248
Cyclohexane	110-82-7	DMSO	19.4 mg/mL	36286
2,4-D (2,4-Dichlorophenoxyacetic acid)	94-75-7	M	1,000	32239
2,4-D methyl ester	1928-38-7	M	1,000	32240
DCPA methyl ester (Chlorthal-dimethyl)	1861-32-1	M	1,000	32216
Dalapon	75-99-0	ACN	1,000	32432
Dalapon	75-99-0	M	1,000	32253
Dalapon	75-99-0	M	2,000	32056
Dalapon methyl ester	17640-02-7	H	2,000	32057
2,4-DB	94-82-6	M	1,000	32241
DCPA diacid	2136-79-0	M	200	32261
2,4'-DDD	53-19-0	M	1,000	32098
4,4'-DDD	72-54-8	M	1,000	32201
2,4'-DDE	3424-82-6	M	1,000	32099
4,4'-DDE	72-55-9	M	1,000	32202
2,4'-DDT	789-02-6	M	1,000	32200
4,4'-DDT	50-29-3	M	1,000	32203

Volume is 1 mL/ampul unless otherwise noted. Concentration is µg/mL unless otherwise noted.

Solvent codes:

A = acetone
ACN = acetonitrile
C = carbon disulfide
Cy = cyclohexane
D = methylene chloride
DEA = diethylamine
DMSO = dimethyl sulfoxide
EA = ethyl acetate
H = hexane
I = isooctane
Ip = isopropanol
M = methanol
MTBE = methyl *tert*-butyl ether
PTM = purge-and-trap grade methanol
T = toluene
TO = transformer oil
W = water (DI)

Single-Component Solutions

Compound	CAS #	Solvent	Conc.	cat.#
Decachlorobiphenyl (BZ #209) (5 mL)	2051-24-3	A	200	32030
Decachlorobiphenyl (BZ #209)	2051-24-3	A	200	32029
Decachlorobiphenyl (BZ #209)	2051-24-3	I	10	32289
Decafluorobiphenyl	434-90-2	A	1,000	31855
Decafluorobiphenyl	434-90-2	D	2,000	31041
Decafluorobiphenyl	434-90-2	ACN	1,000	31842
Decafluorotriphenylphosphine (DFTPP)	5074-71-5	D	2,500	31001
n-Decane	124-18-5	Neat	1 mL	31858
Dextromethorphan HBr monohydrate	6700-34-1	M	1,000	34081
Dextro-propoxyphene	1639-60-7	PTM	1,000	34008
Diazepam	439-14-5	PTM	1,000	34047
Diazinon-d10 (diethyl-d10)	100155-47-3	ACN	100	31986
Dibenz(a,h)anthracene	53-70-3	D	1,000	31276
4,4'-Dibromobiphenyl	92-86-4	EA	500	32092
Dibromochloromethane (chlorodibromochloromethane)	124-48-1	PTM	2,000	30271
1,2-Dibromo-3-chloropropane (DBCP)	96-12-8	PTM	2,000	30270
1,2-Dibromoethane	106-93-4	PTM	2,000	30272
Dibromomethane	74-95-3	PTM	2,000	30430
4,4'-Dibromooctafluorobiphenyl	10386-84-2	D	2,000	31040
4,4'-Dibromooctafluorobiphenyl	10386-84-2	H	250	32053
4,4'-Dibromooctafluorobiphenyl	10386-84-2	MTBE	2,000	31856
2,3-Dibromopropionic acid	600-05-5	MTBE	1,000	31655
2,5-Dibromotoluene	615-59-8	PTM	1,000	30435
2,5-Dibromotoluene	615-59-8	PTM	10,000	30453
Dibutylchlorendate	1770-80-5	A	200	32025
Dicamba	1918-00-9	M	1,000	32247
Dicamba methyl ester	6597-78-0	M	1,000	32248
1,2-Dichlorobenzene	95-50-1	M	1,000	31442
1,3-Dichlorobenzene	541-73-1	M	1,000	31443
1,4-Dichlorobenzene	106-46-7	ACN	1,000	30498
1,4-Dichlorobenzene	106-46-7	M	1,000	31444
1,2-Dichlorobenzene-d4	2199-69-1	PTM	2,000	30049
3,3'-Dichlorobenzidine	91-94-1	D	2,000	31835
3,3'-Dichlorobenzidine	91-94-1	M	2,000	31026
1,4-Dichlorobutane	110-56-5	PTM	2,000	30227
trans-1,4-Dichloro-2-butene	110-57-6	PTM	2,000	30274
Dichlorodifluoromethane (CFC-12)	75-71-8	PTM	2,000	30275
1,1-Dichloroethane	75-34-3	PTM	2,000	30276
1,2-Dichloroethane	107-06-2	DMSO	25 mg/mL	36288
1,2-Dichloroethane	107-06-2	PTM	2,000	30277
1,2-Dichloroethane-d4	17060-07-0	PTM	2,000	30027
1,1-Dichloroethene	75-35-4	DMSO	40 mg/mL	36287
1,1-Dichloroethene	75-35-4	PTM	2,000	30278
cis-1,2-Dichloroethene	156-59-2	PTM	2,000	30279
trans-1,2-Dichloroethene	156-60-5	PTM	2,000	30280
cis-1,2-Dichloroethylene	156-59-2	DMSO	4.67 mg/mL	36289
trans-1,2-Dichloroethylene	156-60-5	DMSO	4.67 mg/mL	36290
2,6-Dichlorophenol	87-65-0	M	1,000	31409
2,4-Dichlorophenylacetic acid	19719-28-9	M	200	32049
2,4-Dichlorophenylacetic acid	19719-28-9	A	1,000	32439
2,4-Dichlorophenyl acetic acid methyl ester	55954-23-9	H	200	32050
1,2-Dichloropropane	78-87-5	PTM	2,000	30281
2,2-Dichloropropane	594-20-7	PTM	2,000	30283
cis-1,3-Dichloropropene	10061-01-5	PTM	2,000	30284
trans-1,3-Dichloropropene	10061-02-6	PTM	2,000	30285
2,3-Dichloropropionic acid	565-64-0	MTBE	1,000	31650
1,2-Dichlorotetrafluoroethane (CFC-114)	76-14-2	PTM	2,000	30476
Dichlorprop	120-36-5	M	1,000	32249
Dichlorprop methyl ester	57153-17-0	M	1,000	32250
Dichlorvos-d6	203645-53-8	A	100	31987
Dieldrin	60-57-1	M	1,000	32218

Compound	CAS #	Solvent	Conc.	cat.#
Diesel fuel #2 composite (5 mL)	68334-30-5	D	50,000	31259
Diesel fuel #2 composite	68334-30-5	D	5,000	31093
Diesel fuel #2 composite	68334-30-5	D	50,000	31258
Diesel fuel #2: 25% weathered	68334-30-5	D	5,000	31234
Diesel fuel #2: 50% weathered	68334-30-5	D	5,000	31235
Diesel fuel #2: 75% weathered	68334-30-5	D	5,000	31236
Diesel fuel #2: unweathered	68334-30-5	D	5,000	31233
Diesel:biodiesel (80:20)	67784-80-9	D	5,000	31880
Diethyl ether (ethyl ether)	60-29-7	PTM	2,000	30286
1,4-Difluorobenzene	540-36-3	PTM	2,000	30032
Diisopropyl ether (DIPE)	108-20-3	PTM	2,000	30627
Dimethachlor ESA sodium salt		M	100	33203
Dimethoate-d6	1219794-81-6	ACN	100	31988
1,2-Dimethoxyethane	110-71-4	DMSO	0.5 mg/mL	36291
N,N-Dimethylacetamide	127-19-5	DMSO	5.45 mg/mL	36292
Dimethyldichlorosilane (DMDCS) (25 mL)	75-78-5	Neat	25 mL	31861
N,N-Dimethylformamide	68-12-2	DMSO	4.4 mg/mL	36293
3,5-Dinitroaniline	618-87-1	ACN	1,000	31661
1,2-Dinitrobenzene	528-29-0	M	1,000	31453
1,3-Dinitrobenzene	99-65-0	ACN	1,000	31662
1,4-Dinitrobenzene	100-25-4	ACN	2,000	33205
4,6-Dinitro-2-methylphenol (Dinitro-*o*-cresol)	534-52-1	M	1,000	31292
2,4-Dinitrophenol	51-28-5	M	1,000	31291
2,4-Dinitrotoluene	121-14-2	ACN	1,000	31663
2,6-Dinitrotoluene	606-20-2	ACN	1,000	31664
3,4-Dinitrotoluene	610-39-9	M	1,000	31452
Di-*n*-octyl phthalate	117-84-0	M	1,000	31426
Dinoseb	88-85-7	M	1,000	32251
Dinoseb methyl ether	6099-79-2	M	1,000	32252
Diolein (1,3-di[*cis*-octadecenoyl] glycerol)	2465-32-9	pyridine	5,000	33022
1,4-Dioxane	123-91-1	DMSO	1.9 mg/mL	36294
1,4-Dioxane	123-91-1	D	2,000	31853
1,4-Dioxane	123-91-1	PTM	2,000	30287
1,4-Dioxane-d8	17647-74-4	PTM	2,000	30614
1,2-Diphenylhydrazine	122-66-7	M	1,000	31497
Diuron	330-54-1	ACN	200	32450
Diuron-d6	1007536-67-5	ACN	100	31989
Ecgonine	5796-31-6	PTM	1,000	34017
Ecgonine methyl ester	38969-40-3	PTM	1,000	34018
EDDP perchlorate	66729-78-0	M	1,000	34069
EGDN*	628-96-6	M	1,000	31601
Endosulfan I	959-98-8	A	1,000	32465
Endosulfan II	33213-65-9	A	1,000	32466
Endosulfan sulfate	1031-07-8	A	1,000	32467
Endrin	72-20-8	A	1,000	32463
Endrin ketone	53494-70-5	A	1,000	32464
Ethanol	64-17-5	PTM	2,000	30288
Ethanol	64-17-5	W	10,000	30466
2-Ethoxyethanol	110-80-5	DMSO	0.8 mg/mL	36295
Ethylbenzene	100-41-4	DMSO	1.84 mg/mL	36296
Ethylbenzene	100-41-4	PTM	2,000	30290
Ethylbenzene-d10	25837-05-2	PTM	2,000	30029
Ethylbenzene-d5	20302-26-5	PTM	2,000	30028
Ethyl-*tert*-butyl ether (ETBE)	637-92-3	PTM	2,000	30628
Ethylenediamine	107-15-3	M	540	35222
Ethylene glycol	3775-85-7	DMSO	3.1 mg/mL	36297
Ethylene oxide	75-21-8	D	50 mg/mL	30620
Ethylene oxide	75-21-8	DMSO	500	36005
Ethylene oxide (5 mL)	75-21-8	PEG-200	0.005% w/w	30548
Ethyl methacrylate	97-63-2	PTM	2,000	30289
Fentanyl	437-38-7	M	1,000	34082
nor-Fentanyl oxalate	1609-66-1	M	1,000	34083

Volume is 1 mL/ampul unless otherwise noted. Concentration is µg/mL unless otherwise noted.

*Ships under Restek's USDOT explosives approval.

Compound	CAS #	Solvent	Conc.	cat.#
Fluazinam	79622-59-6	ACN	100	31982
Flunitrazepam	1622-62-4	PTM	1,000	34049
Fluoranthene	206-44-0	M	1,000	31277
Fluorene	86-73-7	M	1,000	31278
Fluorobenzene	462-06-6	PTM	2,000	30030
2-Fluorobiphenyl	321-60-8	D	2,000	31091
2-Fluorobiphenyl	321-60-8	D	10,000	31096
2-Fluorophenol	367-12-4	D	2,000	31047
Flurazepam	1172-18-5	PTM	1,000	34050
Formaldehyde-DNPH	1081-15-8	ACN	500	31837
Formaldehyde-2,4-DNPH	1081-15-8	ACN	100	33082
Formamide	75-12-7	DMSO	1.1 mg/mL	36298
Fuel oil # 4	68476-31-3	D	5,000	31216
Fuel oil # 4	68476-31-3	D	50,000	31244
Fuel oil # 6	68553-00-4	D	5,000	31218
Fuel oil # 6	68553-00-4	D	50,000	31248
DL-Glutethimide	18389-24-7	PTM	1,000	34058
Glycerin	56-81-5	pyridine	500	33020
Glycolaldehyde-2,4-DNPH		ACN	100	33091
Glyphosate (5 mL)	1071-83-6	W	1,000	32427
Glyphosate	1071-83-6	W	1,000	32426
1,6-HDIP	72375-27-0	DMSO	1,000	33002
Heptachlor	76-44-8	M	1,000	32228
Heptachlor epoxide (isomer B)	1024-57-3	M	1,000	32230
Hexachlorobenzene	118-74-1	A	1,000	32231
Hexachloro-1,3-butadiene	87-68-3	M	1,000	31435
Hexachlorocyclopentadiene	77-47-4	M	1,000	32232
Hexachloroethane	67-72-1	M	1,000	31436
Hexachlorophene	70-30-4	D	2,000	31811
Hexane	8031-34-3	DMSO	1.45 mg/mL	36299
Hexobarbital	56-29-1	PTM	1,000	34033
HMX*	2691-41-0	ACN	1,000	31665
Hydramethylnon	67485-29-4	ACN	100	31979
Hydraulic oil	64741-89-5	D	50,000	31839
Hydrocodone	34195-34-1	PTM	1,000	34002
Hydromorphone	71-68-1	PTM	1,000	34063
Indeno(1,2,3-cd)pyrene	193-39-5	D	1,000	31279
Iodomethane	74-88-4	PTM	2,000	30292
Isobutyl alcohol	78-83-1	PTM	2,000	30293
Isobutylbenzene	538-93-2	PTM	1,000	30613
Isopropylbenzene	98-82-8	PTM	2,000	30294
Jet fuel A (5 mL)	64742-47-8	D	50,000	31243
Jet fuel A	64742-47-8	D	5,000	31215
Jet fuel A	64742-47-8	D	50,000	31242
JP-5 military fuel	8008-20-6	D	50,000	31252
JP-8 military fuel	94114-58-6	D	5,000	31262
JP-8 military fuel	94114-58-6	D	50,000	31254
Kerosene composite (5 mL)	84742-81-0	D	50,000	31257
Kerosene composite	84742-81-0	D	5,000	31094
Kerosene composite	84742-81-0	D	50,000	31256
Kerosene: 25% weathered	84742-81-0	D	5,000	31230
Kerosene: 50% weathered	84742-81-0	D	5,000	31231
Kerosene: 75% weathered	84742-81-0	D	5,000	31232
Kerosene: unweathered	84742-81-0	D	5,000	31229

Compound	CAS #	Solvent	Conc.	cat.#
Levorphanol	5985-38-6	PTM	1,000	34003
Linuron-d6	330-55-2	ACN	100	31990
Lorazepam	846-49-1	PTM	1,000	34051
3,4-MDA HCl	4764-17-4	M	1,000	34070
3,4-MDEA HCl	82801-81-8	M	1,000	34072
4,4'-MDIP	72375-24-7	DMSO	1,000	33003
3,4-MDMA HCl	64057-70-1	M	1,000	34071
Melamine	108-78-1	DEA:W (20:80)	1,000	33247
Meperidine	50-13-5	PTM	1,000	34004
Mephobarbital	115-38-8	PTM	1,000	34034
Meprobamate	57-53-4	PTM	1,000	34059
Methacrylonitrile	126-98-7	PTM	2,000	30297
Methadone	1095-90-5	PTM	1,000	34005
(+)Methamphetamine	51-57-0	PTM	1,000	34021
Methanol	67-56-1	DMSO	15 mg/mL	36401
Methanol	67-56-1	W	10,000	30467
Methapyrilene hydrochloride	135-23-9	D	2,000	32460
Methaqualone	340-56-7	PTM	1,000	34064
Methohexital	151-83-7	PTM	1,000	34035
Methoxychlor	72-43-5	M	1,000	32233
2-Methoxyethanol	109-86-4	DMSO	0.25 mg/mL	36402
Methyl arachidate	1120-28-1	Neat		35056
Methyl behenate	929-77-1	Neat		35062
Methyl *tert*-butyl ether (MTBE)	1634-04-4	PTM	2,000	30402
Methylbutylketone	591-78-6	DMSO	0.25 mg/mL	36400
Methyl caprate	110-42-9	Neat		35041
Methyl caproate	106-70-7	Neat		35037
Methyl caprylate	111-11-5	Neat		35039
3-Methylcholanthrene	56-49-5	D	2,000	31996
Methylcyclohexane	108-87-2	DMSO	5.9 mg/mL	36403
Methyl-2,3-dibromopropionate	1729-67-5	MTBE	1,000	31656
Methyl eicosatrienoate	55682-88-7	Neat		35059
Methyl eicosenoate	2390-09-2	Neat		35057
Methyl erucate	1120-34-9	Neat		35063
Methyl heneicosanoate	6064-90-0	Neat		35061
Methyl heptadecanoate	1731-92-6	Neat		35050

Volume is 1 mL/ampul unless otherwise noted. Concentration is µg/mL unless otherwise noted.

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Solvent codes:

A = acetone
ACN = acetonitrile
C = carbon disulfide
Cy = cyclohexane
D = methylene chloride
DEA = diethylamine
DMSO = dimethyl sulfoxide
EA = ethyl acetate
H = hexane
I = isooctane
Ip = isopropanol
M = methanol
MTBE = methyl *tert*-butyl ether
PTM = purge-and-trap grade methanol
T = toluene
TO = transformer oil
W = water (DI)

Restek Offers a Full Line of Certified Reference Materials

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See **pages 464–465** or visit www.restek.com/iso

Single-Component Solutions

Compound	CAS #	Solvent	Conc.	cat.#
Methyl laurate	111-82-0	Neat		35043
Methyl lignocerate	2442-49-1	Neat		35064
Methyl linoleate	112-63-0	Neat		35053
Methyl linolenate	301-00-8	Neat		35054
Methyl methacrylate	80-62-6	PTM	2,000	30299
Methyl myristate	124-10-7	Neat		35045
1-Methylnaphthalene	90-12-0	M	1,000	31283
2-Methylnaphthalene	91-57-6	D	1,000	31285
Methyl nonadecanoate	1731-94-8	Neat		35055
Methyl oleate	112-62-9	Neat		35052
Methyl palmitate	112-39-0	Neat		35048
Methyl palmitoleate	1120-25-8	Neat		35049
4-Methyl-2-pentanone (MIBK)	108-10-1	PTM	5,000	30400
3-Methylphenol	108-39-4	M	1,000	31403
N-Methylpyrrolidone	872-50-4	DMSO	2.65 mg/mL	36405
Methyl stearate	112-61-8	Neat		35051
Methyl tridecanoate	1731-88-0	Neat		35044
Methyl undecanoate	1731-86-8	Neat		35042
α-Methylene-γ-butyrolactone (AMGBL)	547-65-9	ACN	1,000	34079
Methylene chloride (dichloromethane)	75-09-2	DMSO	3 mg/mL	36404
Methylene chloride (dichloromethane)	75-09-2	PTM	2,000	30401
Methyprylon	125-64-4	PTM	1,000	34060
Metribuzin	21087-64-9	A	1,000	32436
Mineral spirits: unweathered	8030-30-6	D	5,000	31225
Mineral spirits: unweathered	8030-30-6	D	50,000	31260
Monolein (1-mono[*cis*-9-octadecenoyl]-rac-glycerol)	111-03-5	pyridine	5,000	33021
Monopalmitin	524-44-9	pyridine	5,000	33026
Morphine	6211-15-0	PTM	1,000	34006
Motor oil composite	64742-47-8	D	50,000	31464
Naphthalene	91-20-3	M	1,000	31280
Naphthalene-d8	1146-65-2	D	2,000	31043
Nicarbazin (bis-nitrophenol urea) (5 mL)	330-95-0	ACN	10	33261
Nicotine	54-11-5	M	1,000	34085
Nitrazepam	146-22-5	PTM	1,000	34053
Nitrobenzene	98-95-3	ACN	1,000	31657
Nitroglycerin*	55-63-0	M	1,000	31498
Nitroguanidine*†	556-88-7	M	1,000	31602
Nitromethane	75-52-5	DMSO	0.25 mg/mL	36406
4-Nitrophenol	100-02-7	M	1,000	31296
2-Nitropropane	79-46-9	PTM	2,000	30403
N-Nitrosodimethylamine	62-75-9	M	1,000	31427
N-Nitrosodimethylamine-d6	17829-05-9	D	1,000	33910
N-Nitrosodiphenylamine	86-30-6	M	1,000	31429
N-Nitroso-di-*n*-propylamine	621-64-7	M	1,000	31428
N-Nitrosodi-*n*-propylamine-d14	93951-96-3	D	1,000	33911
2-Nitrotoluene	88-72-2	ACN	1,000	31659
3-Nitrotoluene	99-08-1	ACN	1,000	31660
4-Nitrotoluene	99-99-0	ACN	1,000	31658
n-Nonatriacontane (C39) (10 mL)	7194-86-7	C	3,000	31877
n-Nonatriacontane (C39)	7194-86-7	C	3,000	31456
n-Octacosane (C28)	630-02-4	D	10,000	31672
Oxazepam	604-75-1	PTM	1,000	34054
Oxycodone	124-90-3	PTM	1,000	34007
Oxymorphone	76-41-5	PTM	1,000	34065
PCB 18 (5 mL)	37680-65-2	ACN	50	33255
PCB 28 (5 mL)	7012-37-5	ACN	50	33256
PCB 52 (5 mL)	35693-99-3	ACN	50	33257
PCB 138 (5 mL)	35065-28-2	ACN	50	33262
PCB 153 (5 mL)	35065-27-1	ACN	50	33263

Compound	CAS #	Solvent	Conc.	cat.#
Pentachloroanisole	1825-21-4	M	1,000	32268
Pentachloroethane	76-01-7	PTM	2,000	30404
Pentachloronitrobenzene	82-68-8	EA	100	32091
Pentachlorophenol	87-86-5	M	1,000	31297
n-Pentacontane (C50)	6596-40-3	T	10	31685
Pentacosane (C25)	629-99-2	D	10,000	31487
Pentafluorobenzene	363-72-4	PTM	2,000	30031
Pentafluorophenol	771-61-9	D	2,000	31048
Pentazocine	64024-15-3	PTM	1,000	34062
Pentobarbital	76-74-4	PTM	1,000	34036
Perfluorotributylamine (PFTBA)	311-89-7	Neat	1 mL	30482
PETN (pentaerythritol tetranitrate)*	78-11-5	M	1,000	31600
Phenanthrene	85-01-8	M	1,000	31281
Phenanthrene-d10	1517-22-2	D	2,000	31045
Phencyclidine	956-90-1	PTM	1,000	34027
Phendimetrazine	50-58-8	PTM	1,000	34025
Phenmetrazine	1707-14-8	PTM	1,000	34026
Phenobarbital	50-06-6	PTM	1,000	34037
Phenol	108-95-2	M	1,000	31298
Phenol-d6	13127-88-3	D	2,000	31049
Phentermine	1197-21-3	PTM	1,000	34024
Picloram	1918-02-1	M	1,000	32265
Picloram methyl ester	14143-55-6	M	1,000	32266
Picric acid*	88-89-1	M	1,000	31499
Poly (ethylene glycol) 200 (10 mL)	25322-68-3	Neat		30549
Poly (ethylene glycol) 400 (10 mL)	25322-68-3	Neat		30559
Polywax 500	9002-88-4	Neat	1 g	36224
Polywax 655	9002-88-4	Neat	1 g	36225
Polywax 850	9002-88-4	Neat	1 g	36226
Polywax 1,000	9002-88-4	Neat	1 g	36227
Prazepam	2955-38-6	PTM	1,000	34055
Propachlor	1918-16-7	M	1,000	32235
2-Propanol	67-63-0	W	50,000	30473
Propionitrile	107-12-0	PTM	2,000	30407
Pyrene	129-00-0	M	1,000	31282
Pyridine	110-86-1	DMSO	1 mg/mL	36407
Pyridine	110-86-1	PTM	2,000	30409

Volume is 1 mL/ampul unless otherwise noted. Concentration is µg/mL unless otherwise noted.

*Ships under Restek's USDOT explosives approval.

† Available only to customers or distributors inside the 48 contiguous United States; item may not be resold for export.



Restek® Safe Cracker

Included with every reference standard shipment for added convenience.

Compound	CAS #	Solvent	Conc.	cat.#
RDX*	121-82-4	ACN	1,000	31666
Secobarbital	29071-21-4	PTM	1,000	34038
Simazine	122-34-9	A	1,000	32236
Stearyl stearate (10 mL)	2778-96-3	Cy	2,000	31636
Stearyl stearate (10 mL)	2778-96-3	H	2,000	31681
Stearyl stearate	2778-96-3	Neat	100 mg	31860
Stoddard solvent	8052-41-3	PTM	10,000	30487
Styrene	100-42-5	PTM	2,000	30410
Sulfolane	126-33-0	DMSO	0.8 mg/mL	36413
2,4,5-T methyl ester	1928-37-6	M	1,000	32244
Talbutal	115-44-6	PTM	1,000	34039
2,4-TDIP	72375-21-4	DMSO	1,000	33001
2,6-TDIP	195625-39-9	DMSO	1,000	33000
Temazepam	846-50-4	PTM	1,000	34056
o-Terphenyl	84-15-1	A	2,000	31066
o-Terphenyl	84-15-1	D	10,000	31097
p-Terphenyl	92-94-4	D	10,000	31095
p-Terphenyl-d14	1718-51-0	D	1,000	31828
α-Terpineol	98-55-5	D	2,000	33912
1,1,1,2-Tetrachloroethane	630-20-6	PTM	2,000	30411
1,1,2,2-Tetrachloroethane	79-34-5	PTM	2,000	30412
Tetrachloroethene	127-18-4	PTM	2,000	30413
2,3,4,6-Tetrachlorophenol	58-90-2	M	1,000	31402
2,4,5,6-Tetrachloro-*m*-xylene (5 mL)	877-09-8	A	200	32028
2,4,5,6-Tetrachloro-*m*-xylene	877-09-8	A	200	32027
n-Tetracontane (C40)	4181-95-7	Neat	100 mg	31859
Δ^8-Tetrahydrocannabinol (THC)	5957-75-5	PTM	1,000	34090
Tetrahydrofuran (THF)	109-99-9	DMSO	3.6 mg/mL	36408
Tetrahydrofuran (THF)	109-99-9	PTM	2,000	30414
Tetrahydrofuran-d8	1693-74-9	PTM	2,000	30112
Tetralin	119-64-2	DMSO	0.5 mg/mL	36409
Tetra-*n*-propyltin	2176-98-9	D	2,000	31474
Tetryl*	479-45-8	ACN	1,000	31667
Δ^9-Tetrahydrocannabinol (THC)	1972-08-3	M	1,000	34067
(±)11-nor-9-carboxy-Δ^9-THC	104874-50-2	M	100	34068
Δ^9-Tetrahydrocannabinolic acid A (THCA-A)	23978-85-0	PTM	1,000	34093
Thebaine	115-37-7	PTM	1,000	34009
Tinuvin P	2440-22-4	Ip	52	31629
Toluene	108-88-3	DMSO	4.45 mg/mL	36410
Toluene	108-88-3	PTM	2,000	30415
Toluene-d8	2037-26-5	PTM	2,000	30224
Toxaphene	8001-35-2	H	1,000	32005
Toxaphene	8001-35-2	I	5,000	32071
Toxaphene	8001-35-2	M	2,000	32015
2,4,5-TP (Silvex)	93-72-1	M	1,000	32245
2,4,5-TP (Silvex) methyl ester	4841-20-7	M	1,000	32246
Transformer oil (PCB-free)	64742-53-6	Neat	50 mL	32425
Transformer oil (PCB-free)	64742-53-6	Neat	5 mL	32424
n-Triacontane-d62 (C30)	638-68-6	D	500	31816
Triazolam	28911-01-5	PTM	1,000	34057
2,4,6-Tribromophenol	118-79-6	M	1,000	31401
Tributylphosphate	126-73-8	A	1,000	32280
Tributyltin chloride	1461-22-9	D	2,000	31478
Tricaprin (1,2,3-tricaprinoylglycerol)	621-71-6	pyridine	8,000	33025
Tricaprin (1,2,3-tricaprinoylglycerol) (5 mL)	621-71-6	pyridine	8,000	33033
1,2,3-Trichlorobenzene	87-61-6	PTM	2,000	30416
1,2,4-Trichlorobenzene	120-82-1	M	1,000	31439
1,3,5-Trichlorobenzene	108-70-3	PTM	1,000	31081
1,1,1-Trichloroethane	71-55-6	DMSO	50 mg/mL	36411
1,1,1-Trichloroethane	71-55-6	PTM	2,000	30418
1,1,2-Trichloroethane	79-00-5	PTM	2,000	30419
Trichloroethene	79-01-6	DMSO	0.4 mg/mL	36412
Trichloroethene	79-01-6	PTM	2,000	30420

Compound	CAS #	Solvent	Conc.	cat.#
Trichlorofluoromethane (CFC-11)	75-69-4	PTM	2,000	30421
2,4,5-Trichlorophenol	95-95-4	A	1,000	32017
2,4,5-Trichlorophenol	95-95-4	M	1,000	31299
2,4,6-Trichlorophenol	88-06-2	M	1,000	31400
1,2,3-Trichloropropane	96-18-4	MTBE	1,000	31648
1,2,3-Trichloropropane	96-18-4	PTM	2,000	30429
1,1,2-Trichlorotrifluoroethane (CFC-113)	76-13-1	PTM	2,000	30462
α,α,α-Trifluorotoluene	98-08-8	PTM	2,000	30048
α,α,α-Trifluorotoluene	98-08-8	PTM	2,500	30068
α,α,α-Trifluorotoluene	98-08-8	PTM	10,000	30083
Trifluralin	1582-09-8	M	1,000	32238
1,2,4-Trimethylbenzene	95-63-6	PTM	2,000	30422
1,3,5-Trimethylbenzene	108-67-8	PTM	2,000	30423
2,2,4-Trimethylpentane (isooctane)	540-84-1	nonane	5% vol/vol	30671
1,3,5-Trinitrobenzene*	99-35-4	ACN	1,000	31668
2,4,6-Trinitrotoluene*	118-96-7	ACN	1,000	31669
Triolein (1,2,3-tri[*cis*-octadecenoyl] glycerol)	122-32-7	pyridine	5,000	33023
Tripentyltin chloride	3342-67-4	D	2,000	31477
Triphenylmethane (5 mL)	519-73-3	ACN	10	33260
Triphenylphosphate (5 mL)	115-86-6	ACN:acetic acid (99:1)	2	31964
Triphenylphosphate (5 mL)	115-86-6	ACN	20	33258
Tri-*n*-propyltin chloride	995-25-5	D	2,000	31476
Triphenylphosphate	115-86-6	A	1,000	32281
Tris(1,3-dichloroisopropyl)phosphate (5 mL)	13674-87-8	ACN	50	33259
Unleaded gasoline composite (5 mL)	8006-61-9	PTM	50,000	30206
Unleaded gasoline composite	8006-61-9	PTM	2,500	30081
Unleaded gasoline composite	8006-61-9	PTM	50,000	30205
Unleaded gasoline: 25% weathered	8006-61-9	PTM	5,000	30097
Unleaded gasoline: 50% weathered	8006-61-9	PTM	5,000	30098
Unleaded gasoline: 75% weathered	8006-61-9	PTM	5,000	30099
Unleaded gasoline: 99% weathered	8006-61-9	PTM	5,000	30436
Unleaded gasoline: unweathered	8006-61-9	PTM	5,000	30096
Used motor oil composite	64742-65-0	D	50,000	31465
γ-Valerolactone	108-29-2	ACN	1,000	34080
Vinyl acetate	108-05-4	PTM	2,000	30216
Vinyl chloride	75-01-4	PTM	2,000	30089
Vinyl chloride	75-01-4	PTM	2,500	30093
m-Xylene	108-38-3	DMSO	6.51 mg/mL	36414
m-Xylene	108-38-3	PTM	2,000	30424
o-Xylene	95-47-6	DMSO	0.97 mg/mL	36415
o-Xylene	95-47-6	PTM	2,000	30425
p-Xylene	106-42-3	DMSO	1.52 mg/mL	36416
p-Xylene	106-42-3	PTM	2,000	30426

Volume is 1 mL/ampul unless otherwise noted. Concentration is µg/mL unless otherwise noted.

*Ships under Restek's USDOT explosives approval.

Solvent codes:

A = acetone
ACN = acetonitrile
C = carbon disulfide
Cy = cyclohexane
D = methylene chloride
DEA = diethylamine
DMSO = dimethyl sulfoxide
EA = ethyl acetate
H = hexane
I = isooctane
Ip = isopropanol
M = methanol
MTBE = methyl *tert*-butyl ether
PTM = purge-and-trap grade methanol
T = toluene
TO = transformer oil
W = water (DI)

Reference Standards

Column & Detector Test Mixes & Reagents



Deactivating Agent..... 472
Derivatization Reagents..... 472–473
Detector Tuning Mixtures..... 473
GC Column & Detector Test Mixes.. 473–474
GPC Calibration Mixes..... 474
LC Column & Detector Test Mixes..... 475

Deactivating Agent

Dimethyldichlorosilane (DMDCS) Deactivating Agent

- Easy deactivation of liners and other glass surfaces.
- Convenient—25 mL bottle deactivates 60 inlet liners.
- Tested to ensure consistent quality and effectiveness.

Restek offers dimethyldichlorosilane (DMDCS) for deactivating liners and other glassware. DMDCS reacts with active hydroxyl groups on the glass surface to produce a deactivated surface. A simple, step-by-step procedure is included with the product.

Dimethyldichlorosilane (DMDCS) (75-78-5)

Neat, 25 mL/bottle

cat.# 31861 (ea.)

Ground transportation shipments only.
No data pack available.

Quantity Discounts Available

— Buy 3 Standards, Get 10% Off
— Buy 5 Standards, Get 20% Off

Not available for all standards. Contact your local Restek® representative for more details.

Derivatization Reagents

Acylation Derivatization Reagents

- Most commonly used for electron capture detection.
- React with alcohols, amines, and phenols.
- Frequently used for drugs of abuse confirmation.

Acylation reagents offer the same advantage available from silylation reagents: creating less polar, more volatile derivatives. In comparison to silylating reagents, the acylating reagents can more readily target highly polar multifunctional compounds, such as carbohydrates and amino acids. In addition, acylating reagents offer the distinct advantage of introducing electron-capturing groups, thus enhancing detectability during analysis.

Compound	CAS #	cat.#
MBTFA (N-methyl-bis-trifluoroacetamide)		
10-pk. (10x1 g)	685-27-8	35616
25 g vial	685-27-8	35617
TFAA (trifluoroacetic acid anhydride)		
10-pk. (10x1 g)	407-25-0	35618
25 g vial	407-25-0	35619
PFAA (pentafluoropropionic acid anhydride)		
10-pk. (10x1 g)	356-42-3	35620
25 g vial	356-42-3	35621
HFAA (heptafluorobutyric acid anhydride)		
10-pk. (10x1 g)	336-59-4	35622
25 g vial	336-59-4	35623
PFPOH (pentafluoropropanol)		
10-pk. (10x1 g)	422-05-9	35624
25 g vial	422-05-9	35625

Derivatization Reagents, *cont.*

Silylation Derivatization Reagents

- Replace active hydrogen, reducing polarity and making the compounds more volatile.
- Increase stability of derivatives.

Silylation is the most widely used derivatization procedure for sample analysis by GC. In silylation, an active hydrogen is replaced by an alkylsilyl group such as trimethylsilyl (TMS) or *tert*-butyldimethylsilyl (*tert*-BDMS). Silyl derivatives are more volatile, less polar, and more thermally stable. As a result, GC separation is improved and detection is enhanced.

Both TMS and *tert*-BDMS reagents are suitable for a wide variety of compounds and can be used for many GC applications. (Note that silylation reagents are generally moisture-sensitive and must be sealed to prevent deactivation.)

Compound	CAS #	cat.#
MSTFA (N-methyl-N-trimethylsilytrifluoroacetamide)		
10-pk. (10x1 g)	24589-78-4	35600
25 g vial	24589-78-4	35601
MSTFA w/1% TMCS (N-methyl-N-trimethylsilytrifluoroacetamide w/1% trimethylchlorosilane)		
10-pk. (10x1 g)	24589-78-4	35602
25 g vial	24589-78-4	35603
BSTFA (N,O-bis[trimethylsilyl]trifluoroacetamide)		
10-pk. (10x1 g)	25561-30-2	35604
BSTFA w/1% TMCS (N,O-bis[trimethylsilyltrifluoroacetamide] w/1% trimethylchlorosilane)		
10-pk. (10x1 g)	25561-30-2	35606
25 g vial	25561-30-2	35607
MTBSTFA w/1% TBDMCS (N-methyl-N[tert-butyldimethylsilyl trifluoroacetamide] w/1% tert-butyldimethylchlorosilane)		
10-pk. (10x1 g)	77377-52-7	35608
25 g vial	77377-52-7	35610
TMCS (trimethylchlorosilane)		
10-pk. (10x1 g)	75-77-4	35611



Restek® Safe Cracker

Included with every reference standard shipment for added convenience.

Detector Tuning Mixes

VOA Tuning Compound

1-Bromo-4-fluorobenzene (BFB) (460-00-4)

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

cat.# 30003 (ea.)

SV Tuning Compound

Decafluorotriphenylphosphine (DFTPP) (5074-71-5)

2,500 µg/mL in methylene chloride, 1 mL/ampul

cat.# 31001 (ea.)

PFTBA (MS Tuning Compound)

Perfluorotributylamine (PFTBA) (311-89-7)

Neat, 1 mL/ampul

cat.# 30482 (ea.)

No data pack available.

GC-MS Tuning Mixture (4 components)

Benzidine (92-87-5)
4,4'-DDT (50-29-3)
Decafluorotriphenylphosphine (DFTPP) (5074-71-5)
Pentachlorophenol (87-86-5)

1,000 µg/mL each in methylene chloride, 1 mL/ampul

cat.# 31615 (ea.)

GC Column & Detector Test Mixes

Amine Column Test Mix (8 components)

For Stabilwax®-DB, Rtx®-5 Amine, Rtx®-35 Amine, and Rtx®-Volatile Amine columns.

Decane (C10) (124-18-5)	0.60 mg/mL	Diethylenetriamine (111-40-0)	1.20
Dodecane (C12) (112-40-3)	0.60	2,6-Dimethylaniline (87-62-7)	0.60
1,2-Butanediol (26171-83-5)	0.60	2-Nonanol (628-99-9)	0.60
Diethanolamine (DEA) (111-42-2)	1.20	Pyridine (110-86-1)	0.60

In methylene chloride:methanol (1:1), 1 mL/ampul

cat.# 35002 (ea.)

No data pack available.

FID Performance Evaluation Standard (3 components)

n-Tetradecane (C14) (629-59-4)
n-Pentadecane (C15) (629-62-9)
n-Pexadecane (C16) (544-76-3)

0.03 w/w% each in hexane, 1 mL/ampul

cat.# 33908 (ea.)

GC-FID Test Mix (3 components)

n-Dodecane (C12) (112-40-3)
n-Tetradecane (C14) (629-59-4)
n-Hexadecane (C16) (544-76-3)

20 µg/mL each in hexane, 1 mL/ampul

cat.# 35108 (ea.)

GC Column & Detector Test Mixes, *cont.*

Grob Test Mix (12 components)

For use with temperature-programmed conditions.

*n*C10-FAME (110-42-9)	0.42 mg/mL	Dicyclohexylamine (101-83-7)	0.31
*n*C11-FAME (1731-86-8)	0.42	2,6-Dimethylaniline (87-62-7)	0.32
*n*C12-FAME (111-82-0)	0.41	2,6-Dimethylphenol (576-26-1)	0.32
Decane (C10) (124-18-5)	0.28	2-Ethylhexanoic acid (149-57-5)	0.38
Undecane (C11) (1120-21-4)	0.29	Nonanal (124-19-6)	0.40
2,3-Butanediol (6982-25-8)	0.53	1-Octanol (111-87-5)	0.36

In methylene chloride, 1 mL/ampul

cat.# 35000 (ea.)

No data pack available.

Inter-Polar Column Test Mix (11 components)

n-Heptane (C7) (142-82-5)	1.25 mg/mL	1,2-Dichloropropane (78-87-5)	2.00
n-Octane (C8) (111-65-9)	1.40	Methanol (67-56-1)	1.25
n-Nonane (C9) (111-84-2)	2.00	1-Propanol (71-23-8)	1.25
Acetone (67-64-1)	1.25	Pyridine (110-86-1)	1.40
2-Butanone (MEK) (78-93-3)	1.25	Tetrachloroethylene (127-18-4)	3.25
Chlorobenzene (108-90-7)	2.00		

In methylene chloride, 1 mL/ampul

cat.# 35076 (ea.)

ISO-C14-C20 Column Test Mix (5 components)

n-Tetradecane (C14) (629-59-4)	*n*-Octadecane (C18) (593-45-3)
n-Pentadecane (C15) (629-62-9)	*n*-Eicosane (C20) (112-95-8)
n-Hexadecane (C16) (544-76-3)	

400 µg/mL each in cyclohexane, 1 mL/ampul

cat.# 35006 (ea.)

OQ/PV Headspace Standard (3 components)

tert-Butyl disulfide (110-06-5)	Nitrobenzene (98-95-3)
1,2-Dichlorobenzene (95-50-1)	

2,000 µg/mL each in ethanol, 1 mL/ampul

cat.# 33909 (ea.)

OQ Response Linearity Test Standard (6 components)

n-Heptadecane (C17) (629-78-7)	1.5 µg/mL	*n*-Eicosane (C20) (112-95-8)	100
n-Octadecane (C18) (593-45-3)	10	*n*-Docosane (C22) (629-97-0)	1,000
n-Nonadecane (C19) (629-92-5)	2	*n*-Tetracosane (C24) (646-31-1)	10,000

In isooctane, 1 mL/ampul

cat.# 33906 (ea.)

Polar ISO Column Test Mix (8 components)

n-Heptadecane (C17) (629-78-7)	2-Dodecanol (10203-28-8)
n-Nonadecane (C19) (629-92-5)	Methyl dodecanoate
Aniline (62-53-3)	2-Nonanone (821-55-6)
2-Chlorophenol (95-57-8)	1-Octanol (111-87-5)

250 µg/mL each in 1,2-dichloroethane, 1 mL/ampul

cat.# 35103 (ea.)

Q-BOND and U-BOND Column Test Mix (7 components)

n-Pentane (C5) (109-66-0)	Ethanol (64-17-5)
n-Hexane (C6) (110-54-3)	Ethyl acetate (141-78-6)
Acetone (67-64-1)	Methanol (67-56-1)
Diethyl ether (ethyl ether) (60-29-7)	

0.1% vol/vol each in heptane, 1 mL/ampul

cat.# 35202 (ea.)

Volatile Amine Column Test Mix (8 components)

n-Nonane (C9) (111-84-2)	900 µg/mL	Diethylenetriamine (111-40-0)	1,800
n-Dodecane (C12) (112-40-3)	900	2,6-Dimethylaniline (87-62-7)	900
1,2-Butanediol (26171-83-5)	900	2-Nonanol (628-99-9)	900
Diethanolamine (DEA) (111-42-2)	1,800	Pyridine (110-86-1)	900

In methanol:dichloromethane (50:50), 1 mL/ampul

cat.# 35008 (ea.)

XIL-350 Column Test Mix (8 components)

n-Tridecane (C13) (629-50-5)	2-Ethylhexanoic acid (149-57-5)
n-Tetradecane (C14) (629-59-4)	1,6-Hexanediol (629-11-8)
4-Chlorophenol (106-48-9)	1-Methylnaphthalene (90-12-0)
Dicyclohexylamine (101-83-7)	1-Undecanol (112-42-5)

350 µg/mL each in methylene chloride, 1 mL/ampul

cat.# 35226 (ea.)

GPC Calibration Mixes

CLP GPC Calibration Mix (5 components)

Qualitative mixture useful for determining GPC dump/collect times. The compounds are dissolved in methylene chloride at the concentrations listed.

Bis(2-ethylhexyl) phthalate (117-81-7)	10 mg/mL	Methoxychlor (72-43-5)	2.0
		Perylene (198-55-0)	0.2
Corn oil (8001-30-7)	250	Sulfur (7704-34-9)	0.8

In methylene chloride, 1 mL/ampul

cat.# 32019 (ea.)

In methylene chloride, 5 mL/ampul

cat.# 32023 (ea.)

No data pack available.

Revised GPC Calibration Mix (5 components)

Qualitative mixture useful for determining GPC dump/collect times. The compounds are dissolved in methylene chloride at the concentrations listed.

Bis(2-ethylhexyl) phthalate (117-81-7)	5 mg/mL	Methoxychlor (72-43-5)	1.0
		Perylene (198-55-0)	0.2
Corn oil (8001-30-7)	250	Sulfur (7704-34-9)	0.8

In methylene chloride, 1 mL/ampul

cat.# 32041 (ea.)

In methylene chloride, 5 mL/ampul

cat.# 32042 (ea.)

No data pack available.

LC Column & Detector Test Mixes

LC Normal Phase Test Mix #1 (4 components)

Routine analysis using this mix can assist in determining the need to perform column and/or system maintenance.

Benzene (71-43-2)	1.00 mg/mL	Benzyl alcohol (100-51-6)	3.00
Benzaldehyde (100-52-7)	0.04	4-Methoxybenzyl alcohol (105-13-5)	2.00

In hexane, 1 mL/ampul

cat.# 35004 (ea.)

LC Reversed Phase Test Mix #1 (4 components)

Routine analysis using this mix can assist in determining the need to perform column and/or system maintenance.

Benzene (71-43-2)	3.00 mg/mL	Naphthalene (91-20-3)	0.50
Biphenyl (92-52-4)	0.06	Uracil (66-22-8)	0.02

In methanol:water (75:25), 1 mL/ampul

cat.# 35005 (ea.)

LC Performance Test Mix (5 components)

- Highly effective for characterizing LC column parameters.
- Simple, easy, reliable approach to quality control (QC) evaluations or column classification.
- Monitor column performance over time.

The National Institute of Standards and Technology (NIST) has formulated a mixture that is highly effective for characterizing LC columns for efficiency, void volume, methylene selectivity, retentiveness, and activity toward chelators and organic bases. Results can be used for column classification, for column selection, for monitoring column performance over time, or for quality control. We test our material against the NIST 870 standard.

Amitriptyline hydrochloride (549-18-8)	2,800 µg/mL	Quinizarin (81-64-1)	94
		Toluene (108-88-3)	1,400
Ethylbenzene (100-41-4)	1,700	Uracil (66-22-8)	28

In methanol, 1 mL/ampul

cat.# 31699 (ea.)



Carbohydrate LC Performance Check Mix (5 components)

Performance qualification (PQ) determines the precision of the LC system. Our performance check mix for LC-RI consists of five simple sugars in varied concentrations. We prepare the reference material in water, dehydrate it, and package it dry for enhanced stability.

Glucose (50-99-7)	2.1 mg	Maltose (6363-53-7)	4.5
Fructose (57-48-7)	2.0	Sucrose (57-50-1)	4.0
Lactose (5989-81-1)	4.4		

Dry components in 4 mL screw-cap vial. Reconstitute in 1 mL acetonitrile:water (75:25) to 2.1, 2.0, 4.4, 4.5, 4.0 mg/mL, respectively.

cat.# 31809 (ea.)

No data pack available.

LC OQ Wavelength Accuracy Standard

Erbium perchlorate (14017-55-1)

10 mg/mL in water, 5 mL/ampul

cat.# 31053 (ea.)

No data pack available.

LC OQ Gradient Standard (Acetone)

Acetone (67-64-1)

Neat, 1 mL/ampul

cat.# 30012 (ea.)

No data pack available.

LC OQ Linearity Test Mix Kit

Linear detector responses to concentration variations are an important part of operation qualification (OQ) for LC instruments. Our kit of five aqueous solutions of caffeine can be used to generate simple plots of UV response versus concentration. Certificate of analysis includes caffeine concentration, calculated variance in preparing each mixture, a linearity plot, and coefficient of determination (r^2) for the linear plot.

Contains 1 mL each of these mixtures.
31804: Caffeine (caffeine at 5 µg/mL in water)
31803: Caffeine (caffeine at 25 µg/mL in water)
31802: Caffeine (caffeine at 125 µg/mL in water)
31801: Caffeine (caffeine at 250 µg/mL in water)
31800: Caffeine (caffeine at 500 µg/mL in water)
1 mL each of these mixtures.

kit

cat.# 31805 (kit)

No data pack available.

LC OQ Standards Kit

Contains the following:
30012: LC OQ Gradient Standard, 1 mL
31053: LC OQ Wavelength Accuracy Standard, 5 mL
31068: LC OQ Linearity Kit, 6 - 1 mL/ampuls

kit

cat.# 31069 (kit)

No data pack available.

Reference Standards

Clinical, Forensic & Toxicology

Blood Alcohol.....477
Exempted Drugs of Abuse.....478
Explosives.....479
Fire Debris Analysis.....479
Personal Care Products.....480
Weathered Petrochemical.....480–481



Blood Alcohol

Blood Alcohol Standards (Control)

Use to verify the retention time for each compound normally included in a blood alcohol test and to verify that the compounds are resolved from and do not interfere with one another.

Blood Alcohol Mix Resolution Control Standard

(8 components)

Acetaldehyde (75-07-0)
Acetone (67-64-1)
Acetonitrile (75-05-8)
Ethanol (64-17-5)
Ethyl acetate (141-78-6)
2-Propanol (Isopropanol) (67-63-0)
Methanol (67-56-1)
Methyl ethyl ketone (78-93-3)

0.100 g/dL each in water, 1 mL/ampul

cat.# 36256 (ea.)

BAC Resolution Control Standard n-P (6 components)

- Includes 1-propanol internal standard.
- Intended for qualitative use only.

Acetaldehyde (75-07-0)
Acetone (67-64-1)
Ethanol (BAC) (64-17-5)
Methanol (67-56-1)
1-Propanol (*n*-Propanol) (71-23-8)
2-Propanol (Isopropanol) (67-63-0)

100 mg/dL each in water, 1 mL/ampul

cat.# 36010 (ea.)

No data pack available.

BAC Resolution Control Standard t-B (6 components)

- Includes *tert*-butanol internal standard.
- Intended for qualitative use only.

Acetaldehyde (75-07-0)
Acetone (67-64-1)
tert-Butanol (TBA) (75-65-0)
Ethanol (BAC) (64-17-5)
Methanol (67-56-1)
2-Propanol (Isopropanol) (67-63-0)

100 mg/dL each in water, 1 mL/ampul

cat.# 36011 (ea.)

No data pack available.



Get Fast, Definitive Data for Blood Alcohol Testing

Rtx®-BAC Plus 1 and Rtx®-BAC Plus 2 Columns & Standards

- Optimized column selectivities.
- Robust and reproducible column chemistry.
- 2-minute analysis time.
- Product line also features resolution control standards.

See **page 65** for columns.

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Formulated and produced by our team of veteran chemists, 50,000+ batches of highly stable and accurate reference standards have left our facility over the last 20+ years.

Exempted Drug of Abuse

Exempted Drug of Abuse Reference Standards

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

Compound	CAS #	Solvent	Conc.	cat.#
Benzodiazepines				
Alprazolam	28981-97-7	PTM	1,000	34042
Bromazepam	1812-30-2	PTM	1,000	34043
Chlordiazepoxide	438-41-5	PTM	1,000	34044
Clobazam	22316-47-8	PTM	1,000	34045
Clonazepam	1622-61-3	PTM	1,000	34046
Diazepam	439-14-5	PTM	1,000	34047
Flunitrazepam	1622-62-4	PTM	1,000	34049
Flurazepam	1172-18-5	PTM	1,000	34050
Lorazepam	846-49-1	PTM	1,000	34051
Nitrazepam	146-22-5	PTM	1,000	34053
Oxazepam	604-75-1	PTM	1,000	34054
Prazepam	2955-38-6	PTM	1,000	34055
Temazepam	846-50-4	PTM	1,000	34056
Triazolam	28911-01-5	PTM	1,000	34057
Cocaine & Metabolites				
Cocaethylene	529-38-4	ACN	1,000	34066
Cocaine	53-21-4	PTM	1,000	34015
Benzoylecgonine	519-09-5	PTM	1,000	34016
Ecgonine	5796-31-6	PTM	1,000	34017
Ecgonine methyl ester	38969-40-3	PTM	1,000	34018
Methadone & Metabolites				
EDDP perchlorate	66729-78-0	M	1,000	34069
Methadone	1095-90-5	PTM	1,000	34005
Amphetamines & Metabolites				
d-Amphetamine	51-63-8	PTM	1,000	34020
(+)Methamphetamine	51-57-0	PTM	1,000	34021
3,4-MDA HCl	4764-17-4	M	1,000	34070
3,4-MDEA HCl	82801-81-8	M	1,000	34072
3,4-MDMA HCl	64057-70-1	M	1,000	34071
Opiates & Metabolites				
Codeine	76-57-3	PTM	1,000	34000
Dextromethorphan HBr monohydrate	6700-34-1	M	1,000	34081
Hydrocodone	34195-34-1	PTM	1,000	34002
Hydromorphone	71-68-1	PTM	1,000	34063
Morphine	6211-15-0	PTM	1,000	34006
Oxycodone	124-90-3	PTM	1,000	34007
Oxymorphone	76-41-5	PTM	1,000	34065
Cannabinoid & Metabolites				
Cannabichromene (CBC)	20675-51-8	PTM	1,000	34092
Cannabidiol (CBD)	13956-29-1	PTM	1,000	34011
Cannabidiolic Acid (CBDA)	1244-58-2	ACN	1,000	34094
Cannabigerol (CBG)	25654-31-3	PTM	1,000	34091
Cannabinol (CBN)	521-35-7	PTM	1,000	34010
Δ^9-Tetrahydrocannabinol (THC)	1972-08-3	M	1,000	34067
(±)11-nor-9-carboxy-Δ^9-THC	104874-50-2	M	100	34068
Barbiturates				
Amobarbital	64-43-7	PTM	1,000	34028
Aprobarbital	77-02-1	PTM	1,000	34029
Barbital	57-44-3	PTM	1,000	34030
Butabarbital	125-40-6	PTM	1,000	34031
Butalbital	77-26-9	PTM	1,000	34032
DL-Glutethimide	18389-24-7	PTM	1,000	34058
Hexobarbital	56-29-1	PTM	1,000	34033
Mephobarbital	115-38-8	PTM	1,000	34034
Methohexital	151-83-7	PTM	1,000	34035
Pentobarbital	76-74-4	PTM	1,000	34036
Phenobarbital	50-06-6	PTM	1,000	34037
Secobarbital	29071-21-4	PTM	1,000	34038
Talbutal	115-44-6	PTM	1,000	34039

Compound	CAS #	Solvent	Conc.	cat.#
GHB				
1,4-Butanediol	110-63-4	M	1,000	34078
γ-Butyrolactone (GBL)	96-48-0	ACN	1,000	34077
α-Methylene-γ-butyrolactone (AMGBL)	547-65-9	ACN	1,000	34079
γ-Valerolactone	108-29-2	ACN	1,000	34080
Other				
Benzphetamine	5411-22-3	PTM	1,000	34022
Caffeine	58-08-2	M	1,000	34084
Cotinine	486-56-6	M	1,000	34086
Fentanyl	437-38-7	M	1,000	34082
nor-Fentanyl oxalate	1609-66-1	M	1,000	34083
Levorphanol	5985-38-6	PTM	1,000	34003
Meperidine	50-13-5	PTM	1,000	34004
Meprobamate	57-53-4	PTM	1,000	34059
Methaqualone	340-56-7	PTM	1,000	34064
Methyprylon	125-64-4	PTM	1,000	34060
Nicotine	54-11-5	M	1,000	34085
Pentazocine	64024-15-3	PTM	1,000	34062
Phencyclidine	956-90-1	PTM	1,000	34027
Phendimetrazine	50-58-8	PTM	1,000	34025
Phenmetrazine	1707-14-8	PTM	1,000	34026
Phentermine	1197-21-3	PTM	1,000	34024
Dextro-propoxyphene	1639-60-7	PTM	1,000	34008
Thebaine	115-37-7	PTM	1,000	34009

ACN = acetonitrile; M = methanol; PTM = purge-and-trap grade methanol

Forensic Drug Screen Test Mixture (8 components)

Amiodarone (19774-82-4)	10 µg/mL	Diazepam (439-14-5)	10
Amphetamine (51-63-8)	10	Doxepine (1229-29-4)	10
Caffeine (58-08-2)	10	Haloperidol (52-86-8)	1
Codeine (76-57-3)	10	Morphine (6211-15-0)	10

In P&T methanol, 1 mL/ampul

cat.# 36340 (ea.)

Forensic Drug Screen Internal Standard Solution 1 rev A (2 components)

Diazepam-d5
D5-doxepine

10 µg/mL each in P&T methanol, 10 mL/ampul

cat.# 36341 (ea.)

Restek Offers a Full Line of Certified Reference Materials

QUALITY ISO 9001 • 17025 • Guide 34

www.restek.com/iso

See **pages 464–465**.

Explosives

Single-Component Explosives Solutions

- Supports U.S. Department of Defense base closures and remediation.
- Mixtures and singles supporting LC U.S. EPA Method 8330.
- Mixtures and singles supporting GC-ECD U.S. EPA Method 8095.
- Internal standards and surrogates to support both methods.

These materials support nitroaromatic, nitramine, and nitroester analyses by GC-ECD (Method 8095).[1,2] Compounds listed are explosives, manufacturing intermediates, or degradation products. Method 8095 mixtures contain the components at concentration ratios appropriate for ECD.

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

Compound	CAS #	Solvent	Conc.	cat.#
4-Amino-2,6-dinitrotoluene	19406-51-0	ACN	1,000	31671
3,5-Dinitroaniline	618-87-1	ACN	1,000	31661
1,2-Dinitrobenzene	528-29-0	M	1,000	31453
1,3-Dinitrobenzene	99-65-0	ACN	1,000	31662
2,4-Dinitrotoluene	121-14-2	ACN	1,000	31663
2,6-Dinitrotoluene	606-20-2	ACN	1,000	31664
3,4-Dinitrotoluene	610-39-9	M	1,000	31452
EGDN*	628-96-6	M	1,000	31601
HMX*	2691-41-0	ACN	1,000	31665
Nitrobenzene	98-95-3	ACN	1,000	31657
Nitroglycerin*	55-63-0	M	1,000	31498
Nitroguanidine*†	556-88-7	M	1,000	31602
2-Nitrotoluene	88-72-2	ACN	1,000	31659
3-Nitrotoluene	99-08-1	ACN	1,000	31660
4-Nitrotoluene	99-99-0	ACN	1,000	31658
PETN (pentaerythritol tetranitrate)*	78-11-5	M	1,000	31600
Picric acid*	88-89-1	M	1,000	31499
RDX*	121-82-4	ACN	1,000	31666
Tetryl*	479-45-8	ACN	1,000	31667
1,3,5-Trinitrobenzene*	99-35-4	ACN	1,000	31668
2,4,6-Trinitrotoluene*	118-96-7	ACN	1,000	31669

ACN = acetonitrile; M = methanol

* Ships under Restek's USDOT explosives approval.
† Available only to customers or distributors inside the 48 contiguous United States; item may not be resold for export.

References (Not available from Restek)

[1]U.S. Environmental Protection Agency. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods. SW-846, Proposed Draft Update IVB, Office of Solid Waste, Washington, DC, 1999.
[2]M. E. Walsh, T. Ranney, J. Chromatogr. Sci., Vol. 36, pp. 406–416, August 1998.

Fire Debris Analysis (ASTM E1387 and E1618)

These materials also can be used for underground storage tank monitoring.

E1387 Column Resolution Check Mix (13 components)

n-Hexane (C6) (110-54-3)
n-Octane (C8) (111-65-9)
n-Decane (C10) (124-18-5)
n-Dodecane (C12) (112-40-3)
n-Tetradecane (C14) (629-59-4)
n-Hexadecane (C16) (544-76-3)
n-Octadecane (C18) (593-45-3)
n-Eicosane (C20) (112-95-8)
2-Ethyltoluene (611-14-3)
3-Ethyltoluene (620-14-4)
Toluene (108-88-3)
1,2,4-Trimethylbenzene (95-63-6)
p-Xylene (106-42-3)

2,000 µg/mL each in methylene chloride, 1 mL/ampul
cat.# 31224 (ea.)

E1618 Test Mix (13 components)

Components in this mix (0.5 µL/mL or 0.05% volume/volume each) are at 10x the concentration of the final test solution specified in ASTM 1618 and ASTM 1387.

n-Hexane (C6) (110-54-3)
n-Octane (C8) (111-65-9)
n-Decane (C10) (124-18-5)
n-Dodecane (C12) (112-40-3)
n-Tetradecane (C14) (629-59-4)
n-Hexadecane (C16) (544-76-3)
n-Octadecane (C18) (593-45-3)
n-Eicosane (C20) (112-95-8)
2-Ethyltoluene (611-14-3)
3-Ethyltoluene (620-14-4)
Toluene (108-88-3)
1,2,4-Trimethylbenzene (95-63-6)
p-Xylene (106-42-3)

0.05% volume/volume each in methylene chloride, 1 mL/ampul
cat.# 31613 (ea.)

No data pack available.

please note

We can custom prepare weathered accelerants for fire debris analysis.

Please complete the custom reference material request form at **www.restek.com/solutions**

We'll be glad to work with you!

Compound Index for Reference Standards

See **pages 586–592.**



Personal Care Products

Ethylene Oxide Standards

- The industry's only suite of off-the-shelf reference standards for detecting ethylene oxide and 1,4-dioxane in PEG-based products.
- Formulated with concentrations needed by labs analyzing cosmetics and personal care products for possible carcinogens.
- Quantitatively tested to confirm composition; detailed support documentation provided.
- Certified reference material (CRM) manufactured and QC-tested in Restek's ISO-accredited labs satisfies your ISO requirements.

Ethylene Oxide/1,4-Dioxane Standard

NEW!

(2 components)

1,4-Dioxane (123-91-1)
Ethylene oxide (75-21-8)

0.001% w/w each in PEG-400, 5 mL/ampul

cat.# 30546 (ea.)

Ethylene Oxide/Acetaldehyde Standard

NEW!

(2 components)

Acetaldehyde (75-07-0)
Ethylene oxide (75-21-8)

0.001% w/w each in PEG-400, 5 mL/ampul

cat.# 30547 (ea.)

Ethylene Oxide Standard

NEW!

Ethylene oxide (75-21-8)

0.005% w/w in PEG-200, 5 mL/ampul

cat.# 30548 (ea.)

PEG-200 Standard

NEW!

Poly (ethylene glycol) 200 (25322-68-3)

Neat, 10 mL/ampul

cat.# 30549 (ea.)

PEG-400 Standard

NEW!

Poly (ethylene glycol) 400 (25322-68-3)

Neat, 10 mL/ampul

cat.# 30559 (ea.)

Weathered Petrochemical

Weathered Petrochemical Standards

These solutions are prepared from a single-source (one-refinery) product. The weathered materials indicate the percent weight loss from the original material. Samples of regular- and premium-grade unleaded gasoline were collected, then blended in equal volumes.

There are four general types of mineral spirits, classified according to boiling point range (BPR):

- Type I (Stoddard solvent) BPR 149–182 °C
- Type II (high flash point) BPR 177–196 °C
- Type III (odorless) BPR 149–196 °C
- Type IV (low dry point) BPR 149–174 °C

Stoddard Solvent Standard

Stoddard solvent is also known as Type I mineral spirits, Texsolve S, or Varsol® 1 mineral spirits. We offer this reference material for those who need to calibrate Stoddard solvent separately. This standard is dissolved in methanol for analysis by either direct injection or purge-and-trap.

Stoddard solvent (8052-41-3)

10,000 µg/mL in P&T methanol, 1 mL/ampul

cat.# 30487 (ea.)

We prepare our mineral spirit solutions from an equal-volume blend of Type I, II, and III mineral spirits.

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

Compound	CAS #	Solvent	Conc.	cat.#
Unleaded gasoline: unweathered	8006-61-9	PTM	5,000	30096
Unleaded gasoline: 25% weathered	8006-61-9	PTM	5,000	30097
Unleaded gasoline: 50% weathered	8006-61-9	PTM	5,000	30098
Unleaded gasoline: 75% weathered	8006-61-9	PTM	5,000	30099
Unleaded gasoline: 99% weathered	8006-61-9	PTM	5,000	30436
Kerosene	**CAS #**	**Solvent**	**Conc.**	**cat.#**
Kerosene: unweathered	84742-81-0	D	5,000	31229
Kerosene: 25% weathered	84742-81-0	D	5,000	31230
Kerosene: 50% weathered	84742-81-0	D	5,000	31231
Kerosene: 75% weathered	84742-81-0	D	5,000	31232
Diesel Fuel #2	**CAS #**	**Solvent**	**Conc.**	**cat.#**
Diesel fuel #2: unweathered	68334-30-5	D	5,000	31233
Diesel fuel #2: 25% weathered	68334-30-5	D	5,000	31234
Diesel fuel #2: 50% weathered	68334-30-5	D	5,000	31235
Diesel fuel #2: 75% weathered	68334-30-5	D	5,000	31236
Mineral Spirits	**CAS #**	**Solvent**	**Conc.**	**cat.#**
Mineral spirits: unweathered	8030-30-6	D	5,000	31225
Mineral spirits: unweathered	8030-30-6	D	50,000	31260

D = methylene chloride
PTM = purge-and-trap grade methanol

Weathered Petrochemical, *cont.*

Weathered Gasoline Kit

These solutions are prepared from a single-source (one-refinery) product. The weathered materials indicate the percent weight loss from the original material. Samples of regular- and premium-grade unleaded gasoline were collected, then blended in equal volumes.

Contains 1 mL each of these mixtures.
30096: Unleaded Gasoline Standard
30097: Unleaded Gasoline Standard: 25% Weathered
30098: Unleaded Gasoline Standard: 50% Weathered
30099: Unleaded Gasoline Standard: 75% Weathered

cat.# 30100 (kit) — kit

Weathered Gasoline Kit #2

These solutions are prepared from a single-source (one-refinery) product. The weathered materials indicate the percent weight loss from the original material. Samples of regular- and premium-grade unleaded gasoline were collected, then blended in equal volumes.

Contains 1 mL each of these mixtures.
30096: Unleaded Gasoline Standard
30097: Unleaded Gasoline Standard: 25% Weathered
30098: Unleaded Gasoline Standard: 50% Weathered
30099: Unleaded Gasoline Standard: 75% Weathered
30436: Unleaded Gasoline Standard: 99% Weathered

cat.# 30437 (kit) — kit

Weathered Kerosene Kit

These solutions are prepared from a single-source (one-refinery) product. The weathered materials indicate the percent weight loss from the original material.

Contains 1 mL each of these mixtures.
31229: Kerosene Standard
31230: Kerosene Standard: 25% Weathered
31231: Kerosene Standard: 50% Weathered
31232: Kerosene Standard: 75% Weathered

cat.# 31238 (kit) — kit

Weathered Diesel Fuel #2 Kit

These solutions are prepared from a single-source (one-refinery) product. The weathered materials indicate the percent weight loss from the original material.

Contains 1 mL each of these mixtures.
31233: Diesel Fuel #2 Standard
31234: Diesel Fuel #2 Standard: 25% Weathered
31235: Diesel Fuel #2 Standard: 50% Weathered
31236: Diesel Fuel #2 Standard: 75% Weathered

cat.# 31239 (kit) — kit



Reference Standards

Environmental

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Acetates

8260B Acetate Mix (5 components)

n-Butyl acetate (123-86-4)
Ethyl acetate (141-78-6)
Isopropyl acetate (108-21-4)
n-Propyl acetate (109-60-4)
Vinyl acetate (108-05-4)

2,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30477 (ea.)

8260B Acetate Mix (Revised) (7 components)

- Includes methyl acetate and *n*-amyl acetate.
- Contains 7 acetates.

n-Amyl acetate (628-63-7)
Butyl acetate (123-86-4)
Ethyl acetate (141-78-6)
Isopropyl acetate (108-21-4)
Methyl acetate (79-20-9)
Propyl acetate (109-60-4)
Vinyl acetate (108-05-4)

2,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30489 (ea.)

Vinyl Acetate

Vinyl acetate (108-05-4)

2,000 µg/mL in P&T methanol, 1 mL/ampul
cat.# 30216 (ea.)

Alcohols

8240 Alcohols Mix (5 components)

Allyl alcohol (2-propen-1-ol) (107-18-6)
2-Chloroethanol (107-07-3)
Ethanol (64-17-5)
Isobutyl alcohol (78-83-1)
Propargyl alcohol (107-19-7)

2,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30214 (ea.)

Aldehydes

Method 8315 (Aldehydes & Ketones DNPH by LC)

Aldehyde-Ketone-DNPH TO-11A Calibration Mix (15 components)

Acetaldehyde-DNPH (1019-57-4)
Acetone-DNPH (1567-89-1)
Acrolein-DNPH (888-54-0)
Benzaldehyde-DNPH (1157-84-2)
n-Butyraldehyde-DNPH (1527-98-6)
Crotonaldehyde-DNPH (1527-96-4)
2,5-Dimethylbenzaldehyde-DNPH (152477-96-8)
Formaldehyde-DNPH (1081-15-8)
Hexaldehyde-DNPH (1527-97-5)
Isovaleraldehyde-DNPH (2256-01-1)
Propionaldehyde-DNPH (725-00-8)
m-Tolualdehyde-DNPH (2880-05-9)
o-Tolualdehyde-DNPH (1773-44-0)
p-Tolualdehyde-DNPH (2571-00-8)
Valeraldehyde-DNPH (2057-84-3)

15 µg/mL each in acetonitrile, 1 mL/ampul*
cat.# 31808 (ea.)

*The reported concentrations reflect the amount of aldehyde or ketone in the mixture. The concentration of derivatized aldehyde or ketone is not reported.

Formaldehyde-DNPH Mix

500 µg/mL in acetonitrile, 1 mL/ampul*
cat.# 31837 (ea.)

*The reported concentrations reflect the amount of formaldehyde in the mixture. The concentration of derivatized formaldehyde is not reported.

Aldehydes, *cont.*

CARB 1004 Aldehyde/Ketone-DNPH Calibration Standard (13 components)

Acetaldehyde-2,4-DNPH (1019-57-4)
Acetone-2,4-DNPH (1567-89-1)
Acrolein-2,4-DNPH (888-54-0)
Benzaldehyde-2,4-DNPH (1157-84-2)
n-Butyraldehyde-2,4-DNPH (1527-98-6)
Crotonaldehyde-2,4-DNPH (1527-96-4)
Formaldehyde-2,4-DNPH (1081-15-8)
Hexaldehyde-2,4-DNPH (1527-97-5)
Methacrolein-2,4-DNPH (5077-73-6)
Methyl ethyl ketone-2,4-DNPH (958-60-1)
Propionaldehyde-2,4-DNPH (725-00-8)
m-Tolualdehyde-2,4-DNPH (2880-05-9)
Valeraldehyde-2,4-DNPH (2057-84-3)

3 µg/mL each in acetonitrile, 1 mL/ampul*
cat.# 33093 (ea.)

*The reported concentrations reflect the amount of aldehyde or ketone in the mixture. The concentration of derivatized aldehyde or ketone is not reported.

DNPH Reference Materials

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

Compound	CAS #	Solvent	Conc.	cat.#
acetaldehyde-2,4-DNPH	1019-57-4	ACN	100	33074
formaldehyde-2,4-DNPH	1081-15-8	ACN	100	33082
glycolaldehyde-2,4-DNPH		ACN	100	33091

*The reported concentrations reflect the amount of aldehyde or ketone in the mixture. The concentration of derivatized aldehyde or ketone is not reported.
ACN = acetonitrile

ASTM Method 5197 (Formaldehyde and Other Carbonyl Compounds in Air)

See cat. #s 33093, 33074, 33082, and 33091 above.

Base, Neutral & Acid Extractable (BNA)/ Semivolatile Organics

See pages 532–544.

Benzidines

605 Benzidines Calibration Mix (2 components)

Benzidine (92-87-5)
3,3'-Dichlorobenzidine (91-94-1)

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

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

8270 Benzidines Mix (3 components)

Benzidine (92-87-5)
3,3'-Dichlorobenzidine (91-94-1)
3,3'-Dimethylbenzidine (*o*-tolidine) (119-93-7)

2,000 µg/mL each in methanol, 1 mL/ampul
cat.# 31688 (ea.)

2,000 µg/mL each in methylene chloride, 1 mL/ampul
cat.# 31852 (ea.)

3,3'-Dichlorobenzidine

3,3'-Dichlorobenzidine (91-94-1)

2,000 µg/mL in methanol, 1 mL/ampul
cat.# 31026 (ea.)

2,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31835 (ea.)

BTEX

BTEX Standard (6 components)

Benzene (71-43-2)
Ethylbenzene (100-41-4)
Toluene (108-88-3)
m-Xylene (108-38-3)
o-Xylene (95-47-6)
p-Xylene (106-42-3)

200 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30051 (ea.)

2,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30213 (ea.)

2,000 µg/mL each in P&T methanol (*m*- & *p*-xylene at 1,000 µg/mL), 1 mL/ampul
cat.# 30488 (ea.)

BTEX Gas Mix (6 components)

Benzene (71-43-2)
Ethylbenzene (100-41-4)
Toluene (108-88-3)
m-Xylene (108-38-3)
o-Xylene (95-47-6)
p-Xylene (106-42-3)

cylinder design

Cylinder Construction: aluminum
Cylinder Fitting: CGA-180 outlet

Spectra (Linde)
104 L Cylinders:

Size: 8 x 24 cm
Volume/Pressure:
104 liters of gas
@ 1,800 psi
Weight: 1.5 lb/0.7 kg



Scotty (Air Liquide)
110 L Cylinders:

Size: 8.3 x 29.5 cm
Volume/Pressure:
110 liters of gas
@ 1,800 psi
Weight: 2.2 lb/1 kg
U.S. DOT Specs: 3AL2216



1 ppm in nitrogen, 104 liters @ 1,800 psi
cat.# 34414 (ea.)

1 ppm in nitrogen, 110 liters @ 1,800 psi
cat.# 26361 (ea.)

1 ppm in nitrogen, 110 liters @ 1,800 psi (Pi-marked cylinder)
cat.# 34414-PI (ea.)

100 ppb in nitrogen, 104 liters @ 1,800 psi
cat.# 34428 (ea.)

100 ppb in nitrogen, 110 liters @ 1,800 psi
cat.# 26362 (ea.)

100 ppb in nitrogen, 110 liters @ 1,800 psi (Pi-marked cylinder)
cat.# 34428-PI (ea.)

No data pack available.

Gas standards are subject to hazardous materials shipping fees by most freight carriers. All calibration gas standards are nonreturnable due to DOT hazardous shipping requirements.

also available

High-Purity VOC Regulators

See **page 453.**



Diesel Fuel

Diesel Surrogate and Internal Standards

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

Compound	CAS #	Solvent	Conc.	cat.#
1-Chlorooctadecane	3386-33-2	D	10,000	31098
2-Fluorobiphenyl	321-60-8	D	10,000	31096
o-Terphenyl	84-15-1	D	10,000	31097
p-Terphenyl	92-94-4	D	10,000	31095

Recommended Internal Standards

Compound	CAS #	Solvent	Conc.	cat.#
5-α-Androstane	438-22-2	D	2,000	31065
o-Terphenyl	84-15-1	A	2,000	31066

A = acetone; D = methylene chloride

Diesel Fuel #2 Composite Standard

Diesel fuel #2 composite (68334-30-5)

5,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31093 (ea.)

50,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31258 (ea.)

50,000 µg/mL in methylene chloride, 5 mL/ampul
cat.# 31259 (ea.)

Diesel Fuel #2 Standard

Prepared from a single-source (one-refinery) product.

Diesel fuel #2: unweathered (68334-30-5)

5,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31233 (ea.)

Certified PAHs in Diesel (7 components)

- Confirms diesel #2 TPH and priority PAHs in a single analysis.
- Certificate of analysis includes concentration of TPH and certified concentrations of individual PAHs.
- Complete data packs available.

Certified for:
Acenaphthene*
Acenaphthylene*
Fluorene*
1-Methylnaphthalene*
2-Methylnaphthalene*
Naphthalene*
Phenanthrene*

50,000 ppm diesel #2 in methylene chloride, 1 mL/ampul
cat.# 31673 (ea.)

*Concentration differs from lot to lot. See online data pack for certified concentrations.

Diesel:Biodiesel (80:20) Blend Standard

The biodiesel component is methyl soyate.

Diesel:biodiesel (80:20) (67784-80-9)

5,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31880 (ea.)

Diesel Fuel, *cont.*

ISO/DIS 9377 Water Quality Testing (German H-53)

Reference mixtures for ISO/DIS 9377 (German H-53), a gas chromatography–flame ionization detection (GC-FID) method.

Diesel #2/Motor Oil (2 components)

Diesel fuel #2 composite (68334-30-5)
Motor oil (64742-65-0)

5,000 µg/mL each in hexane, 1 mL/ampul
cat.# 31682 (ea.)

Diesel #2/Mineral Oil (2 components)

Diesel fuel #2 composite (68334-30-5)
Mineral oil (8042-47-5)

5,000 µg/mL each in hexane, 1 mL/ampul
cat.# 31676 (ea.)

Standard Mixture Stock Solution (2 components)

- For GC analysis of total petroleum hydrocarbons (TPH) in water.
- Calibration standard available as Diesel #2/motor oil and Diesel #2/mineral oil.

Diesel #2 (additive-free) (68334-30-5)
Mineral oil (additive-free [i.e., USP grade] bp 325–460 or C18–C32 retention time range) (8042-47-5)

5,000 µg/mL each in cyclohexane, 1 mL/ampul (prepares 8 mL of 1.25 µg/µL calibration curve high point). Total hydrocarbon concentration is 10,000 µg/mL.
cat.# 31630 (ea.)

Quality Control Standard Mixture, Revised (2 components)

- Updated reference materials for GC analysis of TPH in water.
- Determination of hydrocarbon oil index—applicable to drinking, surface, waste, and treated water.

Diesel #2 (additive-free) (68334-30-5)
Motor oil (additive-free bp 325–460 or C18–C32 retention time range) (64742-65-0)

500 µg/mL each in acetone, 1 mL/ampul (1 mL is enough mix to spike one 900 mL quality control sample). Total hydrocarbon concentration is 1,000 µg/mL.
cat.# 31641 (ea.)

Quality Control Standard Mixture (2 components)

- For GC analysis of total petroleum hydrocarbons (TPH) in water.
- Environmentally safer than previous methods.
- Calibration standard available as Diesel #2/motor oil and Diesel #2/mineral oil.

Diesel #2 (additive-free) (68334-30-5)
Mineral oil (additive-free [i.e., USP grade] bp 391–522 or C24–C40 retention time range) (8042-47-5)

500 µg/mL each in acetone, 1 mL/ampul (1 mL is enough mix to spike one quality control sample). Total hydrocarbon concentration is 1,000 µg/mL.
cat.# 31631 (ea.)

Disinfection By-Products

Chloral Hydrate

Chloral hydrate (302-17-0)

1,000 µg/mL in acetonitrile, 1 mL/ampul
cat.# 30609 (ea.)

Disinfection By-Product Mix (7 components)

Bromochloroacetonitrile (83463-62-1)
Chloropicrin (76-06-2)
Dibromoacetonitrile (3252-43-5)
Dichloroacetonitrile (3018-12-0)
1,1-Dichloro-2-propanone (513-88-2)
Trichloroacetonitrile (545-06-2)
1,1,1-Trichloro-2-propanone (918-00-3)

2,000 µg/mL each in acetone, 1 mL/ampul
cat.# 30616 (ea.)

Drinking Water Odor

Drinking Water Odor Standard (2 components)

- Reference mix of the two most common odor-causing compounds.
- Convenient concentration for purge-and-trap analysis: 100 µg/mL in methanol.

Unpleasant odor in drinking water is associated with the growth and decay of microorganisms. The threshold value for these compounds is low (10 ppt), and purge-and-trap analyses usually are used to quantify them.

(+/–)-Geosmin (16423-19-1)
2-Methylisoborneol (MIB) (2371-42-8)

100 µg/mL in P&T methanol, 1 mL/ampul
cat.# 30608 (ea.)

Ethylene Oxide

Ethylene Oxide

Ethylene oxide (75-21-8)

500 µg/mL in dimethyl sulfoxide, 1 mL/ampul
cat.# 36005 (ea.)

50 mg/mL in methylene chloride, 1 mL/ampul
cat.# 30620 (ea.)

Ethylene oxide is available in other solvents and concentrations. Request your custom formulation at **www.restek.com/solutions**

Restek Offers a Full Line of Certified Reference Materials

See **pages 464–465**.

QUALITY ISO 9001 • 17025 • Guide 34

www.restek.com/iso

Explosives

Method 609 (Nitroaromatics & Isophorone)

609 Nitroaromatics & Isophorone Calibration Mix

(4 components)

2,4-Dinitrotoluene (121-14-2)
Isophorone (78-59-1)
2,6-Dinitrotoluene (606-20-2)
Nitrobenzene (98-95-3)

2,000 µg/mL each in hexane, 1 mL/ampul
cat.# 31033 (ea.)

Method 8095 (Explosives by GC)

8095 Matrix Spike Mix B (7 components)

3,5-Dinitroaniline (618-87-1)*
Nitrobenzene (98-95-3)
Nitroglycerin (55-63-0)
2-Nitrotoluene (88-72-2)
3-Nitrotoluene (99-08-1)
4-Nitrotoluene (99-99-0)
PETN (78-11-5)

1,000 µg/mL each in acetonitrile (*3,5-dinitroaniline at 200 µg/mL), 1 mL/ampul
cat.# 31610 (ea.)

Ships under Restek's USDOT explosives approval.

8095 Calibration Mix A (10 components)

2-Amino-4,6-dinitrotoluene (35572-78-2)
4-Amino-2,6-dinitrotoluene (19406-51-0)
1,3-Dinitrobenzene (99-65-0)
2,4-Dinitrotoluene (121-14-2)
2,6-Dinitrotoluene (606-20-2)
HMX (2691-41-0)
RDX (121-82-4)
Tetryl (479-45-8)
1,3,5-Trinitrobenzene (99-35-4)
2,4,6-Trinitrotoluene (118-96-7)

1,000 µg/mL each in acetonitrile, 1 mL/ampul
cat.# 31607 (ea.)

Ships under Restek's USDOT explosives approval.

8095 Calibration Mix B (7 components)

3,5-Dinitroaniline (618-87-1)*
Nitrobenzene (98-95-3)
Nitroglycerine (55-63-0)
2-Nitrotoluene (88-72-2)
3-Nitrotoluene (99-08-1)
4-Nitrotoluene (99-99-0)
PETN (78-11-5)

5,000 µg/mL each in acetonitrile (*3,5-dinitroaniline at 1,000 µg/mL), 1 mL/ampul
cat.# 31608 (ea.)

Ships under Restek's USDOT explosives approval.

Method 8095 (Explosives by GC), *cont.*

Single-Component Explosives Solutions

- Supports U.S. Department of Defense base closures and remediation.
- Mixtures and singles supporting LC U.S. EPA Method 8330.
- Mixtures and singles supporting GC-ECD U.S. EPA Method 8095.
- Internal standards and surrogates to support both methods.

These materials support nitroaromatic, nitramine, and nitroester analyses by GC-ECD (Method 8095).[1,2] Compounds listed are explosives, manufacturing intermediates, or degradation products. Method 8095 mixtures contain the components at concentration ratios appropriate for ECD.

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

Compound	CAS #	Solvent	Conc.	cat.#
4-Amino-2,6-dinitrotoluene	19406-51-0	ACN	1,000	31671
3,5-Dinitroaniline	618-87-1	ACN	1,000	31661
1,2-Dinitrobenzene	528-29-0	M	1,000	31453
1,3-Dinitrobenzene	99-65-0	ACN	1,000	31662
2,4-Dinitrotoluene	121-14-2	ACN	1,000	31663
2,6-Dinitrotoluene	606-20-2	ACN	1,000	31664
3,4-Dinitrotoluene	610-39-9	M	1,000	31452
EGDN*	628-96-6	M	1,000	31601
HMX*	2691-41-0	ACN	1,000	31665
Nitrobenzene	98-95-3	ACN	1,000	31657
Nitroglycerin*	55-63-0	M	1,000	31498
Nitroguanidine*†	556-88-7	M	1,000	31602
2-Nitrotoluene	88-72-2	ACN	1,000	31659
3-Nitrotoluene	99-08-1	ACN	1,000	31660
4-Nitrotoluene	99-99-0	ACN	1,000	31658
PETN (pentaerythritol tetranitrate)*	78-11-5	M	1,000	31600
Picric acid*	88-89-1	M	1,000	31499
RDX*	121-82-4	ACN	1,000	31666
Tetryl*	479-45-8	ACN	1,000	31667
1,3,5-Trinitrobenzene*	99-35-4	ACN	1,000	31668
2,4,6-Trinitrotoluene*	118-96-7	ACN	1,000	31669

ACN = acetonitrile; M = methanol

* Ships under Restek's USDOT explosives approval.
† Available only to customers or distributors inside the 48 contiguous United States; item may not be resold for export.

References (Not available from Restek)

[1]U.S. Environmental Protection Agency. Test Methods for Evaluating Solid Waste, Physical/Chemical Methods. SW-846, Proposed Draft Update IVB, Office of Solid Waste, Washington, DC, 1999.
[2]M. E. Walsh, T. Ranney, J. Chromatogr. Sci., Vol. 36, pp. 406–416, August 1998.

Compound Index for Reference Standards

See **pages 586–592.**



Explosives, *cont.*

Method 8330 (Nitroaromatics and Nitramines by LC)

8330 Internal Standard

3,4-Dinitrotoluene (610-39-9)

1,000 µg/mL in methanol, 1 mL/ampul

cat.# 31452 (ea.)

8330 Internal Standard

1,4-Dinitrobenzene (100-25-4)

2,000 µg/mL in acetonitrile, 1 mL/ampul

cat.# 33205 (ea.)

8330 Surrogate

1,2-Dinitrobenzene (528-29-0)

1,000 µg/mL in methanol, 1 mL/ampul

cat.# 31453 (ea.)

8330B Nitroaromatics and Nitramine Mix

(17 components)*

2-Amino-4,6-dinitrotoluene (35572-78-2)
4-Amino-2,6-dinitrotoluene (19406-51-0)
3,5-Dinitroaniline (618-87-1)
1,3-Dinitrobenzene (99-65-0)
2,4-Dinitrotoluene (121-14-2)
2,6-Dinitrotoluene (606-20-2)
HMX (2691-41-0)
Nitrobenzene (98-95-3)
Nitroglycerin (55-63-0)
2-Nitrotoluene (88-72-2)
3-Nitrotoluene (99-08-1)
4-Nitrotoluene (99-99-0)
PETN (78-11-5)
RDX (121-82-4)
Tetryl (479-45-8)
1,3,5-Trinitrobenzene (99-35-4)
2,4,6-Trinitrotoluene (118-96-7)

1,000 µg/mL each in acetonitrile, 1 mL/ampul

cat.# 33204 (ea.)

Nitroaromatics and Nitramine Explosives by LC

(14 components)*

1,3-Dinitrobenzene (99-65-0)
2-Amino-4,6-dinitrotoluene (35572-78-2)
4-Amino-2,6-dinitrotoluene (19406-51-0)
2,4-Dinitrotoluene (121-14-2)
2,6-Dinitrotoluene (606-20-2)
HMX (2691-41-0)
Nitrobenzene (98-95-3)
2-Nitrotoluene (88-72-2)
3-Nitrotoluene (99-08-1)
4-Nitrotoluene (99-99-0)
RDX (121-82-4)
Tetryl (479-45-8)
1,3,5-Trinitrobenzene (99-35-4)
2,4,6-Trinitrotoluene (118-96-7)

1,000 µg/mL each in acetonitrile, 1 mL/ampul

cat.# 33905 (ea.)

*Ships under Restek's USDOT explosives approval.

8330 Calibration Mix #1 (7 components)*

1,3-Dinitrobenzene (99-65-0)
2,4-Dinitrotoluene (121-14-2)
HMX (2691-41-0)
Nitrobenzene (98-95-3)
RDX (121-82-4)
1,3,5-Trinitrobenzene (99-35-4)
2,4,6-Trinitrotoluene (118-96-7)

1,000 µg/mL each in acetonitrile, 1 mL/ampul

cat.# 31450 (ea.)

8330 Calibration Mix #2 (7 components)*

2-Amino-4,6-dinitrotoluene (35572-78-2)
4-Amino-2,6-dinitrotoluene (19406-51-0)
2,6-Dinitrotoluene (606-20-2)
2-Nitrotoluene (88-72-2)
3-Nitrotoluene (99-08-1)
4-Nitrotoluene (99-99-0)
Tetryl (479-45-8)

1,000 µg/mL each in acetonitrile, 1 mL/ampul

cat.# 31451 (ea.)

*Ships under Restek's USDOT explosives approval.

did you know?

Obtaining pure, neat compounds for Method 8330 reference standards can be very difficult.

To ensure the highest quality standards, Restek's Quality Control (QC) lab confirms the chemical identity and purity of mixture components and solvents using one or more of the following techniques: GC-FID, HPLC, GC-ECD, GC-MS, LC-MS, refractive index, and melting point.



More than 1/3 of the ampuls that leave our facility are custom-ordered reference standards, and almost all of them are certified reference materials (CRMs).



Restek® Safe Cracker

Included with every reference standard shipment for added convenience.



Gases

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

Bromomethane (methyl bromide) (74-83-9)
Chloroethane (ethyl chloride) (75-00-3)
Chloromethane (methyl chloride) (74-87-3)
Trichlorofluoromethane (CFC-11) (75-69-4)
Vinyl chloride (75-01-4)

2,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30020 (ea.)

Method 8240 (Volatile Organic Compounds [VOCs])

502.2 Calibration Mix #1 (gases) (6 components)

Bromomethane (methyl bromide) (74-83-9)
Chloroethane (ethyl chloride) (75-00-3)
Chloromethane (methyl chloride) (74-87-3)
Dichlorodifluoromethane (CFC-12) (75-71-8)
Trichlorofluoromethane (CFC-11) (75-69-4)
Vinyl chloride (75-01-4)

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

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

tech tip

Achieving the Best Results From Gas Standards

In order to achieve the best results from gas standards, proper handling and storage of gas solutions is of vital importance. Use the following tips to help ensure trouble-free performance:

- Before opening the sealed ampul, gently invert the ampul several times. This will redissolve any gases that may have migrated into the headspace of the ampul.
- When diluting a gas standard, always add it to a solvent. Adding the gas standard to an empty vessel prior to adding solvent will result in the loss of gas compounds.
- Keep the gas standard cold throughout its use. Make sure it is cold before opening the ampul, work quickly to minimize heat transfer from hands or room, and only dilute the standard into a very cold solvent.
- When diluting a gas standard in solvent, make sure the pipette or needle tip is directly above, or immersed below, the solvent surface.
- We recommend that any unused portion of gas standard be disposed of after it has been removed from the sealed ampul. If it is necessary to store the unused portion, place it into a tightly capped vial with little to no headspace and store it in the freezer.
- We recommend that any gas solutions that have been stored outside of a sealed ampul be disposed of after 7 days.



For more gas calibration standards,
see **pages 443–451.**

BTEX Gas Mix (6 components)

Benzene (71-43-2)
Ethylbenzene (100-41-4)
Toluene (108-88-3)
m-Xylene (108-38-3)
o-Xylene (95-47-6)
p-Xylene (106-42-3)

1 ppm in nitrogen, 104 liters @ 1,800 psi
cat.# 34414 (ea.)

1 ppm in nitrogen, 110 liters @ 1,800 psi
cat.# 26361 (ea.)

1 ppm in nitrogen, 110 liters @ 1,800 psi (Pi-marked cylinder)
cat.# 34414-PI (ea.)

100 ppb in nitrogen, 104 liters @ 1,800 psi
cat.# 34428 (ea.)

100 ppb in nitrogen, 110 liters @ 1,800 psi
cat.# 26362 (ea.)

100 ppb in nitrogen, 110 liters @ 1,800 psi (Pi-marked cylinder)
cat.# 34428-PI (ea.)

No data pack available.

Gas standards are subject to hazardous materials shipping fees by most freight carriers. All calibration gas standards are nonreturnable due to DOT hazardous shipping requirements.

cylinder design

Cylinder Construction: aluminum
Cylinder Fitting: CGA-180 outlet

Spectra (Linde) 104 L Cylinders:

Size: 8 x 24 cm
Volume/Pressure:
104 liters of gas
@ 1,800 psi
Weight: 1.5 lb/0.7 kg



Scotty (Air Liquide) 110 L Cylinders:

Size: 8.3 x 29.5 cm
Volume/Pressure:
110 liters of gas
@ 1,800 psi
Weight: 2.2 lb/1 kg
U.S. DOT Specs: 3AL2216



Japan Calibration Mix (9 components)

Acrylonitrile
Benzene
1,3-Butadiene
Chloroform
1,2-Dichloroethane
Dichloromethane
Tetrachloroethylene
Trichloroethylene
Vinyl chloride

1 ppm in nitrogen, 104 liters @ 1,800 psi
cat.# 34418 (ea.)

1 ppm in nitrogen, 110 liters @ 1,800 psi
cat.# 26367 (ea.)

1 ppm in nitrogen, 110 liters @ 1,800 psi (Pi-marked cylinder)
cat.# 34418-PI (ea.)

No data pack available.

also available

High-Purity VOC Regulators

See **page 453.**



Gasoline

Gasoline Surrogate and Internal Standards

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

Compound	CAS #	Solvent	Conc.	cat.#
1-Bromo-4-fluorobenzene (BFB)	460-00-4	PTM	2,500	30067
1-Bromo-4-fluorobenzene (BFB)	460-00-4	PTM	10,000	30082
1-Chlorooctane	111-85-3	PTM	10,000	30084
α,α,α-Trifluorotoluene	98-08-8	PTM	2,500	30068
α,α,α-Trifluorotoluene	98-08-8	PTM	10,000	30083

Recommended Internal Standard (PID) for EPA GRO Method

Compound	CAS #	Solvent	Conc.	cat.#
1-Chloro-4-fluorobenzene	352-33-0	PTM	2,500	30066

PTM = Purge-and-trap grade methanol

Unleaded Gasoline Standard

Prepared from a single-source (one-refinery) product.

Unleaded gasoline: unweathered (8006-61-9)

5,000 µg/mL in P&T methanol, 1 mL/ampul
cat.# 30096 (ea.)

Unleaded Gasoline Composite Standard

Unleaded gasoline composite (8006-61-9)

2,500 µg/mL in P&T methanol, 1 mL/ampul
cat.# 30081 (ea.)

50,000 µg/mL in P&T methanol, 1 mL/ampul
cat.# 30205 (ea.)

50,000 µg/mL in P&T methanol, 5 mL/ampul
cat.# 30206 (ea.)

Petroleum Volatile Organic Compounds (PVOC), Gasoline Range Organics (GRO) & Benzene-Toluene-Ethylbenzene-Xylenes (BTEX)

PVOC Mix (California) (7 components)

Benzene (71-43-2)
Ethylbenzene (100-41-4)
Methyl *tert*-butyl ether (MTBE) (1634-04-4)
Toluene (108-88-3)
m-Xylene (108-38-3)
o-Xylene (95-47-6)
p-Xylene (106-42-3)

1,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30231 (ea.)

PVOC/GRO Mix (Wisconsin) (10 components)

Benzene (71-43-2)
Ethylbenzene (100-41-4)
Methyl *tert*-butyl ether (MTBE) (1634-04-4)
Naphthalene (91-20-3)
Toluene (108-88-3)
1,2,4-Trimethylbenzene (95-63-6)
1,3,5-Trimethylbenzene (108-67-8)
m-Xylene (108-38-3)
o-Xylene (95-47-6)
p-Xylene (106-42-3)

1,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30095 (ea.)

GRO Mix (9 components)

Benzene (71-43-2)
Ethylbenzene (100-41-4)
3-Methylpentane (96-14-0)
Naphthalene (91-20-3)
Toluene (108-88-3)
1,2,4-Trimethylbenzene (95-63-6)
2,2,4-Trimethylpentane (isooctane) (540-84-1)
m-Xylene (108-38-3)
o-Xylene (95-47-6)

1,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30069 (ea.)

Petroleum Volatile Organic Compounds (PVOC), Gasoline Range Organics (GRO) & Benzene-Toluene-Ethylbenzene-Xylenes (BTEX), *cont.*

GRO Mix (EPA) (9 components)

Benzene (71-43-2)	500 µg/mL	1,2,4-Trimethylbenzene (95-63-6)	1,000
Ethylbenzene (100-41-4)	500	2,2,4-Trimethylpentane	
Heptane (142-82-5)	500	(isooctane) (540-84-1)	1,500
2-Methylpentane (107-83-5)	1,500	*m*-Xylene (108-38-3)	1,000
Toluene (108-88-3)	1,500	*o*-Xylene (95-47-6)	1,000

In P&T methanol, 1 mL/ampul
cat.# 30065 (ea.)

BTEX Standard (6 components)

Benzene (71-43-2)
Ethylbenzene (100-41-4)
Toluene (108-88-3)
m-Xylene (108-38-3)
o-Xylene (95-47-6)
p-Xylene (106-42-3)

200 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30051 (ea.)

2,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30213 (ea.)

2,000 µg/mL each in P&T methanol (*m*- & *p*-xylene at 1,000 µg/mL), 1 mL/ampul
cat.# 30488 (ea.)

Gasoline Component Standard (10 components)

Benzene (71-43-2)	500 µg/mL	2,2,4-Trimethylpentane	
Ethylbenzene (100-41-4)	500	(isooctane) (540-84-1)	1,500
Heptane (142-82-5)	500	*m*-Xylene (108-38-3)	1,000
2-Methylpentane (107-83-5)	1,500	*o*-Xylene (95-47-6)	1,000
Toluene (108-88-3)	1,500	*p*-Xylene (106-42-3)	1,000
1,2,4-Trimethylbenzene (95-63-6)	1,000		

10,000 µg/mL total in P&T methanol, 1 mL/ampul
cat.# 30486 (ea.)

Certified BTEX in Unleaded Gas Composite Standard (9 components)

Certified for:
Benzene*
Ethylbenzene*
Isopropyl benzene*
Methyl *tert*-butyl ether (MTBE)*
Naphthalene*
Toluene*
m-Xylene*
o-Xylene*
p-Xylene*

5,500 ppm gasoline in P&T methanol, 1 mL/ampul
cat.# 30237 (ea.)

*Concentration differs from lot to lot. See online data pack for certified concentrations.

Certified Aromatics in Gasoline (16 components)

Certified for:
Benzene*
Ethylbenzene*
m-Ethyltoluene*
o-Ethyltoluene*
p-Ethyltoluene*
Isopropylbenzene*
Methyl *tert*-butyl ether (MTBE)*
Naphthalene*
n-Propylbenzene*
Toluene*
1,2,3-Trimethylbenzene*
1,2,4-Trimethylbenzene*
1,3,5-Trimethylbenzene*
m-Xylene*
o-Xylene*
p-Xylene*

5,500 ppm gasoline in P&T methanol, 1 mL/ampul
cat.# 30485 (ea.)

*Concentration differs from lot to lot. See online data pack for certified concentrations.

Glycols

Glycols Standard (2 components)

Ethylene glycol (107-21-1)
Propylene glycol (57-55-6)

50,000 µg/mL each in DI water, 1 mL/ampul
cat.# 30471 (ea.)

Haloacetic Acids

Methods 552, 552.1, 552.2, 552.3 (Haloacetic Acids and Dalapon)

Internal Standards and Surrogates for Method 552

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

Compound	CAS #	Solvent	Conc.	cat.#
Internal Standard				
1,2,3-trichloropropane	96-18-4	MTBE	1,000	31648
Surrogates for Method 552, 552.1				
2,3-dichloropropionic acid	565-64-0	MTBE	1,000	31650
Surrogates for Method 552.2				
2-bromopropionic acid	598-72-1	MTBE	1,000	31653
2,3-dibromopropionic acid	600-05-5	MTBE	1,000	31655
methyl-2,3-dibromopropionate	1729-67-5	MTBE	1,000	31656
Surrogates for Method 552.3				
2-bromobutanoic acid	80-58-0	MTBE	2,000	31881
2-bromobutyrate	3196-15-4	MTBE	2,000	31882

MTBE = methyl *tert*-butyl ether

Haloacetic Acid Mix (9 components)

Bromochloroacetic acid (5589-96-8)
Bromodichloroacetic acid (71133-14-7)
Chlorodibromoacetic acid (5278-95-5)
Dibromoacetic acid (631-64-1)
Dichloroacetic acid (79-43-6)
Monobromoacetic acid (79-08-3)
Monochloroacetic acid (79-11-8)
Tribromoacetic acid (75-96-7)
Trichloroacetic acid (76-03-9)

1,000 µg/mL each in methyl *tert*-butyl ether, 1 mL/ampul
cat.# 31896 (ea.)

Haloacetic Acid Mix #1 (6 components)

Bromochloroacetic acid (5589-96-8)
Dibromoacetic acid (631-64-1)
Dichloroacetic acid (79-43-6)
Monobromoacetic acid (79-08-3)
Monochloroacetic acid (79-11-8)
Trichloroacetic acid (76-03-9)

2,000 µg/mL each in methyl *tert*-butyl ether, 1 mL/ampul
cat.# 31644 (ea.)

Haloacetic Acids, *cont.*

Methods 552, 552.1, 552.2, 552.3 (Haloacetic Acids and Dalapon), *cont.*

Haloacetic Acid Methyl Ester Mix #1 (6 components)

Methyl bromochloroacetate (20428-74-4)
Methyl dibromoacetate (6482-26-4)
Methyl dichloroacetate (116-54-1)
Methyl monobromoacetate (96-32-2)
Methyl monochloroacetate (96-34-4)
Methyl trichloroacetate (598-99-2)

1,000 µg/mL each in methyl *tert*-butyl ether, 1 mL/ampul
cat.# 31645 (ea.)

Haloacetic Acid Mix #2 (9 components)

Bromochloroacetic acid (5589-96-8)	400 µg/mL	Dibromoacetic acid (631-64-1)	200
Bromodichloroacetic acid (71133-14-7)	400	Dichloroacetic acid (79-43-6)	600
Chlorodibromoacetic acid (5278-95-5)	1,000	Monobromoacetic acid (79-08-3)	400
		Monochloroacetic acid (79-11-8)	600
		Tribromoacetic acid (75-96-7)	2,000
		Trichloroacetic acid (76-03-9)	200

In methyl *tert*-butyl ether, 1 mL/ampul
cat.# 31646 (ea.)

Dalapon (2,2-dichloropropionic acid)

Dalapon (75-99-0)

1,000 µg/mL in acetonitrile, 1 mL/ampul
cat.# 32432 (ea.)

1,000 µg/mL in methanol, 1 mL/ampul
cat.# 32253 (ea.)

2,000 µg/mL in methanol, 1 mL/ampul
cat.# 32056 (ea.)

Dalapon Methyl Ester

Dalapon methyl ester (17640-02-7)

2,000 µg/mL in hexane, 1 mL/ampul
cat.# 32057 (ea.)



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Herbicides, Chloroacetanilide Herbicide Degradates

Method 535 (Chloroacetanilide Herbicide Degradates)

Method 535 Internal Standard

Butachlor ESA sodium salt

100 µg/mL in methanol, 1 mL/ampul
cat.# 33202 (ea.)

Method 535 Surrogate Standard

Dimethachlor ESA sodium salt

100 µg/mL in methanol, 1 mL/ampul
cat.# 33203 (ea.)

Herbicides, Chlorinated Acids

Method 515, 515.4 (Chlorinated Acid Herbicides)

Herbicide Internal Standard

4,4'-Dibromooctafluorobiphenyl (10386-84-2)

250 µg/mL in hexane, 1 mL/ampul
cat.# 32053 (ea.)

2,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31040 (ea.)

2,000 µg/mL in methyl *tert*-butyl ether, 1 mL/ampul
cat.# 31856 (ea.)

Herbicide Surrogate

Free Acid Form

2,4-Dichlorophenylacetic acid (2,4-DCAA) (19719-28-9)

200 µg/mL in methanol, 1 mL/ampul
cat.# 32049 (ea.)

1,000 µg/mL in acetone, 1 mL/ampul
cat.# 32439 (ea.)

Derivatized Form

2,4-Dichlorophenyl acetic acid methyl ester (DCAA methyl ester) (55954-23-9)

200 µg/mL in hexane, 1 mL/ampul
cat.# 32050 (ea.)

Herbicide Lab Performance Check Mix (5 components)

Dinoseb methyl ether (6099-79-2)	4 µg/mL	3,5-Dichlorobenzoic acid methyl ester (2905-67-1)	600
DCAA methyl ester (55954-23-9)	500	4-Nitroanisole (100-17-4)	1,600
4,4'-Dibromooctafluorobiphenyl (10386-84-2)	250		

In methyl *tert*-butyl ether, 1 mL/ampul
cat.# 32063 (ea.)

Method 515, 515.4 (Chlorinated Acid Herbicides), *cont.*

Herbicide Mix #1 (7 components)

Free Acid Form

2,4-D (94-75-7)
2,4-DB (94-82-6)
2,4,5-T (93-76-5)
2,4,5-TP (Silvex) (93-72-1)
Dicamba (1918-00-9)
Dichlorprop (120-36-5)
Dinoseb (88-85-7)

200 µg/mL each in methanol, 1 mL/ampul
cat.# 32054 (ea.)

Derivatized Form

2,4-D methyl ester (1928-38-7)
2,4-DB methyl ester (18625-12-2)
2,4,5-T methyl ester (1928-37-6)
2,4,5-TP methyl ester (Silvex) (4841-20-7)
Dicamba methyl ester (6597-78-0)
Dichlorprop methyl ester (57153-17-0)
Dinoseb methyl ether (6099-79-2)

200 µg/mL each in hexane, 1 mL/ampul
cat.# 32055 (ea.)

Herbicide Mix #2

Free Acid Form

Dalapon (75-99-0)

1,000 µg/mL in acetonitrile, 1 mL/ampul
cat.# 32432 (ea.)

1,000 µg/mL in methanol, 1 mL/ampul
cat.# 32253 (ea.)

2,000 µg/mL in methanol, 1 mL/ampul
cat.# 32056 (ea.)

Derivatized Form

Dalapon methyl ester (17640-02-7)

2,000 µg/mL in hexane, 1 mL/ampul
cat.# 32057 (ea.)

Herbicide Mix #4 (8 components)

Free Acid Form

Acifluorfen (50594-66-6)
Bentazon (25057-89-0)
Chloramben (133-90-4)
DCPA diacid (tetrachloroterephthalic acid) (2136-79-0)
3,5-Dichlorobenzoic acid (51-36-5)
4-Nitrophenol (100-02-7)
Pentachlorophenol (87-86-5)
Picloram (1918-02-1)

200 µg/mL each in methanol, 1 mL/ampul
cat.# 32061 (ea.)

Derivatized Form

Acifluorfen methyl ester (50594-67-7)
Bentazon methyl ester (61592-45-8)
Chloramben methyl ester (7286-84-2)
DCPA methyl ester (Chlorthal-dimethyl) (1861-32-1)
3,5-Dichlorobenzoic acid methyl ester (2905-67-1)
4-Nitroanisole (100-17-4)
Pentachloroanisole (1825-21-4)
Picloram methyl ester (14143-55-6)

200 µg/mL each in hexane, 1 mL/ampul
cat.# 32062 (ea.)

Herbicides, Chlorinated Acids, *cont.*

Method 515, 515.4 (Chlorinated Acid Herbicides), *cont.*

515.4 Calibration Mix (16 components)

Acifluorfen (50594-66-6)	50 µg/mL	3,5-Dichlorobenzoic acid (51-36-5)	50
Bentazon (25057-89-0)	100	Dichlorprop (120-36-5)	100
Chloramben (133-90-4)	50	Dinoseb (88-85-7)	100
2,4-D (94-75-7)	100	Pentachlorophenol (87-86-5)	10
Dalapon (75-99-0)	100	Picloram (1918-02-1)	50
2,4-DB (94-82-6)	100	Quinclorac (84087-01-4)	50
DCPA diacid (tetrachloroterephthalic acid) (2136-79-0)	50	2,4,5-T (93-76-5)	25
Dicamba (1918-00-9)	50	2,4,5-TP (Silvex) (93-72-1)	25

In acetone, 1 mL/ampul

cat.# 32443 (ea.)

515.4 Methylated Chlorinated Acids Mix

(16 components)

Acifluorfen methyl ester (50594-67-7)	50 µg/mL	3,5-Dichlorobenzoic acid methyl ester (2905-67-1)	50
Bentazon methyl ester (61592-45-8)	100	Dichlorprop methyl ester (57153-17-0)	100
Chloramben methyl ester (7286-84-2)	50	Dinoseb methyl ether (6099-79-2)	100
Dalapon methyl ester (17640-02-7)	100	Pentachloroanisole (1825-21-4)	10
2,4-D methyl ester (1928-38-7)	100	Picloram methyl ester (14143-55-6)	50
2,4-DB methyl ester (18625-12-2)	100	Quinclorac methyl ester	50
DCPA methyl ester (Chlorthal-dimethyl) (1861-32-1)	100	2,4,5-T methyl ester (1928-37-6)	25
Dicamba methyl ester (6597-78-0)	50	2,4,5-TP (Silvex) methyl ester (4841-20-7)	25

In methyl *tert*-butyl ether, 1 mL/ampul

cat.# 32444 (ea.)

Method 555 (Chlorinated Acids) LC Mixes

Chlorinated Acids by LC, Mix A (8 components)

Acifluorfen (50594-66-6)	Dicamba (1918-00-9)
Bentazon (25057-89-0)	Dichlorprop (120-36-5)
Chloramben (133-90-4)	Picloram (1918-02-1)
2,4-D (94-75-7)	2,4,5-TP (Silvex) (93-72-1)

1,000 µg/mL each in acetonitrile, 1 mL/ampul

cat.# 32431 (ea.)

Chlorinated Acids by LC, Mix B (8 components)

2,4-DB (94-82-6)	MCPP (Mecoprop) (93-65-2)
3,5-Dichlorobenzoic acid (51-36-5)	4-Nitrophenol (100-02-7)
Dinoseb (88-85-7)	Pentachlorophenol (87-86-5)
MCPA (94-74-6)	2,4,5-T (93-76-5)

1,000 µg/mL each in acetonitrile, 1 mL/ampul

cat.# 32430 (ea.)

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Method 615 (Chlorinated Acid Herbicides)

Herbicide Surrogate

Free Acid Form

2,4-Dichlorophenylacetic acid (2,4-DCAA) (19719-28-9)

200 µg/mL in methanol, 1 mL/ampul

cat.# 32049 (ea.)

1,000 µg/mL in acetone, 1 mL/ampul

cat.# 32439 (ea.)

Derivatized Form

2,4-Dichlorophenyl acetic acid methyl ester (DCAA methyl ester) (55954-23-9)

200 µg/mL in hexane, 1 mL/ampul

cat.# 32050 (ea.)

Herbicide Mix #1 (7 components)

Free Acid Form

2,4-D (94-75-7)	Dicamba (1918-00-9)
2,4-DB (94-82-6)	Dichlorprop (120-36-5)
2,4,5-T (93-76-5)	Dinoseb (88-85-7)
2,4,5-TP (Silvex) (93-72-1)	

200 µg/mL each in methanol, 1 mL/ampul

cat.# 32054 (ea.)

Derivatized Form

2,4-D methyl ester (1928-38-7)	Dicamba methyl ester (6597-78-0)
2,4-DB methyl ester (18625-12-2)	Dichlorprop methyl ester (57153-17-0)
2,4,5-T methyl ester (1928-37-6)	Dinoseb methyl ether (6099-79-2)
2,4,5-TP methyl ester (Silvex) (4841-20-7)	

200 µg/mL each in hexane, 1 mL/ampul

cat.# 32055 (ea.)

Herbicide Mix #2

Free Acid Form

Dalapon (75-99-0)

1,000 µg/mL in acetonitrile, 1 mL/ampul

cat.# 32432 (ea.)

1,000 µg/mL in methanol, 1 mL/ampul

cat.# 32253 (ea.)

2,000 µg/mL in methanol, 1 mL/ampul

cat.# 32056 (ea.)

Derivatized Form

Dalapon methyl ester (17640-02-7)

2,000 µg/mL in hexane, 1 mL/ampul

cat.# 32057 (ea.)

Herbicide Mix #3 (2 components)

Free Acid Form

MCPA (94-74-6)
MCPP (Mecoprop) (93-65-2)

20,000 µg/mL each in methanol, 1 mL/ampul

cat.# 32058 (ea.)

Derivatized Form

MCPA methyl ester (2436-73-9)
MCPP (Mecoprop) methyl ester (2786-19-8)

20,000 µg/mL each in hexane, 1 mL/ampul

cat.# 32059 (ea.)

Herbicides, Chlorinated Acids, *cont.*

Method 8150, 8151, 8151A (Chlorinated Acid Herbicides)

Herbicide Internal Standard

4,4'-Dibromooctafluorobiphenyl (10386-84-2)

250 µg/mL in hexane, 1 mL/ampul
cat.# 32053 (ea.)

2,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31040 (ea.)

2,000 µg/mL in methyl *tert*-butyl ether, 1 mL/ampul
cat.# 31856 (ea.)

Herbicide Surrogate

Free Acid Form

2,4-Dichlorophenylacetic acid (2,4-DCAA) (19719-28-9)

200 µg/mL in methanol, 1 mL/ampul
cat.# 32049 (ea.)

1,000 µg/mL in acetone, 1 mL/ampul
cat.# 32439 (ea.)

Derivatized Form

2,4-Dichlorophenyl acetic acid methyl ester (DCAA methyl ester) (55954-23-9)

200 µg/mL in hexane, 1 mL/ampul
cat.# 32050 (ea.)

Herbicide Mix #1 (7 components)

Free Acid Form

2,4-D (94-75-7)
2,4-DB (94-82-6)
2,4,5-T (93-76-5)
2,4,5-TP (Silvex) (93-72-1)
Dicamba (1918-00-9)
Dichlorprop (120-36-5)
Dinoseb (88-85-7)

200 µg/mL each in methanol, 1 mL/ampul
cat.# 32054 (ea.)

Derivatized Form

2,4-D methyl ester (1928-38-7)
2,4-DB methyl ester (18625-12-2)
2,4,5-T methyl ester (1928-37-6)
2,4,5-TP methyl ester (Silvex) (4841-20-7)
Dicamba methyl ester (6597-78-0)
Dichlorprop methyl ester (57153-17-0)
Dinoseb methyl ether (6099-79-2)

200 µg/mL each in hexane, 1 mL/ampul
cat.# 32055 (ea.)

Herbicide Mix #2

Free Acid Form

Dalapon (75-99-0)

1,000 µg/mL in acetonitrile, 1 mL/ampul
cat.# 32432 (ea.)

1,000 µg/mL in methanol, 1 mL/ampul
cat.# 32253 (ea.)

2,000 µg/mL in methanol, 1 mL/ampul
cat.# 32056 (ea.)

Derivatized Form

Dalapon methyl ester (17640-02-7)

2,000 µg/mL in hexane, 1 mL/ampul
cat.# 32057 (ea.)

Herbicide Mix #3 (2 components)

Free Acid Form

MCPA (94-74-6)
MCPP (Mecoprop) (93-65-2)

20,000 µg/mL each in methanol, 1 mL/ampul
cat.# 32058 (ea.)

Derivatized Form

MCPA methyl ester (2436-73-9)
MCPP (Mecoprop) methyl ester (2786-19-8)

20,000 µg/mL each in hexane, 1 mL/ampul
cat.# 32059 (ea.)

Herbicide Mix #4 (8 components)

Free Acid Form

Acifluorfen (50594-66-6)
Bentazon (25057-89-0)
Chloramben (133-90-4)
DCPA diacid (tetrachloroterephthalic acid) (2136-79-0)
3,5-Dichlorobenzoic acid (51-36-5)
4-Nitrophenol (100-02-7)
Pentachlorophenol (87-86-5)
Picloram (1918-02-1)

200 µg/mL each in methanol, 1 mL/ampul
cat.# 32061 (ea.)

Derivatized Form

Acifluorfen methyl ester (50594-67-7)
Bentazon methyl ester (61592-45-8)
Chloramben methyl ester (7286-84-2)
DCPA methyl ester (Chlorthal-dimethyl) (1861-32-1)
3,5-Dichlorobenzoic acid methyl ester (2905-67-1)
4-Nitroanisole (100-17-4)
Pentachloroanisole (1825-21-4)
Picloram methyl ester (14143-55-6)

200 µg/mL each in hexane, 1 mL/ampul
cat.# 32062 (ea.)

Picloram

Picloram (1918-02-1)

1,000 µg/mL in methanol, 1 mL/ampul
cat.# 32265 (ea.)

Reference Standards Documentation Search

Locate SDSs, certificates, & data packs by cat. # or lot #

www.restek.com/documentation



Herbicides, Chlorinated Acids, *cont.*

Method 8321 (Chlorinated Acids by LC)

Chlorinated Acids by LC, Mix A (8 components)

Acifluorfen (50594-66-6)
Bentazon (25057-89-0)
Chloramben (133-90-4)
2,4-D (94-75-7)
Dicamba (1918-00-9)
Dichlorprop (120-36-5)
Picloram (1918-02-1)
2,4,5-TP (Silvex) (93-72-1)

1,000 µg/mL each in acetonitrile, 1 mL/ampul
cat.# 32431 (ea.)

Chlorinated Acids by LC, Mix B (8 components)

2,4-DB (94-82-6)
3,5-Dichlorobenzoic acid (51-36-5)
Dinoseb (88-85-7)
MCPA (94-74-6)
MCPP (Mecoprop) (93-65-2)
4-Nitrophenol (100-02-7)
Pentachlorophenol (87-86-5)
2,4,5-T (93-76-5)

1,000 µg/mL each in acetonitrile, 1 mL/ampul
cat.# 32430 (ea.)

Dalapon (2,2-dichloropropionic acid)

Dalapon (75-99-0)

1,000 µg/mL in acetonitrile, 1 mL/ampul
cat.# 32432 (ea.)

1,000 µg/mL in methanol, 1 mL/ampul
cat.# 32253 (ea.)

2,000 µg/mL in methanol, 1 mL/ampul
cat.# 32056 (ea.)

Method 1311 (Toxicity Characteristic Leaching Procedure [TCLP])

TCLP Herbicide Mix (2 components)

2,4-D (free acid) (94-75-7)
2,4,5-TP (Silvex) (free acid) (93-72-1)

2,000 µg/mL each in methanol, 1 mL/ampul
cat.# 32014 (ea.)

Herbicides, Glyphosate

Method 547 (Glyphosate)

Glyphosate Standard

Glyphosate (N-(phosphonomethyl)glycine) (1071-83-6)

1,000 µg/mL in DI water, 1 mL/ampul
cat.# 32426 (ea.)

1,000 µg/mL in DI water, 5 mL/ampul
cat.# 32427 (ea.)

AMPA (glyphosate metabolite)

Aminomethyl phosphonic acid (AMPA) (1066-51-9)

100 µg/mL in DI water, 1 mL/ampul
cat.# 32428 (ea.)

Herbicides, Paraquat/Diquat

Method 549.2 (Paraquat/Diquat)

Paraquat & Diquat Calibration Mix (2 components)

Diquat dibromide (6385-62-2)
Paraquat dichloride (1910-42-5)

1,000 µg/mL each in water, 1 mL/ampul
cat.# 32437 (ea.)

Herbicides, Triazines

Canadian Drinking Water Triazine Herbicides Mix

(7 components)

Alachlor (15972-60-8)
Atrazine (122-34-9)
Cyanazine (Bladex) (21725-46-2)
Metolachlor (51218-45-2)
Metribuzin (21087-64-9)
Prometryne (7287-19-6)
Simazine (122-34-9)

500 µg/mL each in acetone, 1 mL/ampul
cat.# 31864 (ea.)

Compound Index for Reference Standards



See **pages 586–592.**

Hormones

Method 539 (Hormones in Drinking Water)

EPA 539 Calibration Stock Standard (7 components)

- Contains the seven hormones listed in EPA Method 539 at the appropriate concentrations.
- Certified reference material (CRM) manufactured and QC-tested in Restek's ISO-accredited labs—satisfy your ISO requirements.
- Also available: UCMR3 Method 539 calibration standard with concentrations of 10–400 µg/mL to more conveniently match UCMR3 requirements (cat.# 32461, see below).

4-Androstene-3,17-dione (63-05-8)	100 µg/mL
Equilin (474-86-2)	200
17-beta-Estradiol (50-28-2)	250
Estriol (50-27-1)	200
Estrone (53-16-7)	200
17-alpha-Ethynylestradiol (57-63-6)	350
Testosterone (58-22-0)	100

In acetonitrile, 1 mL/ampul

cat.# 31998 (ea.)

UCMR3 Method 539 Calibration Standard

(7 components)

- Contains the seven hormones listed in EPA Method 539 at concentrations suited for Unregulated Contaminant Monitoring Rule 3 (UCMR3) screening.
- Ideal for the analysis of finished drinking water as outlined in UCMR3, which requires monitoring of all public drinking water systems with 10,000 or more customers.
- Certified reference material (CRM) manufactured and QC-tested in Restek's ISO-accredited labs—satisfy your ISO requirements.
- Also available: EPA 539 calibration stock standard with concentrations of 100–350 µg/mL to more conveniently match EPA requirements (cat.# 31998, see above).

4-Androstene-3,17-dione (63-05-8)	30 µg/mL
Equilin (474-86-2)	400
17-beta-Estradiol (50-28-2)	40
Estriol (50-27-1)	80
Estrone (53-16-7)	200
17-alpha-Ethynylestradiol (57-63-6)	90
Testosterone (58-22-0)	10

In acetonitrile, 1 mL/ampul

cat.# 32461 (ea.)

Hydrocarbons, Aromatic

Method 8020 (Aromatic Volatile Organics)

Internal and Surrogate Standards for Method 8020

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

Compound	CAS #	Solvent	Conc.	cat.#
1-Bromo-4-fluorobenzene (BFB)	460-00-4	PTM	2,000	30026
1,4-Difluorobenzene	540-36-3	PTM	2,000	30032
Fluorobenzene	462-06-6	PTM	2,000	30030
α,α,α-Trifluorotoluene	98-08-8	PTM	2,000	30048

PTM = Purge-and-trap grade methanol

8020A Calibration Mix (10 components)

Benzene (71-43-2)
Chlorobenzene (108-90-7)
1,2-Dichlorobenzene (95-50-1)
1,3-Dichlorobenzene (541-73-1)
1,4-Dichlorobenzene (106-46-7)
Ethylbenzene (100-41-4)
Toluene (108-88-3)
m-Xylene (108-38-3)
o-Xylene (95-47-6)
p-Xylene (106-42-3)

2,000 µg/mL each in P&T methanol, 1 mL/ampul

cat.# 30222 (ea.)

Method 609 (Nitroaromatics & Isophorone)

609 Nitroaromatics & Isophorone Calibration Mix

(4 components)

2,4-Dinitrotoluene (121-14-2)
Isophorone (78-59-1)
2,6-Dinitrotoluene (606-20-2)
Nitrobenzene (98-95-3)

2,000 µg/mL each in hexane, 1 mL/ampul

cat.# 31033 (ea.)

Hydrocarbons, Halogenated

Method 612 (Chlorinated Hydrocarbons)

612 Chlorinated Hydrocarbons Calibration Mix

(9 components)

2-Chloronaphthalene (91-58-7)
1,2-Dichlorobenzene (95-50-1)
1,3-Dichlorobenzene (541-73-1)
1,4-Dichlorobenzene (106-46-7)
Hexachlorobenzene (118-74-1)
Hexachlorobutadiene (87-68-3)
Hexachlorocyclopentadiene (77-47-4)
Hexachloroethane (67-72-1)
1,2,4-Trichlorobenzene (120-82-1)

2,000 µg/mL each in isooctane, 1 mL/ampul

cat.# 31035 (ea.)

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Hydrocarbons, Halogenated, *cont.*

Method 624 (Purgeable Halocarbons)

Volatiles MegaMix® Standard, EPA Method 624 (26 components)

MEGAMIX®

Benzene (71-43-2)
Bromodichloromethane (75-27-4)
Bromoform (75-25-2)
Carbon tetrachloride (56-23-5)
Chlorobenzene (108-90-7)
2-Chloroethyl vinyl ether (110-75-8)
Chloroform (67-66-3)
Dibromochloromethane (124-48-1)
1,2-Dichlorobenzene (95-50-1)
1,3-Dichlorobenzene (541-73-1)
1,4-Dichlorobenzene (106-46-7)
1,1-Dichloroethane (75-34-3)
1,2-Dichloroethane (107-06-2)
1,1-Dichloroethene (75-35-4)
trans-1,2-Dichloroethene (156-60-5)
1,2-Dichloropropane (78-87-5)
cis-1,3-Dichloropropene (10061-01-5)
trans-1,3-Dichloropropene (10061-02-6)
Ethylbenzene (100-41-4)
Methylene chloride (dichloromethane) (75-09-2)
1,1,2,2-Tetrachloroethane (79-34-5)
Tetrachloroethene (127-18-4)
Toluene (108-88-3)
1,1,1-Trichloroethane (71-55-6)
1,1,2-Trichloroethane (79-00-5)
Trichloroethene (79-01-6)

2,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30497 (ea.)

624 Internal Standard Mix (3 components)

Bromochloromethane (74-97-5)
2-Bromo-1-chloropropane (3017-95-6)
1,4-Dichlorobutane (110-56-5)

1,500 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30023 (ea.)

624 Surrogate Standard Mix (3 components)

1-Bromo-4-fluorobenzene (BFB) (460-00-4)
Fluorobenzene (462-06-6)
Pentafluorobenzene (363-72-4)

2,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30243 (ea.)

Surrogate Standard (2 components)

1-Bromo-4-fluorobenzene (BFB) (460-00-4)
α,α,α-Trifluorotoluene (98-08-8)

2,500 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30484 (ea.)

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

Bromomethane (methyl bromide) (74-83-9)
Chloroethane (ethyl chloride) (75-00-3)
Chloromethane (methyl chloride) (74-87-3)
Trichlorofluoromethane (CFC-11) (75-69-4)
Vinyl chloride (75-01-4)

2,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30020 (ea.)

Method 624 (Purgeable Halocarbons), *cont.*

624 Calibration Mix #2 (12 components)

Benzene (71-43-2)
Carbon tetrachloride (56-23-5)
Chlorobenzene (108-90-7)
2-Chloroethyl vinyl ether (110-75-8)
Dibromochloromethane (124-48-1)
1,1-Dichloroethane (75-34-3)
1,1-Dichloroethene (75-35-4)
1,2-Dichloropropane (78-87-5)
Methylene chloride (dichloromethane) (75-09-2)
Tetrachloroethene (127-18-4)
1,1,2-Trichloroethane (79-00-5)
Trichloroethene (79-01-6)

2,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30021 (ea.)

624 Calibration Mix #3 (14 components)

Bromodichloromethane (75-27-4)
Bromoform (75-25-2)
Chloroform (67-66-3)
1,2-Dichlorobenzene (95-50-1)
1,3-Dichlorobenzene (541-73-1)
1,4-Dichlorobenzene (106-46-7)
1,2-Dichloroethane (107-06-2)
trans-1,2-Dichloroethene (156-60-5)
cis-1,3-Dichloropropene (10061-01-5)
trans-1,3-Dichloropropene (10061-02-6)
Ethylbenzene (100-41-4)
1,1,2,2-Tetrachloroethane (79-34-5)
Toluene (108-88-3)
1,1,1-Trichloroethane (71-55-6)

2,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30022 (ea.)

Method 8010 (Halogenated Volatile Organics)

502.2 Calibration Mix #1 (gases) (6 components)

Bromomethane (methyl bromide) (74-83-9)
Chloroethane (ethyl chloride) (75-00-3)
Chloromethane (methyl chloride) (74-87-3)
Dichlorodifluoromethane (CFC-12) (75-71-8)
Trichlorofluoromethane (CFC-11) (75-69-4)
Vinyl chloride (75-01-4)

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

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

BTEX Standard (6 components)

Benzene (71-43-2)
Ethylbenzene (100-41-4)
Toluene (108-88-3)
m-Xylene (108-38-3)
o-Xylene (95-47-6)
p-Xylene (106-42-3)

200 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30051 (ea.)

2,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30213 (ea.)

2,000 µg/mL each in P&T methanol (*m*- & *p*-xylene at 1,000 µg/mL), 1 mL/ampul
cat.# 30488 (ea.)

Method 8011 (1,2-Dibromoethane & 1,2-Dibromo-3-chloropropane)

8011 Calibration Mix—EDB/DBCP (2 components)

1,2-Dibromo-3-chloropropane (DBCP) (96-12-8)
1,2-Dibromoethane (EDB) (106-93-4)

2,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30062 (ea.)

Hydrocarbons, Leaking Underground Storage Tank (LUST): General

Retention Time Standards

Used during initial sample screening to determine retention time windows for each petroleum product. Gasoline generally elutes in the window from C6 to C10 (or C12), and diesel fuel from C10 (or C12) to C24 (or C28). Retention above C24 (or C28) indicates oil or lubricant contamination.

Leaking Underground Storage Tank Retention Time Standard (7 components)

n-Hexane (C6) (110-54-3)
n-Decane (C10) (124-18-5)
n-Dodecane (C12) (112-40-3)
n-Tetracosane (C24) (646-31-1)
n-Octacosane (C28) (630-02-4)
n-Triacontane (C30) (638-68-6)
n-Tetracontane (C40) (4181-95-7)

25 µg/mL each in methylene chloride, 1 mL/ampul
cat.# 31200 (ea.)

Retention Time Marker (3 components)

n-Hexane (C6) (110-54-3)
n-Decane (C10) (124-18-5)
n-Dodecane (C12) (112-40-3)

1,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30483 (ea.)

TNRCC 1005 Retention Time Markers Mix

(4 components)

- Easily determine the retention time window for each boiling point range.
- Prepared in *n*-pentane according to EPA requirements.

n-Hexane (C6) (110-54-3)
n-Dodecane (C12) (112-40-3)
n-Octacosane (C28) (630-02-4)
n-Pentatriacontane (C35) (630-07-9)

200 µg/mL each in pentane, 1 mL/ampul
cat.# 31698 (ea.)

Retention Time Marker - Alaska (4 components)

n-Hexane (C6) (110-54-3)
n-Decane (C10) (124-18-5)
n-Pentacosane (C25) (629-99-2)
n-Hexatriacontane (C36) (630-06-8)

1,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31819 (ea.)

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See **pages 464–465**.

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Fuel Composite Standards

Unleaded Gasoline Composite Standard

Unleaded gasoline composite (8006-61-9)

2,500 µg/mL in P&T methanol, 1 mL/ampul
cat.# 30081 (ea.)

50,000 µg/mL in P&T methanol, 1 mL/ampul
cat.# 30205 (ea.)

50,000 µg/mL in P&T methanol, 5 mL/ampul
cat.# 30206 (ea.)

Diesel Fuel #2 Composite Standard

Diesel fuel #2 composite (68334-30-5)

5,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31093 (ea.)

50,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31258 (ea.)

50,000 µg/mL in methylene chloride, 5 mL/ampul
cat.# 31259 (ea.)

Kerosene Composite Standard

Kerosene composite (84742-81-0)

5,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31094 (ea.)

50,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31256 (ea.)

50,000 µg/mL in methylene chloride, 5 mL/ampul
cat.# 31257 (ea.)

Motor Oil Composite Standards

Motor Oil Composite Standard

Prepared from an equal-volume blend of 5W30, 10W30, 10W40, and 20W50 motor oils. After blending, a precisely weighed amount of the composite is added to a volumetric flask to produce the standard.

Motor oil composite (64742-65-0)

50,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31464 (ea.)

Used Motor Oil Composite Standard

Prepared from an equal-volume blend from five gasoline-powered vehicles (belonging to Restek employees). After blending, a precisely weighed amount of the composite is added to a volumetric flask to produce the standard.

Used motor oil composite (64742-65-0)

50,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31465 (ea.)

also available

Other fuels, oils, and lubricant oils available on request as custom products.

Hydrocarbons, Leaking Underground Storage Tank (LUST): General, *cont.*

Single-Source Fuels

Unleaded Gasoline Standard

Prepared from a single-source (one-refinery) product.

Unleaded gasoline: unweathered (8006-61-9)

5,000 µg/mL in P&T methanol, 1 mL/ampul
cat.# 30096 (ea.)

Kerosene Standard

Prepared from a single-source (one-refinery) product.

Kerosene: unweathered (84742-81-0)

5,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31229 (ea.)

Diesel Fuel #2 Standard

Prepared from a single-source (one-refinery) product.

Diesel fuel #2: unweathered (68334-30-5)

5,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31233 (ea.)

Fuel Oil #4 Standard

Fuel oil #4 is typically used in limited applications in which the fuel cannot be preheated prior to burning. The fuel is a blend of distillate (fuel oil #2) and residual (fuel oil #6) to meet ASTM viscosity specifications. The fuel oil #4 used to prepare this mixture has a kinematic viscosity of 21.9 at 38 °C (100 °F), measured using ASTM D-445.

Fuel oil #4 (68476-31-3)

5,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31216 (ea.)

50,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31244 (ea.)



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Fuel Oil #6 Standard

This fuel, sometimes called bunker C or residual, is a black viscous oil. Applications in which it may be used require the ability to preheat the fuel prior to pumping and burning.

Fuel oil #6 (68553-00-4)

5,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31218 (ea.)

50,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31248 (ea.)

Diesel:Biodiesel (80:20) Blend Standard

The biodiesel component is methyl soyate.

Diesel:biodiesel (80:20) (67784-80-9)

5,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31880 (ea.)

Aviation Gas Standard

100-octane, low-lead fuel used in piston-type aircraft.

Aviation gas (8006-69-1)

50,000 µg/mL in P&T methanol, 1 mL/ampul
cat.# 30207 (ea.)

Jet Fuel A Standard

Jet fuel A (64742-47-8)

5,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31215 (ea.)

50,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31242 (ea.)

50,000 µg/mL in methylene chloride, 5 mL/ampul
cat.# 31243 (ea.)

Creosote Oil Standard

Creosote oil, a widely used wood preservative produced by distilling coal tar, contains chemicals that are classified as carcinogens (e.g., benzo(a)pyrene).

Creosote oil (8001-58-9)

50,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31838 (ea.)

Hydraulic Oil Standard

Hydraulic oil (64741-89-5)

50,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31839 (ea.)

Hydrocarbons, Leaking Underground Storage Tank (LUST): General, *cont.*

Military Fuels (Jet Propellant)

JP-5 Military Fuel Standard

JP-5 Military fuel (8008-20-6)

50,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31252 (ea.)

JP-8 Military Fuel Standard

JP-8 Military fuel (94114-58-6)

5,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31262 (ea.)

50,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31254 (ea.)

Fuel Oil Degradation Test

Subsurface degradation of fuel oil spills can be estimated by examining the ratios of C17/pristane and C18/phytane.[1] To assist in identifying these four compounds from the complex fuel oil analysis, we offer a product that contains these compounds for retention time determination.

Fuel Oil Degradation Mix (4 components)

Heptadecane (C17) (629-78-7)
Octadecane (C18) (593-45-3)
Pristane (2,6,10,14-tetramethylpentadecane) (1921-70-6)
Phytane (2,6,10,14-tetramethylhexadecane) (638-36-8)

2,000 µg/mL each in methylene chloride, 1 mL/ampul
cat.# 31240 (ea.)

[1]Interpretation of Gas Chromatographic Data in Subsurface Hydrocarbon Investigations, R. Senn and M. Johnson, Ground Water Monitoring Review, Winter 1987.

Mineral Spirits

There are four general types of mineral spirits, classified according to boiling point range (BPR):

- Type I (Stoddard solvent) BPR 149–182 °C
- Type II (high flash point) BPR 177–196 °C
- Type III (odorless) BPR 149–196 °C
- Type IV (low dry point) BPR 149–174 °C

We prepare our solutions from an equal-volume blend of Type I, II, and III mineral spirits.

Mineral Spirits Standards (Unweathered)

5,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31225 (ea.)

50,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31260 (ea.)

Stoddard Solvent Standard

Stoddard solvent is also known as Type I mineral spirits, Texsolve S, or Varsol® 1 mineral spirits. We offer this reference material for those who need to calibrate Stoddard solvent separately. This standard is dissolved in methanol for analysis by either direct injection or purge-and-trap.

Stoddard solvent (8052-41-3)

10,000 µg/mL in P&T methanol, 1 mL/ampul
cat.# 30487 (ea.)

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Hydrocarbons, Leaking Underground Storage Tank (LUST): General, *cont.*

Petroleum Volatile Organic Compounds (PVOCs), Gasoline Range Organics (GRO) & Benzene-Toluene-Ethylbenzene-Xylenes (BTEX)

PVOC Mix (California) (7 components)

Benzene (71-43-2)
Ethylbenzene (100-41-4)
Methyl *tert*-butyl ether (MTBE) (1634-04-4)
Toluene (108-88-3)
m-Xylene (108-38-3)
o-Xylene (95-47-6)
p-Xylene (106-42-3)

1,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30231 (ea.)

PVOC/GRO Mix (Wisconsin) (10 components)

Benzene (71-43-2)
Ethylbenzene (100-41-4)
Methyl *tert*-butyl ether (MTBE) (1634-04-4)
Naphthalene (91-20-3)
Toluene (108-88-3)
1,2,4-Trimethylbenzene (95-63-6)
1,3,5-Trimethylbenzene (108-67-8)
m-Xylene (108-38-3)
o-Xylene (95-47-6)
p-Xylene (106-42-3)

1,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30095 (ea.)

GRO Mix (9 components)

Benzene (71-43-2)
Ethylbenzene (100-41-4)
3-Methylpentane (96-14-0)
Naphthalene (91-20-3)
Toluene (108-88-3)
1,2,4-Trimethylbenzene (95-63-6)
2,2,4-Trimethylpentane (isooctane) (540-84-1)
m-Xylene (108-38-3)
o-Xylene (95-47-6)

1,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30069 (ea.)

GRO Mix (EPA) (9 components)

Benzene (71-43-2)	500 µg/mL	1,2,4-Trimethylbenzene (95-63-6)	1,000
Ethylbenzene (100-41-4)	500	2,2,4-Trimethylpentane (isooctane) (540-84-1)	1,500
Heptane (142-82-5)	500	*m*-Xylene (108-38-3)	1,000
2-Methylpentane (107-83-5)	1,500	*o*-Xylene (95-47-6)	1,000
Toluene (108-88-3)	1,500		

In P&T methanol, 1 mL/ampul
cat.# 30065 (ea.)

Gasoline Component Standard (10 components)

Benzene (71-43-2)	500 µg/mL	2,2,4-Trimethylpentane (isooctane) (540-84-1)	1,500
Ethylbenzene (100-41-4)	500	*m*-Xylene (108-38-3)	1,000
Heptane (142-82-5)	500	*o*-Xylene (95-47-6)	1,000
2-Methylpentane (107-83-5)	1,500	*p*-Xylene (106-42-3)	1,000
Toluene (108-88-3)	1,500		
1,2,4-Trimethylbenzene (95-63-6)	1,000		

10,000 µg/mL total in P&T methanol, 1 mL/ampul
cat.# 30486 (ea.)

BTEX Standard (6 components)

Benzene (71-43-2)
Ethylbenzene (100-41-4)
Toluene (108-88-3)
m-Xylene (108-38-3)
o-Xylene (95-47-6)
p-Xylene (106-42-3)

200 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30051 (ea.)

2,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30213 (ea.)

2,000 µg/mL each in P&T methanol (*m*- & *p*-xylene at 1,000 µg/mL), 1 mL/ampul
cat.# 30488 (ea.)

BTEX Gas Mix (6 components)

Benzene (71-43-2)
Ethylbenzene (100-41-4)
Toluene (108-88-3)
m-Xylene (108-38-3)
o-Xylene (95-47-6)
p-Xylene (106-42-3)

1 ppm in nitrogen, 104 liters @ 1,800 psi
cat.# 34414 (ea.)

1 ppm in nitrogen, 110 liters @ 1,800 psi
cat.# 26361 (ea.)

1 ppm in nitrogen, 110 liters @ 1,800 psi (Pi-marked cylinder)
cat.# 34414-PI (ea.)

100 ppb in nitrogen, 104 liters @ 1,800 psi
cat.# 34428 (ea.)

100 ppb in nitrogen, 110 liters @ 1,800 psi
cat.# 26362 (ea.)

100 ppb in nitrogen, 110 liters @ 1,800 psi (Pi-marked cylinder)
cat.# 34428-PI (ea.)

cylinder design



Spectra (Linde)
104 L Cylinders:
Aluminum construction
Size: 8 x 24 cm
Volume/Pressure:
104 liters of gas @ 1,800 psi
CGA-180 outlet fitting.
Weight: 1.5 lb/0.7 kg



Scotty (Air Liquide)
110 L Cylinders:
Aluminum construction
Size: 8.3 x 29.5 cm
Volume/Pressure:
110 liters of gas @ 1,800 psi
CGA-180 outlet fitting.
Weight: 2.2 lb/1 kg
U.S. DOT Specs: 3AL2216

No data pack available.

Gas standards are subject to hazardous materials shipping fees by most freight carriers. All calibration gas standards are nonreturnable due to DOT hazardous shipping requirements.

also available

High-Purity VOC Regulators

See **page 453.**



Hydrocarbons, Leaking Underground Storage Tank (LUST): General, *cont.*

Petroleum Volatile Organic Compounds (PVOCs), Gasoline Range Organics (GRO) & Benzene-Toluene-Ethylbenzene-Xylenes (BTEX), *cont.*

Certified BTEX in Unleaded Gas Composite Standard
(9 components)

Certified for:
Benzene*
Ethylbenzene*
Isopropyl benzene*
Methyl *tert*-butyl ether (MTBE)*
Naphthalene*
Toluene*
m-Xylene*
o-Xylene*
p-Xylene*

5,500 ppm gasoline in P&T methanol, 1 mL/ampul
cat.# 30237 (ea.)

*Concentration differs from lot to lot. See online data pack for certified concentrations.

Certified Aromatics in Gasoline (16 components)

Certified for:
Benzene*
Ethylbenzene*
m-Ethyltoluene*
o-Ethyltoluene*
p-Ethyltoluene*
Isopropylbenzene*
Methyl *tert*-butyl ether (MTBE)*
Naphthalene*
n-Propylbenzene*
Toluene*
1,2,3-Trimethylbenzene*
1,2,4-Trimethylbenzene*
1,3,5-Trimethylbenzene*
m-Xylene*
o-Xylene*
p-Xylene*

5,500 ppm gasoline in P&T methanol, 1 mL/ampul
cat.# 30485 (ea.)

*Concentration differs from lot to lot. See online data pack for certified concentrations.

Certified PAHs in Diesel (7 components)

Certified for:
Acenaphthene*
Acenaphthylene*
Fluorene*
1-Methylnaphthalene*
2-Methylnaphthalene*
Naphthalene*
Phenanthrene*

50,000 ppm diesel #2 in methylene chloride, 1 mL/ampul
cat.# 31673 (ea.)

*Concentration differs from lot to lot. See online data pack for certified concentrations.

Gasoline Surrogate & Internal Standards

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

Compound	CAS #	Solvent	Conc.	cat.#
1-Bromo-4-fluorobenzene (BFB)	460-00-4	PTM	2,500	30067
1-Bromo-4-fluorobenzene (BFB)	460-00-4	PTM	10,000	30082
1-Chlorooctane	111-85-3	PTM	10,000	30084
α,α,α-Trifluorotoluene	98-08-8	PTM	2,500	30068
α,α,α-Trifluorotoluene	98-08-8	PTM	10,000	30083
1-Chloro-4-fluorobenzene	352-33-0	PTM	2,500	30066

PTM = Purge-and-trap grade methanol

Diesel Surrogate & Internal Standards

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

Compound	CAS #	Solvent	Conc.	cat.#
1-Chlorooctadecane	3386-33-2	D	10,000	31098
2-Fluorobiphenyl	321-60-8	D	10,000	31096
o-Terphenyl	84-15-1	D	10,000	31097
p-Terphenyl	92-94-4	D	10,000	31095
5-α-Androstane	438-22-2	D	2,000	31065
o-Terphenyl	84-15-1	A	2,000	31066

A = acetone; D = methylene chloride

Diesel/Biodiesel Standard

Diesel:Biodiesel (80:20) Blend Standard
The biodiesel component is methyl soyate.

Diesel:biodiesel (80:20) (67784-80-9)

5,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31880 (ea.)

also available

ASTM Method D6584-10 and
EN14105 Biodiesel Standards

See **page 577.**



Hydrocarbons, Leaking Underground Storage Tank (LUST): State-Specific Methods, *cont.*

Alaska

Alaska Department of Environmental Conservation (ADEC) regulations indicate which products and indicator compounds are to be tested for each petroleum range. The analyst must use the following Alaska Series Methods or appropriate SW-846 Method for the indicator compounds. The Alaska UST procedurals manual indicates which products are to be tested for each petroleum range.

AK101

Method for determination of aromatic and aliphatic hydrocarbons in gasoline range organics.

Retention Time Marker - Alaska (4 components)

n-Hexane (C6) (110-54-3)
n-Decane (C10) (124-18-5)
n-Pentacosane (C25) (629-99-2)
n-Hexatriacontane (C36) (630-06-8)

1,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31819 (ea.)

Alaska UST Method AK101AA (14 components)

Benzene (71-43-2)
Ethylbenzene (100-41-4)
1-Ethyl-2-methylbenzene (611-14-3)
1-Ethyl-3-methylbenzene (620-14-4)
1-Ethyl-4-methylbenzene (622-96-8)
Isopropylbenzene (cumene) (98-82-8)
n-Propylbenzene (103-65-1)
Toluene (108-88-3)
1,2,3-Trimethylbenzene (526-73-8)
1,2,4-Trimethylbenzene (95-63-6)
1,3,5-Trimethylbenzene (108-67-8)
m-Xylene (108-38-3)
o-Xylene (95-47-6)
p-Xylene (106-42-3)

2,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30461 (ea.)

Unleaded Gasoline Composite Standard

Unleaded gasoline composite (8006-61-9)

2,500 µg/mL in P&T methanol, 1 mL/ampul
cat.# 30081 (ea.)

50,000 µg/mL in P&T methanol, 1 mL/ampul
cat.# 30205 (ea.)

50,000 µg/mL in P&T methanol, 5 mL/ampul
cat.# 30206 (ea.)

1-Chloro-4-fluorobenzene Mix

1-Chloro-4-fluorobenzene (352-33-0)

2,500 µg/mL in P&T methanol, 1 mL/ampul
cat.# 30066 (ea.)

1-Bromo-4-fluorobenzene (BFB)

1-Bromo-4-fluorobenzene (BFB) (460-00-4)

2,000 µg/mL in P&T methanol, 1 mL/ampul
cat.# 30026 (ea.)

2,500 µg/mL in P&T methanol, 1 mL/ampul
cat.# 30067 (ea.)

10,000 µg/mL in P&T methanol, 1 mL/ampul
cat.# 30082 (ea.)

α,α,α-Trifluorotoluene

α,α,α-Trifluorotoluene (98-08-8)

2,000 µg/mL in P&T methanol, 1 mL/ampul
cat.# 30048 (ea.)

2,500 µg/mL in P&T methanol, 1 mL/ampul
cat.# 30068 (ea.)

10,000 µg/mL in P&T methanol, 1 mL/ampul
cat.# 30083 (ea.)



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Hydrocarbons, Leaking Underground Storage Tank (LUST): State-Specific Methods, *cont.*

Alaska, *cont.*

AK102

Method for determination of aromatic and aliphatic hydrocarbons in diesel range organics.

DRO Mix (Tennessee/Mississippi) (16 components)

n-Decane (C10) (124-18-5)
n-Undecane (C11) (1120-21-4)
n-Dodecane (C12) (112-40-3)
n-Tridecane (C13) (629-50-5)
n-Tetradecane (C14) (629-59-4)
n-Pentadecane (C15) (629-62-9)
n-Hexadecane (C16) (544-76-3)
n-Heptadecane (C17) (629-78-7)
n-Octadecane (C18) (593-45-3)
n-Nonadecane (C19) (629-92-5)
n-Eicosane (C20) (112-95-8)
n-Heneicosane (C21) (629-94-7)
n-Docosane (C22) (629-97-0)
n-Tricosane (C23) (638-67-5)
n-Tetracosane (C24) (646-31-1)
n-Pentacosane (C25) (629-99-2)

1,000 µg/mL each in methylene chloride, 1 mL/ampul
cat.# 31214 (ea.)

Kerosene Composite Standard

Kerosene composite (84742-81-0)

5,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31094 (ea.)

50,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31256 (ea.)

50,000 µg/mL in methylene chloride, 5 mL/ampul
cat.# 31257 (ea.)

Diesel Fuel #2 Composite Standard

Diesel fuel #2 composite (68334-30-5)

5,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31093 (ea.)

50,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31258 (ea.)

50,000 µg/mL in methylene chloride, 5 mL/ampul
cat.# 31259 (ea.)

o-Terphenyl

o-Terphenyl (84-15-1)

2,000 µg/mL in acetone, 1 mL/ampul
cat.# 31066 (ea.)

10,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31097 (ea.)

5-α-Androstane

5-α-Androstane (438-22-2)

2,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31065 (ea.)

AK103

Method for determination of aromatic and aliphatic hydrocarbons in residual range organics.

Residual Range Calibration Standard (RCS)

(2 components)

SAE30 motor oil:SAE40 motor oil (1:1) (64742-65-0)

50,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31817 (ea.)

Residual Range Calibration Verification Standard (CVS) (2 components)

SAE30 motor oil:SAE40 motor oil (1:1) (64742-65-0)

25,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31818 (ea.)

Motor Oil Composite Standard

Prepared from an equal-volume blend of 5W30, 10W30, 10W40, and 20W50 motor oils. After blending, a precisely weighed amount of the composite is added to a volumetric flask to produce the standard.

Motor oil composite (64742-65-0)

50,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31464 (ea.)

Fuel Oil #6 Standard

This fuel, sometimes called bunker C or residual, is a black viscous oil. Applications in which it may be used require the ability to preheat the fuel prior to pumping and burning.

Fuel oil #6 (68553-00-4)

5,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31218 (ea.)

50,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31248 (ea.)

n-Triacontane-d62

n-Triacontane-d62

500 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31816 (ea.)



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Hydrocarbons, Leaking Underground Storage Tank (LUST): State-Specific Methods, *cont.*

Arizona

Extraction Retention Time Standard (4 components)

n-Hexane (C6) (110-54-3)
n-Decane (C10) (124-18-5)
n-Docosane (C22) (629-97-0)
n-Dotriacontane (C32) (544-85-4)

2,000 µg/mL each in methylene chloride, 1 mL/ampul
cat.# 31830 (ea.)

DRO/ORO Calibration Standard (2 components)

10W30 Motor oil (64742-65-0):diesel fuel #2 (68334-30-5) (1:1 blend)

25,000 µg/mL each in methylene chloride, 1 mL/ampul
cat.# 31831 (ea.)

DRO/ORO Range Calibration Standard (12 components)

n-Decane (C10) (124-18-5)
n-Dodecane (C12) (112-40-3)
n-Tetradecane (C14) (629-59-4)
n-Hexadecane (C16) (544-76-3)
n-Octadecane (C18) (593-45-3)
n-Eicosane (C20) (112-95-8)
n-Docosane (C22) (629-97-0)
n-Tetracosane (C24) (646-31-1)
n-Hexacosane (C26) (630-01-3)
n-Octacosane (C28) (630-02-4)
n-Triacontane (C30) (638-68-6)
n-Dotriacontane (C32) (544-85-4)

2,000 µg/mL each in methylene chloride, 1 mL/ampul
cat.# 31832 (ea.)

o-Terphenyl

o-Terphenyl (84-15-1)

2,000 µg/mL in acetone, 1 mL/ampul
cat.# 31066 (ea.)

10,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31097 (ea.)

Los Angeles County, CA Well Investigation Program (WIP)*

*For monitoring samples suspected of gasoline contamination, Los Angeles County requires laboratories to calibrate and report these compounds.

CA WIP VOA Standard (11 components)

Benzene (71-43-2)
Chlorobenzene (108-90-7)
1,2-Dichlorobenzene (95-50-1)
1,3-Dichlorobenzene (541-73-1)
1,4-Dichlorobenzene (106-46-7)
Ethylbenzene (100-41-4)
Methyl *tert*-butyl ether (MTBE) (1634-04-4)
Toluene (108-88-3)
m-Xylene (108-38-3)
o-Xylene (95-47-6)
p-Xylene (106-42-3)

2,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30236 (ea.)

Compound Index for Reference Standards

See **pages 586–592.**



California

PVOC Mix (California) (7 components)

Benzene (71-43-2)
Ethylbenzene (100-41-4)
Methyl *tert*-butyl ether (MTBE) (1634-04-4)
Toluene (108-88-3)
m-Xylene (108-38-3)
o-Xylene (95-47-6)
p-Xylene (106-42-3)

1,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30231 (ea.)

California Oxygenates Mix (5 components)

tert-Amyl methyl ether (TAME) (994-05-8)	2,000 µg/mL
tert-Butanol (TBA) (75-65-0)	10,000
Diisopropyl ether (DIPE) (108-20-3)	2,000
Ethyl-*tert*-butyl ether (ETBE) (637-92-3)	2,000
Methyl *tert*-butyl ether (MTBE) (1634-04-4)	2,000

In P&T methanol, 1 mL/ampul
cat.# 30465 (ea.)

Methanol

Methanol (67-56-1)

10,000 µg/mL in DI water, 1 mL/ampul
cat.# 30467 (ea.)

15 mg/mL in dimethyl sulfoxide, 1 mL/ampul
cat.# 36401 (ea.)

Ethanol

Ethanol (64-17-5)

10,000 µg/mL in DI water, 1 mL/ampul
cat.# 30466 (ea.)

2,000 µg/mL in P&T methanol, 1 mL/ampul
cat.# 30288 (ea.)

Glycols Standard (2 components)

Ethylene glycol (107-21-1)
Propylene glycol (57-55-6)

50,000 µg/mL each in DI water, 1 mL/ampul
cat.# 30471 (ea.)

Connecticut

Connecticut ETPH Calibration Mixture (15 components)

n-Nonane (C9) (111-84-2)
n-Decane (C10) (124-18-5)
n-Dodecane (C12) (112-40-3)
n-Tetradecane (C14) (629-59-4)
n-Hexadecane (C16) (544-76-3)
n-Octadecane (C18) (593-45-3)
n-Eicosane (C20) (112-95-8)
n-Docosane (C22) (629-97-0)
n-Tetracosane (C24) (646-31-1)
n-Hexacosane (C26) (630-01-3)
n-Octacosane (C28) (630-02-4)
n-Triacontane (C30) (638-68-6)
n-Dotriacontane (C32) (544-85-4)
n-Tetratriacontane (C34) (14167-59-0)
n-Hexatriacontane (C36) (630-06-8)

1,000 µg/mL each in methylene chloride, 1 mL/ampul
cat.# 31614 (ea.)

Hydrocarbons, Leaking Underground Storage Tank (LUST): State-Specific Methods, *cont.*

Florida

Florida TRPH Standard (17 components)

n-Octane (C8) (111-65-9)
n-Decane (C10) (124-18-5)
n-Dodecane (C12) (112-40-3)
n-Tetradecane (C14) (629-59-4)
n-Hexadecane (C16) (544-76-3)
n-Octadecane (C18) (593-45-3)
n-Eicosane (C20) (112-95-8)
n-Docosane (C22) (629-97-0)
n-Tetracosane (C24) (646-31-1)
n-Hexacosane (C26) (630-01-3)
n-Octacosane (C28) (630-02-4)
n-Triacontane (C30) (638-68-6)
n-Dotriacontane (C32) (544-85-4)
n-Tetratriacontane (C34) (14167-59-0)
n-Hexatriacontane (C36) (630-06-8)
n-Octatriacontane (C38) (7194-85-6)
n-Tetracontane (C40) (4181-95-7)

500 µg/mL each in hexane, 1 mL/ampul
cat.# 31266 (ea.)

2,000 µg/mL each in carbon disulfide, 1 mL/ampul
cat.# 31878 (ea.)

Florida TRPH Surrogate Mix

n-Nonatriacontane (C39) (7194-86-7)

3,000 µg/mL in carbon disulfide, 1 mL/ampul
cat.# 31456 (ea.)

3,000 µg/mL in carbon disulfide, 10 mL/ampul
cat.# 31877 (ea.)

Note: Reference standards containing greater than 99% carbon disulfide are classified as UN1131 carbon disulfide 3(6.1), I and are restricted from air transportation. Additional restrictions may apply to lower concentration materials depending on formulations. Contact standards@restek.com with any questions.

Massachusetts

MA VPH Standard With Surrogate Rev. 1.1 (July 2004) (16 components)

n-Pentane (C5) (109-66-0)
n-Nonane (C9) (111-84-2)
n-Decane (C10) (124-18-5)
Benzene (71-43-2)
n-Butylcyclohexane (1678-93-9)
2,5-Dibromotoluene (SS) (615-59-8)
Ethylbenzene (100-41-4)
2-Methylpentane (107-83-5)
Methyl *tert*-butyl ether (MTBE) (1634-04-4)
Naphthalene (91-20-3)
Toluene (108-88-3)
1,2,4-Trimethylbenzene (95-63-6)
2,2,4-Trimethylpentane (isooctane) (540-84-1)
m-Xylene (108-38-3)
o-Xylene (95-47-6)
p-Xylene (106-42-3)

10,000 µg/mL in P&T methanol, 1 mL/ampul
cat.# 30604 (ea.)

MA VPH Matrix Spike Mix With Surrogate Rev. 1.1 (July 2004) (16 components)

n-Pentane (C5) (109-66-0)
n-Nonane (C9) (111-84-2)
n-Decane (C10) (124-18-5)
Benzene (71-43-2)
n-Butylcyclohexane (1678-93-9)
2,5-Dibromotoluene (SS) (615-59-8)
Ethylbenzene (100-41-4)
2-Methylpentane (107-83-5)
Methyl *tert*-butyl ether (MTBE) (1634-04-4)
Naphthalene (91-20-3)
Toluene (108-88-3)
1,2,4-Trimethylbenzene (95-63-6)
2,2,4-Trimethylpentane (isooctane) (540-84-1)
m-Xylene (108-38-3)
o-Xylene (95-47-6)
p-Xylene (106-42-3)

50 µg/mL in P&T methanol, 1 mL/ampul
cat.# 30605 (ea.)

Massachusetts, *cont.*

MA Volatile Petroleum Hydrocarbon (VPH) Standard (13 components)

n-Pentane (C5) (109-66-0)	1,000 µg/mL	Toluene (108-88-3)	1,500
n-Nonane (C9) (111-84-2)	1,000	1,2,4-Trimethylbenzene (95-63-6)	1,000
Benzene (71-43-2)	500	2,2,4-Trimethylpentane (isooctane) (540-84-1)	1,500
Ethylbenzene (100-41-4)	500	*m*-Xylene (108-38-3)	1,000
2-Methylpentane (107-83-5)	1,500	*o*-Xylene (95-47-6)	1,000
Methyl *tert*-butyl ether (MTBE) (1634-04-4)	1,500	*p*-Xylene (106-42-3)	1,000
Naphthalene (91-20-3)	1,000		

In P&T methanol, 1 mL/ampul
cat.# 30434 (ea.)

MA VPH Standard With Surrogate (14 components)

n-Pentane (C5) (109-66-0)	1,000 µg/mL	Naphthalene (91-20-3)	1,000
n-Nonane (C9) (111-84-2)	1,000	Toluene (108-88-3)	1,500
Benzene (71-43-2)	500	1,2,4-Trimethylbenzene (95-63-6)	1,000
2,5-Dibromotoluene (SS) (615-59-8)	1,000	2,2,4-Trimethylpentane (isooctane) (540-84-1)	1,500
Ethylbenzene (100-41-4)	500	*m*-Xylene (108-38-3)	1,000
2-Methylpentane (107-83-5)	1,500	*o*-Xylene (95-47-6)	1,000
Methyl *tert*-butyl ether (MTBE) (1634-04-4)	1,500	*p*-Xylene (106-42-3)	1,000

In P&T methanol, 1 mL/ampul
cat.# 30452 (ea.)

MA VPH Matrix Spike Mix With Surrogate (14 components)

n-Pentane (C5) (109-66-0)
n-Nonane (C9) (111-84-2)
Benzene (71-43-2)
2,5-Dibromotoluene (SS) (615-59-8)
Ethylbenzene (100-41-4)
2-Methylpentane (107-83-5)
Methyl *tert*-butyl ether (MTBE) (1634-04-4)
Naphthalene (91-20-3)
Toluene (108-88-3)
1,2,4-Trimethylbenzene (95-63-6)
2,2,4-Trimethylpentane (isooctane) (540-84-1)
m-Xylene (108-38-3)
o-Xylene (95-47-6)
p-Xylene (106-42-3)

2,500 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30454 (ea.)

MA VPH Surrogate Standard

2,5-Dibromotoluene (615-59-8)

1,000 µg/mL in P&T methanol, 1 mL/ampul
cat.# 30435 (ea.)

10,000 µg/mL in P&T methanol, 1 mL/ampul
cat.# 30453 (ea.)

Quantity Discounts Available

— Buy 3 Standards, Get 10% Off
— Buy 5 Standards, Get 20% Off

Not available for all standards. Contact your local Restek® representative for more details.

Hydrocarbons, Leaking Underground Storage Tank (LUST): State-Specific Methods, *cont.*

Massachusetts, *cont.*

Massachusetts APH Mix (26 components)

Benzene
1,3-Butadiene
Butylcyclohexane
Cyclohexane
n-Decane
2,3-Dimethylheptane
2,3-Dimethylpentane
n-Dodecane
Ethylbenzene
n-Heptane
n-Hexane
Isopentane
Isopropylbenzene
p-Isopropyltoluene
Methyl *tert*-butyl ether
1-Methyl-3-ethylbenzene
Naphthalene
n-Nonane
n-Octane
Toluene
1,2,3-Trimethylbenzene
1,3,5-Trimethylbenzene
n-Undecane
o-Xylene
m/*p*-Xylene (combined)

cylinder design



Spectra (Linde)
104 L Cylinders:
Aluminum construction
Size: 8 x 24 cm
Volume/Pressure:
104 liters of gas @ 1,800 psi
CGA-180 outlet fitting.
Weight: 1.5 lb/0.7 kg



Scotty (Air Liquide)
110 L Cylinders:
Aluminum construction
Size: 8.3 x 29.5 cm
Volume/Pressure:
110 liters of gas @ 1,800 psi
CGA-180 outlet fitting.
Weight: 2.2 lb/1 kg
U.S. DOT Specs: 3AL2216

1 ppm in nitrogen, 104 liters @ 1,800 psi
cat.# 34540 (ea.)

100 ppb in nitrogen, 110 liters @ 1,800psi
cat.# 26366 (ea.)

100 ppb in nitrogen, 110 liters @ 1,800 psig (Pi-marked cylinder)
cat.# 34540-PI (ea.)

No data pack available.

Gas standards are subject to hazardous materials shipping fees by most freight carriers. All calibration gas standards are nonreturnable due to DOT hazardous shipping requirements.

MA EPH Aromatic Hydrocarbon Standard

(17 components)

Acenaphthene (83-32-9)
Acenaphthylene (208-96-8)
Anthracene (120-12-7)
Benz(a)anthracene (56-55-3)
Benzo(a)pyrene (50-32-8)
Benzo(b)fluoranthene (205-99-2)
Benzo(k)fluoranthene (207-08-9)
Benzo(ghi)perylene (191-24-2)
Chrysene (218-01-9)
Dibenz(a,h)anthracene (53-70-3)
Fluoranthene (206-44-0)
Fluorene (86-73-7)
Indeno(1,2,3-cd)pyrene (193-39-5)
2-Methylnaphthalene (91-57-6)
Naphthalene (91-20-3)
Phenanthrene (85-01-8)
Pyrene (129-00-0)

1,000 µg/mL each in methylene chloride, 1 mL/ampul
cat.# 31458 (ea.)

MA EPH Aliphatic Hydrocarbon Standard

(14 components)

n-Nonane (C9) (111-84-2)
n-Decane (C10) (124-18-5)
n-Dodecane (C12) (112-40-3)
n-Tetradecane (C14) (629-59-4)
n-Hexadecane (C16) (544-76-3)
n-Octadecane (C18) (593-45-3)
n-Nonadecane (C19) (629-92-5)
n-Eicosane (C20) (112-95-8)
n-Docosane (C22) (629-97-0)
n-Tetracosane (C24) (646-31-1)
n-Hexacosane (C26) (630-01-3)
n-Octacosane (C28) (630-02-4)
n-Triacontane (C30) (638-68-6)
n-Hexatriacontane (C36) (630-06-8)

1,000 µg/mL each in hexane, 1 mL/ampul
cat.# 31459 (ea.)

MA EPH Matrix Spike Mix (10 components)

n-Nonane (C9) (111-84-2)
n-Tetradecane (C14) (629-59-4)
n-Nonadecane (C19) (629-92-5)
n-Eicosane (C20) (112-95-8)
n-Octacosane (C28) (630-02-4)
Acenaphthene (83-32-9)
Anthracene (120-12-7)
Chrysene (218-01-9)
Naphthalene (91-20-3)
Pyrene (129-00-0)

250 µg/mL each in acetone, 1 mL/ampul
cat.# 31460 (ea.)

5-α-Androstane

5-α-Androstane (438-22-2)

2,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31065 (ea.)

MA EPH Surrogate Spike Mix (2 components)

1-Chlorooctadecane (3386-33-2)
o-Terphenyl (84-15-1)

4,000 µg/mL each in acetone, 1 mL/ampul
cat.# 31479 (ea.)

1-Chlorooctadecane

1-Chlorooctadecane (3386-33-2)

10,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31098 (ea.)

Naphthalene-d8

Naphthalene-d8 (1146-65-2)

2,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31043 (ea.)

MA Fractionation Surrogate Spike Mix (2 components)

2-Bromonaphthalene (580-13-2)
2-Fluorobiphenyl (321-60-8)

4,000 µg/mL each in hexane, 1 mL/ampul
cat.# 31480 (ea.)

MA Fractionation Check Mix (31 components)

PAHs:
Acenaphthene (83-32-9)
Acenaphthylene (208-96-8)
Anthracene (120-12-7)
Benz(a)anthracene (56-55-3)
Benzo(a)pyrene (50-32-8)
Benzo(b)fluoranthene (205-99-2)
Benzo(k)fluoranthene (207-08-9)
Benzo(ghi)perylene (191-24-2)
Chrysene (218-01-9)
Dibenz(a,h)anthracene (53-70-3)
Fluoranthene (206-44-0)
Fluorene (86-73-7)
Indeno(1,2,3-cd)pyrene (193-39-5)
2-Methylnaphthalene (91-57-6)
Naphthalene (91-20-3)
Phenanthrene (85-01-8)
Pyrene (129-00-0)

Hydrocarbons:
n-Nonane (C9) (111-84-2)
n-Decane (C10) (124-18-5)
n-Dodecane (C12) (112-40-3)
n-Tetradecane (C14) (629-59-4)
n-Hexadecane (C16) (544-76-3)
n-Octadecane (C18) (593-45-3)
n-Nonadecane (C19) (629-92-5)
n-Eicosane (C20) (112-95-8)
n-Docosane (C22) (629-97-0)
n-Tetracosane (C24) (646-31-1)
n-Hexacosane (C26) (630-01-3)
n-Octacosane (C28) (630-02-4)
n-Triacontane (C30) (638-68-6)
n-Hexatriacontane (C36) (630-06-8)

25 µg/mL each in hexane, 1 mL/ampul
cat.# 31481 (ea.)

Hydrocarbons, Leaking Underground Storage Tank (LUST): State-Specific Methods, *cont.*

Michigan

Michigan GRO Mix (14 components)

Benzene (71-43-2)
1,2-Dibromoethane (106-93-4)
1,2-Dichloroethane (107-06-2)
Ethylbenzene (100-41-4)
Isopropylbenzene (cumene) (98-82-8)
2-Methylnaphthalene (91-57-6)
Methyl *tert*-butyl-ether (MTBE) (1634-04-4)
Naphthalene (91-20-3)
Toluene (108-88-3)
1,2,4-Trimethylbenzene (95-63-6)
1,3,5-Trimethylbenzene (108-67-8)
m-Xylene (108-38-3)
o-Xylene (95-47-6)
p-Xylene (106-42-3)

2,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30468 (ea.)

Mississippi

DRO Mix (Tennessee/Mississippi) (16 components)

n-Decane (C10) (124-18-5)
n-Undecane (C11) (1120-21-4)
n-Dodecane (C12) (112-40-3)
n-Tridecane (C13) (629-50-5)
n-Tetradecane (C14) (629-59-4)
n-Pentadecane (C15) (629-62-9)
n-Hexadecane (C16) (544-76-3)
n-Heptadecane (C17) (629-78-7)
n-Octadecane (C18) (593-45-3)
n-Nonadecane (C19) (629-92-5)
n-Eicosane (C20) (112-95-8)
n-Heneicosane (C21) (629-94-7)
n-Docosane (C22) (629-97-0)
n-Tricosane (C23) (638-67-5)
n-Tetracosane (C24) (646-31-1)
n-Pentacosane (C25) (629-99-2)

1,000 µg/mL each in methylene chloride, 1 mL/ampul
cat.# 31214 (ea.)

Gasoline Component Standard (10 components)

Benzene (71-43-2)	500 µg/mL	2,2,4-Trimethylpentane (isooctane) (540-84-1)	1,500
Ethylbenzene (100-41-4)	500	*m*-Xylene (108-38-3)	1,000
Heptane (142-82-5)	500	*o*-Xylene (95-47-6)	1,000
2-Methylpentane (107-83-5)	1,500	*p*-Xylene (106-42-3)	1,000
Toluene (108-88-3)	1,500		
1,2,4-Trimethylbenzene (95-63-6)	1,000		

10,000 µg/mL total in P&T methanol, 1 mL/ampul
cat.# 30486 (ea.)

Save time with prepacked sample prep cartridges!

EPH Fractionation Tubes



See **page 398.**

New Jersey

NJDEP EPH 10/08 Rev. 2 Aliphatics Calibration Standard (20 components)

n-Nonane (C9) (111-84-2)
n-Decane (C10) (124-18-5)
n-Dodecane (C12) (112-40-3)
n-Tetradecane (C14) (629-59-4)
n-Hexadecane (C16) (544-76-3)
n-Octadecane (C18) (593-45-3)
n-Eicosane (C20) (112-95-8)
n-Heneicosane (C21) (629-94-7)
n-Docosane (C22) (629-97-0)
n-Tetracosane (C24) (646-31-1)
n-Hexacosane (C26) (630-01-3)
n-Octacosane (C28) (630-02-4)
n-Triacontane (C30) (638-68-6)
n-Dotriacontane (C32) (544-85-4)
n-Tetratriacontane (C34) (14167-59-0)
n-Hexatriacontane (C36) (630-06-8)
n-Octatriacontane (C38) (7194-85-6)
n-Tetracontane (C40) (4181-95-7)
2-Methylnaphthalene (91-57-6)
Naphthalene (91-20-3)

2,000 µg/mL each in hexane:carbon disulfide (80:20), 1 mL/ampul
cat.# 30540 (ea.)

NJDEP EPH 10/08 Rev. 2 Aromatics Calibration Standard (18 components)

Acenaphthene (83-32-9)
Acenaphthylene (208-96-8)
Anthracene (120-12-7)
Benz(a)anthracene (56-55-3)
Benzo(a)pyrene (50-32-8)
Benzo(b)fluoranthene (205-99-2)
Benzo(ghi)perylene (191-24-2)
Benzo(k)fluoranthene (207-08-9)
Chrysene (218-01-9)
Dibenz(a,h)anthracene (53-70-3)
Fluoranthene (206-44-0)
Fluorene (86-73-7)
Indeno(1,2,3-cd)pyrene (193-39-5)
2-Methylnaphthalene (91-57-6)
Naphthalene (91-20-3)
Phenanthrene (85-01-8)
Pyrene (129-00-0)
1,2,3-Trimethylbenzene (526-73-8)

2,000 µg/mL each in methylene chloride, 1 mL/ampul
cat.# 30541 (ea.)

NJDEP EPH 10/08 Rev. 2 Aliphatics Matrix Spike Mix (18 components)

n-Nonane (C9) (111-84-2)
n-Decane (C10) (124-18-5)
n-Dodecane (C12) (112-40-3)
n-Tetradecane (C14) (629-59-4)
n-Hexadecane (C16) (544-76-3)
n-Octadecane (C18) (593-45-3)
n-Eicosane (C20) (112-95-8)
n-Heneicosane (C21) (629-94-7)
n-Docosane (C22) (629-97-0)
n-Tetracosane (C24) (646-31-1)
n-Hexacosane (C26) (630-01-3)
n-Octacosane (C28) (630-02-4)
n-Triacontane (C30) (638-68-6)
n-Dotriacontane (C32) (544-85-4)
n-Tetratriacontane (C34) (14167-59-0)
n-Hexatriacontane (C36) (630-06-8)
n-Octatriacontane (C38) (7194-85-6)
n-Tetracontane (C40) (4181-95-7)

200 µg/mL each in pentane, 5 mL/ampul
cat.# 30542 (ea.)

NJDEP EPH 10/08 Rev. 2 Aromatics Matrix Spike Mix (18 components)

Acenaphthene (83-32-9)
Acenaphthylene (208-96-8)
Anthracene (120-12-7)
Benz(a)anthracene (56-55-3)
Benzo(a)pyrene (50-32-8)
Benzo(b)fluoranthene (205-99-2)
Benzo(ghi)perylene (191-24-2)
Benzo(k)fluoranthene (207-08-9)
Chrysene (218-01-9)
Dibenz(a,h)anthracene (53-70-3)
Fluoranthene (206-44-0)
Fluorene (86-73-7)
Indeno(1,2,3-cd)pyrene (193-39-5)
2-Methylnaphthalene (91-57-6)
Naphthalene (91-20-3)
Phenanthrene (85-01-8)
Pyrene (129-00-0)
1,2,3-Trimethylbenzene (526-73-8)

200 µg/mL each in acetone:toluene (50:50), 5 mL/ampul
cat.# 30543 (ea.)

Hydrocarbons, Leaking Underground Storage Tank (LUST): State-Specific Methods, *cont.*

New Jersey, *cont.*

NJDEP EPH 10/08 Rev. 2 Aliphatics Fractionation Check Mix (18 components)

n-Nonane (C9) (111-84-2)
n-Decane (C10) (124-18-5)
n-Dodecane (C12) (112-40-3)
n-Tetradecane (C14) (629-59-4)
n-Hexadecane (C16) (544-76-3)
n-Octadecane (C18) (593-45-3)
n-Eicosane (C20) (112-95-8)
n-Heneicosane (C21) (629-94-7)
n-Docosane (C22) (629-97-0)
n-Tetracosane (C24) (646-31-1)
n-Hexacosane (C26) (630-01-3)
n-Octacosane (C28) (630-02-4)
n-Triacontane (C30) (638-68-6)
n-Dotriacontane (C32) (544-85-4)
n-Tetratriacontane (C34) (14167-59-0)
n-Hexatriacontane (C36) (630-06-8)
n-Octatriacontane (C38) (7194-85-6)
n-Tetracontane (C40) (4181-95-7)

400 µg/mL each in hexane, 5 mL/ampul
cat.# 30544 (ea.)

NJDEP EPH 10/08 Rev. 2 Aromatics Fractionation Check Mix (16 components)

Acenaphthene (83-32-9)
Acenaphthylene (208-96-8)
Anthracene (120-12-7)
Benz(a)anthracene (56-55-3)
Benzo(a)pyrene (50-32-8)
Benzo(b)fluoranthene (205-99-2)
Benzo(ghi)perylene (191-24-2)
Benzo(k)fluoranthene (207-08-9)
Chrysene (218-01-9)
Dibenz(a,h)anthracene (53-70-3)
Fluoranthene (206-44-0)
Fluorene (86-73-7)
Indeno(1,2,3-cd)pyrene (193-39-5)
Phenanthrene (85-01-8)
Pyrene (129-00-0)
1,2,3-Trimethylbenzene (526-73-8)

400 µg/mL each in hexane:toluene (50:50), 5 mL/ampul
cat.# 30545 (ea.)

Northwest U.S. Regional Method (Oregon & Washington)

Also see Washington, page 510.

Glycols Standard (2 components)

Ethylene glycol (107-21-1)
Propylene glycol (57-55-6)

50,000 µg/mL each in DI water, 1 mL/ampul
cat.# 30471 (ea.)

NW TPH-Dx Surrogate Mix Standards

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

Compound	CAS #	Solvent	Conc.	cat.#
2-Fluorobiphenyl	321-60-8	D	10,000	31096
o-Terphenyl	84-15-1	D	10,000	31097
p-Terphenyl	92-94-4	D	10,000	31095
Pentacosane (C25)	629-99-2	D	10,000	31487

D = methylene choride

Pennsylvania

PA DEP UST Standard (11 components)

Benzene (71-43-2)
1,2-Dibromoethane (EDB) (106-93-4)
1,2-Dichloroethane (107-06-2)
Ethylbenzene (100-41-4)
Isopropyl benzene (cumene) (98-82-8)
Methyl *tert*-butyl ether (MTBE) (1634-04-4)
Naphthalene (91-20-3)
Toluene (108-88-3)
m-Xylene (108-38-3)
o-Xylene (95-47-6)
p-Xylene (106-42-3)

2,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30433 (ea.)

Tennessee/Mississippi

DRO Mix (Tennessee/Mississippi) (16 components)

n-Decane (C10) (124-18-5)
n-Undecane (C11) (1120-21-4)
n-Dodecane (C12) (112-40-3)
n-Tridecane (C13) (629-50-5)
n-Tetradecane (C14) (629-59-4)
n-Pentadecane (C15) (629-62-9)
n-Hexadecane (C16) (544-76-3)
n-Heptadecane (C17) (629-78-7)
n-Octadecane (C18) (593-45-3)
n-Nonadecane (C19) (629-92-5)
n-Eicosane (C20) (112-95-8)
n-Heneicosane (C21) (629-94-7)
n-Docosane (C22) (629-97-0)
n-Tricosane (C23) (638-67-5)
n-Tetracosane (C24) (646-31-1)
n-Pentacosane (C25) (629-99-2)

1,000 µg/mL each in methylene chloride, 1 mL/ampul
cat.# 31214 (ea.)

Gasoline Component Standard (10 components)

Benzene (71-43-2)	500 µg/mL	2,2,4-Trimethylpentane (isooctane) (540-84-1)	1,500
Ethylbenzene (100-41-4)	500	*m*-Xylene (108-38-3)	1,000
Heptane (142-82-5)	500	*o*-Xylene (95-47-6)	1,000
2-Methylpentane (107-83-5)	1,500	*p*-Xylene (106-42-3)	1,000
Toluene (108-88-3)	1,500		
1,2,4-Trimethylbenzene (95-63-6)	1,000		

10,000 µg/mL total in P&T methanol, 1 mL/ampul
cat.# 30486 (ea.)

Reference Standards Documentation Search

Locate SDSs, certificates, & data packs by cat. # or lot #

www.restek.com/**documentation**



Hydrocarbons, Leaking Underground Storage Tank (LUST): State-Specific Methods, *cont.*

Texas

Texas TNRCC Method 1006

TNRCC 1006 Retention Time Marker Mix (9 components)

n-Hexane (C6) (110-54-3)
n-Heptane (C7) (142-82-5)
n-Octane (C8) (111-65-9)
n-Decane (C10) (124-18-5)
n-Dodecane (C12) (112-40-3)
n-Hexadecane (C16) (544-76-3)
n-Heneicosane (C21) (629-94-7)
n-Octacosane (C28) (630-02-4)
n-Pentatriacontane (C35) (630-07-9)

200 µg/mL in pentane, 1 mL/ampul
cat.# 31814 (ea.)

Texas TNRCC Method 1005

TNRCC 1005 Retention Time Markers Mix

(4 components)

n-Hexane (C6) (110-54-3)
n-Dodecane (C12) (112-40-3)
n-Octacosane (C28) (630-02-4)
n-Pentatriacontane (C35) (630-07-9)

200 µg/mL each in pentane, 1 mL/ampul
cat.# 31698 (ea.)

TX TPH Locator Mix (3 components)

n-Hexane (C6) (110-54-3)
n-Decane (C10) (124-18-5)
n-Octacosane (C28) (630-02-4)

200 µg/mL each in pentane, 1 mL/ampul
cat.# 31482 (ea.)

TX TPH Calibration Mix (2 components)

Diesel fuel #2 composite (68334-30-5)
Unleaded gasoline composite (8006-61-9)

10,000 µg/mL each in pentane, 1 mL/ampul
cat.# 31483 (ea.)

TX TPH Matrix Spike Mix (2 components)

Diesel fuel #2 composite (68334-30-5)
Unleaded gasoline composite (8006-61-9)

10,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 31484 (ea.)

Texas TNRCC Method 1005, *cont.*

Alternate Boiling Point/Carbon Number Distribution Marker Stock Standard (9 components)

n-Hexane (C6) (110-54-3)
n-Octane (C8) (111-65-9)
n-Decane (C10) (124-18-5)
n-Dodecane (C12) (112-40-3)
n-Hexadecane (C16) (544-76-3)
n-Heneicosane (C21) (629-94-7)
n-Octacosane (C28) (630-02-4)
n-Pentatriacontane (C35) (630-07-9)
n-Hexatriacontane (C36) (630-06-8)

200 µg/mL each in pentane, 1 mL/ampul
cat.# 31639 (ea.)

α,α,α-Trifluorotoluene

α,α,α-Trifluorotoluene (98-08-8)

2,000 µg/mL in P&T methanol, 1 mL/ampul
cat.# 30048 (ea.)

2,500 µg/mL in P&T methanol, 1 mL/ampul
cat.# 30068 (ea.)

10,000 µg/mL in P&T methanol, 1 mL/ampul
cat.# 30083 (ea.)

1-Chlorooctane

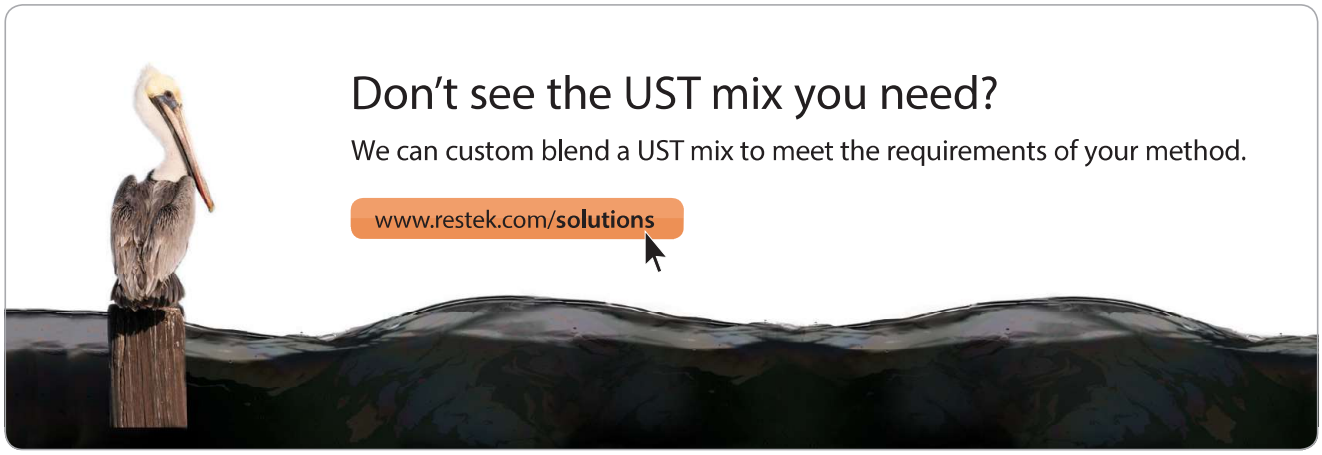
1-Chlorooctane (111-85-3)

10,000 µg/mL in P&T methanol, 1 mL/ampul
cat.# 30084 (ea.)

1-Chlorooctadecane

1-Chlorooctadecane (3386-33-2)

10,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31098 (ea.)



Hydrocarbons, Leaking Underground Storage Tank (LUST): State-Specific Methods, *cont.*

Washington

Also see Northwest U.S. Regional Method, page 508.

WA VPH Marker Standard (9 components)

n-Pentane (C5) (109-66-0)
n-Hexane (C6) (110-54-3)
n-Octane (C8) (111-65-9)
n-Decane (C10) (124-18-5)
n-Dodecane (C12) (112-40-3)
1-Methylnaphthalene (90-12-0)
Naphthalene (91-20-3)
Toluene (108-88-3)
1,2,3-Trimethylbenzene (526-73-8)

1,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30450 (ea.)

WA VPH Standard (15 components)

n-Pentane (C5) (109-66-0)
n-Hexane (C6) (110-54-3)
n-Octane (C8) (111-65-9)
n-Decane (C10) (124-18-5)
n-Dodecane (C12) (112-40-3)
Benzene (71-43-2)
Ethylbenzene (100-41-4)
1-Methylnaphthalene (90-12-0)
Methyl *tert*-butyl ether (MTBE) (1634-04-4)
Naphthalene (91-20-3)
Toluene (108-88-3)
1,2,3-Trimethylbenzene (526-73-8)
m-Xylene (108-38-3)
o-Xylene (95-47-6)
p-Xylene (106-42-3)

1,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30451 (ea.)

WA EPH Aromatic Hydrocarbon Mix (6 components)

Acenaphthene (83-32-9)
Benzo(ghi)perylene (191-24-2)
Naphthalene (91-20-3)
Pyrene (129-00-0)
Toluene (108-88-3)
1,2,3-Trimethylbenzene (526-73-8)

1,000 µg/mL each in methylene chloride, 1 mL/ampul
cat.# 31488 (ea.)

WA EPH Aliphatic Hydrocarbon Mix (6 components)

n-Octane (C8) (111-65-9)
n-Decane (C10) (124-18-5)
n-Dodecane (C12) (112-40-3)
n-Hexadecane (C16) (544-76-3)
n-Heneicosane (C21) (629-94-7)
n-Tetratriacontane (C34) (14167-59-0)

1,000 µg/mL each in hexane, 1 mL/ampul
cat.# 31489 (ea.)

WA EPH Aromatic Hydrocarbon Standard (18 components)

Acenaphthene (83-32-9)
Acenaphthylene (208-96-8)
Anthracene (120-12-7)
Benz(a)anthracene (56-55-3)
Benzo(a)pyrene (50-32-8)
Benzo(b)fluoranthene (205-99-2)
Benzo(k)fluoranthene (207-08-9)
Benzo(ghi)perylene (191-24-2)
Chrysene (218-01-9)
Dibenz(a,h)anthracene (53-70-3)
Fluoranthene (206-44-0)
Fluorene (86-73-7)
Indeno(1,2,3-cd)pyrene (193-39-5)
2-Methylnaphthalene (91-57-6)
Naphthalene (91-20-3)
Phenanthrene (85-01-8)
Pyrene (129-00-0)
1,2,3-Trimethylbenzene (526-73-8)

1,000 µg/mL each in methylene chloride, 1 mL/ampul
cat.# 31469 (ea.)

Washington, *cont.*

WA EPH Fractionation Check Mix (22 components)

n-Octane (C8) (111-65-9)
n-Decane (C10) (124-18-5)
n-Dodecane (C12) (112-40-3)
n-Hexadecane (C16) (544-76-3)
n-Heneicosane (C21) (629-94-7)
n-Tetratriacontane (C34) (14167-59-0)
Acenaphthene (83-32-9)
Acenaphthylene (208-96-8)
Anthracene (120-12-7)
Benz(a)anthracene (56-55-3)
Benzo(a)pyrene (50-32-8)
Benzo(b)fluoranthene (205-99-2)
Benzo(k)fluoranthene (207-08-9)
Benzo(ghi)perylene (191-24-2)
Chrysene (218-01-9)
Dibenz(a,h)anthracene (53-70-3)
Fluoranthene (206-44-0)
Fluorene (86-73-7)
Indeno(1,2,3-cd)pyrene (193-39-5)
Naphthalene (91-20-3)
Phenanthrene (85-01-8)
Pyrene (129-00-0)

25 µg/mL each in hexane, 1 mL/ampul
cat.# 31491 (ea.)

Wisconsin

PVOC/GRO Mix (Wisconsin) (10 components)

Benzene (71-43-2)
Ethylbenzene (100-41-4)
Methyl *tert*-butyl ether (MTBE) (1634-04-4)
Naphthalene (91-20-3)
Toluene (108-88-3)
1,2,4-Trimethylbenzene (95-63-6)
1,3,5-Trimethylbenzene (108-67-8)
m-Xylene (108-38-3)
o-Xylene (95-47-6)
p-Xylene (106-42-3)

1,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30095 (ea.)

DRO Mix (EPA/Wisconsin) (10 components)

n-Decane (C10) (124-18-5)
n-Dodecane (C12) (112-40-3)
n-Tetradecane (C14) (629-59-4)
n-Hexadecane (C16) (544-76-3)
n-Octadecane (C18) (593-45-3)
n-Eicosane (C20) (112-95-8)
n-Docosane (C22) (629-97-0)
n-Tetracosane (C24) (646-31-1)
n-Hexacosane (C26) (630-01-3)
n-Octacosane (C28) (630-02-4)

2,000 µg/mL each in methylene chloride, 1 mL/ampul
cat.# 31064 (ea.)



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Hydrocarbons, Polycyclic Aromatic (PAHs)

Method 610
(Polycyclic Aromatic Hydrocarbons [PAHs])

SV Calibration Mix #5/610 PAH Mix (16 components)

Acenaphthene (83-32-9)
Acenaphthylene (208-96-8)
Anthracene (120-12-7)
Benz(a)anthracene (56-55-3)
Benzo(a)pyrene (50-32-8)
Benzo(b)fluoranthene (205-99-2)
Benzo(k)fluoranthene (207-08-9)
Benzo(ghi)perylene (191-24-2)
Chrysene (218-01-9)
Dibenz(a,h)anthracene (53-70-3)
Fluoranthene (206-44-0)
Fluorene (86-73-7)
Indeno(1,2,3-cd)pyrene (193-39-5)
Naphthalene (91-20-3)
Phenanthrene (85-01-8)
Pyrene (129-00-0)

2,000 µg/mL each in methylene chloride, 1 mL/ampul
cat.# 31011 (ea.)

610 PAH Calibration Mix A (16 components)

For LC-fluorescence detection.

Acenaphthene (83-32-9)	1,000 µg/mL	Chrysene (218-01-9)	500
Acenaphthylene (208-96-8)	1,000	Dibenz(a,h)anthracene (53-70-3)	500
Anthracene (120-12-7)	1,000	Fluoranthene (206-44-0)	500
Benz(a)anthracene (56-55-3)	500	Fluorene (86-73-7)	1,000
Benzo(a)pyrene (50-32-8)	500	Indeno(1,2,3-cd)pyrene (193-39-5)	500
Benzo(b)fluoranthene (205-99-2)	500	Naphthalene (91-20-3)	1,000
Benzo(k)fluoranthene (207-08-9)	500	Phenanthrene (85-01-8)	500
Benzo(ghi)perylene (191-24-2)	500	Pyrene (129-00-0)	500

In methylene chloride, 1 mL/ampul
cat.# 31264 (ea.)

610 PAH Calibration Mix B (16 components)

For LC-UV detection.

Acenaphthene (83-32-9)	1,000 µg/mL	Chrysene (218-01-9)	100
Acenaphthylene (208-96-8)	2,000	Dibenz(a,h)anthracene (53-70-3)	200
Anthracene (120-12-7)	100	Fluoranthene (206-44-0)	200
Benz(a)anthracene (56-55-3)	100	Fluorene (86-73-7)	200
Benzo(a)pyrene (50-32-8)	100	Indeno(1,2,3-cd)pyrene (193-39-5)	100
Benzo(b)fluoranthene (205-99-2)	200	Naphthalene (91-20-3)	1,000
Benzo(k)fluoranthene (207-08-9)	100	Phenanthrene (85-01-8)	100
Benzo(ghi)perylene (191-24-2)	200	Pyrene (129-00-0)	100

In methylene chloride:methanol (1:1), 1 mL/ampul
cat.# 31455 (ea.)

Method 8100
(Polycyclic Aromatic Hydrocarbons [PAHs])

PAH Supplement Mix for Method 8100 (8 components)

Benzo(j)fluoranthene (205-82-3)
Dibenz(a,h)acridine (226-36-8)
Dibenz(a,j)acridine (224-42-0)
7H-Dibenzo(c,g)carbazole (194-59-2)
Dibenzo(a,e)pyrene (192-65-4)
Dibenzo(a,h)pyrene (189-64-0)
Dibenzo(a,i)pyrene (189-55-9)
3-Methylcholanthrene (56-49-5)

1,000 µg/mL each in methylene chloride, 1 mL/ampul
cat.# 31857 (ea.)

SV Calibration Mix #5/610 PAH Mix (16 components)

See cat.# 31011 (above).

Method 8310
(Polycyclic Aromatic Hydrocarbons [PAHs])

EPA Method 8310 PAH Mixture (18 components)

Acenaphthene (83-32-9)
Acenaphthylene (208-96-8)
Anthracene (120-12-7)
Benz(a)anthracene (56-55-3)
Benzo(a)pyrene (50-32-8)
Benzo(b)fluoranthene (205-99-2)
Benzo(ghi)perylene (191-24-2)
Benzo(k)fluoranthene (207-08-9)
Chrysene (218-01-9)
Dibenz(a,h)anthracene (53-70-3)
Fluoranthene (206-44-0)
Fluorene (86-73-7)
Indeno(1,2,3-cd)pyrene (193-39-5)
1-Methylnaphthalene (90-12-0)
2-Methylnaphthalene (91-57-6)
Naphthalene (91-20-3)
Phenanthrene (85-01-8)
Pyrene (129-00-0)

500 µg/mL each in acetonitrile:toluene (92:8), 1 mL/ampul
cat.# 31874 (ea.)

EPA Method 8310 Surrogate Standard

Decafluorobiphenyl (434-90-2)

1,000 µg/mL in acetonitrile, 1 mL/ampul
cat.# 31842 (ea.)

EPA Method 8310 Quality Control Check

(18 components)

Acenaphthene (83-32-9)	100 µg/mL	Dibenz(a,h)anthracene (53-70-3)	10
Acenaphthylene (208-96-8)	100	Fluoranthene (206-44-0)	10
Anthracene (120-12-7)	100	Fluorene (86-73-7)	100
Benz(a)anthracene (56-55-3)	10	Indeno(1,2,3-cd)pyrene (193-39-5)	10
Benzo(a)pyrene (50-32-8)	10	1-Methylnaphthalene (90-12-0)	100
Benzo(b)fluoranthene (205-99-2)	10	2-Methylnaphthalene (91-57-6)	100
Benzo(ghi)perylene (191-24-2)	10	Naphthalene (91-20-3)	100
Benzo(k)fluoranthene (207-08-9)	5	Phenanthrene (85-01-8)	100
Chrysene (218-01-9)	10	Pyrene (129-00-0)	10

In acetonitrile, 1 mL/ampul
cat.# 31843 (ea.)

8270 Calibration Mix #5, Revised (18 components)

Acenaphthene (83-32-9)
Acenaphthylene (208-96-8)
Anthracene (120-12-7)
Benz(a)anthracene (56-55-3)
Benzo(a)pyrene (50-32-8)
Benzo(b)fluoranthene (205-99-2)
Benzo(ghi)perylene (191-24-2)
Benzo(k)fluoranthene (207-08-9)
Chrysene (218-01-9)
Dibenz(a,h)anthracene (53-70-3)
Fluoranthene (206-44-0)
Fluorene (86-73-7)
Indeno(1,2,3-cd)pyrene (193-39-5)
1-Methylnaphthalene (90-12-0)
2-Methylnaphthalene (91-57-6)
Naphthalene (91-20-3)
Phenanthrene (85-01-8)
Pyrene (129-00-0)

2,000 µg/mL each in methylene chloride, 1 mL/ampul
cat.# 31995 (ea.)

Certified PAHs in Diesel (7 components)

Certified for:
Acenaphthene*
Acenaphthylene*
Fluorene*
1-Methylnaphthalene*
2-Methylnaphthalene*
Naphthalene*
Phenanthrene*

50,000 ppm diesel #2 in methylene chloride, 1 mL/ampul
cat.# 31673 (ea.)

*Concentration differs from lot to lot. See online data pack for certified concentrations.

Hydrocarbons, Polycyclic Aromatic (PAHs), *cont.*

Miscellaneous

MA EPH Aromatic Hydrocarbon Standard
(17 components)

Acenaphthene (83-32-9)
Acenaphthylene (208-96-8)
Anthracene (120-12-7)
Benz(a)anthracene (56-55-3)
Benzo(a)pyrene (50-32-8)
Benzo(b)fluoranthene (205-99-2)
Benzo(k)fluoranthene (207-08-9)
Benzo(ghi)perylene (191-24-2)
Chrysene (218-01-9)
Dibenz(a,h)anthracene (53-70-3)
Fluoranthene (206-44-0)
Fluorene (86-73-7)
Indeno(1,2,3-cd)pyrene (193-39-5)
2-Methylnaphthalene (91-57-6)
Naphthalene (91-20-3)
Phenanthrene (85-01-8)
Pyrene (129-00-0)

1,000 µg/mL each in methylene chloride, 1 mL/ampul
cat.# 31458 (ea.)

MA Fractionation Surrogate Spike Mix (2 components)

2-Bromonaphthalene (580-13-2)
2-Fluorobiphenyl (321-60-8)

4,000 µg/mL each in hexane, 1 mL/ampul
cat.# 31480 (ea.)

MA Fractionation Check Mix (31 components)

PAHs:
Acenaphthene (83-32-9)
Acenaphthylene (208-96-8)
Anthracene (120-12-7)
Benz(a)anthracene (56-55-3)
Benzo(a)pyrene (50-32-8)
Benzo(b)fluoranthene (205-99-2)
Benzo(k)fluoranthene (207-08-9)
Benzo(ghi)perylene (191-24-2)
Chrysene (218-01-9)
Dibenz(a,h)anthracene (53-70-3)
Fluoranthene (206-44-0)
Fluorene (86-73-7)
Indeno(1,2,3-cd)pyrene (193-39-5)
2-Methylnaphthalene (91-57-6)
Naphthalene (91-20-3)
Phenanthrene (85-01-8)
Pyrene (129-00-0)

Hydrocarbons:
n-Nonane (C9) (111-84-2)
n-Decane (C10) (124-18-5)
n-Dodecane (C12) (112-40-3)
n-Tetradecane (C14) (629-59-4)
n-Hexadecane (C16) (544-76-3)
n-Octadecane (C18) (593-45-3)
n-Nonadecane (C19) (629-92-5)
n-Eicosane (C20) (112-95-8)
n-Docosane (C22) (629-97-0)
n-Tetracosane (C24) (646-31-1)
n-Hexacosane (C26) (630-01-3)
n-Octacosane (C28) (630-02-4)
n-Triacontane (C30) (638-68-6)
n-Hexatriacontane (C36) (630-06-8)

25 µg/mL each in hexane, 1 mL/ampul
cat.# 31481 (ea.)

NJDEP EPH 10/08 Rev. 2 Aromatics Fractionation Check Mix (16 components)

Acenaphthene (83-32-9)
Acenaphthylene (208-96-8)
Anthracene (120-12-7)
Benz(a)anthracene (56-55-3)
Benzo(a)pyrene (50-32-8)
Benzo(b)fluoranthene (205-99-2)
Benzo(ghi)perylene (191-24-2)
Benzo(k)fluoranthene (207-08-9)
Chrysene (218-01-9)
Dibenz(a,h)anthracene (53-70-3)
Fluoranthene (206-44-0)
Fluorene (86-73-7)
Indeno(1,2,3-cd)pyrene (193-39-5)
Phenanthrene (85-01-8)
Pyrene (129-00-0)
1,2,3-Trimethylbenzene (526-73-8)

400 µg/mL each in hexane:toluene (50:50), 5 mL/ampul
cat.# 30545 (ea.)

NJDEP EPH 10/08 Rev. 2 Aromatics Matrix Spike Mix
(18 components)

Acenaphthene (83-32-9)
Acenaphthylene (208-96-8)
Anthracene (120-12-7)
Benz(a)anthracene (56-55-3)
Benzo(a)pyrene (50-32-8)
Benzo(b)fluoranthene (205-99-2)
Benzo(ghi)perylene (191-24-2)
Benzo(k)fluoranthene (207-08-9)
Chrysene (218-01-9)
Dibenz(a,h)anthracene (53-70-3)
Fluoranthene (206-44-0)
Fluorene (86-73-7)
Indeno(1,2,3-cd)pyrene (193-39-5)
2-Methylnaphthalene (91-57-6)
Naphthalene (91-20-3)
Phenanthrene (85-01-8)
Pyrene (129-00-0)
1,2,3-Trimethylbenzene (526-73-8)

200 µg/mL each in acetone:toluene (50:50), 5 mL/ampul
cat.# 30543 (ea.)

WA EPH Aromatic Hydrocarbon Standard
(18 components)

Acenaphthene (83-32-9)
Acenaphthylene (208-96-8)
Anthracene (120-12-7)
Benz(a)anthracene (56-55-3)
Benzo(a)pyrene (50-32-8)
Benzo(b)fluoranthene (205-99-2)
Benzo(k)fluoranthene (207-08-9)
Benzo(ghi)perylene (191-24-2)
Chrysene (218-01-9)
Dibenz(a,h)anthracene (53-70-3)
Fluoranthene (206-44-0)
Fluorene (86-73-7)
Indeno(1,2,3-cd)pyrene (193-39-5)
2-Methylnaphthalene (91-57-6)
Naphthalene (91-20-3)
Phenanthrene (85-01-8)
Pyrene (129-00-0)
1,2,3-Trimethylbenzene (526-73-8)

1,000 µg/mL each in methylene chloride, 1 mL/ampul
cat.# 31469 (ea.)

WA EPH Aromatic Hydrocarbon Mix (6 components)

Acenaphthene (83-32-9)
Benzo(ghi)perylene (191-24-2)
Naphthalene (91-20-3)
Pyrene (129-00-0)
Toluene (108-88-3)
1,2,3-Trimethylbenzene (526-73-8)

1,000 µg/mL each in methylene chloride, 1 mL/ampul
cat.# 31488 (ea.)

Naphthalene-d8

Naphthalene-d8 (1146-65-2)

2,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31043 (ea.)

Method 525.2 Fortification Recovery Standard

p-Terphenyl-d14 (1718-51-0)

1,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31828 (ea.)

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See **pages 464–465**.

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Hydrocarbons, Polycyclic Aromatic (PAHs), *cont.*

Miscellaneous, *cont.*

SV Internal Standard Mix (6 components)

Acenaphthene-d10 (15067-26-2)
Chrysene-d12 (1719-03-5)
1,4-Dichlorobenzene-d4 (3855-82-1)
Naphthalene-d8 (1146-65-2)
Perylene-d12 (1520-96-3)
Phenanthrene-d10 (1517-22-2)

Each	15-pk.	25-pk.
2,000 µg/mL each in methylene chloride, 1 mL/ampul		
31206	31206.15	31206.25
4,000 µg/mL each in methylene chloride, 1 mL/ampul		
31006	31006.15	31006.25

Revised SV Internal Standard Mix (7 components)

Acenaphthene-d10 (15067-26-2)
Chrysene-d12 (1719-03-5)
1,4-Dichlorobenzene-d4 (3855-82-1)
1,4-Dioxane-d8 (17647-74-4)
Naphthalene-d8 (1146-65-2)
Perylene-d12 (1520-96-3)
Phenanthrene-d10 (1517-22-2)

Each	15-pk.	25-pk.
2,000 µg/mL each in methylene chloride, 1 mL/ampul		
31885	31885.15	31885.25
4,000 µg/mL each in methylene chloride, 1 mL/ampul		
31886	—	—

B/N Surrogate Mix (4/89 SOW) (3 components)

2-Fluorobiphenyl (321-60-8)
Nitrobenzene-d5 (4165-60-0)
p-Terphenyl-d14 (1718-51-0)

Each	15-pk.	25-pk.
1,000 µg/mL each in methylene chloride, 1 mL/ampul		
31024	31024.15	31024.25
5,000 µg/mL each in methylene chloride, 1 mL/ampul		
31062	31062.15	—
5,000 µg/mL each in methylene chloride, 5 mL/ampul		
31086	—	—
5,000 µg/mL each in methylene chloride, 10 mL/ampul		
33028	—	33028.25

Revised B/N Surrogate Mix (4 components)

2-Fluorobiphenyl (321-60-8)
Nitrobenzene-d5 (4165-60-0)
p-Terphenyl-d14 (1718-51-0)
Pyrene-d10 (1718-52-1)

Each	15-pk.
1,000 µg/mL each in methylene chloride, 1 mL/ampul	
31887	31887.15
5,000 µg/mL each in methylene chloride, 1 mL/ampul	
31888	31888.15
5,000 µg/mL each in methylene chloride, 5 mL/ampul	
31889	—

Hydrocarbons, Petroleum

Fuels & Products

Aviation Gas

Aviation Gas Standard

100-octane, low-lead fuel used in piston-type aircraft.

Aviation gas (8006-69-1)

50,000 µg/mL in P&T methanol, 1 mL/ampul
cat.# 30207 (ea.)

Hydrocarbons, Petroleum, *cont.*

Fuels & Products, *cont.*

BTEX

See page 484.

Creosote Oil

Creosote Oil Standard

- For total petroleum hydrocarbon pattern recognition of creosote oil.
- High concentration—50,000 µg/mL in methylene chloride.

Creosote oil, a widely used wood preservative produced by distilling coal tar, contains chemicals that are classified as carcinogens (e.g., benzo(a)pyrene).

Creosote oil (8001-58-9)

50,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31838 (ea.)

Diesel

See pages 484–485.

Fuel Oil

Fuel Oil #4 Standard

Fuel oil #4 is typically used in limited applications in which the fuel cannot be preheated prior to burning. The fuel is a blend of distillate (fuel oil #2) and residual (fuel oil #6) to meet ASTM viscosity specifications. The fuel oil #4 used to prepare this mixture has a kinematic viscosity of 21.9 at 38 °C (100 °F), measured using ASTM D-445.

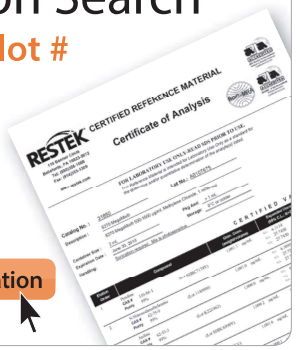
Fuel oil #4 (68476-31-3)

5,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31216 (ea.)

50,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31244 (ea.)

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Hydrocarbons, Petroleum, *cont.*

Fuels & Products, *cont.*

Fuel Oil, *cont.*

Fuel Oil #6 Standard

This fuel, sometimes called bunker C or residual, is a black viscous oil. Applications in which it may be used require the ability to preheat the fuel prior to pumping and burning.

Fuel oil #6 (68553-00-4)

5,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31218 (ea.)

50,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31248 (ea.)

Fuel Oil Degradation Mix (4 components)

Subsurface degradation of fuel oil spills can be estimated by examining the ratios of C17/pristane and C18/phytane.[1] To assist in identifying these four compounds from the complex fuel oil analysis, we offer a product that contains these compounds for retention time determination.

Heptadecane (C17) (629-78-7)
Octadecane (C18) (593-45-3)
Pristane (2,6,10,14-tetramethylpentadecane) (1921-70-6)
Phytane (2,6,10,14-tetramethylhexadecane) (638-36-8)

2,000 µg/mL each in methylene chloride, 1 mL/ampul
cat.# 31240 (ea.)

[1]Interpretation of Gas Chromatographic Data in Subsurface Hydrocarbon Investigations, R. Senn and M. Johnson, Ground Water Monitoring Review, Winter 1987.

Gasoline

See page 489.

Hydraulic Oil

Hydraulic Oil Standard

- For total petroleum hydrocarbon pattern recognition of hydraulic oil.
- High concentration—50,000 µg/mL in methylene chloride.

Hydraulic oil (64741-89-5)

50,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31839 (ea.)



Restek® Safe Cracker

Included with every reference standard shipment for added convenience.

Jet Fuel

JP-5 Military Fuel Standard

JP-5 Military fuel (8008-20-6)

50,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31252 (ea.)

JP-8 Military Fuel Standard

JP-8 Military fuel (94114-58-6)

5,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31262 (ea.)

50,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31254 (ea.)

Jet Fuel A Standard

Jet fuel A (64742-47-8)

5,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31215 (ea.)

50,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31242 (ea.)

50,000 µg/mL in methylene chloride, 5 mL/ampul
cat.# 31243 (ea.)

Kerosene

Kerosene Standard

Prepared from a single-source (one-refinery) product.

Kerosene: unweathered (84742-81-0)

5,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31229 (ea.)

Kerosene Composite Standard

Kerosene composite (84742-81-0)

5,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31094 (ea.)

50,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31256 (ea.)

50,000 µg/mL in methylene chloride, 5 mL/ampul
cat.# 31257 (ea.)

Leaking Underground Storage Tank (LUST)

See pages 497–510.

Hydrocarbons, Petroleum, *cont.*

Fuels & Products, *cont.*

Mineral Spirits

There are four general types of mineral spirits, classified according to boiling point range (BPR):

- Type I (Stoddard solvent) BPR 149–182 °C
- Type II (high flash point) BPR 177–196 °C
- Type III (odorless) BPR 149–196 °C
- Type IV (low dry point) BPR 149–174 °C

We prepare our solutions from an equal-volume blend of Type I, II, and III mineral spirits.

Mineral Spirits Standards (Unweathered)

5,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31225 (ea.)

50,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31260 (ea.)

Stoddard Solvent Standard

Stoddard solvent is also known as Type I mineral spirits, Texsolve S, or Varsol® 1 mineral spirits. We offer this reference material for those who need to calibrate Stoddard solvent separately. This standard is dissolved in methanol for analysis by either direct injection or purge-and-trap.

Stoddard solvent (8052-41-3)

10,000 µg/mL in P&T methanol, 1 mL/ampul
cat.# 30487 (ea.)

Motor Oil

Motor Oil Composite Standard

Prepared from an equal-volume blend of 5W30, 10W30, 10W40, and 20W50 motor oils. After blending, a precisely weighed amount of the composite is added to a volumetric flask to produce the standard.

Motor oil composite (64742-65-0)

50,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31464 (ea.)

Used Motor Oil Composite Standard

Prepared from an equal-volume blend from five gasoline-powered vehicles (belonging to Restek employees). After blending, a precisely weighed amount of the composite is added to a volumetric flask to produce the standard.

Used motor oil composite (64742-65-0)

50,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31465 (ea.)

Stoddard Solvent

See cat.# 30487 (left).



Hydrocarbons, Petroleum, *cont.*

Retention Time Markers

Used during initial sample screening to determine retention time windows for each petroleum product. Gasoline generally elutes in the window from C6 to C10 (or C12), and diesel fuel from C10 (or C12) to C24 (or C28). Retention above C24 (or C28) indicates oil or lubricant contamination.

Leaking Underground Storage Tank Retention Time Standard (7 components)

n-Hexane (C6) (110-54-3)
n-Decane (C10) (124-18-5)
n-Dodecane (C12) (112-40-3)
n-Tetracosane (C24) (646-31-1)
n-Octacosane (C28) (630-02-4)
n-Triacontane (C30) (638-68-6)
n-Tetracontane (C40) (4181-95-7)

25 µg/mL each in methylene chloride, 1 mL/ampul
cat.# 31200 (ea.)

Retention Time Marker (3 components)

n-Hexane (C6) (110-54-3)
n-Decane (C10) (124-18-5)
n-Dodecane (C12) (112-40-3)

1,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30483 (ea.)

TNRCC 1005 Retention Time Markers Mix (4 components)

n-Hexane (C6) (110-54-3)
n-Dodecane (C12) (112-40-3)
n-Octacosane (C28) (630-02-4)
n-Pentatriacontane (C35) (630-07-9)

200 µg/mL each in pentane, 1 mL/ampul
cat.# 31698 (ea.)

TNRCC 1006 Retention Time Marker Mix (9 components)

n-Hexane (C6) (110-54-3)
n-Heptane (C7) (142-82-5)
n-Octane (C8) (111-65-9)
n-Decane (C10) (124-18-5)
n-Dodecane (C12) (112-40-3)
n-Hexadecane (C16) (544-76-3)
n-Heneicosane (C21) (629-94-7)
n-Octacosane (C28) (630-02-4)
n-Pentatriacontane (C35) (630-07-9)

200 µg/mL in pentane, 1 mL/ampul
cat.# 31814 (ea.)

Retention Time Marker—Alaska (4 components)

n-Hexane (C6) (110-54-3)
n-Decane (C10) (124-18-5)
n-Pentacosane (C25) (629-99-2)
n-Hexatriacontane (C36) (630-06-8)

1,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31819 (ea.)

Alternate Boiling Point/Carbon Number Distribution Marker Stock Standard (9 components)

n-Hexane (C6) (110-54-3)
n-Octane (C8) (111-65-9)
n-Decane (C10) (124-18-5)
n-Dodecane (C12) (112-40-3)
n-Hexadecane (C16) (544-76-3)
n-Heneicosane (C21) (629-94-7)
n-Octacosane (C28) (630-02-4)
n-Pentatriacontane (C35) (630-07-9)
n-Hexatriacontane (C36) (630-06-8)

200 µg/mL each in pentane, 1 mL/ampul
cat.# 31639 (ea.)

CCME F1 Retention Time Marker (3 components)

n-Hexane (C6) (110-54-3)
n-Decane (C10) (124-18-5)
Toluene (108-88-3)

2,000 µg/mL each in methanol, 1 mL/ampul
cat.# 30611 (ea.)



Hydrocarbons, Petroleum, *cont.*

Total Petroleum Hydrocarbons (TPH)

Method 418.1 (Total Recoverable Petroleum Hydrocarbons [TRPH])

418.1 Calibration Mix (3 components)

Method 418.1 is an infrared spectrophotometric method for determining Total Recoverable Petroleum Hydrocarbons (TRPH). Dilute this mixture 1:200 to make the stock mixture specified in section 6.5.2 of Method 418.1.

Chlorobenzene (108-90-7) 25.0% (v/v)
n-Hexadecane (C16) (544-76-3) 37.5%
2,2,4-Trimethylpentane (isooctane) (540-84-1) 37.5%

1 mL/ampul

cat.# 30080 (ea.)

Miscellaneous

Glycols Standard (2 components)

Ethylene glycol (107-21-1)
Propylene glycol (57-55-6)

50,000 µg/mL each in DI water, 1 mL/ampul

cat.# 30471 (ea.)

NW TPH-Dx Surrogate Mix Standards

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

Compound	CAS #	Solvent	Conc.	cat.#
2-Fluorobiphenyl	321-60-8	D	10,000	31096
o-Terphenyl	84-15-1	D	10,000	31097
p-Terphenyl	92-94-4	D	10,000	31095
Pentacosane (C25)	629-99-2	D	10,000	31487

D = methylene choride

TX TPH Locator Mix (3 components)

n-Hexane (C6) (110-54-3)
n-Decane (C10) (124-18-5)
n-Octacosane (C28) (630-02-4)

200 µg/mL each in pentane, 1 mL/ampul

cat.# 31482 (ea.)

TX TPH Calibration Mix (2 components)

Diesel fuel #2 composite (68334-30-5)
Unleaded gasoline composite (8006-61-9)

10,000 µg/mL each in pentane, 1 mL/ampul

cat.# 31483 (ea.)

TX TPH Matrix Spike Mix (2 components)

Diesel fuel #2 composite (68334-30-5)
Unleaded gasoline composite (8006-61-9)

10,000 µg/mL each in P&T methanol, 1 mL/ampul

cat.# 31484 (ea.)

Miscellaneous, *cont.*

CCME PHC Calibration Mix (3 components)

- Meets CCME 2001 Petroleum Hydrocarbons in Soil Method—Tier 1.
- Primary reference calibration standards for quantification of four fractions.

n-Decane (C10) (124-18-5)
n-Hexadecane (C16) (544-76-3)
n-Tetratriacontane (C34) (14167-59-0)

5,000 µg/mL each in toluene, 1 mL/ampul

cat.# 31684 (ea.)

α,α,α-Trifluorotoluene

α,α,α-Trifluorotoluene (98-08-8)

2,000 µg/mL in P&T methanol, 1 mL/ampul

cat.# 30048 (ea.)

2,500 µg/mL in P&T methanol, 1 mL/ampul

cat.# 30068 (ea.)

10,000 µg/mL in P&T methanol, 1 mL/ampul

cat.# 30083 (ea.)

1-Chlorooctane

1-Chlorooctane (111-85-3)

10,000 µg/mL in P&T methanol, 1 mL/ampul

cat.# 30084 (ea.)

1-Chlorooctadecane

1-Chlorooctadecane (3386-33-2)

10,000 µg/mL in methylene chloride, 1 mL/ampul

cat.# 31098 (ea.)

Weathered Petrochemical Solutions

See pages 480–481.

Compound Index for Reference Standards

See **pages 586–592.**



Isocyanates

ASTM Method D5836-03/OSHA 42, OSHA 47, NIOSH 5522 (Analysis of Isocyanates in Indoor Air by LC)

ASTM D5836 and OSHA 42 are test methods for determining 2,4-toluene diisocyanate (2,4-TDI) and 2,6-TDI in the workplace atmosphere. OSHA 47 is for 4,4'-methylenediphenyl isocyanate (4,4'-MDI) in indoor air, and NIOSH Method 5522 is for 2,4-TDI; 2,6-TDI; 4,4'-MDI; and 1,6-hexamethylene diisocyanate (1,6-HDI) in air. Restek offers the 1-(2-pyridyl) piperzine (1-2pp) derivative.

Isocyanates Singles

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

Compound	CAS #	Solvent	Conc.	cat.#
2,6-TDIP	195625-39-9	DMSO	1,000	33000
2,4-TDIP	72375-21-4	DMSO	1,000	33001
1,6-HDIP	72375-27-0	DMSO	1,000	33002
4,4'-MDIP	72375-24-7	DMSO	1,000	33003

DMSO = dimethyl sulfoxide

Jet Fuel

See page 514.

Kerosene

See page 514.

Ketones

VOA Calibration Mix #1 (ketones) (4 components)

Acetone (67-64-1)
2-Butanone (MEK) (78-93-3)
2-Hexanone (591-78-6)
4-Methyl-2-pentanone (MIBK) (108-10-1)

5,000 µg/mL each in P&T methanol:water (90:10), 1 mL/ampul
cat.# 30006 (ea.)

Ketones Mix, 524.2 Rev. 4.1 (5 components)

Acetone (67-64-1)
2-Butanone (MEK) (78-93-3)
1,1-Dichloro-2-propanone (513-88-2)
2-Hexanone (591-78-6)
4-Methyl-2-pentanone (MIBK) (108-10-1)

5,000 µg/mL each in P&T methanol:water (90:10), 1 mL/ampul
cat.# 30602 (ea.)

Quantity Discounts Available

— Buy 3 Standards, Get 10% Off
— Buy 5 Standards, Get 20% Off

Not available for all standards. Contact your local Restek® representative for more details.

Ketones, *cont.*

Aldehyde-Ketone-DNPH TO-11A Calibration Mix (15 components)

Acetaldehyde-DNPH (1019-57-4)
Acetone-DNPH (1567-89-1)
Acrolein-DNPH (888-54-0)
Benzaldehyde-DNPH (1157-84-2)
n-Butyraldehyde-DNPH (1527-98-6)
Crotonaldehyde-DNPH (1527-96-4)
2,5-Dimethylbenzaldehyde-DNPH (152477-96-8)
Formaldehyde-DNPH (1081-15-8)
Hexaldehyde-DNPH (1527-97-5)
Isovaleraldehyde-DNPH (2256-01-1)
Propionaldehyde-DNPH (725-00-8)
m-Tolualdehyde-DNPH (2880-05-9)
o-Tolualdehyde-DNPH (1773-44-0)
p-Tolualdehyde-DNPH (2571-00-8)
Valeraldehyde-DNPH (2057-84-3)

15 µg/mL each in acetonitrile, 1 mL/ampul*
cat.# 31808 (ea.)

*The reported concentrations reflect the amount of aldehyde or ketone in the mixture. The concentration of derivatized aldehyde or ketone is not reported.

Leaking Underground Storage Tank (LUST)

See pages 497–510.

Nitriles

8240 Nitriles Mix (7 components)

Acrylonitrile (107-13-1)
Ethyl methacrylate (97-63-2)
Malononitrile (109-77-3)
Methacrylonitrile (126-98-7)
Methyl methacrylate (80-62-6)
Propionitrile (107-12-0)
Styrene (100-42-5)

2,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30215 (ea.)

Method 603 (Acrolein & Acrylonitrile)

Acrolein/Acrylonitrile (2 components)

Acrolein (107-02-8)
Acrylonitrile (107-13-1)

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

Must ship overnight on ice.
This product has a limited shelf life. We recommend that you order only the ampul quantity that meets your immediate needs.

Acrolein

Acrolein (107-02-8)

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

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

This product has a limited shelf life. We recommend that you order only the ampul quantity that meets your immediate needs.

Acrylonitrile

Acrylonitrile (107-13-1)

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

Nitroaromatics & Nitramines

See pages 486–487.

Nitrosamines

Method 521 (Nitrosamines)

Nitrosamine Calibration Mix, Method 521

(7 components)

N-Nitrosodiethylamine (55-18-5)
N-Nitrosodimethylamine (62-75-9)
N-Nitrosodi-*n*-butylamine (924-16-3)
N-Nitrosodi-*n*-propylamine (621-64-7)
N-Nitrosomethylethylamine (10595-95-6)
N-Nitrosopiperidine (100-75-4)
N-Nitrosopyrrolidine (930-55-2)

1,000 µg/mL each in methylene chloride, 1 mL/ampul
cat.# 31898 (ea.)

N-Nitrosodimethylamine-d6

N-Nitrosodimethylamine-d6 (17829-05-9)

1,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 33910 (ea.)

N-Nitrosodi-*n*-propylamine-d14

N-Nitrosodi-*n*-propylamine-d14 (93951-96-3)

1,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 33911 (ea.)

EPA 521 &
522 Cartridge



- Activated charcoal for extraction of nitrosamines and dioxane in drinking water.
- Batch tested to ensure low background and consistent recoveries.
- High-quality polypropylene tubes and frits to minimize interference.
- Specially treated charcoal and frits to minimize fines that result from inconsistent recoveries.



See page 398.
Disks are also available on page 402.

Method 522 (1,4-Dioxane)

Tetrahydrofuran-d8

Tetrahydrofuran-d8 (1693-74-9)

2,000 µg/mL in P&T methanol, 1 mL/ampul
cat.# 30112 (ea.)

1,4-Dioxane-d8

1,4-Dioxane-d8 (17647-74-4)

2,000 µg/mL in P&T methanol, 1 mL/ampul
cat.# 30614 (ea.)

1,4-Dioxane

1,4-Dioxane (123-91-1)

2,000 µg/mL in P&T methanol, 1 mL/ampul
cat.# 30287 (ea.)

2,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31853 (ea.)

1.9 mg/mL in dimethyl sulfoxide, 1 mL/ampul
cat.# 36294 (ea.)

Method 607 (Nitrosamines)

607 Nitrosamines Calibration Mix (3 components)

N-Nitrosodimethylamine (62-75-9)
N-Nitroso-di-*n*-propylamine (621-64-7)
N-Nitrosodiphenylamine (86-30-6)

2,000 µg/mL each in methanol, 1 mL/ampul
cat.# 31032 (ea.)

Oil & Grease

Method 1664 (Oil & Grease)

Method 1664 Oil & Grease Standard (2 components)

n-Hexadecane (C16) (544-76-3)
Stearic acid (57-11-4)

2,000 µg/mL each in acetone, 10 mL/ampul
cat.# 31954 (ea.)

Method 1664 Oil & Grease Mix (2 components)

n-Hexadecane (C16) (544-76-3)
Stearic acid (57-11-4)

4,000 µg/mL each in acetone, 5 mL/ampul
cat.# 31457 (ea.)

Organometallics/Organotin

Complete data pack available for audit compliance.

Butyltin Chloride Calibration Mixture (4 components)

n-Butyltin trichloride (1118-46-3)
Dibutyltin dichloride (683-18-1)
Tetrabutyltin (1461-25-2)
Tributyltin chloride (1461-22-9)

2,000 µg/mL each in methylene chloride, 1 mL/ampul
cat.# 31472 (ea.)

Tributyltin Chloride Calibration Mixture

Tributyltin chloride (1461-22-9)

2,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31478 (ea.)

Phenyltin Chloride Calibration Mixture (4 components)

Diphenyltin dichloride (1135-99-5)
Phenyltin trichloride (1124-19-2)
Tetraphenyltin (595-90-4)
Triphenyltin chloride (639-58-7)

2,000 µg/mL each in methylene chloride, 1 mL/ampul
cat.# 31473 (ea.)

Tri-*n*-propyltin Chloride Surrogate

Tri-*n*-propyltin chloride

2,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31476 (ea.)

Tripentyltin Chloride Surrogate

Tripentyltin chloride (3342-67-4)

2,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31477 (ea.)

Tetra-*n*-propyltin Internal Standard

Tetra-*n*-propyltin (2176-98-9)

2,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31474 (ea.)

Oxygenates/Ethers

California Oxygenates Mix (5 components)

tert-Amyl methyl ether (TAME) (994-05-8)	2,000 µg/mL
tert-Butanol (TBA) (75-65-0)	10,000
Diisopropyl ether (DIPE) (108-20-3)	2,000
Ethyl-*tert*-butyl ether (ETBE) (637-92-3)	2,000
Methyl *tert*-butyl ether (MTBE) (1634-04-4)	2,000

In P&T methanol, 1 mL/ampul
cat.# 30465 (ea.)

Oxygenates (6 components)

tert-Amyl ethyl ether (TAEE) (919-94-8)	2,000 µg/mL
tert-Amyl methyl ether (TAME) (994-05-8)	2,000
tert-Butanol (TBA) (75-65-0)	10,000
Diisopropyl ether (DIPE) (108-20-3)	2,000
Ethyl-*tert*-butyl ether (ETBE) (637-92-3)	2,000
Methyl *tert*-butyl ether (MTBE) (1634-04-4)	2,000

In P&T methanol, 1 mL/ampul
cat.# 30626 (ea.)

Single-Component Oxygenates

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

Compound	CAS #	Solvent	Conc.	cat.#
tert-Amyl alcohol	75-85-4	PTM	10,000	30631
tert-Amyl ethyl ether (TAEE)	919-94-8	PTM	2,000	30617
tert-Amyl methyl ether (TAME)	994-05-8	PTM	2,000	30629
tert-Butanol (TBA)	75-65-0	PTM	50,000	30470
tert-Butanol-d9	25725-11-5	PTM	20,000	30618
Diisopropyl ether (DIPE)	108-20-3	PTM	2,000	30627
Ethanol	64-17-5	PTM	2,000	30288
Ethanol	64-17-5	W	10,000	30466
Ethyl-*tert*-butyl ether (ETBE)	637-92-3	PTM	2,000	30628
Methanol	67-56-1	W	10,000	30467
Methyl *tert*-butyl ether (MTBE)	1634-04-4	PTM	2,000	30402

PTM = purge-and-trap grade methanol; W = DI water



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Pesticides, Carbamate

Method 531.1, 531.2 (Carbamates)

531.1 Internal Standard

4-Bromo-3,5-dimethylphenyl-N-methylcarbamate (BDMC) (672-99-1)

100 µg/mL in methanol, 1 mL/ampul

cat.# 32274 (ea.)

531.1 Performance Check Mix (4 components)

Aldicarb sulfoxide	100 µg/mL	3-Hydroxycarbofuran	2
BDMC	10	Methiocarb	20

In methanol, 1 mL/ampul

cat.# 32275 (ea.)

531.1 Carbamate Pesticide Calibration Mixture

(10 components)

Aldicarb (116-06-3)
Aldicarb sulfone (1646-88-4)
Aldicarb sulfoxide (1646-87-3)
Carbaryl (Sevin) (63-25-2)
Carbofuran (1563-66-2)
3-Hydroxycarbofuran (16655-82-6)
Methiocarb (2032-65-7)
Methomyl (16752-77-5)
Oxamyl (23135-22-0)
Propoxur (Baygon) (114-26-1)

100 µg/mL each in methanol, 1 mL/ampul

cat.# 32273 (ea.)

531.2 Carbamate Pesticide Calibration Mixture

(11 components)

- Complete set of materials for N-methylcarbamoyloximes and N-methylcarbamates.
- New mix satisfies latest update of EPA Method 531.2.
- Formulated in acetonitrile for stability and convenience for LC analysis.

Aldicarb (116-06-3)
Aldicarb sulfone (1646-88-4)
Aldicarb sulfoxide (1646-87-3)
Carbaryl (Sevin) (63-25-2)
Carbofuran (1563-66-2)
3-Hydroxycarbofuran (16655-82-6)
Methiocarb (2032-65-7)
Methomyl (16752-77-5)
1-Naphthol (90-15-3)
Oxamyl (23135-22-0)
Propoxur (Baygon) (114-26-1)

100 µg/mL in acetonitrile, 1 mL/ampul

cat.# 32435 (ea.)

Pesticides, Chlordane & Toxaphene

Chlordane, Toxaphene Solutions

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

Compound	CAS #	Solvent	Conc.	cat.#
Chlordane	57-74-9	H	1,000	32021
Chlordane	57-74-9	I	5,000	32072
Chlordane	57-74-9	M	2,000	32016
Toxaphene	8001-35-2	H	1,000	32005
Toxaphene	8001-35-2	I	5,000	32071
Toxaphene	8001-35-2	M	2,000	32015

H = hexane; I = isooctane; M = methanol

Pesticides, Chlorinated Disinfection By-Products, Pesticides & Herbicides

Method 551 (Chlorinated Disinfection By-Products, Pesticides & Herbicides)

551.1 Surrogate Standard

Decafluorobiphenyl (434-90-2)

1,000 µg/mL in acetone, 1 mL/ampul

cat.# 31855 (ea.)

Method 551.1 Pesticide/Herbicide Mix (16 components)

Alachlor (15972-60-8)
Atrazine (1912-24-9)
Bromacil (314-40-9)
Cyanazine (Bladex) (21725-46-2)
Endrin (72-20-8)
Endrin aldehyde (7421-93-4)
Endrin ketone (53494-70-5)
γ-BHC (Lindane) (58-89-9)
Heptachlor (76-44-8)
Heptachlor epoxide (isomer B) (1024-57-3)
Hexachlorobenzene (118-74-1)
Hexachlorocyclopentadiene (77-47-4)
Methoxychlor (72-43-5)
Metolachlor (51218-45-2)
Simazine (122-34-9)
Trifluralin (1582-09-8)

1,000 µg/mL each in acetone, 1 mL/ampul

cat.# 32438 (ea.)

Chloral Hydrate

Chloral hydrate (302-17-0)

1,000 µg/mL in acetonitrile, 1 mL/ampul

cat.# 30609 (ea.)

Disinfection By-Product Mix (7 components)

Bromochloroacetonitrile (83463-62-1)
Chloropicrin (76-06-2)
Dibromoacetonitrile (3252-43-5)
Dichloroacetonitrile (3018-12-0)
1,1-Dichloro-2-propanone (513-88-2)
Trichloroacetonitrile (545-06-2)
1,1,1-Trichloro-2-propanone (918-00-3)

2,000 µg/mL each in acetone, 1 mL/ampul

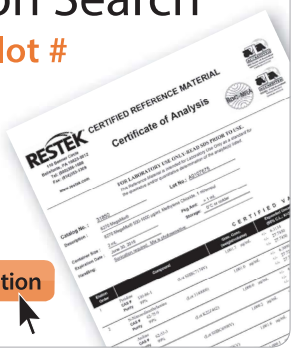
cat.# 30616 (ea.)

Reference Standards Documentation Search

Search by cat. # or lot #

- SDSs
- Certificates
- Data packs

www.restek.com/documentation



Pesticides, Chlorinated/Organochlorine/Organohalide

Method 508 (Chlorinated Pesticides)

508.1 Internal Standard

Pentachloronitrobenzene (82-68-8)

100 µg/mL in ethyl acetate, 1 mL/ampul
cat.# 32091 (ea.)

508.1 Surrogate

4,4'-Dibromobiphenyl (92-86-4)

500 µg/mL in ethyl acetate, 1 mL/ampul
cat.# 32092 (ea.)

508.1 GC Degradation Check Mix (2 components)

4,4'-DDT (50-29-3)
Endrin (72-20-8)

100 µg/mL each in ethyl acetate, 1 mL/ampul
cat.# 32093 (ea.)

508 Performance Check Mix (4 components)

δ-BHC (319-86-8)	0.4 µg/mL	DCPA methyl ester (Chlorthal-dimethyl) (1861-32-1)	0.5
Chlorothalonil (1897-45-6)	0.5		
Chlorpyrifos (2921-88-2)	0.02		

In methyl *tert*-butyl ether, 1 mL/ampul
cat.# 32045 (ea.)

508.1 Calibration Mix #1 (17 components)

Aldrin (309-00-2)
α-BHC (319-84-6)
β-BHC (319-85-7)
δ-BHC (319-86-8)
γ-BHC (Lindane) (58-89-9)
4,4'-DDD (72-54-8)
4,4'-DDE (72-55-9)
4,4'-DDT (50-29-3)
Dieldrin (60-57-1)
Endosulfan I (959-98-8)
Endosulfan II (33213-65-9)
Endosulfan sulfate (1031-07-8)
Endrin (72-20-8)
Endrin aldehyde (7421-93-4)
Heptachlor (76-44-8)
Heptachlor epoxide (isomer B) (1024-57-3)
Methoxychlor (72-43-5)

500 µg/mL each in ethyl acetate, 1 mL/ampul
cat.# 32094 (ea.)

508.1 Calibration Mix #2 (11 components)

Chlorobenzilate (510-15-6)
cis-Chlordane (5103-71-9)
trans-Chlordane (5103-74-2)
Chloroneb (2675-77-6)
DCPA methyl ester (Chlorthal-dimethyl) (1861-32-1)
Etridiazole (2593-15-9)
Hexachlorobenzene (118-74-1)
cis-Permethrin* (52645-53-1)
trans-Permethrin* (52645-53-1)
Propachlor (1918-16-7)
Trifluralin (1582-09-8)

500 µg/mL each in ethyl acetate, 1 mL/ampul
cat.# 32095 (ea.)

*500 µg/mL total permethrin. Exact content of each isomer is listed on certificate of analysis.

508.1 Calibration Mix #3 (8 components)

Alachlor (15972-60-8)
Atrazine (1912-24-9)
Chlorothalonil (1897-45-6)
Cyanazine (bladex) (21725-46-2)
Hexachlorocyclopentadiene (77-47-4)
Metolachlor (51218-45-2)
Metribuzin (21087-64-9)
Simazine (122-34-9)

500 µg/mL each in ethyl acetate, 1 mL/ampul
cat.# 32096 (ea.)

Toxaphene Solutions

Toxaphene (8001-35-2)

1,000 µg/mL in hexane, 1 mL/ampul
cat.# 32005 (ea.)

2,000 µg/mL in methanol, 1 mL/ampul
cat.# 32015 (ea.)

5,000 µg/mL in isooctane, 1 mL/ampul
cat.# 32071 (ea.)

Organochlorine Pesticide System Evaluation Mix

(2 components)

- Designed for daily assessment of system performance.
- Reveals active sites in the injection port and/or GC column.
- Prepared in MTBE—low expansion volume helps minimize backflash.

4,4'-DDT (50-29-3)	200 µg/mL
Endrin (72-20-8)	100 µg/mL

In methyl *tert*-butyl ether, 1 mL/ampul
cat.# 32417 (ea.)

Decachlorobiphenyl, 508A

Decachlorobiphenyl (BZ #209) (2051-24-3)

200 µg/mL in acetone, 1 mL/ampul
cat.# 32029 (ea.)

200 µg/mL in acetone, 5 mL/ampul
cat.# 32030 (ea.)

10 µg/mL in isooctane, 1 mL/ampul
cat.# 32289 (ea.)

508.1 Pesticide Kit

Contains 1 mL each of these mixtures.
32045: 508 Performance Check Mix
32091: 508.1 Internal Standard Mix
32092: 508.1 Surrogate Mix
32093: 508.1 GC Degradation Check Mix
32094: 508.1 Calibration Mix #1
32095: 508.1 Calibration Mix #2
32096: 508.1 Calibration Mix #3

cat.# 32097 (kit) kit



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Pesticides, Chlorinated/Organochlorine/Organohalide, *cont.*

Method 508 (Chlorinated Pesticides), *cont.*

Endrin Standard
Endrin (72-20-8)

1,000 µg/mL in acetone, 1 mL/ampul

cat.# 32463 (ea.)

Endrin Ketone Standard
Endrin ketone (53494-70-5)

1,000 µg/mL in acetone, 1 mL/ampul

cat.# 32464 (ea.)

Endosulfan I Standard
Endosulfan I (959-98-8)

1,000 µg/mL in acetone, 1 mL/ampul

cat.# 32465 (ea.)

Endosulfan II Standard
Endosulfan II (33213-65-9)

1,000 µg/mL in acetone, 1 mL/ampul

cat.# 32466 (ea.)

Endosulfan Sulfate Standard
Endosulfan sulfate (1031-07-8)

1,000 µg/mL in acetone, 1 mL/ampul

cat.# 32467 (ea.)

Endrin Aldehyde Standard
Endrin aldehyde (7421-93-4)

1,000 µg/mL in acetone, 1 mL/ampul

cat.# 32468 (ea.)

Method 505 (Organohalide Pesticides & PCBs)

505 Organohalide Pesticide Mix (16 components)

Aldrin (309-00-2)
Alachlor (15972-60-8)
Atrazine (1912-24-9)
γ-BHC (Lindane) (58-89-9)
cis-Chlordane (5103-71-9)
trans-Chlordane (5103-74-2)
Dieldrin (60-57-1)
Endrin (72-20-8)
Heptachlor (76-44-8)
Heptachlor epoxide (isomer B) (1024-57-3)
Hexachlorobenzene (118-74-1)
Hexachlorocyclopentadiene (77-47-4)
Methoxychlor (72-43-5)
cis-Nonachlor (5103-73-1)
trans-Nonachlor (39765-80-5)
Simazine (122-34-9)

200 µg/mL each in methanol, 1 mL/ampul

cat.# 32024 (ea.)

Toxaphene Solutions
See cat.#s 32005, 32015, and 32071 on page 521.

Method 608 (Organochlorine Pesticides & PCBs)

608 Calibration Mix (16 components)

Aldrin (309-00-2)
α-BHC (319-84-6)
β-BHC (319-85-7)
δ-BHC (319-86-8)
γ-BHC (Lindane) (58-89-9)
4,4'-DDD (72-54-8)
4,4'-DDE (72-55-9)
4,4'-DDT (50-29-3)
Dieldrin (60-57-1)
Endosulfan I (959-98-8)
Endosulfan II (33213-65-9)
Endosulfan sulfate (1031-07-8)
Endrin (72-20-8)
Endrin aldehyde (7421-93-4)
Heptachlor (76-44-8)
Heptachlor epoxide (isomer B) (1024-57-3)

200 µg/mL each in hexane:toluene (1:1), 1 mL/ampul

cat.# 32022 (ea.)

608 Complete Kit
Contains 1 mL 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
Contains 1 mL each of these mixtures.

cat.# 32060 (kit) kit



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Pesticides, Chlorinated/Organochlorine/Organohalide, *cont.*

Method 8080, 8081 (Chlorinated Pesticides)

Organochlorine Pesticide Mix AB #1 (20 components)

Aldrin (309-00-2)
α-BHC (319-84-6)
β-BHC (319-85-7)
δ-BHC (319-86-8)
γ-BHC (Lindane) (58-89-9)
cis-Chlordane (5103-71-9)
trans-Chlordane (5103-74-2)
4,4'-DDD (72-54-8)
4,4'-DDE (72-55-9)
4,4'-DDT (50-29-3)
Dieldrin (60-57-1)
Endosulfan I (959-98-8)
Endosulfan II (33213-65-9)
Endosulfan sulfate (1031-07-8)
Endrin (72-20-8)
Endrin aldehyde (7421-93-4)
Endrin ketone (53494-70-5)
Heptachlor (76-44-8)
Heptachlor epoxide (isomer B) (1024-57-3)
Methoxychlor (72-43-5)

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

Organochlorine Pesticide Mix AB #2 (20 components)

Aldrin (309-00-2)	8 µg/mL	Endosulfan I (959-98-8)	8
α-BHC (319-84-6)	8	Endosulfan II (33213-65-9)	16
β-BHC (319-85-7)	8	Endosulfan sulfate (1031-07-8)	16
δ-BHC (319-86-8)	8	Endrin (72-20-8)	16
γ-BHC (Lindane) (58-89-9)	8	Endrin aldehyde (7421-93-4)	16
cis-Chlordane (5103-71-9)	8	Endrin ketone (53494-70-5)	16
trans-Chlordane (5103-74-2)	8	Heptachlor (76-44-8)	8
4,4'-DDD (72-54-8)	16	Heptachlor epoxide (isomer B) (1024-57-3)	8
4,4'-DDE (72-55-9)	16	Methoxychlor (72-43-5)	80
4,4'-DDT (50-29-3)	16		
Dieldrin (60-57-1)	16		

In hexane:toluene (1:1), 1 mL/ampul
cat.# 32292 (ea.)

Organochlorine Pesticide Mix AB # 3 (20 components)

Aldrin (309-00-2)
α-BHC (319-84-6)
β-BHC (319-85-7)
δ-BHC (319-86-8)
γ-BHC (Lindane) (58-89-9)
cis-Chlordane (5103-71-9)
trans-Chlordane (5103-74-2)
4,4'-DDD (72-54-8)
4,4'-DDE (72-55-9)
4,4'-DDT (50-29-3)
Dieldrin (60-57-1)
Endosulfan I (959-98-8)
Endosulfan II (33213-65-9)
Endosulfan sulfate (1031-07-8)
Endrin (72-20-8)
Endrin aldehyde (7421-93-4)
Endrin ketone (53494-70-5)
Heptachlor (76-44-8)
Heptachlor epoxide (isomer B) (1024-57-3)
Methoxychlor (72-43-5)

2,000 µg/mL each in hexane:toluene (1:1), 1 mL/ampul
cat.# 32415 (ea.)

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Rtx®-CLPesticides/
Rtx®-CLPesticides2
Capillary Column Pair

Analyze all 20 organochlorine pesticides and their surrogates simultaneously.



See **pages 72–73**.

Pesticide Surrogate Mix (2 components)

Decachlorobiphenyl (2051-24-3)
2,4,5,6-Tetrachloro-*m*-xylene (877-09-8)

200 µg/mL each in acetone, 1 mL/ampul
cat.# 32000 (ea.)

200 µg/mL each in acetone, 5 mL/ampul
cat.# 32457 (ea.)

Pesticide Surrogate Mix (2 components)

Decachlorobiphenyl (2051-24-3)	200 µg/mL
2,4,5,6-Tetrachloro-*m*-xylene (877-09-8)	100

In acetone, 1 mL/ampul
cat.# 32453 (ea.)

TCLP Pesticide Mix (5 components)

γ-BHC (Lindane) (58-89-9)
Endrin (72-20-8)
Heptachlor (76-44-8)
Heptachlor epoxide (isomer B) (1024-57-3)
Methoxychlor (72-43-5)

2,000 µg/mL each in methanol, 1 mL/ampul
cat.# 32013 (ea.)

TCLP Toxaphene Mix

Toxaphene (8001-35-2)

2,000 µg/mL in methanol, 1 mL/ampul
cat.# 32015 (ea.)

TCLP Chlordane Mix

Chlordane (57-74-9)

2,000 µg/mL in methanol, 1 mL/ampul
cat.# 32016 (ea.)

SOM01.1 (Pesticides), QA Mixes

Pesticide Surrogate Mix (2 components)

Decachlorobiphenyl (2051-24-3)	200 µg/mL
2,4,5,6-Tetrachloro-*m*-xylene (877-09-8)	100

In acetone, 1 mL/ampul
cat.# 32453 (ea.)

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

Aldrin (309-00-2)	10 µg/mL	Endosulfan I (959-98-8)	10
α-BHC (319-84-6)	10	Endosulfan II (33213-65-9)	20
β-BHC (319-85-7)	10	Endosulfan sulfate (1031-07-8)	20
δ-BHC (319-86-8)	10	Endrin (72-20-8)	20
γ-BHC (Lindane) (58-89-9)	10	Endrin aldehyde (7421-93-4)	20
cis-Chlordane (5103-71-9)	10	Endrin ketone (53494-70-5)	20
trans-Chlordane (5103-74-2)	10	Heptachlor (76-44-8)	10
Decachlorobiphenyl (SS) (2051-24-3)	20	Heptachlor epoxide (isomer B) (1024-57-3)	10
Dieldrin (60-57-1)	20	Methoxychlor (72-43-5)	100
4,4'-DDD (72-54-8)	20	2,4,5,6-Tetrachloro-*m*-xylene (SS) (877-09-8)	10
4,4'-DDE (72-55-9)	20		
4,4'-DDT (50-29-3)	20		

In hexane:toluene (90:10), 1 mL/ampul
cat.# 32454 (ea.)

Pesticides, Chlorinated/Organochlorine/Organohalide, *cont.*

04.2, 04.1, 03.2, 3/90, 4/89, and 2/88 SOW (Pesticides), QA Mixes

Pesticide Surrogate Mix (2 components)

See cat.#s 32000 and 32457 on page 524.

2,4,5,6-Tetrachloro-*m*-xylene

2,4,5,6-Tetrachloro-*m*-xylene (877-09-8)

200 µg/mL in acetone, 1 mL/ampul
cat.# 32027 (ea.)

200 µg/mL in acetone, 5 mL/ampul
cat.# 32028 (ea.)

Decachlorobiphenyl (BZ #209)

Decachlorobiphenyl (BZ #209) (2051-24-3)

200 µg/mL in acetone, 1 mL/ampul
cat.# 32029 (ea.)

200 µg/mL in acetone, 5 mL/ampul
cat.# 32030 (ea.)

10 µg/mL in isooctane, 1 mL/ampul
cat.# 32289 (ea.)

Dibutylchlorendate

Dibutylchlorendate (1770-80-5)

200 µg/mL in acetone, 1 mL/ampul
cat.# 32025 (ea.)

Florisil® Cartridge Check Standard (2,4,5-Trichlorophenol)

2,4,5-Trichlorophenol (95-95-4)

1,000 µg/mL in acetone, 1 mL/ampul
cat.# 32017 (ea.)

Organochlorine Pesticide System Evaluation Mix

(2 components)

- Designed for daily assessment of system performance.
- Reveals active sites in the injection port and/or GC column.
- Prepared in MTBE—low expansion volume helps minimize backflash.

4,4'-DDT (50-29-3)	200 µg/mL
Endrin (72-20-8)	100 µg/mL

In methyl *tert*-butyl ether, 1 mL/ampul
cat.# 32417 (ea.)

Pesticide Performance Evaluation Mix (6 components)

α-BHC (319-84-6)	1 µg/mL	4,4'-DDT (50-29-3)	10
β-BHC (319-85-7)	1	Endrin (72-20-8)	5
γ-BHC (Lindane) (58-89-9)	1	Methoxychlor (72-43-5)	25

In hexane, 1 mL/ampul
cat.# 32002 (ea.)

Pesticide Performance Evaluation Mix w/Surrogates

(8 components)

α-BHC (319-84-6)	1 µg/mL	Endrin (72-20-8)	5
β-BHC (319-85-7)	1	Methoxychlor (72-43-5)	25
γ-BHC (Lindane) (58-89-9)	1	2,4,5,6-Tetrachloro-*m*-xylene (SS) (877-09-8)	2
4,4'-DDT (50-29-3)	10		
Decachlorobiphenyl (SS) (2051-24-3)	2		

In hexane, 1 mL/ampul
cat.# 32074 (ea.)

tech tip

Working with solutions containing decachlorobiphenyl

Decachlorobiphenyl has poor solubility in most organic solvents. The maximum concentration that can be prepared in acetone, hexane, or isooctane is 200 µg/mL. Temperature will affect the solubility as well. Storing solutions at reduced temperatures will cause decachlorobiphenyl to precipitate.

Products containing decachlorobiphenyl must be sonicated for a minimum of 10 minutes prior to opening the ampul. Because each ultrasonic bath operates at a different energy level, 10 minutes is a guideline only. Longer sonication time will not affect product quality.

These precautions apply to working solutions prepared in your laboratory as well. The amount of compound that precipitates depends on concentration AND temperature. If you store your standards at a temperature lower than 4 °C (even dilute solutions), allow extra sonication time.

CLP Pesticides Mixtures, QA Mixes

Pesticide Matrix Spike Mix (6 components)

Aldrin (309-00-2)	25 µg/mL	Dieldrin (60-57-1)	50
γ-BHC (Lindane) (58-89-9)	25	Endrin (72-20-8)	50
4,4'-DDT (50-29-3)	50	Heptachlor (76-44-8)	25

In acetone, 1 mL/ampul
cat.# 32018 (ea.)

For complete listing of PCB reference standards, see pages 530–531.

Low-Concentration Pesticides Mixtures, QA Mixes

L/C Pesticide Lab Control Sample (7 components)

γ-BHC (Lindane) (58-89-9)	10 µg/mL	Endosulfan sulfate (1031-07-8)	20
trans-Chlordane (5103-74-2)	10	Endrin (72-20-8)	20
4,4'-DDE (72-55-9)	20	Heptachlor epoxide (isomer B) (1024-57-3)	10
Dieldrin (60-57-1)	20		

In acetone, 1 mL/ampul
cat.# 32040 (ea.)

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See **pages 568–571**.

Pesticides, Chlorinated/Organochlorine/Organohalide, *cont.*

CLP Pesticides Mixtures, Calibration Mixes

Pesticide Standard Mix A (9 components)

α-BHC (319-84-6)	5 µg/mL	Endosulfan I (959-98-8)	5
γ-BHC (Lindane) (58-89-9)	5	Endrin (72-20-8)	10
4,4'-DDD (72-54-8)	10	Heptachlor (76-44-8)	5
4,4'-DDT (50-29-3)	10	Methoxychlor (72-43-5)	50
Dieldrin (60-57-1)	10		

In hexane:toluene (90:10), 1 mL/ampul

cat.# 32297 (ea.)

Pesticide Standard Mix B (11 components)

Aldrin (309-00-2)	5 µg/mL	Endosulfan II (33213-65-9)	10
β-BHC (319-85-7)	5	Endosulfan sulfate (1031-07-8)	10
δ-BHC (319-86-8)	5	Endrin aldehyde (7421-93-4)	10
cis-Chlordane (5103-71-9)	5	Endrin ketone (53494-70-5)	10
trans-Chlordane (5103-74-2)	5	Heptachlor epoxide (isomer B) (1024-57-3)	5
4,4'-DDE (72-55-9)	10		

In hexane:toluene (90:10), 1 mL/ampul

cat.# 32298 (ea.)

Organochlorine Pesticide Mix AB #1 (20 components)

Aldrin (309-00-2)	Endosulfan I (959-98-8)
α-BHC (319-84-6)	Endosulfan II (33213-65-9)
β-BHC (319-85-7)	Endosulfan sulfate (1031-07-8)
δ-BHC (319-86-8)	Endrin (72-20-8)
γ-BHC (Lindane) (58-89-9)	Endrin aldehyde (7421-93-4)
cis-Chlordane (5103-71-9)	Endrin ketone (53494-70-5)
trans-Chlordane (5103-74-2)	Heptachlor (76-44-8)
4,4'-DDD (72-54-8)	Heptachlor epoxide (isomer B) (1024-57-3)
4,4'-DDE (72-55-9)	Methoxychlor (72-43-5)
4,4'-DDT (50-29-3)	
Dieldrin (60-57-1)	

200 µg/mL each in hexane:toluene (1:1), 1 mL/ampul

cat.# 32291 (ea.)

Organochlorine Pesticide Mix AB #2 (20 components)

Aldrin (309-00-2)	8 µg/mL	Endosulfan I (959-98-8)	8
α-BHC (319-84-6)	8	Endosulfan II (33213-65-9)	16
β-BHC (319-85-7)	8	Endosulfan sulfate (1031-07-8)	16
δ-BHC (319-86-8)	8	Endrin (72-20-8)	16
γ-BHC (Lindane) (58-89-9)	8	Endrin aldehyde (7421-93-4)	16
cis-Chlordane (5103-71-9)	8	Endrin ketone (53494-70-5)	16
trans-Chlordane (5103-74-2)	8	Heptachlor (76-44-8)	8
4,4'-DDD (72-54-8)	16	Heptachlor epoxide (isomer B) (1024-57-3)	8
4,4'-DDE (72-55-9)	16	Methoxychlor (72-43-5)	80
4,4'-DDT (50-29-3)	16		
Dieldrin (60-57-1)	16		

In hexane:toluene (1:1), 1 mL/ampul

cat.# 32292 (ea.)

Organochlorine Pesticide Mix AB # 3 (20 components)

Aldrin (309-00-2)	Endosulfan I (959-98-8)
α-BHC (319-84-6)	Endosulfan II (33213-65-9)
β-BHC (319-85-7)	Endosulfan sulfate (1031-07-8)
δ-BHC (319-86-8)	Endrin (72-20-8)
γ-BHC (Lindane) (58-89-9)	Endrin aldehyde (7421-93-4)
cis-Chlordane (5103-71-9)	Endrin ketone (53494-70-5)
trans-Chlordane (5103-74-2)	Heptachlor (76-44-8)
4,4'-DDD (72-54-8)	Heptachlor epoxide (isomer B) (1024-57-3)
4,4'-DDE (72-55-9)	Methoxychlor (72-43-5)
4,4'-DDT (50-29-3)	
Dieldrin (60-57-1)	

2,000 µg/mL each in hexane:toluene (1:1), 1 mL/ampul

cat.# 32415 (ea.)

Pesticides Calibration Mixtures

Components of these products are at 16x the contract-required quantitation level (CRQL) and can be used to prepare calibration mixes at 4x CRQL and at 1x CRQL by serial dilution.

Pesticide Standard Mix A w/Surrogates (11 components)

α-BHC (319-84-6)	8 µg/mL	Endosulfan I (959-98-8)	8
γ-BHC (Lindane) (58-89-9)	8	Endrin (72-20-8)	16
4,4'-DDD (72-54-8)	16	Heptachlor (76-44-8)	8
4,4'-DDT (50-29-3)	16	Methoxychlor (72-43-5)	80
Decachlorobiphenyl (SS) (2051-24-3)	16	2,4,5,6-Tetrachloro-*m*-xylene (SS) (877-09-8)	8
Dieldrin (60-57-1)	16		

In hexane, 1 mL/ampul

cat.# 32003 (ea.)

Pesticide Standard Mix B w/Surrogates (13 components)

Aldrin (309-00-2)	8 µg/mL	Endosulfan sulfate (1031-07-8)	16
β-BHC (319-85-7)	8	Endrin aldehyde (7421-93-4)	16
δ-BHC (319-86-8)	8	Endrin ketone (53494-70-5)	16
cis-Chlordane (5103-71-9)	8	Heptachlor epoxide (isomer B) (1024-57-3)	8
trans-Chlordane (5103-74-2)	8	2,4,5,6-Tetrachloro-*m*-xylene (SS) (877-09-8)	8
4,4'-DDE (72-55-9)	16		
Decachlorobiphenyl (SS) (2051-24-3)	16		
Endosulfan II (33213-65-9)	16		

In hexane, 1 mL/ampul

cat.# 32004 (ea.)

Pesticide Kit #3

Calibration mixes only for CLP 04.1. Includes pesticide standard mixes A & B at 16x CRQL with surrogates.

Contains 1 mL each of these mixtures.
32003: Pesticide Standard Mix A w/Surrogates
32004: Pesticide Standard Mix B w/Surrogates
32005: Toxaphene
32007: Aroclor 1221
32008: Aroclor 1232
32009: Aroclor 1242
32010: Aroclor 1248
32011: Aroclor 1254
32039: Aroclor 1016/1260

cat.# 32404 (kit) **kit**

Chlordane & Toxaphene Solutions

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

Compound	CAS #	Solvent	Conc.	cat.#
Chlordane	57-74-9	H	1,000	32021
Chlordane	57-74-9	I	5,000	32072
Chlordane	57-74-9	M	2,000	32016
Toxaphene	8001-35-2	H	1,000	32005
Toxaphene	8001-35-2	I	5,000	32071
Toxaphene	8001-35-2	M	2,000	32015

H = hexane; I = isooctane; M = methanol

Pesticides, Nitrogen & Phosphorus

Method 507 (Nitrogen & Phosphorus Pesticides)

Organonitrogen Pesticide Mix #1 (Rev), Method 525.2

(37 components)

Alachlor (15972-60-8)
Ametryn (834-12-8)
Atraton (1610-17-9)
Atrazine (1912-24-9)
Bromacil (314-40-9)
Butachlor (23184-66-9)
Butylate (2008-41-5)
Chlorpropham (101-21-3)
Cyanazine (Bladex) (21725-46-2)
Cycloate (1134-23-2)
Diphenamid (957-51-7)
EPTC (759-94-4)
Etridiazole (2593-15-9)
Fenarimol (60168-88-9)
Fluridone (Sonar) (59756-60-4)
Hexazinone (Velpar) (51235-04-2)
Metolachlor (51218-45-2)
Metribuzin (21087-64-9)
MGK-264 (113-48-4)
Molinate (2212-67-1)
Napropamide (Devrinol) (15299-99-7)
Norflurazon (27314-13-2)
Pebulate (1114-71-2)
Prometon (1610-18-0)
Prometryne (7287-19-6)
Propachlor (1918-16-7)
Propazine (139-40-2)
Propyzamide (23950-58-5)
Simazine (122-34-9)
Simetryn (1014-70-6)
Tebuthiuron (34014-18-1)
Terbacil (5902-51-2)
Terbutryn (886-50-0)
Triadimefon (43121-43-3)
Tricyclazole (Beam) (41814-78-2)
Trifluralin (1582-09-8)
Vernolate (1929-77-7)

500 µg/mL each in acetone, 1 mL/ampul
cat.# 33012 (ea.)

Organophosphorus Pesticide Mix #1 (Rev), Method 525.2 (7 components)

Chlorpyrifos (2921-88-2)
Dichlorvos (DDVP) (62-73-7)
Disulfoton sulfone (2497-06-5)
Ethoprop (ethoprophos) (13194-48-4)
Methyl paraoxon (Parathion methyl-O-analog) (950-35-6)
Mevinphos (7786-34-7)
Stirofos (tetrachlorvinphos) (961-11-5)

500 µg/mL each in acetone, 1 mL/ampul
cat.# 33013 (ea.)

Method 525.2 Nitrogen/Phosphorus Pesticide Mix #2

(6 components)

Carboxin (5234-68-4)
Diazinon (333-41-5)
Disulfoton (298-04-4)
Fenamiphos (22224-92-6)
Merphos (150-50-5)
Terbufos (13071-79-9)

1,000 µg/mL each in acetone, 1 mL/ampul
cat.# 32423 (ea.)

Compound Index for Reference Standards

See **pages 586–592.**



Pesticides, Organophosphorus

Method 8140, 8141 (Organophosphorus Pesticides)

The preparation of accurate and stable OP standards is complicated by their sensitivity to light, pH, heat, and water. Restek has overcome these issues through our ongoing research into OP pesticide mixtures to save your lab time and effort.

- Solvents are assayed to ensure low water content.
- Reference mixtures are stored in deactivated amber ampuls, under an inert atmosphere.
- Purity is determined by a combination of methods: GC-FID, HPLC, GC-ECD, GC-MS, LC-MS, refractive index, and melting point.

8140/8141 Internal Standards & Surrogates

NPD Detector:

Internal Standard: 1-Bromo-2-nitrobenzene (cat.# 32279)
Surrogate: 4-Chloro-3-nitrobenzotrifluoride (cat.# 32282)

1,000 µg/mL in acetone, 1 mL/ampul
cat.# 32279 (ea.)

1,000 µg/mL in acetone, 1 mL/ampul
cat.# 32282 (ea.)

FPD Detector:

Internal Standard: None recommended
Surrogate: Tributylphosphate (cat.# 32280) and Triphenylphosphate (cat.# 32281)

1,000 µg/mL in acetone, 1 mL/ampul
cat.# 32280 (ea.)

1,000 µg/mL in acetone, 1 mL/ampul
cat.# 32281 (ea.)

8140/8141 OP Pesticide Calibration Mix A

(20 components)

Azinphos methyl (86-50-0)
Chlorpyrifos (2921-88-2)
Coumaphos (56-72-4)
Demeton, O & S (8065-48-3)
Diazinon (333-41-5)
Dichlorvos (DDVP) (62-73-7)
Disulfoton (298-04-4)
Ethoprophos (13194-48-4)
Fenchlorphos (Ronnel) (299-84-3)
Fensulfothion (115-90-2)
Fenthion (55-38-9)
Merphos (150-50-5)
Methyl parathion (298-00-0)
Mevinphos (7786-34-7)
Naled (300-76-5)
Phorate (298-02-2)
Prothiofos (34643-46-4)
Stirofos (tetrachlorvinphos) (961-11-5)
Sulprofos (35400-43-2)
Trichloronate (327-98-0)

200 µg/mL each in hexane:acetone (95:5), 1 mL/ampul
cat.# 32277 (ea.)

8141 OP Pesticide Calibration Mix B (7 components)

Dimethoate (60-51-5)
EPN (2104-64-5)
Malathion (121-75-5)
Monocrotophos (6923-22-4)
Parathion (ethyl parathion) (56-38-2)
Sulfotepp (3689-24-5)
TEPP (tetraethylpyrophosphate) (107-49-3)

200 µg/mL each in hexane:acetone (95:5), 1 mL/ampul
cat.# 32278 (ea.)

Pesticides, Organophosphorus, *cont.*

International-Specific

Canadian Drinking Water OP Pesticides Mix

(9 components)

Azinphos methyl (86-50-0)
Chlorpyrifos (2921-88-2)
Diazinon (333-41-5)
Dimethoate (60-51-5)
Malathion (121-75-5)
Parathion (ethyl parathion) (56-38-2)
Phorate (298-02-2)
Temephos (Abate) (3383-96-8)
Terbufos (13071-79-9)

1,000 µg/mL each in acetonitrile, 1 mL/ampul

cat.# 31867 (ea.)

Organophosphorus Pesticide Mix, European Formulation (16 components)

Acephate (30560-19-1)	200 µg/mL	Methamidophos (10265-92-6)	500
Azinphos methyl (86-50-0)	400	Methidathion (950-37-8)	200
Chlorpyrifos (2921-88-2)	100	Omethoate (1113-02-6)	1,000
Demeton-S-methyl (919-86-8)	200	Pirimiphos methyl (29232-93-7)	100
Dichlorvos (DDVP) (62-73-7)	500	Profenofos (41198-08-7)	200
Dimethoate (60-51-5)	200	Prothiofos (34643-46-4)	200
Ethion (563-12-2)	200	Pyrazophos (13457-18-6)	500
Malathion (121-75-5)	200	Tolclofos-methyl (57018-04-9)	100

In acetone, 1 mL/ampul

cat.# 32418 (ea.)

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Provides fast analyses, low bleed, and better resolution than alternative choices.



See **page 74** for details.

Pesticides, Pesticides & Flame Retardants

Method 527 (Pesticides & Flame Retardants—GC-MS)

Method 525.2 Internal Standard Mix (3 components)

Acenaphthene-d10 (15067-26-2)
Chrysene-d12 (1719-03-5)
Phenanthrene-d10 (1517-22-2)

1,000 µg/mL each in acetone, 1 mL/ampul

cat.# 31825 (ea.)

Method 525.2 Surrogate Standard Mix (4 components)

2-Nitro-*m*-xylene (81-20-9)
Perylene-d12 (1520-96-3)
Pyrene-d10 (1718-52-1)
Triphenylphosphate (115-86-6)

1,000 µg/mL each in acetone, 1 mL/ampul

cat.# 31826 (ea.)

PBDE Mix (5 components)

2,2',4,4',5,5'-Hexabromobiphenyl (59080-40-9)
2,2',4,4',5,5'-Hexabromodiphenyl ether (BDE-153) (68631-49-2)
2,2',4,4',5-Pentabromodiphenyl ether (BDE-99) (60348-60-9)
2,2',4,4',6-Pentabromodiphenyl ether (BDE-100) (189084-64-8)
2,2',4,4'-Tetrabromodiphenyl ether (BDE-47) (5436-43-1)

50 µg/mL each in isooctane:ethyl acetate (4:1), 1 mL/ampul

cat.# 33098 (ea.)

Pesticides Mix #1, Method 527 (16 components)

Atrazine (1912-24-9)
Bifenthrin (82657-04-3)
Esbiol (Bioallethrin, S-cyclopentyl isomer) (28434-00-6)
Bromacil (314-40-9)
Esfenvalarate (66230-04-4)
Fenvalarate (51630-58-1)
Hexazinone (Velpar) (51235-04-2)
Kepone (143-50-0)
Mirex (2385-85-5)
Nitrofen (1836-75-5)
Norflurazon (27314-13-2)
Oxychlordane (27304-13-8)
Prometryne (7287-19-6)
Propazine (139-40-2)
Thiobencarb (28249-77-6)
Vinclozolin (50471-44-8)

500 µg/mL each in ethyl acetate, 1 mL/ampul

cat.# 33007 (ea.)

Pesticides Mix #2, Method 527 (5 components)

Chlorpyrifos (2921-88-2)
Dimethoate (60-51-5)
Malathion (121-75-5)
Parathion (Ethyl parathion) (56-38-2)
Terbufos sulfone (56070-16-7)

500 µg/mL each in ethyl acetate, 1 mL/ampul

cat.# 33008 (ea.)

Pesticides, Phenylurea

Method 532 (Phenylurea Pesticides)

Phenylurea Pesticide Mixture (8 components)

Diflubenzuron (35367-38-5)
Diuron (330-54-1)
Fluometuron (2164-17-2)
Linuron (330-55-2)
Propanil (709-98-8)
Siduron (1982-49-6)
Tebuthiuron (34014-18-1)
Thidiazuron (51707-55-2)

200 µg/mL each in acetonitrile:acetone (90:10), 1 mL/ampul

cat.# 32434 (ea.)

Pesticides, State-Specific

Minnesota Department of Agriculture List 1 Pesticides

Minnesota Ag List 1 Pesticides Mix A (16 components)

Acetochlor (34256-82-1)
Alachlor (15972-60-8)
Atrazine (1912-24-9)
Cyanazine (Bladex) (21725-46-2)
Desethylatrazine (6190-65-4)
Desisopropylatrazine (1007-28-9)
Dimethenamid (87674-68-8)*
Ethalfluralin (55283-68-6)
Metolachlor (51218-45-2)
Metribuzin (21087-64-9)
Pendimethalin (40487-42-1)
Prometon (1610-18-0)
Propachlor (1918-16-7)
Propazine (139-40-2)
Simazine (122-34-9)
Trifluralin (1582-09-8)

200 ppm each in acetone, 1 mL/ampul
cat.# 32406 (ea.)

*Added to Minnesota Department of Agriculture List 1 pesticide (neutrals) incident investigation requirements, effective January 1, 2000.[1] CAS # 87674-68-8 manufactured by several companies under various trade names.
[1]Analytical Lists for Pesticide Incident Investigations, Minnesota Department of Agriculture, Guidance Document 26 (3/99), St. Paul, MN. For a copy, visit their website at: www.mda.state.mn.us

Minnesota Ag List 1 Pesticides Mix B (6 components)

Chlorpyrifos (2921-88-2)
EPTC (759-94-4)
Fonofos (944-22-9)
Phorate (298-02-2)
Terbufos (13071-79-9)
Triallate (2303-17-5)

200 ppm each in acetone, 1 mL/ampul
cat.# 32407 (ea.)

Minnesota Ag List 1 Pesticide Kit

Contains 1 mL each of these mixtures.
32406: Minnesota Ag List Pesticides Mix A
32407: Minnesota Ag List Pesticides Mix B
Contains 1 mL each of these mixtures.
cat.# 32408 (kit) kit

Quantity Discounts Available

— Buy 3 Standards, Get 10% Off
— Buy 5 Standards, Get 20% Off

Not available for all standards. Contact your local Restek® representative for more details.

Phenols

Method 528 (Phenols)

- Reference materials for U.S. EPA Method 528.
- Fortification solution formulated based on MS sensitivity to each analyte.

Internal Standard Mix, EPA 528 (2 components)

3-Nitro-*o*-xylene (83-41-0) 1,000 µg/mL
2,3,4,5-Tetrachlorophenol (4901-51-3) 2,000

In methylene chloride, 1 mL/ampul
cat.# 31696 (ea.)

Phenol Calibration Mix, EPA 528 (12 components)

4-Chloro-3-methylphenol (59-50-7)
2-Chlorophenol (95-57-8)
2,4-Dichlorophenol (120-83-2)
2,4-Dimethylphenol (105-67-9)
4,6-Dinitro-2-methylphenol (Dinitro-*o*-cresol) (534-52-1)
2,4-Dinitrophenol (51-28-5)
2-Methylphenol (*o*-cresol) (95-48-7)
2-Nitrophenol (88-75-5)
4-Nitrophenol (100-02-7)
Pentachlorophenol (87-86-5)
Phenol (108-95-2)
2,4,6-Trichlorophenol (88-06-2)

2,000 µg/mL each in methylene chloride, 1 mL/ampul
cat.# 31694 (ea.)

Method 604 (Phenols)

604 Phenols Calibration Mix (11 components)

4-Chloro-3-methylphenol (59-50-7)
2-Chlorophenol (95-57-8)
2,4-Dichlorophenol (120-83-2)
2,4-Dimethylphenol (105-67-9)
4,6-Dinitro-2-methylphenol (Dinitro-*o*-cresol) (534-52-1)
2,4-Dinitrophenol (51-28-5)
2-Nitrophenol (88-75-5)
4-Nitrophenol (100-02-7)
Pentachlorophenol (87-86-5)
Phenol (108-95-2)
2,4,6-Trichlorophenol (88-06-2)

2,000 µg/mL each in methanol, 1 mL/ampul
cat.# 31029 (ea.)

Method 8040 (Phenols)

8040 Surrogate Mix (2 components)

2-Fluorophenol (367-12-4)
2,4,6-Tribromophenol (118-79-6)

2,000 µg/mL each in isopropanol, 1 mL/ampul
cat.# 31090 (ea.)

8040 Phenols Mix #1 (9 components)

4-Chloro-3-methylphenol (59-50-7)
2,4-Dichlorophenol (120-83-2)
4,6-Dinitro-2-methylphenol (Dinitro-*o*-cresol) (534-52-1)
3-Methylphenol (*m*-cresol) (108-39-4)
2-Nitrophenol (88-75-5)
4-Nitrophenol (100-02-7)
Pentachlorophenol (87-86-5)
Phenol (108-95-2)
2,4,6-Trichlorophenol (88-06-2)

2,000 µg/mL each in isopropanol, 1 mL/ampul
cat.# 31088 (ea.)

8040 Phenols Mix #2 (9 components)

sec-Butyl-4,6-dinitrophenol (dinoseb) (88-85-7)
2-Chlorophenol (95-57-8)
2,6-Dichlorophenol (87-65-0)
2,4-Dimethylphenol (105-67-9)
2,4-Dinitrophenol (51-28-5)
2-Methylphenol (*o*-cresol) (95-48-7)
4-Methylphenol (*p*-cresol) (106-44-5)
2,3,4,6-Tetrachlorophenol (58-90-2)
2,4,5-Trichlorophenol (95-95-4)

2,000 µg/mL each in isopropanol, 1 mL/ampul
cat.# 31089 (ea.)

Phthalates (Phthalate Esters)

Method 506 (Phthalate & Adipate Esters)

506 Calibration Mix (7 components)

Benzyl butyl phthalate (85-68-7)
Bis(2-ethylhexyl)adipate (103-23-1)
Bis(2-ethylhexyl)phthalate (117-81-7)
Di-*n*-butylphthalate (84-74-2)
Diethylphthalate (84-66-2)
Dimethylphthalate (131-11-3)
Di-*n*-octyl phthalate (117-84-0)

1,000 µg/mL in isooctane, 1 mL/ampul
cat.# 31845 (ea.)

Method 606 (Phthalate Esters)

606 Phthalate Esters Calibration Mix (6 components)

Bis(2-ethylhexyl)phthalate (117-81-7)
Benzyl butyl phthalate (85-68-7)
Di-*n*-butyl phthalate (84-74-2)
Diethylphthalate (84-66-2)
Dimethylphthalate (131-11-3)
Di-*n*-octyl phthalate (117-84-0)

2,000 µg/mL each in methanol, 1 mL/ampul
cat.# 31031 (ea.)

Method 8061A (Phthalate Esters)

Benzyl Benzoate (Internal Standard)

Benzyl benzoate (120-51-4)

5,000 µg/mL in hexane, 1 mL/ampul
cat.# 31847 (ea.)

EPA Method 8061A Phthalate Esters Mixture

(15 components)

Benzyl butyl phthalate (85-68-7)
Bis(2-*n*-butoxyethyl)phthalate (117-83-9)
Bis(2-ethoxyethyl)phthalate (605-54-9)
Bis(2-ethylhexyl)phthalate (117-81-7)
Bis(2-methoxyethyl)phthalate (117-82-8)
Bis(4-methyl-2-pentyl)phthalate (146-50-9)
Di-*n*-butylphthalate (84-74-2)
Diethylphthalate (84-66-2)
Di-*n*-hexyl phthalate (84-75-3)
Dimethylphthalate (131-11-3)
Di-nonyl phthalate (84-76-4)
Di-*n*-octyl phthalate (117-84-0)
Dipentylphthalate (131-18-0)
Phthalic acid dicyclohexyl ester (84-61-7)
Phthalic acid diisobutyl ester (84-69-5)

1,000 µg/mL each in hexane:acetone (80:20), 1 mL/ampul
cat.# 33227 (ea.)

Polybrominated Diphenyl Ethers (PBDEs)

See page 528.

Restek Offers a Full Line of Certified Reference Materials

See **pages 464–465**.

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Polychlorinated Biphenyls (PCBs)

PCB Aroclors

608 Complete Kit

Contains 1 mL 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

Contains 1 mL each of these mixtures.
cat.# 32060 (kit) kit

PCB Kit #1

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

cat.# 32089 (kit) kit

PCB Kit #2

200 µg/mL each in isooctane, 1 mL/ampul
32064: Aroclor 1016
32065: Aroclor 1221
32066: Aroclor 1232
32067: Aroclor 1242
32068: Aroclor 1248
32069: Aroclor 1254
32070: Aroclor 1260

cat.# 32090 (kit) kit

PCB Kit #3

1,000 µg/mL each in hexane, 1 mL/ampul
32007: Aroclor 1221
32008: Aroclor 1232
32009: Aroclor 1242
32010: Aroclor 1248
32011: Aroclor 1254
32039: Aroclor 1016/1260

cat.# 32400 (kit) kit

PCB Kit #4

200 µg/mL each in isooctane, 1 mL/ampul
32065: Aroclor 1221
32066: Aroclor 1232
32067: Aroclor 1242
32068: Aroclor 1248
32069: Aroclor 1254
32299: Aroclor 1016/1260

cat.# 32401 (kit) kit

Polychlorinated Biphenyls (PCBs), *cont.*

PCB Aroclors, *cont.*

Aroclor Solutions

Volume is 1 mL/ampul. Concentration is µg/mL unless otherwise noted.

Compound	CAS #	Solvent	Conc.	cat.#
Aroclor 1016	12674-11-2	H	1,000	32006
Aroclor 1016	12674-11-2	I	200	32064
Aroclor 1016	12674-11-2	TO	500 mg/kg	32076
Aroclor 1221	11104-28-2	H	1,000	32007
Aroclor 1221	11104-28-2	I	200	32065
Aroclor 1232	11141-16-5	H	1,000	32008
Aroclor 1232	11141-16-5	I	200	32066
Aroclor 1242	53469-21-9	H	1,000	32009
Aroclor 1242	53469-21-9	I	200	32067
Aroclor 1242	53469-21-9	TO	50 mg/kg	32081
Aroclor 1242	53469-21-9	TO	500 mg/kg	32082
Aroclor 1248	12672-29-6	H	1,000	32010
Aroclor 1248	12672-29-6	I	200	32068
Aroclor 1254	11097-69-1	H	1,000	32011
Aroclor 1254	11097-69-1	I	200	32069
Aroclor 1254	11097-69-1	TO	50 mg/kg	32085
Aroclor 1254	11097-69-1	TO	500 mg/kg	32086
Aroclor 1260	11096-82-5	H	1,000	32012
Aroclor 1260	11096-82-5	I	200	32070
Aroclor 1260	11096-82-5	TO	50 mg/kg	32087
Aroclor 1260	11096-82-5	TO	500 mg/kg	32088
Aroclor 1262	37324-23-5	H	1,000	32409
Aroclor 1268	11100-14-4	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 = isooctane; TO = transformer oil (PCB-free)

please note

We test our transformer oil solvent to ensure that it is PCB-free.

PCB Congeners

Method 525.2 (Semivolatile Organics)

Method 525.2 PCB Congener Mix (8 components)

2-Chlorobiphenyl (BZ #1) (2051-60-7)
2,3-Dichlorobiphenyl (BZ #5) (16605-91-7)
2,4,5-Trichlorobiphenyl (BZ #29) (15862-07-4)
2,2',4,4'-Tetrachlorobiphenyl (BZ #47) (2437-79-8)
2,2',3',4,6-Pentachlorobiphenyl (BZ #98) (60233-25-2)
2,2',4,4',5,6'-Hexachlorobiphenyl (BZ #154) (60145-22-4)
2,2',3,3',4,4',6-Heptachlorobiphenyl (BZ #171) (52663-71-5)
2,2',3,3',4,5',6,6'-Octachlorobiphenyl (BZ #200) (40186-71-8)

200 µg/mL each in acetone, 1 mL/ampul
cat.# 32420 (ea.)

PCB Congeners, *cont.*

Method 8082, 8082A (PCBs)

PCB Congener Mix, Method 8082A (19 components)

2-Chlorobiphenyl (BZ #1) (2051-60-7)
2,3-Dichlorobiphenyl (BZ #5) (16605-91-7)
2,2',5-Trichlorobiphenyl (BZ #18) (37680-65-2)
2,4',5-Trichlorobiphenyl (BZ #31) (16606-02-3)
2,2',3,5'-Tetrachlorobiphenyl (BZ #44) (41464-39-5)
2,2',5,5'-Tetrachlorobiphenyl (BZ #52) (35693-99-3)
2,3',4,4'-Tetrachlorobiphenyl (BZ #66) (32598-10-0)
2,2',3,4,5'-Pentachlorobiphenyl (BZ #87) (38380-02-8)
2,2',4,5,5'-Pentachlorobiphenyl (BZ #101) (37680-73-2)
2,3,3',4',6-Pentachlorobiphenyl (BZ #110) (38380-03-9)
2,2',3,4,4',5'-Hexachlorobiphenyl (BZ #138) (35065-28-2)
2,2',3,4,5,5'-Hexachlorobiphenyl (BZ #141) (52712-04-6)
2,2',3,5,5',6-Hexachlorobiphenyl (BZ #151) (52663-63-5)
2,2',4,4',5,5'-Hexachlorobiphenyl (BZ #153) (35065-27-1)
2,2',3,3',4,4',5-Heptachlorobiphenyl (BZ #170) (35065-30-6)
2,2',3,4,4',5,5'-Heptachlorobiphenyl (BZ #180) (35065-29-3)
2,2',3,4,4',5',6-Heptachlorobiphenyl (BZ #183) (52663-69-1)
2,2',3,4',5,5',6-Heptachlorobiphenyl (BZ #187) (52663-68-0)
2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (BZ #206) (40186-72-9)

100 µg/mL each in isooctane, 1 mL/ampul
cat.# 32416 (ea.)

Miscellaneous

PCB Congeners

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

Compound	CAS #	Solvent	Conc.	cat.#
decachlorobiphenyl (BZ #209)	2051-24-3	I	10	32289

I = isooctane

PCB Congener Standard #1 (6 components)

2,4,4'-Trichlorobiphenyl (BZ #28) (7012-37-5)
2,2',5,5'-Tetrachlorobiphenyl (BZ #52) (35693-99-3)
2,2',4,5,5'-Pentachlorobiphenyl (BZ #101) (37680-73-2)
2,2',3,4,4',5'-Hexachlorobiphenyl (BZ #138) (35065-28-2)
2,2',4,4',5,5'-Hexachlorobiphenyl (BZ #153) (35065-27-1)
2,2',3,4,4',5,5'-Heptachlorobiphenyl (BZ #180) (35065-29-3)

10 µg/mL each in isooctane, 1 mL/ampul
cat.# 32290 (ea.)

PCB Congener Standard #2 (7 components)

2,4,4'-Trichlorobiphenyl (BZ #28) (7012-37-5)
2,2',5,5'-Tetrachlorobiphenyl (BZ #52) (35693-99-3)
2,2',4,5,5'-Pentachlorobiphenyl (BZ #101) (37680-73-2)
2,3',4,4',5-Pentachlorobiphenyl (BZ #118) (31508-00-6)
2,2',3,4,4',5'-Hexachlorobiphenyl (BZ #138) (35065-28-2)
2,2',4,4',5,5'-Hexachlorobiphenyl (BZ #153) (35065-27-1)
2,2',3,4,4',5,5'-Heptachlorobiphenyl (BZ #180) (35065-29-3)

10 µg/mL each in isooctane, 1 mL/ampul
cat.# 32294 (ea.)

Polycyclic Aromatic Hydrocarbons (PAHs)

See pages 511–513.

Semivolatile Organics/Base, Neutral & Acid Extractables (BNAs)

Individual Semivolatile Surrogate and Internal Standards for EPA Methods

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

Compound	CAS #	Solvent	Conc.	cat.#
Anthracene-d10	1719-06-08	D	2,000	31037
Decafluorobiphenyl	434-90-2	D	2,000	31041
Decafluorobiphenyl	434-90-2	A	1,000	31855
4,4'-Dibromooctafluorobiphenyl	10386-84-2	D	2,000	31040
2-Fluorobiphenyl	321-60-8	D	2,000	31091
2-Fluorophenol	367-12-4	D	2,000	31047
Naphthalene-d8	1146-65-2	D	2,000	31043
N-Nitrosodimethylamine-d6	17829-05-9	D	1,000	33910
Pentafluorophenol	771-61-9	D	2,000	31048
Phenanthrene-d10	1517-22-2	D	2,000	31045
Phenol-d6	13127-88-3	D	2,000	31049
p-Terphenyl-d14	1718-51-0	D	1,000	31828
2,4,6-Tribromophenol	118-79-6	M	1,000	31401

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

SV Internal Standard Mix (6 components)

Acenaphthene-d10 (15067-26-2)
Chrysene-d12 (1719-03-5)
1,4-Dichlorobenzene-d4 (3855-82-1)
Naphthalene-d8 (1146-65-2)
Perylene-d12 (1520-96-3)
Phenanthrene-d10 (1517-22-2)

Each	15-pk.	25-pk.
2,000 µg/mL each in methylene chloride, 1 mL/ampul		
31206	31206.15	31206.25
4,000 µg/mL each in methylene chloride, 1 mL/ampul		
31006	31006.15	31006.25



Restek Offers a Full Line of Certified Reference Materials

See **pages 464–465** or visit www.restek.com/iso

Method 525, 525.1, 525.2 (Semivolatile Organics)

Method 525.2 Internal Standard Mix (3 components)

Acenaphthene-d10 (15067-26-2)
Chrysene-d12 (1719-03-5)
Phenanthrene-d10 (1517-22-2)

1,000 µg/mL each in acetone, 1 mL/ampul
cat.# 31825 (ea.)

Method 525.2 Surrogate Standard Mix (4 components)

2-Nitro-*m*-xylene (81-20-9)
Perylene-d12 (1520-96-3)
Pyrene-d10 (1718-52-1)
Triphenylphosphate (115-86-6)

1,000 µg/mL each in acetone, 1 mL/ampul
cat.# 31826 (ea.)

Method 525.2 Herbicide Mix (3 components)

Acetochlor (34256-82-1)
Alachlor (15972-60-8)
Metolachlor (51218-45-2)

100 µg/mL in methanol, 1 mL/ampul
cat.# 33211 (ea.)

Method 525.2 Semivolatile Mix (revised)

(28 components)

Acenaphthylene (208-96-8)
Anthracene (120-12-7)
Benz(a)anthracene (56-55-3)
Benzo(a)pyrene (50-32-8)
Benzo(b)fluoranthene (205-99-2)
Benzo(ghi)perylene (191-24-2)
Benzo(k)fluoranthene (207-08-9)
Benzyl butyl phthalate (85-68-7)
Bis(2-ethylhexyl)adipate (103-23-1)
Bis(2-ethylhexyl)phthalate (117-81-7)
Chrysene (218-01-9)
Dibenz(a,h)anthracene (53-70-3)
Diethylphthalate (84-66-2)
Dimethylphthalate (131-11-3)
Di-*n*-butylphthalate (84-74-2)
2,4-Dinitrotoluene (121-14-2)
2,6-Dinitrotoluene (606-20-2)
Di-*n*-octylphthalate (117-84-0)
Fluoranthene (206-44-0)
Fluorene (86-73-7)
Hexachlorobenzene (118-74-1)
Hexachlorocyclopentadiene (77-47-4)
Indeno(1,2,3-cd)pyrene (193-39-5)
Isophorone (78-59-1)
Naphthalene (91-20-3)
Pentachlorophenol (87-86-5)*
Phenanthrene (85-01-8)
Pyrene (129-00-0)

1,000 µg/mL each in acetone, 1 mL/ampul*
cat.# 31899 (ea.)

*pentachlorophenol at 4,000 µg/mL.

Method 525.2 PCB Congener Mix (8 components)

2-Chlorobiphenyl (BZ #1) (2051-60-7)
2,3-Dichlorobiphenyl (BZ #5) (16605-91-7)
2,4,5-Trichlorobiphenyl (BZ #29) (15862-07-4)
2,2',4,4'-Tetrachlorobiphenyl (BZ #47) (2437-79-8)
2,2',3',4,6-Pentachlorobiphenyl (BZ #98) (60233-25-2)
2,2',4,4',5,6'-Hexachlorobiphenyl (BZ #154) (60145-22-4)
2,2',3,3',4,4',6-Heptachlorobiphenyl (BZ #171) (52663-71-5)
2,2',3,3',4,5',6,6'-Octachlorobiphenyl (BZ #200) (40186-71-8)

200 µg/mL each in acetone, 1 mL/ampul
cat.# 32420 (ea.)

Semivolatile Organics/Base, Neutral & Acid Extractables (BNAs), *cont.*

Method 525, 525.1, 525.2 (Semivolatile Organics), *cont.*

Organochlorine Pesticide Mix AB # 3 (20 components)

Aldrin (309-00-2)
α-BHC (319-84-6)
β-BHC (319-85-7)
δ-BHC (319-86-8)
γ-BHC (Lindane) (58-89-9)
cis-Chlordane (5103-71-9)
trans-Chlordane (5103-74-2)
4,4'-DDD (72-54-8)
4,4'-DDE (72-55-9)
4,4'-DDT (50-29-3)
Dieldrin (60-57-1)
Endosulfan I (959-98-8)
Endosulfan II (33213-65-9)
Endosulfan sulfate (1031-07-8)
Endrin (72-20-8)
Endrin aldehyde (7421-93-4)
Endrin ketone (53494-70-5)
Heptachlor (76-44-8)
Heptachlor epoxide (isomer B) (1024-57-3)
Methoxychlor (72-43-5)

2,000 µg/mL each in hexane:toluene (1:1), 1 mL/ampul
cat.# 32415 (ea.)

Organophosphorus Pesticide Mix #1 (Rev), Method 525.2 (7 components)

Chlorpyrifos (2921-88-2)
Dichlorvos (DDVP) (62-73-7)
Disulfoton sulfone (2497-06-5)
Ethoprop (ethoprophos) (13194-48-4)
Methyl paraoxon (Parathion methyl-O-analog) (950-35-6)
Mevinphos (7786-34-7)
Stirofos (tetrachlorvinphos) (961-11-5)

500 µg/mL each in acetone, 1 mL/ampul
cat.# 33013 (ea.)

Organonitrogen Pesticide Mix #1 (Rev), Method 525.2 (37 components)

Alachlor (15972-60-8)
Ametryn (834-12-8)
Atraton (1610-17-9)
Atrazine (1912-24-9)
Bromacil (314-40-9)
Butachlor (23184-66-9)
Butylate (2008-41-5)
Chlorpropham (101-21-3)
Cyanazine (Bladex) (21725-46-2)
Cycloate (1134-23-2)
Diphenamid (957-51-7)
EPTC (759-94-4)
Etridiazole (2593-15-9)
Fenarimol (60168-88-9)
Fluridone (Sonar) (59756-60-4)
Hexazinone (Velpar) (51235-04-2)
Metolachlor (51218-45-2)
Metribuzin (21087-64-9)
MGK-264 (113-48-4)
Molinate (2212-67-1)
Napropamide (Devrinol) (15299-99-7)
Norflurazon (27314-13-2)
Pebulate (1114-71-2)
Prometon (1610-18-0)
Prometryne (7287-19-6)
Propachlor (1918-16-7)
Propazine (139-40-2)
Propyzamide (23950-58-5)
Simazine (122-34-9)
Simetryn (1014-70-6)
Tebuthiuron (34014-18-1)
Terbacil (5902-51-2)
Terbutryn (886-50-0)
Triadimefon (43121-43-3)
Tricyclazole (Beam) (41814-78-2)
Trifluralin (1582-09-8)
Vernolate (1929-77-7)

500 µg/mL each in acetone, 1 mL/ampul
cat.# 33012 (ea.)

Method 525.2 Nitrogen/Phosphorus Pesticide Mix #2 (6 components)

Carboxin (5234-68-4)
Diazinon (333-41-5)
Disulfoton (298-04-4)
Fenamiphos (22224-92-6)
Merphos (150-50-5)
Terbufos (13071-79-9)

1,000 µg/mL each in acetone, 1 mL/ampul
cat.# 32423 (ea.)

Organochlorine Pesticide Mix #2 (Rev), Method 525.2 (8 components)

Chlorobenzilate (510-15-6)
Chloroneb (2675-77-6)
Chlorothalonil (1897-45-6)
DCPA methyl ester (Chlorthal-dimethyl) (1861-32-1)
Heptachlor epoxide (isomer A) (28044-83-9)
trans-Nonachlor (39765-80-5)
cis-Permethrin (61949-76-6)
trans-Permethrin (61949-77-7)

500 µg/mL each in acetone, 1 mL/ampul
cat.# 33011 (ea.)

Method 525.2 Fortification Recovery Standard

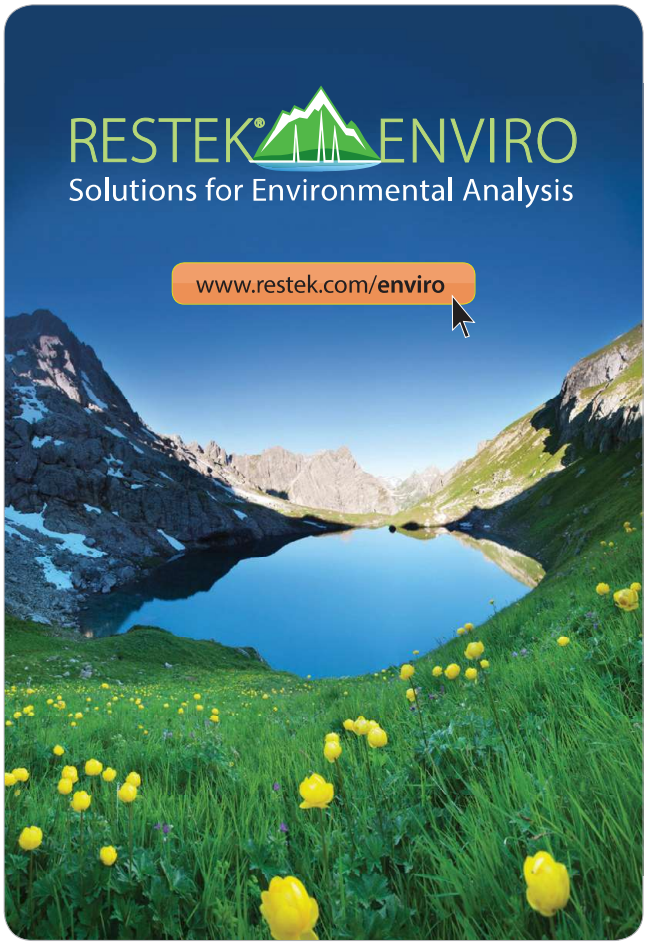
p-Terphenyl-d14 (1718-51-0)

1,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31828 (ea.)

Method 525.2 GC-MS Performance Check Mix (3 components)

4,4'-DDT (50-29-3)
DFTPP (decafluorotriphenylphosphine) (5074-71-5)
Endrin (72-20-8)

1,000 µg/mL each in acetone, 1 mL/ampul
cat.# 31827 (ea.)



Semivolatile Organics/Base, Neutral & Acid Extractables (BNAs), *cont.*

Method 625 (Semivolatiles)

Semivolatiles MegaMix® Standard, EPA Method 625 (54 components)

MEGAMIX®

Acenaphthene (83-32-9)
Acenaphthylene (208-96-8)
Anthracene (120-12-7)
Benz(a)anthracene (56-55-3)
Benzo(a)pyrene (50-32-8)
Benzo(b)fluoranthene (205-99-2)
Benzo(ghi)perylene (191-24-2)
Benzo(k)fluoranthene (207-08-9)
Benzyl butyl phthalate (85-68-7)
Bis(2-chloroethoxy)methane (111-91-1)
Bis(2-chloroethyl)ether (111-44-4)
Bis(2-ethylhexyl)phthalate (117-81-7)
4-Bromophenyl phenyl ether (101-55-3)
4-Chloro-3-methylphenol (59-50-7)
2-Chloronaphthalene (91-58-7)
2-Chlorophenol (95-57-8)
4-Chlorophenyl phenyl ether (7005-72-3)
Chrysene (218-01-9)
Dibenz(a,h)anthracene (53-70-3)
1,2-Dichlorobenzene (95-50-1)
1,3-Dichlorobenzene (541-73-1)
1,4-Dichlorobenzene (106-46-7)
2,4-Dichlorophenol (120-83-2)
Diethylphthalate (84-66-2)
2,4-Dimethylphenol (105-67-9)
Dimethylphthalate (131-11-3)
Di-*n*-butylphthalate (84-74-2)
4,6-Dinitro-2-methylphenol (Dinitro-*o*-cresol) (534-52-1)
2,4-Dinitrophenol (51-28-5)
2,4-Dinitrotoluene (121-14-2)
2,6-Dinitrotoluene (606-20-2)
Di-*n*-octylphthalate (117-84-0)
Diphenylamine (122-39-4)*
Fluoranthene (206-44-0)
Fluorene (86-73-7)
Hexachlorobenzene (118-74-1)
Hexachloro-1,3-butadiene (87-68-3)
Hexachlorocyclopentadiene (77-47-4)*
Hexachloroethane (67-72-1)
Indeno(1,2,3-cd)pyrene (193-39-5)
Isophorone (78-59-1)
Naphthalene (91-20-3)
Nitrobenzene (98-95-3)
2-Nitrophenol (88-75-5)
4-Nitrophenol (100-02-7)
N-Nitrosodimethylamine (62-75-9)*
N-Nitroso-di-*n*-propylamine (621-64-7)
2,2'-Oxybis(1-chloropropane) (108-60-1)
Pentachlorophenol (87-86-5)
Phenanthrene (85-01-8)
Phenol (108-95-2)
Pyrene (129-00-0)
1,2,4-Trichlorobenzene (120-82-1)
2,4,6-Trichlorophenol (88-06-2)

1,000 µg/mL each in methylene chloride, 1 mL/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 537); β-BHC, δ-BHC, endosulfan I, endosulfan II, endrin are in cat.# 32291 (page 524) and cat.# 32415 (page 537).

Method 625 (Semivolatiles), *cont.*

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 523.

Contains 1 mL 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

TCLP

TCLP B/N Mix (7 components)

1,4-Dichlorobenzene (106-46-7)
2,4-Dinitrotoluene (121-14-2)
Hexachlorobenzene (118-74-1)
Hexachlorobutadiene (87-68-3)
Hexachloroethane (67-72-1)
Nitrobenzene (98-95-3)
Pyridine (110-86-1)

2,000 µg/mL each in acetone, 1 mL/ampul
cat.# 31028 (ea.)

Method 3500 (Organic Extraction Surrogates)

High-Concentration Surrogates and Matrix Spike Mixtures for SW-846

- Highest concentrations commercially available—reduces cost per sample extract.
- Convenient 1 mL and 5 mL packaging.

See Method 8270, pages 535–538.

also available

Rxi®-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 32–33** for more information.



Semivolatile Organics/Base, Neutral & Acid Extractables (BNAs), *cont.*

Method 8270C, 8270D (Semivolatile Organic Compounds)

SV Internal Standard Mix (6 components)

- High purity for consistent results.
- Free quality assurance data package available online.
- Highest concentrations commercially available.

Acenaphthene-d10 (15067-26-2)
Chrysene-d12 (1719-03-5)
1,4-Dichlorobenzene-d4 (3855-82-1)
Naphthalene-d8 (1146-65-2)
Perylene-d12 (1520-96-3)
Phenanthrene-d10 (1517-22-2)

Each	15-pk.	25-pk.
2,000 µg/mL each in methylene chloride, 1 mL/ampul		
31206	31206.15	31206.25
4,000 µg/mL each in methylene chloride, 1 mL/ampul		
31006	31006.15	31006.25

Revised SV Internal Standard Mix (7 components)

Acenaphthene-d10 (15067-26-2)
Chrysene-d12 (1719-03-5)
1,4-Dichlorobenzene-d4 (3855-82-1)
1,4-Dioxane-d8 (17647-74-4)
Naphthalene-d8 (1146-65-2)
Perylene-d12 (1520-96-3)
Phenanthrene-d10 (1517-22-2)

Each	15-pk.	25-pk.
2,000 µg/mL each in methylene chloride, 1 mL/ampul		
31885	31885.15	31885.25
4,000 µg/mL each in methylene chloride, 1 mL/ampul		
31886	—	—

B/N Surrogate Mix (4/89 SOW) (3 components)

- High purity for consistent results.
- Free quality assurance data package available online.
- Highest concentrations commercially available.
- Convenient 1 mL, 5 mL, and 10 mL package sizes reduce cost per sample extract.

2-Fluorobiphenyl (321-60-8)
Nitrobenzene-d5 (4165-60-0)
p-Terphenyl-d14 (1718-51-0)

Each	15-pk.	25-pk.
1,000 µg/mL each in methylene chloride, 1 mL/ampul		
31024	31024.15	31024.25
5,000 µg/mL each in methylene chloride, 1 mL/ampul		
31062	31062.15	—
5,000 µg/mL each in methylene chloride, 5 mL/ampul		
31086	—	—
5,000 µg/mL each in methylene chloride, 10 mL/ampul		
33028	—	33028.25

Revised B/N Surrogate Mix (4 components)

2-Fluorobiphenyl (321-60-8)
Nitrobenzene-d5 (4165-60-0)
p-Terphenyl-d14 (1718-51-0)
Pyrene-d10 (1718-52-1)

Each	15-pk.
1,000 µg/mL each in methylene chloride, 1 mL/ampul	
31887	31887.15
5,000 µg/mL each in methylene chloride, 1 mL/ampul	
31888	31888.15
5,000 µg/mL each in methylene chloride, 5 mL/ampul	
31889	—

Acid Surrogate Mix (4/89 SOW) (3 components)

- Highest concentrations commercially available.
- Convenient 1 mL, 5 mL, and 10 mL package sizes.
- Reduces laboratory cost per sample extract.

2-Fluorophenol (367-12-4)
Phenol-d6 (13127-88-3)
2,4,6-Tribromophenol (118-79-6)

Each	15-pk.	25-pk.
2,000 µg/mL each in methanol, 1 mL/ampul		
31025	31025.15	31025.25
10,000 µg/mL each in methanol, 1 mL/ampul		
31063	31063.15	—
10,000 µg/mL each in methanol, 5 mL/ampul		
31087	—	—
10,000 µg/mL each in methanol, 10 mL/ampul		
33029	—	33029.25

B/N Matrix Spike Mix (6 components)

- Highest concentrations commercially available.
- Convenient 1 mL, 5 mL, and 10 mL package sizes.
- Reduces laboratory cost per sample extract.

Acenaphthene (83-32-9)
1,4-Dichlorobenzene (106-46-7)
2,4-Dinitrotoluene (121-14-2)
N-Nitroso-di-*n*-propylamine (621-64-7)
Pyrene (129-00-0)
1,2,4-Trichlorobenzene (120-82-1)

Each	15-pk.
1,000 µg/mL each in methanol, 1 mL/ampul	
31004	31004.15
5,000 µg/mL each in methanol, 1 mL/ampul	
31074	—
5,000 µg/mL each in methanol, 5 mL/ampul	
31084	—

Acid Matrix Spike Mix (5 components)

- Highest concentrations commercially available.
- Convenient 1 mL, 5 mL, and 10 mL package sizes.
- Reduces laboratory cost per sample extract.

4-Chloro-3-methylphenol (59-50-7)
2-Chlorophenol (95-57-8)
4-Nitrophenol (100-02-7)
Pentachlorophenol (87-86-5)
Phenol (108-95-2)

Each	15-pk.
2,000 µg/mL each in methanol, 1 mL/ampul	
31014	31014.15
10,000 µg/mL each in methanol, 1 mL/ampul	
31061	31061.15
10,000 µg/mL each in methanol, 5 mL/ampul	
31071	—

Semivolatile Organics/Base, Neutral & Acid Extractables (BNAs), *cont.*

Method 8270C, 8270D (Semivolatile Organic Compounds), *cont.*

GC-MS Tuning Mixture (4 components)

Benzidine (92-87-5)
4,4'-DDT (50-29-3)
Decafluorotriphenylphosphine (DFTPP) (5074-71-5)
Pentachlorophenol (87-86-5)

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

SV Tuning Compound

Decafluorotriphenylphosphine (DFTPP) (5074-71-5)

2,500 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31001 (ea.)

PFTBA (MS Tuning Compound)

Perfluorotributylamine (PFTBA) (311-89-7)

Neat, 1 mL/ampul
cat.# 30482 (ea.)

No data pack available.

8270 B/N Calibration Check Mix (7 components)

Acenaphthene (83-32-9)
Benzo(a)pyrene (50-32-8)
1,4-Dichlorobenzene (106-46-7)
Di-*n*-octyl phthalate (117-84-0)
Diphenylamine (122-39-4)
Fluoranthene (206-44-0)
Hexachlorobutadiene (87-68-3)

2,000 µg/mL each in methylene chloride, 1 mL/ampul
cat.# 31616 (ea.)

8270 Acid Calibration Check Mix (6 components)

4-Chloro-3-methylphenol (59-50-7)
2,4-Dichlorophenol (120-83-2)
2-Nitrophenol (88-75-5)
Pentachlorophenol (87-86-5)
Phenol (108-95-2)
2,4,6-Trichlorophenol (88-06-2)

2,000 µg/mL each in methylene chloride, 1 mL/ampul
cat.# 31617 (ea.)

SV System Performance Check Mix (SPCC) (4 components)

2,4-Dinitrophenol (51-28-5)
Hexachlorocyclopentadiene (77-47-4)
4-Nitrophenol (100-02-7)
N-Nitroso-di-*n*-propylamine (621-64-7)

2,000 µg/mL each in methylene chloride, 1 mL/ampul
cat.# 31689 (ea.)

8270 MegaMix® Standard (76 components)

MEGAMIX®

- Fewest mixtures needed for calibration and matrix spikes.
- Mixtures formulated for maximum stability.
- Contains most routinely analyzed compounds.

Acenaphthene (83-32-9)
Acenaphthylene (208-96-8)
Aniline (62-53-3)
Anthracene (120-12-7)
Azobenzene (103-33-3)[1]
Benz(a)anthracene (56-55-3)
Benzo(a)pyrene (50-32-8)
Benzo(b)fluoranthene (205-99-2)
Benzo(ghi)perylene (191-24-2)
Benzo(k)fluoranthene (207-08-9)
Benzyl alcohol (100-51-6)
Benzyl butyl phthalate (85-68-7)
Bis(2-chloroethoxy)methane (111-91-1)
Bis(2-chloroethyl)ether (111-44-4)
Bis(2-ethylhexyl)adipate (103-23-1)
Bis(2-ethylhexyl)phthalate (117-81-7)
4-Bromophenyl phenyl ether (101-55-3)
Carbazole (86-74-8)
4-Chloroaniline (106-47-8)
4-Chloro-3-methylphenol (59-50-7)
2-Chloronaphthalene (91-58-7)
2-Chlorophenol (95-57-8)
4-Chlorophenyl phenyl ether (7005-72-3)
Chrysene (218-01-9)
Dibenz(a,h)anthracene (53-70-3)
Dibenzofuran (132-64-9)
1,2-Dichlorobenzene (95-50-1)
1,3-Dichlorobenzene (541-73-1)
1,4-Dichlorobenzene (106-46-7)
2,4-Dichlorophenol (120-83-2)
Diethylphthalate (84-66-2)
2,4-Dimethylphenol (105-67-9)
Dimethylphthalate (131-11-3)
Di-*n*-butyl phthalate (84-74-2)
1,2-Dinitrobenzene (528-29-0)
1,3-Dinitrobenzene (99-65-0)
1,4-Dinitrobenzene (100-25-4)
4,6-Dinitro-2-methylphenol (Dinitro-*o*-cresol) (534-52-1)
2,4-Dinitrophenol (51-28-5)
2,4-Dinitrotoluene (121-14-2)
2,6-Dinitrotoluene (606-20-2)
Di-*n*-octyl phthalate (117-84-0)
Diphenylamine (122-39-4)[2]
Fluoranthene (206-44-0)
Fluorene (86-73-7)
Hexachlorobenzene (118-74-1)
Hexachlorobutadiene (87-68-3)
Hexachlorocyclopentadiene (77-47-4)
Hexachloroethane (67-72-1)
Indeno(1,2,3-cd)pyrene (193-39-5)
Isophorone (78-59-1)
1-Methylnaphthalene (90-12-0)
2-Methylnaphthalene (91-57-6)
2-Methylphenol (*o*-cresol) (95-48-7)
3-Methylphenol (*m*-cresol) (108-39-4)*
4-Methylphenol (*p*-cresol) (106-44-5)*
Naphthalene (91-20-3)
2-Nitroaniline (88-74-4)
3-Nitroaniline (99-09-2)
4-Nitroaniline (100-01-6)
Nitrobenzene (98-95-3)
2-Nitrophenol (88-75-5)
4-Nitrophenol (100-02-7)
N-Nitrosodimethylamine (62-75-9)
N-Nitroso-di-*n*-propylamine (621-64-7)
2,2'-Oxybis(1-chloropropane) (108-60-1)
Pentachlorophenol (87-86-5)
Phenanthrene (85-01-8)
Phenol (108-95-2)
Pyrene (129-00-0)
Pyridine (110-86-1)
2,3,4,6-Tetrachlorophenol (58-90-2)
2,3,5,6-Tetrachlorophenol (935-95-5)
1,2,4-Trichlorobenzene (120-82-1)
2,4,5-Trichlorophenol (95-95-4)
2,4,6-Trichlorophenol (88-06-2)

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

*3-methylphenol and 4-methylphenol concentration is 500 µg/mL.

[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)

MEGAMIX®

Same as 8270 MegaMix® standard list above.

Each	15-pk.
200 µg/mL each in methanol:methylene chloride (80:20), 5 mL/ampul*	
31687	31687.15
200 µg/mL each in methanol:methylene chloride (80:20), 10 mL/ampul*	
33073	—

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

EASIER calibration

8270 MegaMix® standard and 8270 matrix spike mix include 3-methylphenol and 4-methylphenol at 1/2 x concentration of other components.

also available

Rxi®-5Sil MS Columns

Provide high response for 2,4-dinitrophenol, show excellent peak shape of pyridine, and produce outstanding resolution of PAHs.

See **page 75.**



Semivolatile Organics/Base, Neutral & Acid Extractables (BNAs), *cont.*

Method 8270C, 8270D (Semivolatile Organic Compounds), *cont.*

605 Benzidines Calibration Mix (2 components)

Benzidine (92-87-5)
3,3'-Dichlorobenzidine (91-94-1)

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

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

8270 Benzidines Mix (3 components)

Benzidine (92-87-5)
3,3'-Dichlorobenzidine (91-94-1)
3,3'-Dimethylbenzidine (*o*-tolidine) (119-93-7)

2,000 µg/mL each in methanol, 1 mL/ampul
cat.# 31688 (ea.)

2,000 µg/mL each in methylene chloride, 1 mL/ampul
cat.# 31852 (ea.)

8270/Appendix IX Kit

Contains 1 mL each of these mixtures.
31850: 8270 MegaMix Standard
31834: 605 Benzidines Calibration Mix
32459: Appendix IX Mix #1, Revised (Methapyrilene is not included in this revised standard.)
32460: Methapyrilene Standard
31806: Appendix IX Mix #2

cat.# 31815 (kit) kit

Appendix IX Mix #1, Revised (17 components)

2-Acetylaminofluorene (53-96-3)
4-Aminobiphenyl (92-67-1)
p-Dimethylaminoazobenzene (60-11-7)
3,3'-Dimethylbenzidine (*o*-tolidine) (119-93-7)
α,α-Dimethylphenethylamine (phentermine) (122-09-8)
1-Naphthylamine (1-aminonaphthalene) (134-32-7)
2-Naphthylamine (2-aminonaphthalene) (91-59-8)
N-Nitrosodibutylamine (924-16-3)
N-Nitrosodiethylamine (55-18-5)
N-Nitrosomethylethylamine (10595-95-6)
N-Nitrosomorpholine (59-89-2)
N-Nitrosopiperidine (100-75-4)
N-Nitrosopyrrolidine (930-55-2)
5-Nitro-*o*-toluidine (99-55-8)
1,4-Phenylenediamine (106-50-3)
2-Picoline (109-06-8)
o-Toluidine (95-53-4)

2,000 µg/mL each in methylene chloride, 1 mL/ampul
cat.# 32459 (ea.)

Appendix IX Mix #2 (32 components)

Acetophenone (98-86-2)
Aramite (140-57-8)
Atrazine (1912-24-9)
Benzaldehyde (100-52-7)
Biphenyl (92-52-4)
ε-Caprolactam (105-60-2)
Chlorobenzilate (510-15-6)
1-Chloronaphthalene (90-13-1)
Diallate (2303-16-4)
Dibenz(a,j)acridine (224-42-0)
2,6-Dichlorophenol (87-65-0)
7,12-Dimethylbenz(a)anthracene (57-97-6)
1,4-Dioxane (123-91-1)
Diphenyl ether (101-84-8)
Ethyl methacrylate (97-63-2)
Ethyl methanesulfonate (62-50-0)
Hexachloropropene (1888-71-7)
Isodrin (465-73-6)
Isosafrole (*cis* & *trans*) (120-58-1)
Kepone (143-50-0)
3-Methylcholanthrene (56-49-5)
Methyl methanesulfonate (66-27-3)
1,4-Naphthoquinone (130-15-4)
4-Nitroquinoline-N-oxide (56-57-5)
Pentachlorobenzene (608-93-5)
Pentachloroethane (76-01-7)
Pentachloronitrobenzene (quintozene) (82-68-8)
Phenacetin (62-44-2)
Propyzamide (23950-58-5)
Safrole (94-59-7)
1,2,4,5-Tetrachlorobenzene (95-94-3)
1,3,5-Trinitrobenzene (99-35-4)

1,000 µg/mL each in methylene chloride, 1 mL/ampul
cat.# 31806 (ea.)

Methapyrilene Standard

Methapyrilene hydrochloride (135-23-9)

2,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 32460 (ea.)

Organophosphorus Pesticide Mix, 8270/Appendix IX (9 components)

Dimethoate (60-51-5)
Disulfoton (298-04-4)
Famphur (52-85-7)
Methyl parathion (298-00-0)
O,O,O-Triethyl phosphorothioate (126-68-1)
Parathion (ethyl parathion) (56-38-2)
Phorate (298-02-2)
Sulfotepp (3689-24-5)
Zinophos (thionazine) (297-97-2)

2,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 32419 (ea.)

Organochlorine Pesticide Mix AB # 3 (20 components)

Aldrin (309-00-2)
α-BHC (319-84-6)
β-BHC (319-85-7)
δ-BHC (319-86-8)
γ-BHC (Lindane) (58-89-9)
cis-Chlordane (5103-71-9)
trans-Chlordane (5103-74-2)
4,4'-DDD (72-54-8)
4,4'-DDE (72-55-9)
4,4'-DDT (50-29-3)
Dieldrin (60-57-1)
Endosulfan I (959-98-8)
Endosulfan II (33213-65-9)
Endosulfan sulfate (1031-07-8)
Endrin (72-20-8)
Endrin aldehyde (7421-93-4)
Endrin ketone (53494-70-5)
Heptachlor (76-44-8)
Heptachlor epoxide (isomer B) (1024-57-3)
Methoxychlor (72-43-5)

2,000 µg/mL each in hexane:toluene (1:1), 1 mL/ampul
cat.# 32415 (ea.)

8270 Calibration Mix #1 (19 components)

Benzoic acid (65-85-0)
4-Chloro-3-methylphenol (59-50-7)
2-Chlorophenol (95-57-8)
2,4-Dichlorophenol (120-83-2)
2,6-Dichlorophenol (87-65-0)
2,4-Dimethylphenol (105-67-9)
4,6-Dinitro-2-methylphenol (Dinitro-*o*-cresol) (534-52-1)
2,4-Dinitrophenol (51-28-5)
Dinoseb (88-85-7)
2-Methylphenol (*o*-cresol) (95-48-7)
3-Methylphenol (*m*-cresol) (108-39-4)
4-Methylphenol (*p*-cresol) (106-44-5)
2-Nitrophenol (88-75-5)
4-Nitrophenol (100-02-7)
Pentachlorophenol (87-86-5)
Phenol (108-95-2)
2,3,4,6-Tetrachlorophenol (58-90-2)
2,4,5-Trichlorophenol (95-95-4)
2,4,6-Trichlorophenol (88-06-2)

2,000 µg/mL each in methylene chloride, 1 mL/ampul
cat.# 31618 (ea.)

8270 Calibration Mix #2 (11 components)

Aniline (62-53-3)
Benzidine (92-87-5)
4-Chloroaniline (106-47-8)
3,3'-Dichlorobenzidine (91-94-1)
Diphenylamine (122-39-4)*
2-Nitroaniline (88-74-4)
3-Nitroaniline (99-09-2)
4-Nitroaniline (100-01-6)
N-Nitrosodimethylamine (62-75-9)
N-Nitrosodi-*n*-propylamine (621-64-7)
Pyridine (110-86-1)

2,000 µg/mL each in methylene chloride:methanol (85:15), 1 mL/ampul
cat.# 31619 (ea.)

*N-nitrosodiphenylamine (8270-listed analyte) decomposes to diphenylamine (mix component) in the injector.

Semivolatile Organics/Base, Neutral & Acid Extractables (BNAs), *cont.*

Method 8270C, 8270D (Semivolatile Organic Compounds), *cont.*

8270 Calibration Mix #3 (23 components)

Aramite (140-57-8)
Bis(2-chloroethyl)ether (111-44-4)
Bis(2-chloroethoxy)methane (111-91-1)
4-Bromophenyl phenyl ether (101-55-3)
Chlorobenzilate (510-15-6)
2-Chloronaphthalene (91-58-7)
4-Chlorophenyl phenyl ether (7005-72-3)
1,2-Dichlorobenzene (95-50-1)
1,3-Dichlorobenzene (541-73-1)
1,4-Dichlorobenzene (106-46-7)
1,3-Dinitrobenzene (99-65-0)
Hexachlorobenzene (118-74-1)
Hexachlorobutadiene (87-68-3)
Hexachlorocyclopentadiene (77-47-4)
Hexachloroethane (67-72-1)
Hexachloropropene (1888-71-7)
Isodrin (465-73-6)
Kepone (143-50-0)
2,2'-Oxybis(1-chloropropane) (108-60-1)
Pentachlorobenzene (608-93-5)
Pentachloronitrobenzene (quintozene) (82-68-8)
1,2,4,5-Tetrachlorobenzene (95-94-3)
1,2,4-Trichlorobenzene (120-82-1)

2,000 µg/mL each in methylene chloride, 1 mL/ampul
cat.# 31620 (ea.)

8270 Calibration Mix #4 (22 components)

Acetophenone (98-86-2)
Azobenzene (103-33-3)*
Benzyl alcohol (100-51-6)
Bis(2-ethylhexyl)phthalate (117-81-7)
Benzyl butyl phthalate (85-68-7)
Dibenzofuran (132-64-9)
Diethylphthalate (84-66-2)
Dimethylphthalate (131-11-3)
Di-*n*-butyl phthalate (84-74-2)
Di-*n*-octyl phthalate (117-84-0)
2,4-Dinitrotoluene (121-14-2)
2,6-Dinitrotoluene (606-20-2)
Ethyl methanesulfonate (62-50-0)
Isophorone (78-59-1)
Isosafrole (*cis* & *trans*) (120-58-1)
Methyl methanesulfonate (66-27-3)
1,4-Naphthoquinone (130-15-4)
Nitrobenzene (98-95-3)
4-Nitroquinoline-N-oxide (56-57-5)
Phenacetin (62-44-2)
Safrole (94-59-7)
1,3,5-Trinitrobenzene (99-35-4)

2,000 µg/mL each in methylene chloride, 1 mL/ampul
cat.# 31621 (ea.)

*1,2-diphenylhydrazine (8270-listed analyte) decomposes to azobenzene (mix component) in the injector.

3-Methylcholanthrene Standard

3-Methylcholanthrene (56-49-5)

2,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31996 (ea.)

8270 Calibration Mix #5, Revised (18 components)

Acenaphthene (83-32-9)
Acenaphthylene (208-96-8)
Anthracene (120-12-7)
Benz(a)anthracene (56-55-3)
Benzo(a)pyrene (50-32-8)
Benzo(b)fluoranthene (205-99-2)
Benzo(ghi)perylene (191-24-2)
Benzo(k)fluoranthene (207-08-9)
Chrysene (218-01-9)
Dibenz(a,h)anthracene (53-70-3)
Fluoranthene (206-44-0)
Fluorene (86-73-7)
Indeno(1,2,3-cd)pyrene (193-39-5)
1-Methylnaphthalene (90-12-0)
2-Methylnaphthalene (91-57-6)
Naphthalene (91-20-3)
Phenanthrene (85-01-8)
Pyrene (129-00-0)

2,000 µg/mL each in methylene chloride, 1 mL/ampul
cat.# 31995 (ea.)

8270 Calibration Mix #6 (10 components)

Diallate (*cis* & *trans*) (2303-16-4)
Dimethoate (60-51-5)
Disulfoton (298-04-4)
Famphur (52-85-7)
Methyl parathion (298-00-0)
Parathion (ethyl parathion) (56-38-2)
Phorate (298-02-2)
Propyzamide (23950-58-5)
O,O,O-Triethyl phosphorothioate (126-68-1)
Zinophos (Thionazine) (297-97-2)

2,000 µg/mL each in methylene chloride, 1 mL/ampul
cat.# 31623 (ea.)

Aramite

Aramite (140-57-8)

2,000 µg/mL in hexane, 1 mL/ampul
cat.# 31624 (ea.)

1,2-Diphenylhydrazine

1,2-Diphenylhydrazine (122-66-7)

1,000 µg/mL in methanol, 1 mL/ampul
cat.# 31497 (ea.)

No data pack available.

Note that 1,2-diphenylhydrazine is an unstable compound that will oxidize to azobenzene, thereby decreasing the concentration of 1,2-diphenylhydrazine over time. For accurate calibration results, it is recommended that the concentrations of 1,2-diphenylhydrazine and azobenzene be combined. Please contact Restek® Technical Service if you have any questions about this issue.

TCLP Acid Mix (6 components)

2-Methylphenol (*o*-cresol) (95-48-7)
3-Methylphenol (*m*-cresol) (108-39-4)
4-Methylphenol (*p*-cresol) (106-44-5)
Pentachlorophenol (87-86-5)
2,4,5-Trichlorophenol (95-95-4)
2,4,6-Trichlorophenol (88-06-2)

2,000 µg/mL each in methanol, 1 mL/ampul
cat.# 31027 (ea.)

TCLP B/N Mix (7 components)

1,4-Dichlorobenzene (106-46-7)
2,4-Dinitrotoluene (121-14-2)
Hexachlorobenzene (118-74-1)
Hexachlorobutadiene (87-68-3)
Hexachloroethane (67-72-1)
Nitrobenzene (98-95-3)
Pyridine (110-86-1)

2,000 µg/mL each in acetone, 1 mL/ampul
cat.# 31028 (ea.)

8270/Appendix IX Calibration Kit (2,000 µg/mL)

Contains 1 mL each of these mixtures.
31618: 8270 Calibration Mix #1
31619: 8270 Calibration Mix #2
31620: 8270 Calibration Mix #3
31621: 8270 Calibration Mix #4
31995: 8270 Calibration Mix #5, Revised
31996: 3-Methylcholanthrene Standard
31623: 8270 Calibration Mix #6
32459: Appendix IX Mix #1, Revised (Methapyrilene is not included in this revised standard.)
32460: Methapyrilene Standard

cat.# 31627 (kit) kit

8270 Calibration Kit (2,000 µg/mL)

Contains 1 mL each of these mixtures.
31618: 8270 Calibration Mix #1
31619: 8270 Calibration Mix #2
31620: 8270 Calibration Mix #3
31621: 8270 Calibration Mix #4
31995: 8270 Calibration Mix #5, Revised
31996: 3-Methylcholanthrene Standard

cat.# 31626 (kit) kit

Semivolatile Organics/Base, Neutral & Acid Extractables (BNAs), *cont.*

SOM01.1 (Semivolatiles), QA Mixes

SOM01.1 Deuterated Monitoring Compound Mix SIM Compounds (2 components)

Fluoranthene-d10 (93951-69-0)
2-Methylnaphthalene-d10 (7297-45-2)

2,000 µg/mL each in methylene chloride, 1 mL/ampul
cat.# 33913 (ea.)

04.2, 04.1, 4/89, and 3/90 SOW (Semivolatiles), QA Mixes

SV Internal Standard Mix (6 components)

Acenaphthene-d10 (15067-26-2)
Chrysene-d12 (1719-03-5)
1,4-Dichlorobenzene-d4 (3855-82-1)
Naphthalene-d8 (1146-65-2)
Perylene-d12 (1520-96-3)
Phenanthrene-d10 (1517-22-2)

Each	15-pk.	25-pk.
2,000 µg/mL each in methylene chloride, 1 mL/ampul		
31206	31206.15	31206.25
4,000 µg/mL each in methylene chloride, 1 mL/ampul		
31006	31006.15	31006.25

Revised SV Internal Standard Mix (7 components)

Acenaphthene-d10 (15067-26-2)
Chrysene-d12 (1719-03-5)
1,4-Dichlorobenzene-d4 (3855-82-1)
1,4-Dioxane-d8 (17647-74-4)
Naphthalene-d8 (1146-65-2)
Perylene-d12 (1520-96-3)
Phenanthrene-d10 (1517-22-2)

Each	15-pk.	25-pk.
2,000 µg/mL each in methylene chloride, 1 mL/ampul		
31885	31885.15	31885.25
4,000 µg/mL each in methylene chloride, 1 mL/ampul		
31886	—	—

Acid Surrogate Standard Mix (3/90 SOW) (4 components)

2-Chlorophenol-d4 (93951-73-6)
2-Fluorophenol (367-12-4)
Phenol-d6 (13127-88-3)
2,4,6-Tribromophenol (118-79-6)

1,500 µg/mL each in methanol, 1 mL/ampul
cat.# 31003 (ea.)
7,500 µg/mL each in methanol, 1 mL/ampul
cat.# 31073 (ea.)
7,500 µg/mL each in methanol, 5 mL/ampul
cat.# 31083 (ea.)

Acid Surrogate Mix (4/89 SOW) (3 components)

2-Fluorophenol (367-12-4)
Phenol-d6 (13127-88-3)
2,4,6-Tribromophenol (118-79-6)

Each	15-pk.	25-pk.
2,000 µg/mL each in methanol, 1 mL/ampul		
31025	31025.15	31025.25
10,000 µg/mL each in methanol, 1 mL/ampul		
31063	31063.15	—
10,000 µg/mL each in methanol, 5 mL/ampul		
31087	—	—
10,000 µg/mL each in methanol, 10 mL/ampul		
33029	—	33029.25

04.2, 04.1, 4/89, and 3/90 SOW (Semivolatiles), QA Mixes, *cont.*

Revised B/N Surrogate Mix (4 components)

2-Fluorobiphenyl (321-60-8)
Nitrobenzene-d5 (4165-60-0)
p-Terphenyl-d14 (1718-51-0)
Pyrene-d10 (1718-52-1)

Each	15-pk.
1,000 µg/mL each in methylene chloride, 1 mL/ampul	
31887	31887.15
5,000 µg/mL each in methylene chloride, 1 mL/ampul	
31888	31888.15
5,000 µg/mL each in methylene chloride, 5 mL/ampul	
31889	—

CLP 04.1 BNA Surrogate Mix (8 components)

2-Chlorophenol-d4 (93951-73-6)	1,500 µg/mL	Nitrobenzene-d5 (4165-60-0)	1,000
1,2-Dichlorobenzene-d4 (2199-69-1)	1,000	Phenol-d6 (13127-88-3)	1,500
2-Fluorobiphenyl (321-60-8)	1,000	*p*-Terphenyl-d14 (1718-51-0)	1,000
2-Fluorophenol (367-12-4)	1,500	2,4,6-Tribromophenol (118-79-6)	1,500

In methylene chloride, 1 mL/ampul
cat.# 31493 (ea.)

B/N Surrogate Standard Mix (3/90 SOW) (4 components)

1,2-Dichlorobenzene-d4 (2199-69-1)
2-Fluorobiphenyl (321-60-8)
Nitrobenzene-d5 (4165-60-0)
p-Terphenyl-d14 (1718-51-0)

1,000 µg/mL each in methylene chloride, 1 mL/ampul
cat.# 31002 (ea.)
5,000 µg/mL each in methylene chloride, 1 mL/ampul
cat.# 31072 (ea.)
5,000 µg/mL each in methylene chloride, 5 mL/ampul
cat.# 31082 (ea.)

B/N Surrogate Mix (4/89 SOW) (3 components)

2-Fluorobiphenyl (321-60-8)
Nitrobenzene-d5 (4165-60-0)
p-Terphenyl-d14 (1718-51-0)

Each	15-pk.	25-pk.
1,000 µg/mL each in methylene chloride, 1 mL/ampul		
31024	31024.15	31024.25
5,000 µg/mL each in methylene chloride, 1 mL/ampul		
31062	31062.15	—
5,000 µg/mL each in methylene chloride, 5 mL/ampul		
31086	—	—
5,000 µg/mL each in methylene chloride, 10 mL/ampul		
33028	—	33028.25

Acid Matrix Spike Mix (5 components)

4-Chloro-3-methylphenol (59-50-7)
2-Chlorophenol (95-57-8)
4-Nitrophenol (100-02-7)
Pentachlorophenol (87-86-5)
Phenol (108-95-2)

1,500 µg/mL each in methanol, 1 mL/ampul
cat.# 31005 (ea.)
7,500 µg/mL each in methanol, 1 mL/ampul
cat.# 31075 (ea.)
7,500 µg/mL each in methanol, 5 mL/ampul
cat.# 31085 (ea.)

Semivolatile Organics/Base, Neutral & Acid Extractables (BNAs), *cont.*

04.2, 04.1, 4/89, and 3/90 SOW (Semivolatiles), QA Mixes, *cont.*

CLP 04.1 B/N Matrix Spike Mix (4 components)

Acenaphthene (83-32-9)
2,4-Dinitrotoluene (121-14-2)
N-Nitroso-di-*n*-propylamine (621-64-7)
Pyrene (129-00-0)

1,000 µg/mL each in methanol, 1 mL/ampul
cat.# 31492 (ea.)

B/N Matrix Spike Mix (6 components)

Acenaphthene (83-32-9)
1,4-Dichlorobenzene (106-46-7)
2,4-Dinitrotoluene (121-14-2)
N-Nitroso-di-*n*-propylamine (621-64-7)
Pyrene (129-00-0)
1,2,4-Trichlorobenzene (120-82-1)

Each	15-pk.
1,000 µg/mL each in methanol, 1 mL/ampul	
31004	31004.15
5,000 µg/mL each in methanol, 1 mL/ampul	
31074	—
5,000 µg/mL each in methanol, 5 mL/ampul	
31084	—

Low-Concentration Semivolatiles, QA Mixes

SV Tuning Compound

Decafluorotriphenylphosphine (DFTPP) (5074-71-5)

2,500 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31001 (ea.)

PFTBA (MS Tuning Compound)

Perfluorotributylamine (PFTBA) (311-89-7)

Neat, 1 mL/ampul
cat.# 30482 (ea.)

No data pack available.



We maintain an active inventory of more than 1,500 different CRMs. If it's in our catalog, your next standard is likely in stock and waiting for your order.



What separates Restek's line of certified reference materials from ordinary reference standards?

10 Critical Steps...

www.restek.com/10steps

Semivolatile Organics/Base, Neutral & Acid Extractables (BNAs), *cont.*

SOM01.1 (Semivolatiles), Calibration Mixes

SOM01.1 SVOA MegaMix® Standard, Revised (65 components)

MEGAMIX®

Acenaphthene (83-32-9)
Acenaphthylene (208-96-8)
Acetophenone (98-86-2)
Anthracene (120-12-7)
Benz(a)anthracene (56-55-3)
Benzo(a)pyrene (50-32-8)
Benzo(b)fluoranthene (205-99-2)
Benzo(ghi)perylene (191-24-2)
Benzo(k)fluoranthene (207-08-9)
Benzyl butyl phthalate (85-68-7)
Biphenyl (92-52-4)
Bis(2-chloroethoxy)methane (111-91-1)
Bis(2-chloroethyl)ether (111-44-4)
Bis(2-ethylhexyl)phthalate (117-81-7)
4-Bromophenyl-phenylether (101-55-3)
Carbazole (86-74-8)
4-Chloroaniline (106-47-8)
4-Chloro-3-methylphenol (59-50-7)
2-Chloronaphthalene (91-58-7)
2-Chlorophenol (95-57-8)
4-Chlorophenyl-phenylether (7005-72-3)
Chrysene (218-01-9)
Dibenz(a,h)anthracene (53-70-3)
Dibenzofuran (132-64-9)
3,3'-Dichlorobenzidine (91-94-1)
2,4-Dichlorophenol (120-83-2)
Diethylphthalate (84-66-2)
2,4-Dimethylphenol (105-67-9)
Dimethylphthalate (131-11-3)
Di-*n*-butylphthalate (84-74-2)
4,6-Dinitro-2-methylphenol (Dinitro-*o*-cresol) (534-52-1)
2,4-Dinitrophenol (51-28-5)
2,4-Dinitrotoluene (121-14-2)
2,6-Dinitrotoluene (606-20-2)
Di-*n*-octyl phthalate (117-84-0)
Diphenylamine (122-39-4)[1]
Fluoranthene (206-44-0)
Fluorene (86-73-7)
Hexachlorobenzene (118-74-1)
Hexachloro-1,3-butadiene (hexachlorobutadiene) (87-68-3)
Hexachlorocyclopentadiene (77-47-4)
Hexachloroethane (67-72-1)
Indeno(1,2,3-cd)pyrene (193-39-5)
Isophorone (78-59-1)
2-Methylnaphthalene (91-57-6)
2-Methylphenol (*o*-cresol) (95-48-7)
3-Methylphenol (*m*-cresol) (108-39-4)*
4-Methylphenol (*p*-cresol) (106-44-5)*
Naphthalene (91-20-3)
2-Nitroaniline (88-74-4)
3-Nitroaniline (99-09-2)
4-Nitroaniline (100-01-6)
Nitrobenzene (98-95-3)
2-Nitrophenol (88-75-5)
4-Nitrophenol (100-02-7)
N-Nitroso-di-*n*-propylamine (621-64-7)
2,2'-Oxybis(1-chloropropane) (108-60-1)
Pentachlorophenol (87-86-5)
Phenanthrene (85-01-8)
Phenol (108-95-2)
Pyrene (129-00-0)
1,2,4,5-Tetrachlorobenzene (95-94-3)
2,3,4,6-Tetrachlorophenol (58-90-2)
2,4,5-Trichlorophenol (95-95-4)
2,4,6-Trichlorophenol (88-06-2)

1,000 µg/mL each in methylene chloride, 1 mL/ampul
cat.# 31900 (ea.)

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

CLP/SVOA Additions Mix (3 components)

Atrazine (1912-24-9)
Benzaldehyde (100-52-7)
ε-Caprolactam (105-60-2)

1,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31902 (ea.)

SOM01.1 SVOA MegaMix® Kit

MEGAMIX®

Contains 1 mL each of these mixtures.
31900: SOM01.1 SVOA MegaMix Standard, Revised
31902: CLP/SVOA Additions Mix

cat.# 31904 (kit) kit

also available

Rxi®-5Sil MS Capillary Columns
Ideal for semivolatiles analysis
See **pages 32–33** for details.



04.2 and 04.1 (Semivolatiles), Calibration Mixes

CLP 04.1 B/N MegaMix® Standard, Revision 2 (47 components)

MEGAMIX®

Acenaphthene (83-32-9)
Acenaphthylene (208-96-8)
Acetophenone (98-86-2)
Anthracene (120-12-7)
Benz(a)anthracene (56-55-3)
Benzo(a)pyrene (50-32-8)
Benzo(b)fluoranthene (205-99-2)
Benzo(ghi)perylene (191-24-2)
Benzo(k)fluoranthene (207-08-9)
Benzyl butyl phthalate (85-68-7)
Biphenyl (92-52-4)
Bis(2-chloroethoxy)methane (111-91-1)
Bis(2-chloroethyl)ether (111-44-4)
Bis(2-ethylhexyl)phthalate (117-81-7)
4-Bromophenyl phenyl ether (101-55-3)
Carbazole (86-74-8)
4-Chloroaniline (106-47-8)
2-Chloronaphthalene (91-58-7)
4-Chlorophenyl phenyl ether (7005-72-3)
Chrysene (218-01-9)
Dibenz(a,h)anthracene (53-70-3)
Dibenzofuran (132-64-9)
Diethylphthalate (84-66-2)
Dimethylphthalate (131-11-3)
Di-*n*-butyl phthalate (84-74-2)
2,4-Dinitrotoluene (121-14-2)
2,6-Dinitrotoluene (606-20-2)
Di-*n*-octyl phthalate (117-84-0)
Diphenylamine (122-39-4)[1]
Fluoranthene (206-44-0)
Fluorene (86-73-7)
Hexachlorobenzene (118-74-1)
Hexachloro-1,3-butadiene (hexachlorobutadiene) (87-68-3)
Hexachlorocyclopentadiene (77-47-4)
Hexachloroethane (67-72-1)
Indeno(1,2,3-cd)pyrene (193-39-5)
Isophorone (78-59-1)
2-Methylnaphthalene (91-57-6)
Naphthalene (91-20-3)
2-Nitroaniline (88-74-4)
3-Nitroaniline (99-09-2)
4-Nitroaniline (100-01-6)
Nitrobenzene (98-95-3)
N-Nitroso-di-*n*-propylamine (621-64-7)
2,2'-Oxybis(1-chloropropane) (108-60-1)
Phenanthrene (85-01-8)
Pyrene (129-00-0)

1,000 µg/mL each in methylene chloride, 1 mL/ampul
cat.# 31903 (ea.)

[1] N-nitrosodiphenylamine (CLP-listed analyte) decomposes to diphenylamine (mix component) in the injector.

CLP/SVOA Additions Mix (3 components)

Atrazine (1912-24-9)
Benzaldehyde (100-52-7)
ε-Caprolactam (105-60-2)

1,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31902 (ea.)

CLP 04.1 B/N MegaMix® Kit

MEGAMIX®

Contains 1 mL each of these mixtures.
31903: CLP 04.1 B/N MegaMix Standard, Revision 2
31902: CLP/SVOA Additions Mix

cat.# 31905 (kit) kit

tech tip

CLP Semivolatiles Dilution Tip

Atrazine and benzaldehyde react quickly with the methanol stabilizer used in most brands and grades of methylene chloride. This reaction will prevent you from obtaining stable, working-level calibration standards. We prepare our CLP semivolatiles standards from methylene chloride that is stabilized with amylene and is completely free of methanol. We strongly recommend screening the methylene chloride used to dilute these mixtures and confirming that it is free of methanol.

Semivolatile Organics/Base, Neutral & Acid Extractables (BNAs), *cont.*

04.2 and 04.1 (Semivolatiles), Calibration Mixes, *cont.*

CLP 04.1 Phenols Calibration Mix (14 components)

4-Chloro-3-methylphenol (59-50-7)
2-Chlorophenol (95-57-8)
2,4-Dichlorophenol (120-83-2)
2,4-Dimethylphenol (105-67-9)
4,6-Dinitro-2-methylphenol (Dinitro-*o*-cresol) (534-52-1)
2,4-Dinitrophenol (51-28-5)
2-Methylphenol (*o*-cresol) (95-48-7)
4-Methylphenol (*p*-cresol) (106-44-5)
2-Nitrophenol (88-75-5)
4-Nitrophenol (100-02-7)
Pentachlorophenol (87-86-5)
Phenol (108-95-2)
2,4,5-Trichlorophenol (95-95-4)
2,4,6-Trichlorophenol (88-06-2)

2,000 µg/mL each in methylene chloride, 1 mL/ampul
cat.# 31494 (ea.)

Benzidine Mix (2 components)

Benzidine (92-87-5)
3,3'-Dichlorobenzidine (91-94-1)

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

4/89 and 3/90 SOW (Semivolatiles), Calibration Mixes

SV Calibration Mix #1 (5 components)

Benzyl alcohol (100-51-6)
4-Chloroaniline (106-47-8)
2-Nitroaniline (88-74-4)
3-Nitroaniline (99-09-2)
4-Nitroaniline (100-01-6)

2,000 µg/mL each in methylene chloride, 1 mL/ampul
cat.# 31007 (ea.)

SV Calibration Mix #2 (15 components)

Benzoic acid (65-85-0)
4-Chloro-3-methylphenol (59-50-7)
2-Chlorophenol (95-57-8)
2,4-Dichlorophenol (120-83-2)
2,4-Dimethylphenol (105-67-9)
4,6-Dinitro-2-methylphenol (Dinitro-*o*-cresol) (534-52-1)
2,4-Dinitrophenol (51-28-5)
2-Methylphenol (*o*-cresol) (95-48-7)
4-Methylphenol (*p*-cresol) (106-44-5)
2-Nitrophenol (88-75-5)
4-Nitrophenol (100-02-7)
Pentachlorophenol (87-86-5)
Phenol (108-95-2)
2,4,5-Trichlorophenol (95-95-4)
2,4,6-Trichlorophenol (88-06-2)

2,000 µg/mL each in methylene chloride, 1 mL/ampul
cat.# 31008 (ea.)

SV Calibration Mix #3 (14 components)

Bis(2-chloroethoxy)methane (111-91-1)
Bis(2-chloroethyl)ether (111-44-4)
Bis(2-ethylhexyl)phthalate (117-81-7)
4-Bromophenyl phenyl ether (101-55-3)
Benzyl butyl phthalate (85-68-7)
2-Chloronaphthalene (91-58-7)
4-Chlorophenyl phenyl ether (7005-72-3)
Dimethylphthalate (131-11-3)
Di-*n*-butylphthalate (84-74-2)
Di-*n*-octylphthalate (117-84-0)
N-Nitrosodimethylamine (62-75-9)
N-Nitroso-di-*n*-propylamine (621-64-7)
N-Nitrosodiphenylamine (86-30-6)
2,2'-Oxybis(1-chloropropane) (108-60-1)

2,000 µg/mL each in methylene chloride, 1 mL/ampul
cat.# 31009 (ea.)

4/89 and 3/90 SOW (Semivolatiles), Calibration Mixes, *cont.*

SV Calibration Mix #4 (13 components)

Carbazole (86-74-8)
Dibenzofuran (132-64-9)
Diethyl phthalate (84-66-2)
2,4-Dinitrotoluene (121-14-2)
2,6-Dinitrotoluene (606-20-2)
Hexachlorobenzene (118-74-1)
Hexachlorobutadiene (87-68-3)
Hexachlorocyclopentadiene (77-47-4)
Hexachloroethane (67-72-1)
Isophorone (78-59-1)
2-Methylnaphthalene (91-57-6)
Nitrobenzene (98-95-3)
1,2,4-Trichlorobenzene (120-82-1)

2,000 µg/mL each in methylene chloride, 1 mL/ampul
cat.# 31010 (ea.)

SV Calibration Mix #5 / 610 PAH Mix (16 components)

Acenaphthene (83-32-9)
Acenaphthylene (208-96-8)
Anthracene (120-12-7)
Benz(a)anthracene (56-55-3)
Benzo(a)pyrene (50-32-8)
Benzo(b)fluoranthene (205-99-2)
Benzo(k)fluoranthene (207-08-9)
Benzo(ghi)perylene (191-24-2)
Chrysene (218-01-9)
Dibenz(a,h)anthracene (53-70-3)
Fluoranthene (206-44-0)
Fluorene (86-73-7)
Indeno(1,2,3-cd)pyrene (193-39-5)
Naphthalene (91-20-3)
Phenanthrene (85-01-8)
Pyrene (129-00-0)

2,000 µg/mL each in methylene chloride, 1 mL/ampul
cat.# 31011 (ea.)

SV Calibration Mix #6 (18 components)

Aldrin (309-00-2)
α-BHC (319-84-6)
β-BHC (319-85-7)
δ-BHC (319-86-8)
γ-BHC (Lindane) (58-89-9)
4,4'-DDD (72-54-8)
4,4'-DDE (72-55-9)
4,4'-DDT (50-29-3)
Dieldrin (60-57-1)
Endosulfan I (959-98-8)
Endosulfan II (33213-65-9)
Endosulfan sulfate (1031-07-8)
Endrin (72-20-8)
Endrin aldehyde (7421-93-4)
Endrin ketone (53494-70-5)
Heptachlor (76-44-8)
Heptachlor epoxide (isomer B) (1024-57-3)
Methoxychlor (72-43-5)

2,000 µg/mL each in toluene:hexane (1:1), 1 mL/ampul
cat.# 31012 (ea.)

SV Calibration Mix #7 (3 components)

1,2-Dichlorobenzene (95-50-1)
1,3-Dichlorobenzene (541-73-1)
1,4-Dichlorobenzene (106-46-7)

2,000 µg/mL each in methylene chloride, 1 mL/ampul
cat.# 31013 (ea.)

3,3'-Dichlorobenzidine

3,3'-Dichlorobenzidine (91-94-1)

2,000 µg/mL in methanol, 1 mL/ampul
cat.# 31026 (ea.)

2,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31835 (ea.)

605 Benzidines Calibration Mix (2 components)

Benzidine (92-87-5)
3,3'-Dichlorobenzidine (91-94-1)

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

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

Semivolatile Organics/Base, Neutral & Acid Extractables (BNAs), *cont.*

4/89 and 3/90 SOW (Semivolatiles), Calibration Mixes, *cont.*

8270 Benzidines Mix (3 components)

Benzidine (92-87-5)
3,3'-Dichlorobenzidine (91-94-1)
3,3'-Dimethylbenzidine (*o*-tolidine) (119-93-7)

2,000 µg/mL each in methanol, 1 mL/ampul
cat.# 31688 (ea.)

2,000 µg/mL each in methylene chloride, 1 mL/ampul
cat.# 31852 (ea.)

CLP Semivolatile Calibration Kit #2 (without pesticides)

Contains 1 mL each of these mixtures.
31007: SV Calibration Mix #1 (anilines)
31008: SV Calibration Mix #2 (phenols)
31009: SV Calibration Mix #3 (base neutrals)
31010: SV Calibration Mix #4 (base neutrals)
31011: SV Calibration Mix #5 (PAHs)
31013: SV Calibration Mix #7 (dichlorobenzenes)
31026: 3,3'-dichlorobenzidine

cat.# 31462 (kit) kit

Semivolatile Calibration Kit #3 (with benzidine)

Contains 1 mL each of these mixtures.
31007: SV Calibration Mix #1 (anilines)
31008: SV Calibration Mix #2 (phenols)
31009: SV Calibration Mix #3 (base neutrals)
31010: SV Calibration Mix #4 (base neutrals)
31011: SV Calibration Mix #5 (PAHs)
31013: SV Calibration Mix #7 (dichlorobenzenes)
31030: 605 Benzidines Calibration Mix (benzidine & 3,3'-dichlorobenzidine)

cat.# 31463 (kit) kit

03.2 (Semivolatiles), Calibration Mixes

OLC 03.2 SVOA Deuterated Monitoring Compounds (DMC) (16 components)

Acenaphthylene-d8 (93951-97-4)
Anthracene-d10 (1719-06-8)
Benzo(a)pyrene-d12 (63466-71-7)
Bis-(2-chloroethyl)ether-d8 (93952-02-4)
4-Chloroaniline-d4 (191656-33-4)
2-Chlorophenol-d4 (93951-73-6)
2,4-Dichlorophenol-d3 (93951-74-7)
Dimethylphthalate-d6 (85448-30-2)
4,6-Dinitro-2-methylphenol-d2 (93951-76-9)
Fluorene-d10 (81103-79-9)
4-Methylphenol-d8 (190780-66-6)
Nitrobenzene-d5 (4165-60-0)
2-Nitrophenol-d4 (93951-78-1)
4-Nitrophenol-d4 (93951-79-2)
Phenol-d5 (4165-62-2)
Pyrene-d10 (1718-52-1)

2,000 µg/mL each in methylene chloride, 1 mL/ampul
cat.# 31810 (ea.)

N-Nitrosodimethylamine-d6

N-Nitrosodimethylamine-d6 (17829-05-9)

1,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 33910 (ea.)

03.2 (Semivolatiles), Calibration Mixes, *cont.*

Fortification Mix (7 components)

4,6-Dinitro-2-methylphenol (Dinitro-*o*-cresol) (534-52-1)
2,4-Dinitrophenol (51-28-5)
2-Nitroaniline (88-74-4)
3-Nitroaniline (99-09-2)
4-Nitroaniline (100-01-6)
4-Nitrophenol (100-02-7)
2,4,5-Trichlorophenol (95-95-4)

2,000 µg/mL each in methylene chloride, 1 mL/ampul
cat.# 31813 (ea.)

3,3'-Dichlorobenzidine

3,3'-Dichlorobenzidine (91-94-1)

2,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31835 (ea.)

Hexachlorophene

Hexachlorophene (70-30-4)

2,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31811 (ea.)

Low-Concentration Semivolatiles, Calibration Mixes

L/C Phenol Mix A (6 components)

4,6-Dinitro-2-methylphenol (Dinitro-*o*-cresol) (534-52-1)
2,4-Dinitrophenol (51-28-5)
4-Nitrophenol (100-02-7)
Pentachlorophenol (87-86-5)
2,4,6-Tribromophenol (SS) (118-79-6)
2,4,5-Trichlorophenol (95-95-4)

2,000 µg/mL each in methylene chloride, 1 mL/ampul
cat.# 31208 (ea.)

Must be calibrated at a level different from the other listed semivolatile compounds.

L/C Aniline Mix A (3 components)

2-Nitroaniline (88-74-4)
3-Nitroaniline (99-09-2)
4-Nitroaniline (100-01-6)

2,000 µg/mL each in methylene chloride, 1 mL/ampul
cat.# 31210 (ea.)

Must be calibrated at a level different from the other listed semivolatile compounds.

L/C Aniline Mix B

4-Chloroaniline (106-47-8)

2,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31211 (ea.)

Additional Required Low-Concentration Semivolatile Mixes:

31024:	B/N Surrogate Mix (4/89 SOW)	page 535
31009:	SV Calibration Mix #3	page 542
31010:	SV Calibration Mix #4	page 542
31011:	SV Calibration Mix #5	page 542
31026:	3,3'-dichlorobenzidine	page 542
31001:	SV Tuning Compound (DFTPP)	page 536

Note: Pesticides are not included in the EPA CLP semivolatile analytical method.

Semivolatile Organics/Base, Neutral & Acid Extractables (BNAs), *cont.*

GPC Calibration Mix

Qualitative mixture useful for determining GPC dump/collect times. The compounds are dissolved in methylene chloride at the concentrations listed.

CLP GPC Calibration Mix (5 components)

Bis(2-ethylhexyl) phthalate (117-81-7)	10 mg/mL
Corn oil (8001-30-7)	250
Methoxychlor (72-43-5)	2.0
Perylene (198-55-0)	0.2
Sulfur (7704-34-9)	0.8

In methylene chloride, 1 mL/ampul
cat.# 32019 (ea.)

In methylene chloride, 5 mL/ampul
cat.# 32023 (ea.)

No data pack available.

Revised GPC Calibration Mix (5 components)

Bis(2-ethylhexyl) phthalate (117-81-7)	5 mg/mL
Corn oil (8001-30-7)	250
Methoxychlor (72-43-5)	1.0
Perylene (198-55-0)	0.2
Sulfur (7704-34-9)	0.8

In methylene chloride, 1 mL/ampul
cat.# 32041 (ea.)

In methylene chloride, 5 mL/ampul
cat.# 32042 (ea.)

No data pack available.

did you know?

Our **Pesticide Matrix Spike Mix** (cat.# 32018, **page 525**) can be used as a GPC calibration verification solution.

Compound Index for Reference Standards

See **pages 586–592.**



Toxicity Characteristic Leaching Procedure (TCLP)

Method 1311 (Toxicity Characteristic Leaching Procedure [TCLP])

TCLP VOA Mix (11 components)

Benzene (71-43-2)
2-Butanone (MEK) (78-93-3)
Carbon tetrachloride (56-23-5)
Chlorobenzene (108-90-7)
Chloroform (67-66-3)
1,4-Dichlorobenzene (106-46-7)
1,2-Dichloroethane (107-06-2)
1,1-Dichloroethene (75-35-4)
Tetrachloroethene (127-18-4)
Trichloroethene (79-01-6)
Vinyl chloride (75-01-4)

2,000 µg/mL each in P&T methanol:water (90:10), 1 mL/ampul
cat.# 30024 (ea.)

TCLP Acid Mix (6 components)

2-Methylphenol (*o*-cresol) (95-48-7)
3-Methylphenol (*m*-cresol) (108-39-4)
4-Methylphenol (*p*-cresol) (106-44-5)
Pentachlorophenol (87-86-5)
2,4,5-Trichlorophenol (95-95-4)
2,4,6-Trichlorophenol (88-06-2)

2,000 µg/mL each in methanol, 1 mL/ampul
cat.# 31027 (ea.)

TCLP B/N Mix (7 components)

1,4-Dichlorobenzene (106-46-7)
2,4-Dinitrotoluene (121-14-2)
Hexachlorobenzene (118-74-1)
Hexachlorobutadiene (87-68-3)
Hexachloroethane (67-72-1)
Nitrobenzene (98-95-3)
Pyridine (110-86-1)

2,000 µg/mL each in acetone, 1 mL/ampul
cat.# 31028 (ea.)

TCLP Pesticide Mix (5 components)

γ-BHC (Lindane) (58-89-9)
Endrin (72-20-8)
Heptachlor (76-44-8)
Heptachlor epoxide (isomer B) (1024-57-3)
Methoxychlor (72-43-5)

2,000 µg/mL each in methanol, 1 mL/ampul
cat.# 32013 (ea.)

TCLP Herbicide Mix (2 components)

2,4-D (free acid) (94-75-7)
2,4,5-TP (Silvex) (free acid) (93-72-1)

2,000 µg/mL each in methanol, 1 mL/ampul
cat.# 32014 (ea.)

TCLP Toxaphene Mix

Toxaphene (8001-35-2)

2,000 µg/mL in methanol, 1 mL/ampul
cat.# 32015 (ea.)

TCLP Chlordane Mix

Chlordane (57-74-9)

2,000 µg/mL in methanol, 1 mL/ampul
cat.# 32016 (ea.)

Trihalomethanes

Method 501.1, 501.2, 501.3 (Trihalomethanes)

501 Trihalomethane Mix (4 components)

Bromodichloromethane (75-27-4)
Bromoform (75-25-2)
Chloroform (67-66-3)
Dibromochloromethane (124-48-1)

200 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30036 (ea.)

2,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30211 (ea.)

DW-VOC Mix #1 (8 components)

Benzene (71-43-2)
Carbon tetrachloride (56-23-5)
1,4-Dichlorobenzene (106-46-7)
1,2-Dichloroethane (107-06-2)
1,1-Dichloroethene (75-35-4)
1,1,1-Trichloroethane (71-55-6)
Trichloroethene (79-01-6)
Vinyl chloride (75-01-4)

2,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30219 (ea.)

DW-VOC Mix #2 (12 components)

Chlorobenzene (108-90-7)
1,2-Dichlorobenzene (95-50-1)
cis-1,2-Dichloroethene (156-59-2)
trans-1,2-Dichloroethene (156-60-5)
1,2-Dichloropropane (78-87-5)
Ethylbenzene (100-41-4)
Styrene (100-42-5)
Tetrachloroethene (127-18-4)
Toluene (108-88-3)
m-Xylene (108-38-3)
o-Xylene (95-47-6)
p-Xylene (106-42-3)

2,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30220 (ea.)

DW-VOC Mix #3 (3 components)

Methylene chloride (dichloromethane) (75-09-2)
1,2,4-Trichlorobenzene (120-82-1)
1,1,2-Trichloroethane (79-00-5)

2,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30235 (ea.)

DW-VOC Kit #2 (2,000 µg/mL)

Contains 1 mL each of these mixtures.
30211: 501 Trihalomethane Mix
30219: DW-VOC Mix #1
30220: DW-VOC Mix #2
30235: DW-VOC Mix #3
Contains 1 mL each of these mixtures.
cat.# 30221 (kit) kit

Reference Standards Documentation Search

Locate SDSs, certificates, & data packs by cat. # or lot #

www.restek.com/**documentation**



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Volatile Organics

Individual VOA Surrogate and Internal Standards for EPA Methods

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

Compound	CAS #	Solvent	Conc.	cat.#
Benzene-d6	1076-43-3	PTM	2,000	30025
2-Bromochlorobenzene	694-80-4	PTM	2,000	30228
4-Bromochlorobenzene	106-39-8	PTM	2,000	30230
Bromochloromethane	74-97-5	PTM	2,000	30225
2-Bromo-1-chloropropane	3017-95-6	PTM	2,000	30226
1-Bromo-4-fluorobenzene (BFB)	460-00-4	PTM	2,000	30026
Chlorobenzene-d5	3114-55-4	PTM	2,000	30223
1-Chloro-2-fluorobenzene	348-51-6	PTM	2,000	30040
1,2-Dichlorobenzene-d4	2199-69-1	PTM	2,000	30049
1,4-Dichlorobutane	110-56-5	PTM	2,000	30227
1,2-Dichloroethane-d4	17060-07-0	PTM	2,000	30027
1,4-Difluorobenzene	540-36-3	PTM	2,000	30032
Ethylbenzene-d5	20302-26-5	PTM	2,000	30028
Ethylbenzene-d10	25837-05-2	PTM	2,000	30029
Fluorobenzene	462-06-6	PTM	2,000	30030
Pentafluorobenzene	363-72-4	PTM	2,000	30031
Toluene-d8	2037-26-5	PTM	2,000	30224
α,α,α-Trifluorotoluene	98-08-8	PTM	2,000	30048

PTM = Purge-and-trap grade methanol

Method 501.1, 501.2, 501.3 (Trihalomethanes)

See page 545.

Antifoam Agent for Purge-and-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. To use properly, see the instructions on the product certificate or on the product page (search "31822" at www.restek.com).

Neat, 1 mL/ampul

cat.# 31822 (ea.)

No data pack available.

Quantity Discounts Available

— Buy 3 Standards, Get 10% Off

— Buy 5 Standards, Get 20% Off

Not available for all standards. Contact your local Restek® representative for more details.

Method 502.1, 502.2 (Volatile Halogenated Organics)

502.2 Internal Standard #1

1-Chloro-2-fluorobenzene (348-51-6)

2,000 µg/mL in P&T methanol, 1 mL/ampul

cat.# 30040 (ea.)

502.2 Internal Standard Mix #2 (2 components)

2-Bromo-1-chloropropane (3017-95-6)
Fluorobenzene (462-06-6)

2,000 µg/mL each in P&T methanol, 1 mL/ampul

cat.# 30041 (ea.)

8021/502.2 Surrogate Mix #1 (3 components)

1-Bromo-2-chloroethane (107-04-0)
1-Chloro-3-fluorobenzene (625-98-9)
Fluorobenzene (462-06-6)

2,000 µg/mL each in P&T methanol, 1 mL/ampul

cat.# 30463 (ea.)

Volatiles MegaMix® Standard With Gases

MEGAMIX®

(60 components)

Benzene (71-43-2)
Bromobenzene (108-86-1)
Bromochloromethane (74-97-5)
Bromodichloromethane (75-27-4)
Bromoform (75-25-2)
Bromomethane (methyl bromide) (74-83-9)
n-Butylbenzene (104-51-8)
sec-Butylbenzene (135-98-8)
tert-Butylbenzene (98-06-6)
Carbon tetrachloride (56-23-5)
Chlorobenzene (108-90-7)
Chloroethane (ethyl chloride) (75-00-3)
Chloroform (67-66-3)
Chloromethane (methyl chloride) (74-87-3)
2-Chlorotoluene (95-49-8)
4-Chlorotoluene (106-43-4)
Dibromochloromethane (124-48-1)
1,2-Dibromo-3-chloropropane (DBCP) (96-12-8)
1,2-Dibromoethane (EDB) (106-93-4)
Dibromomethane (74-95-3)
1,2-Dichlorobenzene (95-50-1)
1,3-Dichlorobenzene (541-73-1)
1,4-Dichlorobenzene (106-46-7)
Dichlorodifluoromethane (CFC-12) (75-71-8)
1,1-Dichloroethane (75-34-3)
1,2-Dichloroethane (107-06-2)
1,1-Dichloroethene (75-35-4)
cis-1,2-Dichloroethene (156-59-2)
trans-1,2-Dichloroethene (156-60-5)
1,2-Dichloropropane (78-87-5)
1,3-Dichloropropane (142-28-9)
2,2-Dichloropropane (594-20-7)
1,1-Dichloropropene (563-58-6)
cis-1,3-Dichloropropene (10061-01-5)
trans-1,3-Dichloropropene (10061-02-6)
Ethylbenzene (100-41-4)
Hexachloro-1,3-butadiene (hexachlorobutadiene) (87-68-3)
Isopropylbenzene (cumene) (98-82-8)
4-Isopropyltoluene (*p*-Cymene) (99-87-6)
Methylene chloride (dichloromethane) (75-09-2)
Naphthalene (91-20-3)
n-Propylbenzene (103-65-1)
Styrene (100-42-5)
1,1,1,2-Tetrachloroethane (630-20-6)
1,1,2,2-Tetrachloroethane (79-34-5)
Tetrachloroethene (127-18-4)
Toluene (108-88-3)
1,2,3-Trichlorobenzene (87-61-6)
1,2,4-Trichlorobenzene (120-82-1)
1,1,1-Trichloroethane (71-55-6)
1,1,2-Trichloroethane (79-00-5)
Trichloroethene (79-01-6)
Trichlorofluoromethane (CFC-11) (75-69-4)
1,2,3-Trichloropropane (96-18-4)
1,2,4-Trimethylbenzene (95-63-6)
1,3,5-Trimethylbenzene (108-67-8)
Vinyl chloride (75-01-4)
m-Xylene (108-38-3)
o-Xylene (95-47-6)
p-Xylene (106-42-3)

200 µg/mL each in P&T methanol, 1 mL/ampul

cat.# 30603 (ea.)

Volatile Organics

Method 502.1, 502.2 (Volatile Halogenated Organics), *cont.*

502.2 MegaMix® Standard (54 components)

MEGAMIX®

Includes all target analytes except the six gases, which are available separately as 502.2 Calibration Mix #1.

Benzene (71-43-2)
Bromobenzene (108-86-1)
Bromochloromethane (74-97-5)
Bromodichloromethane (75-27-4)
Bromoform (75-25-2)
n-Butylbenzene (104-51-8)
sec-Butylbenzene (135-98-8)
tert-Butylbenzene (98-06-6)
Carbon tetrachloride (56-23-5)
Chlorobenzene (108-90-7)
Chloroform (67-66-3)
2-Chlorotoluene (95-49-8)
4-Chlorotoluene (106-43-4)
Dibromochloromethane (124-48-1)
1,2-Dibromo-3-chloropropane (DBCP) (96-12-8)
1,2-Dibromoethane (EDB) (106-93-4)
Dibromomethane (74-95-3)
1,2-Dichlorobenzene (95-50-1)
1,3-Dichlorobenzene (541-73-1)
1,4-Dichlorobenzene (106-46-7)
1,1-Dichloroethane (75-34-3)
1,2-Dichloroethane (107-06-2)
1,1-Dichloroethene (75-35-4)
cis-1,2-Dichloroethene (156-59-2)
trans-1,2-Dichloroethene (156-60-5)
1,2-Dichloropropane (78-87-5)
1,3-Dichloropropane (142-28-9)
2,2-Dichloropropane (594-20-7)
1,1-Dichloropropene (563-58-6)
cis-1,3-Dichloropropene (10061-01-5)
trans-1,3-Dichloropropene (10061-02-6)
Ethylbenzene (100-41-4)
Hexachloro-1,3-butadiene (hexachlorobutadiene) (87-68-3)
Isopropylbenzene (cumene) (98-82-8)
4-Isopropyltoluene (*p*-cymene) (99-87-6)
Methylene chloride (dichloromethane) (75-09-2)
Naphthalene (91-20-3)
n-Propylbenzene (103-65-1)
Styrene (100-42-5)
1,1,1,2-Tetrachloroethane (630-20-6)
1,1,2,2-Tetrachloroethane (79-34-5)
Tetrachloroethene (127-18-4)
Toluene (108-88-3)
1,2,3-Trichlorobenzene (87-61-6)
1,2,4-Trichlorobenzene (120-82-1)
1,1,1-Trichloroethane (71-55-6)
1,1,2-Trichloroethane (79-00-5)
Trichloroethene (79-01-6)
1,2,3-Trichloropropane (96-18-4)
1,2,4-Trimethylbenzene (95-63-6)
1,3,5-Trimethylbenzene (108-67-8)
m-Xylene (108-38-3)
o-Xylene (95-47-6)
p-Xylene (106-42-3)

200 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30432 (ea.)

2,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30431 (ea.)

502.2 Calibration Mix #1 (gases) (6 components)

Bromomethane (methyl bromide) (74-83-9)
Chloroethane (ethyl chloride) (75-00-3)
Chloromethane (methyl chloride) (74-87-3)
Dichlorodifluoromethane (CFC-12) (75-71-8)
Trichlorofluoromethane (CFC-11) (75-69-4)
Vinyl chloride (75-01-4)

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

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

502.2 Calibration Mix #2 (14 components)

Bromodichloromethane (75-27-4)
Bromoform (75-25-2)
Carbon tetrachloride (56-23-5)
Chloroform (67-66-3)
1,1-Dichloroethane (75-34-3)
1,1-Dichloroethene (75-35-4)
trans-1,2-Dichloroethene (156-60-5)
1,3-Dichloropropane (142-28-9)
2,2-Dichloropropane (594-20-7)
cis-1,3-Dichloropropene (10061-01-5)
trans-1,3-Dichloropropene (10061-02-6)
Methylene chloride (dichloromethane) (75-09-2)
1,1,1-Trichloroethane (71-55-6)
Trichloroethene (79-01-6)

2,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30043 (ea.)

502.2 Calibration Mix #3 (14 components)

Bromochloromethane (74-97-5)
Dibromochloromethane (124-48-1)
1,2-Dibromo-3-chloropropane (96-12-8)
1,2-Dibromoethane (EDB) (106-93-4)
Dibromomethane (74-95-3)
1,2-Dichloroethane (107-06-2)
cis-1,2-Dichloroethene (156-59-2)
1,2-Dichloropropane (78-87-5)
1,1-Dichloropropene (563-58-6)
1,1,1,2-Tetrachloroethane (630-20-6)
1,1,2,2-Tetrachloroethane (79-34-5)
Tetrachloroethene (127-18-4)
1,1,2-Trichloroethane (79-00-5)
1,2,3-Trichloropropane (96-18-4)

2,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30044 (ea.)

502.2 Calibration Mix #4 (9 components)

Benzene (71-43-2)
tert-Butylbenzene (98-06-6)
Chlorobenzene (108-90-7)
Isopropylbenzene (cumene) (98-82-8)
n-Propylbenzene (103-65-1)
Styrene (100-42-5)
Toluene (108-88-3)
1,3,5-Trimethylbenzene (108-67-8)
m-Xylene (108-38-3)

2,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30045 (ea.)

502.2 Calibration Mix #5 (10 components)

Bromobenzene (108-86-1)
n-Butylbenzene (104-51-8)
sec-Butylbenzene (135-98-8)
2-Chlorotoluene (95-49-8)
1,3-Dichlorobenzene (541-73-1)
Ethylbenzene (100-41-4)
1,2,4-Trichlorobenzene (120-82-1)
1,2,4-Trimethylbenzene (95-63-6)
o-Xylene (95-47-6)
p-Xylene (106-42-3)

2,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30046 (ea.)

502.2 Calibration Mix #6 (7 components)

4-Chlorotoluene (106-43-4)
1,2-Dichlorobenzene (95-50-1)
1,4-Dichlorobenzene (106-46-7)
Hexachlorobutadiene (87-68-3)
4-Isopropyltoluene (*p*-Cymene) (99-87-6)
Naphthalene (91-20-3)
1,2,3-Trichlorobenzene (87-61-6)

2,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30047 (ea.)

502.2 VOA Calibration Kit #1 (2,000 µg/mL)

Contains 1 mL each of these mixtures.
30042: 502.2 Calibration Mix #1
30043: 502.2 Calibration Mix #2
30044: 502.2 Calibration Mix #3
30045: 502.2 Calibration Mix #4
30046: 502.2 Calibration Mix #5
30047: 502.2 Calibration Mix #6

cat.# 30444 (kit) kit

502.2 VOA Calibration Kit #2 (2,000 µg/mL)

Contains 1 mL each of these mixtures.
30042: 502.2 Calibration Mix #1
30431: 502.2 MegaMix Standard

cat.# 30445 (kit) kit

502.2 VOA Calibration Kit #3 (200 µg/mL)

Contains 1 mL each of these mixtures.
30439: 502.2 Calibration Mix #1
30432: 502.2 MegaMix Standard

cat.# 30446 (kit) kit

Volatile Organics, *cont.*

Method 504.1 (Ethylene Dibromide/ Dibromochloropropane)

504.1 Calibration Mix (3 components)

1,2-Dibromo-3-chloropropane (96-12-8)
1,2-Dibromoethane (EDB) (106-93-4)
1,2,3-Trichloropropane (96-18-4)

200 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30239 (ea.)

Method 522 (1,4-Dioxane)

See page 519.

Method 524.1, 524.2 (Volatile Organics)

524 Internal Standard/Surrogate Mix (3 components)

1-Bromo-4-fluorobenzene (BFB) (460-00-4)
1,2-Dichlorobenzene-d4 (2199-69-1)
Fluorobenzene (462-06-6)

2,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30201 (ea.)

Surrogate Standard (2 components)

1-Bromo-4-fluorobenzene (BFB) (460-00-4)
α,α,α-Trifluorotoluene (98-08-8)

2,500 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30484 (ea.)

524.2 Surrogate Standard (2 components)

1-Bromo-4-fluorobenzene (BFB) (460-00-4)
1,2-Dichlorobenzene-d4 (2199-69-1)

2,000 µg/mL in P&T methanol, 1 mL/ampul
cat.# 30607 (ea.)

PFTBA (MS Tuning Compound)

Perfluorotributylamine (PFTBA) (311-89-7)

Neat, 1 mL/ampul
cat.# 30482 (ea.)

No data pack available.

Antifoam Agent for Purge-and-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. To use properly, see the instructions on the product certificate or on the product page (search "31822" at www.restek.com).

Neat, 1 mL/ampul
cat.# 31822 (ea.)

No data pack available.

Method 524.1, 524.2 (Volatile Organics), *cont.*

Volatiles MegaMix® Standard With Gases

MEGAMIX®

(60 components)

Benzene (71-43-2)
Bromobenzene (108-86-1)
Bromochloromethane (74-97-5)
Bromodichloromethane (75-27-4)
Bromoform (75-25-2)
Bromomethane (methyl bromide) (74-83-9)
n-Butylbenzene (104-51-8)
sec-Butylbenzene (135-98-8)
tert-Butylbenzene (98-06-6)
Carbon tetrachloride (56-23-5)
Chlorobenzene (108-90-7)
Chloroethane (ethyl chloride) (75-00-3)
Chloroform (67-66-3)
Chloromethane (methyl chloride) (74-87-3)
2-Chlorotoluene (95-49-8)
4-Chlorotoluene (106-43-4)
Dibromochloromethane (124-48-1)
1,2-Dibromo-3-chloropropane (DBCP) (96-12-8)
1,2-Dibromoethane (EDB) (106-93-4)
Dibromomethane (74-95-3)
1,2-Dichlorobenzene (95-50-1)
1,3-Dichlorobenzene (541-73-1)
1,4-Dichlorobenzene (106-46-7)
Dichlorodifluoromethane (CFC-12) (75-71-8)
1,1-Dichloroethane (75-34-3)
1,2-Dichloroethane (107-06-2)
1,1-Dichloroethene (75-35-4)
cis-1,2-Dichloroethene (156-59-2)
trans-1,2-Dichloroethene (156-60-5)
1,2-Dichloropropane (78-87-5)
1,3-Dichloropropane (142-28-9)
2,2-Dichloropropane (594-20-7)
1,1-Dichloropropene (563-58-6)
cis-1,3-Dichloropropene (10061-01-5)
trans-1,3-Dichloropropene (10061-02-6)
Ethylbenzene (100-41-4)
Hexachloro-1,3-butadiene (hexachlorobutadiene) (87-68-3)
Isopropylbenzene (cumene) (98-82-8)
4-Isopropyltoluene (*p*-Cymene) (99-87-6)
Methylene chloride (dichloromethane) (75-09-2)
Naphthalene (91-20-3)
n-Propylbenzene (103-65-1)
Styrene (100-42-5)
1,1,1,2-Tetrachloroethane (630-20-6)
1,1,2,2-Tetrachloroethane (79-34-5)
Tetrachloroethene (127-18-4)
Toluene (108-88-3)
1,2,3-Trichlorobenzene (87-61-6)
1,2,4-Trichlorobenzene (120-82-1)
1,1,1-Trichloroethane (71-55-6)
1,1,2-Trichloroethane (79-00-5)
Trichloroethene (79-01-6)
Trichlorofluoromethane (CFC-11) (75-69-4)
1,2,3-Trichloropropane (96-18-4)
1,2,4-Trimethylbenzene (95-63-6)
1,3,5-Trimethylbenzene (108-67-8)
Vinyl chloride (75-01-4)
m-Xylene (108-38-3)
o-Xylene (95-47-6)
p-Xylene (106-42-3)

200 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30603 (ea.)

502.2 Calibration Mix #1 (gases) (6 components)

Bromomethane (methyl bromide) (74-83-9)
Chloroethane (ethyl chloride) (75-00-3)
Chloromethane (methyl chloride) (74-87-3)
Dichlorodifluoromethane (CFC-12) (75-71-8)
Trichlorofluoromethane (CFC-11) (75-69-4)
Vinyl chloride (75-01-4)

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

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

Ketones Mix, 524.2 Rev. 4.1 (5 components)

Acetone (67-64-1)
2-Butanone (MEK) (78-93-3)
1,1-Dichloro-2-propanone (513-88-2)
2-Hexanone (591-78-6)
4-Methyl-2-pentanone (MIBK) (108-10-1)

5,000 µg/mL each in P&T methanol:water (90:10), 1 mL/ampul
cat.# 30602 (ea.)

Oxygenates Standard (5 components)

tert-Amyl ethyl ether (TAEE) (919-94-8)	2,000 µg/mL
tert-Amyl methyl ether (TAME) (994-05-8)	2,000
tert-Butanol (TBA) (75-65-0)	10,000
Diisopropyl ether (DIPE) (108-20-3)	2,000
Ethyl-*tert*-butyl ether (ETBE) (637-92-3)	2,000

In P&T methanol, 1 mL/ampul
cat.# 30619 (ea.)

Volatile Organics, *cont.*

Method 524.1, 524.2 (Volatile Organics), *cont.*

Drinking Water VOA MegaMix® Standard, 524.2 Rev. 4.1 (73 components)

MEGAMIX®

Acrylonitrile (107-13-1)
Allyl chloride (3-chloropropene) (107-05-1)
Benzene (71-43-2)
Bromobenzene (108-86-1)
Bromochloromethane (74-97-5)
Bromodichloromethane (75-27-4)
Bromoform (75-25-2)
n-Butylbenzene (104-51-8)
sec-Butylbenzene (135-98-8)
tert-Butylbenzene (98-06-6)
Carbon disulfide (75-15-0)
Carbon tetrachloride (56-23-5)
Chloroacetonitrile (107-14-2)
Chlorobenzene (108-90-7)
1-Chlorobutane (Butyl chloride) (109-69-3)
Chlorodibromomethane (dibromochloromethane) (124-48-1)
Chloroform (67-66-3)
2-Chlorotoluene (95-49-8)
4-Chlorotoluene (106-43-4)
1,2-Dibromo-3-chloropropane (DBCP) (96-12-8)
1,2-Dibromoethane (ethylene dibromide) (106-93-4)
Dibromomethane (74-95-3)
1,2-Dichlorobenzene (95-50-1)
1,3-Dichlorobenzene (541-73-1)
1,4-Dichlorobenzene (106-46-7)
trans-1,4-Dichloro-2-butene (110-57-6)
1,1-Dichloroethane (75-34-3)
1,2-Dichloroethane (107-06-2)
1,1-Dichloroethene (75-35-4)
cis-1,2-Dichloroethene (156-59-2)
trans-1,2-Dichloroethene (156-60-5)
1,2-Dichloropropane (78-87-5)
1,3-Dichloropropane (142-28-9)
2,2-Dichloropropane (594-20-7)
1,1-Dichloropropene (563-58-6)
cis-1,3-Dichloropropene (10061-01-5)
trans-1,3-Dichloropropene (10061-02-6)
Diethyl ether (ethyl ether) (60-29-7)
Ethylbenzene (100-41-4)
Ethyl methacrylate (97-63-2)
Hexachloro-1,3-butadiene (87-68-3)
Hexachloroethane (67-72-1)
Iodomethane (methyl iodide) (74-88-4)
Isopropylbenzene (cumene) (98-82-8)
4-Isopropyltoluene (*p*-cymene) (99-87-6)
Methacrylonitrile (126-98-7)
Methyl acrylate (96-33-3)
Methyl *tert*-butyl ether (MTBE) (1634-04-4)
Methylene chloride (dichloromethane) (75-09-2)
Methyl methacrylate (80-62-6)
Naphthalene (91-20-3)
Nitrobenzene (98-95-3)
2-Nitropropane (79-46-9)
Pentachloroethane (76-01-7)
Propionitrile (ethylcyanide) (107-12-0)
n-Propylbenzene (103-65-1)
Styrene (100-42-5)
1,1,1,2-Tetrachloroethane (630-20-6)
1,1,2,2-Tetrachloroethane (79-34-5)
Tetrachloroethene (127-18-4)
Tetrahydrofuran (109-99-9)
Toluene (108-88-3)
1,2,3-Trichlorobenzene (87-61-6)
1,2,4-Trichlorobenzene (120-82-1)
1,1,1-Trichloroethane (71-55-6)
1,1,2-Trichloroethane (79-00-5)
Trichloroethene (79-01-6)
1,2,3-Trichloropropane (96-18-4)
1,2,4-Trimethylbenzene (95-63-6)
1,3,5-Trimethylbenzene (108-67-8)
m-Xylene (108-38-3)
o-Xylene (95-47-6)
p-Xylene (106-42-3)

2,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30601 (ea.)

524 Calibration Mix #7A (5 components)

Acetone (67-64-1)
2-Butanone (MEK) (78-93-3)
2-Hexanone (591-78-6)
4-Methyl-2-pentanone (MIBK) (108-10-1)
Tetrahydrofuran (109-99-9)

2,000 µg/mL each in P&T methanol:water (90:10), 1 mL/ampul
cat.# 30300 (ea.)

524 Calibration Mix #7B (7 components)

Acrylonitrile (107-13-1)
Allyl chloride (3-chloropropene) (107-05-1)
Ethyl methacrylate (97-63-2)
Methyl acrylate (96-33-3)
Methyl methacrylate (80-62-6)
Nitrobenzene (98-95-3)
Pentachloroethane (76-01-7)

2,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30304 (ea.)

524 Calibration Mix #7 Kit

Contains 1 mL each of these mixtures.
30300: 524 Calibration Mix #7A
30304: 524 Calibration Mix #7B

cat.# 30202 (kit) kit

524 Calibration Mix #8 (12 components)

Carbon disulfide (75-15-0)
Chloroacetonitrile (107-14-2)
1-Chlorobutane (Butyl chloride) (109-69-3)
trans-1,4-Dichloro-2-butene (110-57-6)
1,1-Dichloro-2-propanone (513-88-2)
Diethyl ether (ethyl ether) (60-29-7)
Hexachloroethane (67-72-1)
Iodomethane (methyl iodide) (74-88-4)
Methacrylonitrile (126-98-7)
Methyl *tert*-butyl ether (MTBE) (1634-04-4)
2-Nitropropane (79-46-9)
Propionitrile (107-12-0)

2,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30203 (ea.)

524 Rev. 4.0 Volatile Organics Kit (2,000 µg/mL)

Contains 1 mL each of these mixtures.
30201: 524 Internal Standard/Surrogate Mix
30042: 502.2 Calibration Mix #1
30043: 502.2 Calibration Mix #2
30044: 502.2 Calibration Mix #3
30045: 502.2 Calibration Mix #4
30046: 502.2 Calibration Mix #5
30047: 502.2 Calibration Mix #6
30300: 524 Calibration Mix #7A
30304: 524 Calibration Mix #7B
30203: 524 Calibration Mix #8

cat.# 30204 (kit) kit

524 Rev. 4.0 VOA Kit #2 (2,000 µg/mL)

Contains 1 mL each of these mixtures.
30042: 502.2 Calibration Mix #1
30431: 502.2 MegaMix Standard
30300: 524 Calibration Mix #7A
30304: 524 Calibration Mix #7B
30203: 524 Calibration Mix #8
30201: 524 Surrogate/Internal Standard Mix

cat.# 30447 (kit) kit

Compound Index for Reference Standards

See **pages 586–592.**



Volatile Organics, *cont.*

Method 524.3 (Purgeable Organics in Drinking Water)

UCMR3 Method 524.3 Standard (9 components)

Bromochloromethane (74-97-5)	600 µg/mL	Chlorodifluoromethane (CFC-22) (75-45-6)	800
Bromomethane (methyl bromide) (74-83-9)	2,000	Chloromethane (methyl chloride) (74-87-3)	2,000
1,3-Butadiene (106-99-0)	1,000	1,1-Dichloroethane (75-34-3)	300
sec-Butylbenzene (135-98-8)	400	*n*-Propylbenzene (103-65-1)	300
		1,2,3-Trichloropropane (96-18-4)	300

In P&T methanol, 1 mL/ampul

cat.# 30642 (ea.)

EPA 524.3 Reference Standards

- Full 82-component EPA 524.3 list using as few as three ampuls—reduce prep time and chances for error or contamination.
- EPA 524.3 VOA MegaMix® ampul includes oxygenates group—no need to order separately.
- Volatile gases prepared separately—replace shorter-life components without wasting money on full list.
- Two options for internal and surrogate standards—separate or combined mix.
- Certified reference materials (CRMs) manufactured and QC-tested in Restek's ISO-accredited labs—satisfy your ISO requirements.
- Also ideal for surface water and groundwater testing.

In support of the U.S. Safe Drinking Water Act (SDWA), Restek offers a complete set of EPA 524.3 reference standards for the monitoring of purgeable organic compounds in drinking water—using as few as three ampuls! In addition, this collection of certified reference materials (CRMs) also covers the seven volatile organic compounds (VOCs) included in the Unregulated Contaminant Monitoring Rule 3 (UCMR3), which requires monitoring of all public drinking water systems with 10,000 or more customers.

524.3 VOA MegaMix® Standard

MEGAMIX®

(69 components)

Allyl chloride (3-chloropropene) (107-05-1)
tert-Amyl ethyl ether (TAEE) (919-94-8)
tert-Amyl methyl ether (TAME) (994-05-8)
Benzene (71-43-2)
Bromobenzene (108-86-1)
Bromochloromethane (74-97-5)
Bromodichloromethane (75-27-4)
Bromoform (75-25-2)
tert-Butanol (TBA) (75-65-0)
n-Butylbenzene (104-51-8)
sec-Butylbenzene (135-98-8)
tert-Butylbenzene (98-06-6)
Carbon disulfide (75-15-0)
Carbon tetrachloride (56-23-5)
Chlorobenzene (108-90-7)
Chloroform (67-66-3)
1-Chlorobutane (butyl chloride) (109-69-3)
2-Chlorotoluene (95-49-8)
4-Chlorotoluene (106-43-4)
Dibromochloromethane (124-48-1)
1,2-Dibromo-3-chloropropane (96-12-8)
Dibromomethane (74-95-3)
1,2-Dibromoethane (EDB) (106-93-4)
1,2-Dichlorobenzene (95-50-1)
1,3-Dichlorobenzene (541-73-1)
1,4-Dichlorobenzene (106-46-7)
1,1-Dichloroethane (75-34-3)
1,2-Dichloroethane (107-06-2)
1,1-Dichloroethene (75-35-4)
cis-1,2-Dichloroethene (156-59-2)
trans-1,2-Dichloroethene (156-60-5)
1,2-Dichloropropane (78-87-5)
1,3-Dichloropropane (142-28-9)
1,1-Dichloropropene (563-58-6)
cis-1,3-Dichloropropene (10061-01-5)
trans-1,3-Dichloropropene (10061-02-6)
Diethyl ether (ethyl ether) (60-29-7)
Diisopropyl ether (DIPE) (108-20-3)
Ethylbenzene (100-41-4)
Ethyl-*tert*-butyl ether (ETBE) (637-92-3)
Ethyl methacrylate (97-63-2)
Hexachlorobutadiene (87-68-3)
Hexachloroethane (67-72-1)
Iodomethane (methyl iodide) (74-88-4)
Isopropylbenzene (cumene) (98-82-8)
4-Isopropyltoluene (*p*-cymene) (99-87-6)
Methyl acetate (79-20-9)
Methyl-*tert*-butyl ether (MTBE) (1634-04-4)
Methylene chloride (dichloromethane) (75-09-2)
Naphthalene (91-20-3)
Pentachloroethane (76-01-7)
n-Propylbenzene (103-65-1)
Styrene (100-42-5)
Tetrachloroethene (127-18-4)
1,1,1,2-Tetrachloroethane (630-20-6)
1,1,2,2-Tetrachloroethane (79-34-5)
Tetrahydrofuran (109-99-9)
Toluene (108-88-3)
1,2,3-Trichlorobenzene (87-61-6)
1,2,4-Trichlorobenzene (120-82-1)
1,1,1-Trichloroethane (71-55-6)
1,1,2-Trichloroethane (79-00-5)
Trichloroethene (79-01-6)
1,2,3-Trichloropropane (96-18-4)
1,2,4-Trimethylbenzene (95-63-6)
1,3,5-Trimethylbenzene (108-67-8)
m-Xylene (108-38-3)
o-Xylene (95-47-6)
p-Xylene (106-42-3)

2,000 µg/mL each in P&T methanol, 1 mL/ampul

cat.# 30013 (ea.)

524.3 Gas Calibration Mix (7 components)

Bromomethane (methyl bromide) (74-83-9)
1,3-Butadiene (106-99-0)
Chlorodifluoromethane (CFC-22) (75-45-6)
Chloromethane (methyl chloride) (74-87-3)
Dichlorodifluoromethane (CFC-12) (75-71-8)
Trichlorofluoromethane (CFC-11) (75-69-4)
Vinyl chloride (75-01-4)

2,000 µg/mL each in P&T methanol, 1 mL/ampul

cat.# 30014 (ea.)

524.3 Internal Standard Mix (3 components)

Chlorobenzene-d5 (3114-55-4)
1,4-Dichlorobenzene-d4 (3855-82-1)
1,4-Difluorobenzene (540-36-3)

2,000 µg/mL each in P&T methanol, 1 mL/ampul

cat.# 30015 (ea.)

524.3 Surrogate Standard (3 components)

1-Bromo-4-fluorobenzene (BFB) (460-00-4)
Methyl-d3-*tert*-butyl ether (29366-08-3)
1,2-Dichlorobenzene-d4 (2199-69-1)

2,000 µg/mL each in P&T methanol, 1 mL/ampul

cat.# 30016 (ea.)

524.3 Internal Standard/Surrogate Mix (6 components)

1-Bromo-4-fluorobenzene (BFB) (460-00-4)
Methyl-d3-*tert*-butyl ether (29366-08-3)
Chlorobenzene-d5 (3114-55-4)
1,2-Dichlorobenzene-d4 (2199-69-1)
1,4-Dichlorobenzene-d4 (3855-82-1)
1,4-Difluorobenzene (540-36-3)

2,000 µg/mL each in P&T methanol, 1 mL/ampul

cat.# 30017 (ea.)

Volatile Organics, *cont.*

Method 601 (Purgeable Hydrocarbons)

VOA Purgeable Halocarbon Mix #1 (23 components)

Bromodichloromethane (75-27-4)
Bromoform (75-25-2)
Carbon tetrachloride (56-23-5)
Chlorobenzene (108-90-7)
2-Chloroethyl vinyl ether (110-75-8)
Chloroform (67-66-3)
Dibromochloromethane (124-48-1)
1,2-Dichlorobenzene (95-50-1)
1,3-Dichlorobenzene (541-73-1)
1,4-Dichlorobenzene (106-46-7)
1,1-Dichloroethane (75-34-3)
1,2-Dichloroethane (107-06-2)
1,1-Dichloroethene (75-35-4)
trans-1,2-Dichloroethene (156-60-5)
1,2-Dichloropropane (78-87-5)
cis-1,3-Dichloropropene (10061-01-5)
trans-1,3-Dichloropropene (10061-02-6)
Methylene chloride (dichloromethane) (75-09-2)
1,1,2,2-Tetrachloroethane (79-34-5)
Tetrachloroethene (127-18-4)
1,1,1-Trichloroethane (71-55-6)
1,1,2-Trichloroethane (79-00-5)
Trichloroethene (79-01-6)

2,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30212 (ea.)

Method 603 (Acrolein & Acrylonitrile)

Acrolein/Acrylonitrile (2 components)

Acrolein (107-02-8)
Acrylonitrile (107-13-1)

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

Must ship overnight on ice.
This product has a limited shelf life. We recommend that you order only the ampul quantity that meets your immediate needs.

Acrolein

Acrolein (107-02-8)

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

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

This product has a limited shelf life. We recommend that you order only the ampul quantity that meets your immediate needs.

Acrylonitrile

Acrylonitrile (107-13-1)

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

Reference Standards Search

Search by compound name, synonym, or CAS #.

www.restek.com/reference



Method 624 (Purgeable Halocarbons)

Volatiles MegaMix® Standard, EPA Method 624 (26 components)

MEGAMIX®

Benzene (71-43-2)
Bromodichloromethane (75-27-4)
Bromoform (75-25-2)
Carbon tetrachloride (56-23-5)
Chlorobenzene (108-90-7)
2-Chloroethyl vinyl ether (110-75-8)
Chloroform (67-66-3)
Dibromochloromethane (124-48-1)
1,2-Dichlorobenzene (95-50-1)
1,3-Dichlorobenzene (541-73-1)
1,4-Dichlorobenzene (106-46-7)
1,1-Dichloroethane (75-34-3)
1,2-Dichloroethane (107-06-2)
1,1-Dichloroethene (75-35-4)
trans-1,2-Dichloroethene (156-60-5)
1,2-Dichloropropane (78-87-5)
cis-1,3-Dichloropropene (10061-01-5)
trans-1,3-Dichloropropene (10061-02-6)
Ethylbenzene (100-41-4)
Methylene chloride (dichloromethane) (75-09-2)
1,1,2,2-Tetrachloroethane (79-34-5)
Tetrachloroethene (127-18-4)
Toluene (108-88-3)
1,1,1-Trichloroethane (71-55-6)
1,1,2-Trichloroethane (79-00-5)
Trichloroethene (79-01-6)

2,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30497 (ea.)

624 Internal Standard Mix (3 components)

Bromochloromethane (74-97-5)
2-Bromo-1-chloropropane (3017-95-6)
1,4-Dichlorobutane (110-56-5)

1,500 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30023 (ea.)

624 Surrogate Standard Mix (3 components)

1-Bromo-4-fluorobenzene (BFB) (460-00-4)
Fluorobenzene (462-06-6)
Pentafluorobenzene (363-72-4)

2,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30243 (ea.)

Surrogate Standard (2 components)

1-Bromo-4-fluorobenzene (BFB) (460-00-4)
α,α,α-Trifluorotoluene (98-08-8)

2,500 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30484 (ea.)

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

Bromomethane (methyl bromide) (74-83-9)
Chloroethane (ethyl chloride) (75-00-3)
Chloromethane (methyl chloride) (74-87-3)
Trichlorofluoromethane (CFC-11) (75-69-4)
Vinyl chloride (75-01-4)

2,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30020 (ea.)

624 Calibration Mix #2 (12 components)

Benzene (71-43-2)
Carbon tetrachloride (56-23-5)
Chlorobenzene (108-90-7)
2-Chloroethyl vinyl ether (110-75-8)
Dibromochloromethane (124-48-1)
1,1-Dichloroethane (75-34-3)
1,1-Dichloroethene (75-35-4)
1,2-Dichloropropane (78-87-5)
Methylene chloride (dichloromethane) (75-09-2)
Tetrachloroethene (127-18-4)
1,1,2-Trichloroethane (79-00-5)
Trichloroethene (79-01-6)

2,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30021 (ea.)

Volatile Organics, *cont.*

Method 624 (Purgeable Halocarbons), *cont.*

624 Calibration Mix #3 (14 components)

Bromodichloromethane (75-27-4)
Bromoform (75-25-2)
Chloroform (67-66-3)
1,2-Dichlorobenzene (95-50-1)
1,3-Dichlorobenzene (541-73-1)
1,4-Dichlorobenzene (106-46-7)
1,2-Dichloroethane (107-06-2)
trans-1,2-Dichloroethene (156-60-5)
cis-1,3-Dichloropropene (10061-01-5)
trans-1,3-Dichloropropene (10061-02-6)
Ethylbenzene (100-41-4)
1,1,2,2-Tetrachloroethane (79-34-5)
Toluene (108-88-3)
1,1,1-Trichloroethane (71-55-6)

2,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30022 (ea.)

624 Complete Kit

Contains 1 mL 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) **kit**

624 Kit

Contains 1 mL 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) **kit**

Method 8010 (Halogenated Volatile Organics)

624 Internal Standard Mix (3 components)

Bromochloromethane (74-97-5)
2-Bromo-1-chloropropane (3017-95-6)
1,4-Dichlorobutane (110-56-5)

1,500 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30023 (ea.)

502.2 Calibration Mix #1 (gases) (6 components)

Bromomethane (methyl bromide) (74-83-9)
Chloroethane (ethyl chloride) (75-00-3)
Chloromethane (methyl chloride) (74-87-3)
Dichlorodifluoromethane (CFC-12) (75-71-8)
Trichlorofluoromethane (CFC-11) (75-69-4)
Vinyl chloride (75-01-4)

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

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

Method 8010 (Halogenated Volatile Organics), *cont.*

BTEX Standard (6 components)

Benzene (71-43-2)
Ethylbenzene (100-41-4)
Toluene (108-88-3)
m-Xylene (108-38-3)
o-Xylene (95-47-6)
p-Xylene (106-42-3)

200 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30051 (ea.)

2,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30213 (ea.)

2,000 µg/mL each in P&T methanol (*m*- & *p*-xylene at 1,000 µg/mL), 1 mL/ampul
cat.# 30488 (ea.)

tech tip

To analyze compounds listed in Methods 8010 and 8020 concurrently, add BTEX standard to the calibration curve mix.

BTEX Gas Mix (6 components)

Benzene (71-43-2)
Ethylbenzene (100-41-4)
Toluene (108-88-3)
m-Xylene (108-38-3)
o-Xylene (95-47-6)
p-Xylene (106-42-3)

cylinder design

Cylinder Construction: aluminum
Cylinder Fitting: CGA-180 outlet

Spectra (Linde) 104 L Cylinders:

Size: 8 x 24 cm
Volume/Pressure:
104 liters of gas
@ 1,800 psi
Weight: 1.5 lb/0.7 kg



Scotty (Air Liquide) 110 L Cylinders:

Size: 8.3 x 29.5 cm
Volume/Pressure:
110 liters of gas
@ 1,800 psi
Weight: 2.2 lb/1 kg
U.S. DOT Specs: 3AL2216



1 ppm in nitrogen, 104 liters @ 1,800 psi
cat.# 34414 (ea.)

1 ppm in nitrogen, 110 liters @ 1,800 psi
cat.# 26361 (ea.)

1 ppm in nitrogen, 110 liters @ 1,800 psi (Pi-marked cylinder)
cat.# 34414-PI (ea.)

100 ppb in nitrogen, 104 liters @ 1,800 psi
cat.# 34428 (ea.)

100 ppb in nitrogen, 110 liters @ 1,800 psi
cat.# 26362 (ea.)

100 ppb in nitrogen, 110 liters @ 1,800 psi (Pi-marked cylinder)
cat.# 34428-PI (ea.)

No data pack available.

Gas standards are subject to hazardous materials shipping fees by most freight carriers. All calibration gas standards are nonreturnable due to DOT hazardous shipping requirements.

also available

High-Purity VOC Regulators

See **page 453.**



Volatile Organics, *cont.*

Method 8011 (1,2-Dibromoethane & 1,2-Dibromo-3-chloropropane)

8011 Calibration Mix—EDB/DBCP (2 components)

1,2-Dibromo-3-chloropropane (DBCP) (96-12-8)
1,2-Dibromoethane (EDB) (106-93-4)

2,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30062 (ea.)

Method 8020 (Aromatic Volatile Organics)

Internal and Surrogate Standards for Method 8020

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

Compound	CAS #	Solvent	Conc.	cat.#
1-Bromo-4-fluorobenzene (BFB)	460-00-4	PTM	2,000	30026
1,4-Difluorobenzene	540-36-3	PTM	2,000	30032
Fluorobenzene	462-06-6	PTM	2,000	30030
α,α,α-Trifluorotoluene	98-08-8	PTM	2,000	30048

PTM = Purge-and-trap grade methanol

8020A Calibration Mix (10 components)

Benzene (71-43-2)
Chlorobenzene (108-90-7)
1,2-Dichlorobenzene (95-50-1)
1,3-Dichlorobenzene (541-73-1)
1,4-Dichlorobenzene (106-46-7)
Ethylbenzene (100-41-4)
Toluene (108-88-3)
m-Xylene (108-38-3)
o-Xylene (95-47-6)
p-Xylene (106-42-3)

2,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30222 (ea.)

Method 8021 (Volatile Organics)

502.2 Internal Standard Mix #2 (2 components)

2-Bromo-1-chloropropane (3017-95-6)
Fluorobenzene (462-06-6)

2,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30041 (ea.)

8021/502.2 Surrogate Mix #1 (3 components)

1-Bromo-2-chloroethane (107-04-0)
1-Chloro-3-fluorobenzene (625-98-9)
Fluorobenzene (462-06-6)

2,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30463 (ea.)

Restek® innovation!

Xylene-Free, Highly Purified Chloroprene Standard

The R&D chemists at Restek developed a novel procedure that produces a pure, quantitative chloroprene solution specially stabilized in purge-and-trap grade methanol. The entire procedure is performed under carefully monitored conditions to prevent any contamination or polymerization of the highly reactive, neat chloroprene. The final solution is specially stabilized, allowing analysts to make dilutions for working standards in unmodified purge-and-trap grade methanol.

Note: Because chloroprene is not analyzed by many laboratories, it is not included in our 8240 VOA mixes. Chloroprene is included in our 8260B MegaMix® calibration mix. Refer to **page 555.**

Method 8240 (Volatile Organic Compounds [VOCs])

502.2 Calibration Mix #1 (gases) (6 components)

Bromomethane (methyl bromide) (74-83-9)
Chloroethane (ethyl chloride) (75-00-3)
Chloromethane (methyl chloride) (74-87-3)
Dichlorodifluoromethane (CFC-12) (75-71-8)
Trichlorofluoromethane (CFC-11) (75-69-4)
Vinyl chloride (75-01-4)

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

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

VOA Calibration Mix #1 (ketones) (4 components)

Acetone (67-64-1)
2-Butanone (MEK) (78-93-3)
2-Hexanone (591-78-6)
4-Methyl-2-pentanone (MIBK) (108-10-1)

5,000 µg/mL each in P&T methanol:water (90:10), 1 mL/ampul
cat.# 30006 (ea.)

VOA Purgeable Halocarbon Mix #1 (23 components)

Bromodichloromethane (75-27-4)
Bromoform (75-25-2)
Carbon tetrachloride (56-23-5)
Chlorobenzene (108-90-7)
2-Chloroethyl vinyl ether (110-75-8)
Chloroform (67-66-3)
Dibromochloromethane (124-48-1)
1,2-Dichlorobenzene (95-50-1)
1,3-Dichlorobenzene (541-73-1)
1,4-Dichlorobenzene (106-46-7)
1,1-Dichloroethane (75-34-3)
1,2-Dichloroethane (107-06-2)
1,1-Dichloroethene (75-35-4)
trans-1,2-Dichloroethene (156-60-5)
1,2-Dichloropropane (78-87-5)
cis-1,3-Dichloropropene (10061-01-5)
trans-1,3-Dichloropropene (10061-02-6)
Methylene chloride (dichloromethane) (75-09-2)
1,1,2,2-Tetrachloroethane (79-34-5)
Tetrachloroethene (127-18-4)
1,1,1-Trichloroethane (71-55-6)
1,1,2-Trichloroethane (79-00-5)
Trichloroethene (79-01-6)

2,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30212 (ea.)

8240 Volatiles Mix #1A (12 components)

Allyl chloride (3-chloropropene) (107-05-1)
Benzyl chloride (100-44-7)
1,2-Dibromo-3-chloropropane (96-12-8)
1,2-Dibromoethane (EDB) (106-93-4)
Dibromomethane (74-95-3)
cis-1,4-Dichloro-2-butene (1476-11-5)
trans-1,4-Dichloro-2-butene (110-57-6)
1,4-Dioxane (123-91-1)
Iodomethane (methyl iodide) (74-88-4)
Pentachloroethane (76-01-7)
1,1,1,2-Tetrachloroethane (630-20-6)
1,2,3-Trichloropropane (96-18-4)

2,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30217 (ea.)

8240 Volatiles Mix #2A (3 components)

Carbon disulfide (75-15-0)
2-Picoline (109-06-8)
Pyridine (110-86-1)

2,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30218 (ea.)

Restek Offers a Full Line of Certified Reference Materials

See **pages 464–465**.

QUALITY ISO 9001 • 17025 • Guide 34

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Volatile Organics, *cont.*

Method 8240 (Volatile Organic Compounds [VOCs]), *cont.*

8240 Nitriles Mix (7 components)

Acrylonitrile (107-13-1)
Ethyl methacrylate (97-63-2)
Malononitrile (109-77-3)
Methacrylonitrile (126-98-7)
Methyl methacrylate (80-62-6)
Propionitrile (107-12-0)
Styrene (100-42-5)

2,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30215 (ea.)

8240 Alcohols Mix (5 components)

Allyl alcohol (2-propen-1-ol) (107-18-6)
2-Chloroethanol (107-07-3)
Ethanol (64-17-5)
Isobutyl alcohol (78-83-1)
Propargyl alcohol (107-19-7)

2,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30214 (ea.)

Glycols Standard (2 components)

Ethylene glycol (107-21-1)
Propylene glycol (57-55-6)

50,000 µg/mL each in DI water, 1 mL/ampul
cat.# 30471 (ea.)

BTEX Standard (6 components)

Benzene (71-43-2)
Ethylbenzene (100-41-4)
Toluene (108-88-3)
m-Xylene (108-38-3)
o-Xylene (95-47-6)
p-Xylene (106-42-3)

200 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30051 (ea.)

2,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30213 (ea.)

2,000 µg/mL each in P&T methanol (*m*- & *p*-xylene at 1,000 µg/mL), 1 mL/ampul
cat.# 30488 (ea.)

BTEX Gas Mix (6 components)

Benzene (71-43-2)
Ethylbenzene (100-41-4)
Toluene (108-88-3)
m-Xylene (108-38-3)
o-Xylene (95-47-6)
p-Xylene (106-42-3)

1 ppm in nitrogen, 104 liters @ 1,800 psi
cat.# 34414 (ea.)

1 ppm in nitrogen, 110 liters @ 1,800 psi
cat.# 26361 (ea.)

1 ppm in nitrogen, 110 liters @ 1,800 psi (Pi-marked cylinder)
cat.# 34414-PI (ea.)

100 ppb in nitrogen, 104 liters @ 1,800 psi
cat.# 34428 (ea.)

100 ppb in nitrogen, 110 liters @ 1,800 psi
cat.# 26362 (ea.)

100 ppb in nitrogen, 110 liters @ 1,800 psi (Pi-marked cylinder)
cat.# 34428-PI (ea.)

cylinder design



Spectra (Linde) 104 L Cylinders:
Aluminum construction
Size: 8 x 24 cm
Volume/Pressure:
104 liters of gas @ 1,800 psi
CGA-180 outlet fitting.
Weight: 1.5 lb/0.7 kg



Scotty (Air Liquide) 110 L Cylinders:
Aluminum construction
Size: 8.3 x 29.5 cm
Volume/Pressure:
110 liters of gas @ 1,800 psi
CGA-180 outlet fitting.
Weight: 2.2 lb/1 kg
U.S. DOT Specs: 3AL2216

No data pack available.

Gas standards are subject to hazardous materials shipping fees by most freight carriers. All calibration gas standards are nonreturnable due to DOT hazardous shipping requirements.

Method 8260, 8260A, 8260B (Volatile Organic Compounds [VOCs]), *cont.*

8260A Internal Standard Mix (3 components)

Chlorobenzene-d5 (3114-55-4)
1,4-Dichlorobenzene-d4 (3855-82-1)
Fluorobenzene (462-06-6)

2,500 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30241 (ea.)

8260 Internal Standard Mix (4 components)

Chlorobenzene-d5 (3114-55-4)
1,4-Dichlorobenzene-d4 (3855-82-1)
1,4-Difluorobenzene (540-36-3)
Pentafluorobenzene (363-72-4)

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

8260A Surrogate Mix (4 components)

1-Bromo-4-fluorobenzene (BFB) (460-00-4)
Dibromofluoromethane (1868-53-7)
1,2-Dichloroethane-d4 (17060-07-0)
Toluene-d8 (2037-26-5)

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

8260 Surrogate Mix (3 components)

1-Bromo-4-fluorobenzene (BFB) (460-00-4)
Dibromofluoromethane (1868-53-7)
Toluene-d8 (2037-26-5)

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

8260B Matrix Spike Mix (5 components)

Benzene (71-43-2)
Chlorobenzene (108-90-7)
1,1-Dichloroethene (75-35-4)
Toluene (108-88-3)
Trichloroethylene (79-01-6)

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

8240/8260 System Performance Check Mix (5 components)

Bromoform (75-25-2)
Chlorobenzene (108-90-7)
Chloromethane (methyl chloride) (74-87-3)
1,1-Dichloroethane (75-34-3)
1,1,2,2-Tetrachloroethane (79-34-5)

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

1-Bromo-4-fluorobenzene (BFB)

1-Bromo-4-fluorobenzene (BFB) (460-00-4)

2,000 µg/mL in P&T methanol, 1 mL/ampul
cat.# 30026 (ea.)

2,500 µg/mL in P&T methanol, 1 mL/ampul
cat.# 30067 (ea.)

10,000 µg/mL in P&T methanol, 1 mL/ampul
cat.# 30082 (ea.)

1,4-Dioxane-d8

1,4-Dioxane-d8 (17647-74-4)

2,000 µg/mL in P&T methanol, 1 mL/ampul
cat.# 30614 (ea.)

Volatile Organics, *cont.*

Method 8260, 8260A, 8260B (Volatile Organic Compounds [VOCs]), *cont.*

PFTBA (MS Tuning Compound)

Perfluorotributylamine (PFTBA) (311-89-7)

Neat, 1 mL/ampul

cat.# 30482 (ea.)

No data pack available.

8260B MegaMix® Calibration Mix

MEGAMIX®

(76 components)

Acetonitrile (75-05-8)
Acrylonitrile (107-13-1)
Allyl chloride (3-chloropropene) (107-05-1)
Benzene (71-43-2)
Bromobenzene (108-86-1)
Bromochloromethane (74-97-5)
Bromodichloromethane (75-27-4)
Bromoform (75-25-2)
n-Butylbenzene (104-51-8)
sec-Butylbenzene (135-98-8)
tert-Butylbenzene (98-06-6)
Carbon disulfide (75-15-0)
Carbon tetrachloride (56-23-5)
Chlorobenzene (108-90-7)
2-Chloroethanol (107-07-3)
Chloroform (67-66-3)
Chloroprene (2-chloro-1,3-butadiene) (126-99-8)
2-Chlorotoluene (95-49-8)
4-Chlorotoluene (106-43-4)
Dibromochloromethane (124-48-1)
1,2-Dibromo-3-chloropropane (DBCP) (96-12-8)
1,2-Dibromoethane (EDB) (106-93-4)
Dibromomethane (74-95-3)
1,2-Dichlorobenzene (95-50-1)
1,3-Dichlorobenzene (541-73-1)
1,4-Dichlorobenzene (106-46-7)
cis-1,4-Dichloro-2-butene (1476-11-5)
trans-1,4-Dichloro-2-butene (110-57-6)
1,1-Dichloroethane (75-34-3)
1,2-Dichloroethane (107-06-2)
1,1-Dichloroethene (75-35-4)
cis-1,2-Dichloroethene (156-59-2)
trans-1,2-Dichloroethene (156-60-5)
1,2-Dichloropropane (78-87-5)
1,3-Dichloropropane (142-28-9)
2,2-Dichloropropane (594-20-7)
1,1-Dichloropropene (563-58-6)
cis-1,3-Dichloropropene (10061-01-5)
trans-1,3-Dichloropropene (10061-02-6)
Diethyl ether (ethyl ether) (60-29-7)
1,4-Dioxane (123-91-1)
Ethylbenzene (100-41-4)
Ethyl methacrylate (97-63-2)
Hexachloro-1,3-butadiene (87-68-3)
Iodomethane (methyl iodide) (74-88-4)
Isobutyl alcohol (2-methyl-1-propanol) (78-83-1)
Isopropylbenzene (cumene) (98-82-8)
4-Isopropyl toluene (*p*-Cymene) (99-87-6)
Methacrylonitrile (126-98-7)
Methyl acrylate (96-33-3)
Methyl methacrylate (80-62-6)
Methylene chloride (dichloromethane) (75-09-2)
Naphthalene (91-20-3)
Nitrobenzene (98-95-3)
2-Nitropropane (79-46-9)
Pentachloroethane (76-01-7)
Propionitrile (107-12-0)
n-Propylbenzene (103-65-1)
Styrene (100-42-5)
1,1,1,2-Tetrachloroethane (630-20-6)
1,1,2,2-Tetrachloroethane (79-34-5)
Tetrachloroethene (127-18-4)
Tetrahydrofuran (109-99-9)
Toluene (108-88-3)
1,2,3-Trichlorobenzene (87-61-6)
1,2,4-Trichlorobenzene (120-82-1)
1,1,1-Trichloroethane (71-55-6)
1,1,2-Trichloroethane (79-00-5)
Trichloroethene (79-01-6)
1,2,3-Trichloropropane (96-18-4)
1,1,2-Trichlorotrifluoroethane (CFC-113) (76-13-1)
1,2,4-Trimethylbenzene (95-63-6)
1,3,5-Trimethylbenzene (108-67-8)
m-Xylene (108-38-3)
o-Xylene (95-47-6)
p-Xylene (106-42-3)

2,000 µg/mL each in P&T methanol, 1 mL/ampul

cat.# 30633 (ea.)

8260B MegaMix® Calibration Mix, Revised (75 components)

MEGAMIX®

Same list as above, but without pentachloroethane.

2,000 µg/mL each in P&T methanol, 1 mL/ampul

cat.# 30152 (ea.)

2-Chloroethyl Vinyl Ether

2-Chloroethyl vinyl ether (110-75-8)

2,000 µg/mL in P&T methanol, 1 mL/ampul

cat.# 30265 (ea.)

8260B MegaMix® Calibration Mix Kit

MEGAMIX®

Contains 1 mL each of these mixtures.
30633: 8260B MegaMix Calibration Mix
30265: 2-chlorethyl vinyl ether

cat.# 30475 (kit)

kit

8240/8260 Calibration Check Mix (6 components)

Chloroform (67-66-3)
1,1-Dichloroethene (75-35-4)
1,2-Dichloropropane (78-87-5)
Ethylbenzene (100-41-4)
Toluene (108-88-3)
Vinyl chloride (75-01-4)

2,000 µg/mL each in P&T methanol, 1 mL/ampul

cat.# 30427 (ea.)

502.2 Calibration Mix #1 (gases) (6 components)

Bromomethane (methyl bromide) (74-83-9)
Chloroethane (ethyl chloride) (75-00-3)
Chloromethane (methyl chloride) (74-87-3)
Dichlorodifluoromethane (CFC-12) (75-71-8)
Trichlorofluoromethane (CFC-11) (75-69-4)
Vinyl chloride (75-01-4)

200 µg/mL each in P&T methanol, 1 mL/ampul

cat.# 30439 (ea.)

2,000 µg/mL each in P&T methanol, 1 mL/ampul

cat.# 30042 (ea.)

8260B Acetate Mix (5 components)

n-Butyl acetate (123-86-4)
Ethyl acetate (141-78-6)
Isopropyl acetate (108-21-4)
n-Propyl acetate (109-60-4)
Vinyl acetate (108-05-4)

2,000 µg/mL each in P&T methanol, 1 mL/ampul

cat.# 30477 (ea.)

8260B Acetate Mix (Revised) (7 components)

n-Amyl acetate (628-63-7)
Butyl acetate (123-86-4)
Ethyl acetate (141-78-6)
Isopropyl acetate (108-21-4)
Methyl acetate (79-20-9)
Propyl acetate (109-60-4)
Vinyl acetate (108-05-4)

2,000 µg/mL each in P&T methanol, 1 mL/ampul

cat.# 30489 (ea.)

California Oxygenates Mix (5 components)

tert-Amyl methyl ether (TAME) (994-05-8)	2,000 µg/mL
tert-Butanol (TBA) (75-65-0)	10,000
Diisopropyl ether (DIPE) (108-20-3)	2,000
Ethyl-*tert*-butyl ether (ETBE) (637-92-3)	2,000
Methyl *tert*-butyl ether (MTBE) (1634-04-4)	2,000

In P&T methanol, 1 mL/ampul

cat.# 30465 (ea.)

Oxygenates (6 components)

tert-Amyl ethyl ether (TAEE) (919-94-8)	2,000 µg/mL
tert-Amyl methyl ether (TAME) (994-05-8)	2,000
tert-Butanol (TBA) (75-65-0)	10,000
Diisopropyl ether (DIPE) (108-20-3)	2,000
Ethyl-*tert*-butyl ether (ETBE) (637-92-3)	2,000
Methyl *tert*-butyl ether (MTBE) (1634-04-4)	2,000

In P&T methanol, 1 mL/ampul

cat.# 30626 (ea.)

Volatile Organics, *cont.*

Method 8260, 8260A, 8260B (Volatile Organic Compounds [VOCs]), *cont.*

Single-Component Oxygenates Solutions

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

Compound	CAS #	Solvent	Conc.	cat.#
tert-Amyl alcohol	75-85-4	PTM	10,000	30631
tert-Amyl ethyl ether (TAEE)	919-94-8	PTM	2,000	30617
tert-Amyl methyl ether (TAME)	994-05-8	PTM	2,000	30629
tert-Butanol (TBA)	75-65-0	PTM	50,000	30470
tert-Butanol-d9	25725-11-5	PTM	20,000	30618
Diisopropyl ether (DIPE)	108-20-3	PTM	2,000	30627
Ethanol	64-17-5	PTM	2,000	30288
Ethanol	64-17-5	W	10,000	30466
Ethyl-*tert*-butyl ether (ETBE)	637-92-3	PTM	2,000	30628
Methanol	67-56-1	W	10,000	30467
Methyl *tert*-butyl ether (MTBE)	1634-04-4	PTM	2,000	30402

PTM = purge-and-trap grade methanol; W = DI water

also available

Rtx®-VMS Column

Your best choice for EPA Method 8260

- Fastest cycle times for VOCs.
- Tuned selectivity for VOCs.
- Excellent separation of gases.

See **page 78** for more information.



Acrolein

Acrolein (107-02-8)

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

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

This product has a limited shelf life. We recommend that you order only the ampul quantity that meets your immediate needs.

1,2-Dichlorotetrafluoroethane (CFC-114)

1,2-Dichlorotetrafluoroethane (CFC-114) (76-14-2)

2,000 µg/mL in P&T methanol, 1 mL/ampul
cat.# 30476 (ea.)

Chloroprene

A pure, quantitative chloroprene solution, specially stabilized in purge-and-trap grade methanol to allow dilutions for working standards in unmodified purge-and-trap methanol. The entire preparation procedure is performed under carefully monitored conditions to prevent any contamination or polymerization of the highly reactive, neat chloroprene.

Chloroprene (126-99-8)

5,000 µg/mL in P&T methanol, 1 mL/ampul
cat.# 30238 (ea.)

Vinyl Acetate

Vinyl acetate (108-05-4)

2,000 µg/mL in P&T methanol, 1 mL/ampul
cat.# 30216 (ea.)

8260A Volatile Organics Kit (2,000 µg/mL)

Changes in this revision of the method include modification of the recommended internal standard and surrogate solutions.

Contains 1 mL each of these mixtures.
30042: 502.2 Calibration Mix #1
30043: 502.2 Calibration Mix #2
30044: 502.2 Calibration Mix #3
30045: 502.2 Calibration Mix #4
30046: 502.2 Calibration Mix #5
30047: 502.2 Calibration Mix #6
30067: 4-bromofluorobenzene (2,500 µg/mL)
30240: 8260A Surrogate Mix (2,500 µg/mL)
30241: 8260A Internal Standard Mix (2,500 µg/mL)
30075: 8240/8260 System Performance Check Mix
30005: VOA Matrix Spike Mix (2,500 µg/mL)

cat.# 30242 (kit) **kit**

8260 Volatile Organics Kit (2,000 µg/mL)

Contains 1 mL each of these mixtures.
30042: 502.2 Calibration Mix #1
30043: 502.2 Calibration Mix #2
30044: 502.2 Calibration Mix #3
30045: 502.2 Calibration Mix #4
30046: 502.2 Calibration Mix #5
30047: 502.2 Calibration Mix #6
30067: 4-bromofluorobenzene (2,500 µg/mL)
30073: 8260 Surrogate Mix (2,500 µg/mL)
30074: 8260 Internal Standard Mix (2,500 µg/mL)
30075: 8240/8260 System Performance Check Mix
30005: VOA Matrix Spike Mix (2,500 µg/mL)

cat.# 30076 (kit) **kit**

TCLP VOA Mix (11 components)

Benzene (71-43-2)
2-Butanone (MEK) (78-93-3)
Carbon tetrachloride (56-23-5)
Chlorobenzene (108-90-7)
Chloroform (67-66-3)
1,4-Dichlorobenzene (106-46-7)
1,2-Dichloroethane (107-06-2)
1,1-Dichloroethene (75-35-4)
Tetrachloroethene (127-18-4)
Trichloroethene (79-01-6)
Vinyl chloride (75-01-4)

2,000 µg/mL each in P&T methanol:water (90:10), 1 mL/ampul
cat.# 30024 (ea.)



Restek Offers a Full Line of Certified Reference Materials

See **pages 464–465** or visit www.restek.com/iso

Volatile Organics, *cont.*

SOM01.1 (Volatiles), QA Mixes

SOM01.1 VOA Non-Ketone Deuterated Monitoring Compounds (11 components)

Benzene-d6 (1076-43-3)
Chloroethane-d5 (19199-91-8)
Chloroform-d (865-49-6)
1,2-Dichlorobenzene-d4 (2199-69-1)
1,2-Dichloroethane-d4 (17060-07-0)
1,1-Dichloroethene-d2 (22280-73-5)
1,2-Dichloropropane-d6 (93952-08-0)
1,3-Dichloropropene-d4 (202656-23-3)*
1,1,2,2-Tetrachloroethane-d2 (33685-54-0)
Toluene-d8 (2037-26-5)
Vinyl chloride-d3 (6745-35-3)

500 µg/mL each in deuterated methanol (MeOD), 1 mL/ampul
cat.# 30624 (ea.)

*Mix of *cis* and *trans* isomers. Exact proportions will be reported on the data sheet.

SOM01.1 VOA Ketone Deuterated Monitoring Compounds (2 components)

2-Butanone-d5 (24313-50-6)
2-Hexanone-d5 (4840-82-8)

500 µg/mL each in deuterium oxide (D_2O), 1 mL/ampul
cat.# 30625 (ea.)

SOM01.1 VOA DMC Kit

500 µg/mL. 1 mL each of these mixtures.
30624: Non-Ketones
30625: Ketones

500 µg/mL. 1 mL each of these mixtures.
cat.# 30630 (kit) kit

04.2, 04.1, and 10/92 SOW (Volatiles), QA Mixes

CLP 04.1 VOA Internal Standard/SMC Spike Mix (6 components)

Bromochloromethane (74-97-5)
1-Bromo-4-fluorobenzene (BFB) (460-00-4)
Chlorobenzene-d5 (3114-55-4)
1,2-Dichloroethane-d4 (17060-07-0)
1,4-Difluorobenzene (540-36-3)
Toluene-d8 (2037-26-5)

2,500 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30457 (ea.)

VOA Internal Standard Mix (3 components)

Bromochloromethane (74-97-5)
1,4-Difluorobenzene (540-36-3)
Chlorobenzene-d5 (3114-55-4)

2,500 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30011 (ea.)

VOA Surrogate Spike Mix (3 components)

1-Bromo-4-fluorobenzene (BFB) (460-00-4)
1,2-Dichloroethane-d4 (17060-07-0)
Toluene-d8 (2037-26-5)

2,500 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30004 (ea.)

VOA Matrix Spike Mix (5 components)

Benzene (71-43-2)
Chlorobenzene (108-90-7)
1,1-Dichloroethene (75-35-4)
Toluene (108-88-3)
Trichloroethene (79-01-6)

2,500 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30005 (ea.)

04.2, 04.1, and 10/92 SOW (Volatiles), QA Mixes, *cont.*

VOA Tuning Compound

1-Bromo-4-fluorobenzene (BFB) (460-00-4)

5,000 µg/mL in P&T methanol, 1 mL/ampul
cat.# 30003 (ea.)

PFTBA (MS Tuning Compound)

Perfluorotributylamine (PFTBA) (311-89-7)

Neat, 1 mL/ampul
cat.# 30482 (ea.)

No data pack available.

L/C VOA Lab Control Sample

We prepare the L/C VOA lab control sample in two parts. Sample #1 contains all compounds except vinyl chloride because this compound is extremely volatile and must be replaced frequently. Sample #2 contains vinyl chloride.

L/C VOA Lab Control Sample #1 (11 components)

Benzene (71-43-2)
Bromoform (75-25-2)
Carbon tetrachloride (56-23-5)
1,2-Dibromoethane (EDB) (106-93-4)
1,4-Dichlorobenzene (106-46-7)
1,2-Dichloroethane (107-06-2)
1,2-Dichloropropane (78-87-5)
cis-1,3-Dichloropropene (10061-01-5)
Tetrachloroethene (127-18-4)
1,1,2-Trichloroethane (79-00-5)
Trichloroethene (79-01-6)

2,500 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30092 (ea.)

L/C VOA Lab Control Sample #2 (Vinyl chloride)

Vinyl chloride (75-01-4)

2,500 µg/mL in P&T methanol, 1 mL/ampul
cat.# 30093 (ea.)

L/C VOA Internal Standard Mix (3 components)

Chlorobenzene-d5 (3114-55-4)
1,4-Dichlorobenzene-d4 (3855-82-1)
1,4-Difluorobenzene (540-36-3)

2,500 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30091 (ea.)

Volatile Organics, *cont.*

04.2 and 04.1 (Volatiles), Calibration Mixes

CLP 04.1 VOA CAL2000 MegaMix® Standard

MEGAMIX®

(40 components)

Benzene (71-43-2)
Bromodichloromethane (75-27-4)
Bromoform (75-25-2)
Carbon disulfide (75-15-0)
Carbon tetrachloride (56-23-5)
Chlorobenzene (108-90-7)
Chloroform (67-66-3)
Cyclohexane (110-82-7)
Dibromochloromethane (124-48-1)
1,2-Dibromo-3-chloropropane (DBCP) (96-12-8)
1,2-Dibromoethane (EDB) (106-93-4)
1,2-Dichlorobenzene (95-50-1)
1,3-Dichlorobenzene (541-73-1)
1,4-Dichlorobenzene (106-46-7)
1,1-Dichloroethane (75-34-3)
1,2-Dichloroethane (107-06-2)
1,1-Dichloroethene (75-35-4)
cis-1,2-Dichloroethene (156-59-2)
trans-1,2-Dichloroethene (156-60-5)
1,2-Dichloropropane (78-87-5)
cis-1,3-Dichloropropene (10061-01-5)
trans-1,3-Dichloropropene (10061-02-6)
Ethylbenzene (100-41-4)
Isopropylbenzene (cumene) (98-82-8)
Methyl acetate (79-20-9)
Methyl *tert*-butyl ether (MTBE) (1634-04-4)
Methylcyclohexane (108-87-2)
Methylene chloride (dichloromethane) (75-09-2)
Styrene (100-42-5)
1,1,2,2-Tetrachloroethane (79-34-5)
Tetrachloroethene (127-18-4)
Toluene (108-88-3)
1,2,4-Trichlorobenzene (120-82-1)
1,1,1-Trichloroethane (71-55-6)
1,1,2-Trichloroethane (79-00-5)
Trichloroethene (79-01-6)
1,1,2-Trichloro-1,2,2-trifluoroethane (CFC-113) (76-13-1)
m-Xylene (108-38-3)
o-Xylene (95-47-6)
p-Xylene (106-42-3)

2,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30456 (ea.)

502.2 Calibration Mix #1 (gases) (6 components)

Bromomethane (methyl bromide) (74-83-9)
Chloroethane (ethyl chloride) (75-00-3)
Chloromethane (methyl chloride) (74-87-3)
Dichlorodifluoromethane (CFC-12) (75-71-8)
Trichlorofluoromethane (CFC-11) (75-69-4)
Vinyl chloride (75-01-4)

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

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

VOA Calibration Mix #1 (ketones) (4 components)

Acetone (67-64-1)
2-Butanone (MEK) (78-93-3)
2-Hexanone (591-78-6)
4-Methyl-2-pentanone (MIBK) (108-10-1)

5,000 µg/mL each in P&T methanol:water (90:10), 1 mL/ampul
cat.# 30006 (ea.)

CLP 04.1 VOA Kit #3

Contains 1 mL each of these mixtures.
30006: VOA Calibration Mix #1 (ketones)
30042: 502.2 Calibration Mix #1 (gases)
30456: CLP 04.1 VOA CAL2000 MegaMix Standard

cat.# 30460 (kit) kit

3/90 SOW (Volatiles), Calibration Mixes

CLP VOA CAL2000 MegaMix® Standard

MEGAMIX®

(28 components)

Benzene (71-43-2)
Bromodichloromethane (75-27-4)
Bromoform (75-25-2)
Carbon disulfide (75-15-0)
Carbon tetrachloride (56-23-5)
Chlorobenzene (108-90-7)
Chloroform (67-66-3)
Dibromochloromethane (124-48-1)
1,1-Dichloroethane (75-34-3)
1,2-Dichloroethane (107-06-2)
1,1-Dichloroethene (75-35-4)
cis-1,2-Dichloroethene (156-59-2)
trans-1,2-Dichloroethene (156-60-5)
1,2-Dichloropropane (78-87-5)
cis-1,3-Dichloropropene (10061-01-5)
trans-1,3-Dichloropropene (10061-02-6)
Ethylbenzene (100-41-4)
Methylene chloride (dichloromethane) (75-09-2)
Styrene (100-42-5)
1,1,2,2-Tetrachloroethane (79-34-5)
Tetrachloroethene (127-18-4)
Toluene (108-88-3)
1,1,1-Trichloroethane (71-55-6)
1,1,2-Trichloroethane (79-00-5)
Trichloroethene (79-01-6)
m-Xylene (108-38-3)
o-Xylene (95-47-6)
p-Xylene (106-42-3)

2,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30632 (ea.)

Vinyl Acetate

Vinyl acetate (108-05-4)

2,000 µg/mL in P&T methanol, 1 mL/ampul
cat.# 30216 (ea.)

CLP VOA CAL2000 MegaMix® Kit

MEGAMIX®

Contains 1 mL each of these mixtures.
30632: CLP VOA CAL2000 MegaMix Standard
30216: vinyl acetate

cat.# 30438 (kit) kit

VOA Calibration Mix #2 (7 components)

Benzene (71-43-2)
Carbon disulfide (75-15-0)
Ethylbenzene (100-41-4)
Toluene (108-88-3)
Vinyl acetate (108-05-4)
o-Xylene (95-47-6)
p-Xylene (106-42-3)

2,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30007 (ea.)

VOA Calibration Mix #3 (10 components)

Carbon tetrachloride (56-23-5)
Chlorobenzene (108-90-7)
Chloroform (67-66-3)
1,1-Dichloroethane (75-34-3)
1,1-Dichloroethene (75-35-4)
1,2-Dichloropropane (78-87-5)
Methylene chloride (dichloromethane) (75-09-2)
1,1,2-Trichloroethane (79-00-5)
Trichloroethene (79-01-6)
m-Xylene (108-38-3)

2,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30008 (ea.)

VOA Calibration Mix #4 (12 components)

Bromodichloromethane (75-27-4)
Bromoform (75-25-2)
Dibromochloromethane (124-48-1)
1,2-Dichloroethane (107-06-2)
cis-1,2-Dichloroethene (156-59-2)
trans-1,2-Dichloroethene (156-60-5)
cis-1,3-Dichloropropene (10061-01-5)
trans-1,3-Dichloropropene (10061-02-6)
Styrene (100-42-5)
1,1,2,2-Tetrachloroethane (79-34-5)
Tetrachloroethene (127-18-4)
1,1,1-Trichloroethane (71-55-6)

2,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30009 (ea.)

Volatile Organics, *cont.*

3/90 SOW (Volatiles), Calibration Mixes, *cont.*

VOA Calibration Mix #5 (gases) (4 components)

Bromomethane (methyl bromide) (74-83-9)
Chloroethane (ethyl chloride) (75-00-3)
Chloromethane (methyl chloride (74-87-3)
Vinyl chloride (75-01-4)

2,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 30010 (ea.)

CLP VOA Calibration Kit #2

Contains 1 mL each of these mixtures.
30006: VOA Calibration Mix #1 (ketones)
30010: VOA Calibration Mix #5 (gases)
30632: CLP VOA CAL2000 MegaMix Standard
30216: Vinyl acetate

cat.# 30442 (kit) kit

OLC 03.2 (Volatiles), Calibration Mixes

OLC 03.2 VOA MegaMix® Standard

MEGAMIX®

(42 components)

Benzene (71-43-2)
Bromochloromethane (74-97-5)
Bromodichloromethane (75-27-4)
Bromoform (75-25-2)
Carbon disulfide (75-15-0)
Carbon tetrachloride (56-23-5)
Chlorobenzene (108-90-7)
Chloroform (67-66-3)
Cyclohexane (110-82-7)
Dibromochloromethane (chlorodibromomethane) (124-48-1)
1,2-Dibromo-3-chloropropane (DBCP) (96-12-8)
1,2-Dibromoethane (EDB) (106-93-4)
1,2-Dichlorobenzene (95-50-1)
1,3-Dichlorobenzene (541-73-1)
1,4-Dichlorobenzene (106-46-7)
1,1-Dichloroethane (75-34-3)
1,2-Dichloroethane (107-06-2)
1,1-Dichloroethene (75-35-4)
cis-1,2-Dichloroethene (156-59-2)
trans-1,2-Dichloroethene (156-60-5)
1,2-Dichloropropane (78-87-5)
cis-1,3-Dichloropropene (10061-01-5)
trans-1,3-Dichloropropene (10061-02-6)
Ethylbenzene (100-41-4)
Isopropylbenzene (cumene) (98-82-8)
Methyl acetate (79-20-9)
Methylcyclohexane (108-87-2)
Methyl *tert*-butyl ether (MTBE) (1634-04-4)
Methylene chloride (dichloromethane) (75-09-2)
Styrene (100-42-5)
1,1,2,2-Tetrachloroethane (79-34-5)
Tetrachloroethene (127-18-4)
Toluene (108-88-3)
1,2,3-Trichlorobenzene (87-61-6)
1,2,4-Trichlorobenzene (120-82-1)
1,1,1-Trichloroethane (71-55-6)
1,1,2-Trichloroethane (79-00-5)
Trichloroethene (79-01-6)
1,1,2-Trichlorotrifluoroethane (CFC-113) (76-13-1)
m-Xylene (108-38-3)*
o-Xylene (95-47-6)
p-Xylene (106-42-3)*

2,000 µg/mL each in P&T methanol, 1 mL/ampul*
cat.# 30492 (ea.)

*m-xylene and *p*-xylene concentration is 1,000 µg/mL.

Additional VOA Calibration Mixes Required:

30006: VOA Calibration Mix #1 page 558
30007: VOA Calibration Mix #2 page 558
30008: VOA Calibration Mix #3 page 558
30009: VOA Calibration Mix #4 page 558
30010: VOA Calibration Mix #5 see above
30003: VOA Tuning Compound page 557

International-Specific

Canada

C50 in Toluene

n-Pentacontane (C50) (6596-40-3)

10 µg/mL in toluene, 1 mL/ampul
cat.# 31685 (ea.)

CCME F1 Retention Time Marker (3 components)

n-Hexane (C6) (110-54-3)
n-Decane (C10) (124-18-5)
Toluene (108-88-3)

2,000 µg/mL each in methanol, 1 mL/ampul
cat.# 30611 (ea.)

CCME PHC Calibration Mix (3 components)

n-Decane (C10) (124-18-5)
n-Hexadecane (C16) (544-76-3)
n-Tetratriacontane (C34) (14167-59-0)

5,000 µg/mL each in toluene, 1 mL/ampul
cat.# 31684 (ea.)

Canadian Drinking Water Triazine Herbicides Mix

(7 components)

Alachlor (15972-60-8)
Atrazine (122-34-9)
Cyanazine (Bladex) (21725-46-2)
Metolachlor (51218-45-2)
Metribuzin (21087-64-9)
Prometryne (7287-19-6)
Simazine (122-34-9)

500 µg/mL each in acetone, 1 mL/ampul
cat.# 31864 (ea.)

Canadian Drinking Water OP Pesticides Mix

(9 components)

Azinphos methyl (86-50-0)
Chlorpyrifos (2921-88-2)
Diazinon (333-41-5)
Dimethoate (60-51-5)
Malathion (121-75-5)
Parathion (ethyl parathion) (56-38-2)
Phorate (298-02-2)
Temephos (Abate) (3383-96-8)
Terbufos (13071-79-9)

1,000 µg/mL each in acetonitrile, 1 mL/ampul
cat.# 31867 (ea.)

Canada - Atlantic Provinces

Atlantic RBCA EPH Mix (11 components)

n-Decane (C10) (124-18-5)
n-Dodecane (C12) (112-40-3)
n-Hexadecane (C16) (544-76-3)
n-Heneicosane (C21) (629-94-7)
n-Octacosane (C28) (630-02-4)
n-Dotriacontane (C32) (544-85-4)
Acenaphthene (83-32-9)
Anthracene (120-12-7)
Benzo(a)pyrene (50-32-8)
Chrysene (218-01-9)
Naphthalene (91-20-3)

1,000 µg/mL each in hexane:methylene chloride (85:15), 1 mL/ampul
cat.# 31872 (ea.)

Atlantic RBCA VPH Mix (12 components)

n-Hexane (C6) (110-54-3)
n-Heptane (C7) (142-82-5)
n-Octane (C8) (111-65-9)
n-Decane (C10) (124-18-5)
Benzene (71-43-2)
Ethylbenzene (100-41-4)
1-Methyl-3-ethylbenzene (620-14-4)
Toluene (108-88-3)
1,2,4-Trimethylbenzene (95-63-6)
1,3,5-Trimethylbenzene (108-67-8)
o-Xylene (95-47-6)
p-Xylene (106-42-3)

1,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 31871 (ea.)

International-Specific, *cont.*

Europe

Organophosphorus Pesticide Mix, European Formulation (16 components)

Acephate (30560-19-1)	200 µg/mL	Methamidophos (10265-92-6)	500
Azinphos methyl (86-50-0)	400	Methidathion (950-37-8)	200
Chlorpyrifos (2921-88-2)	100	Omethoate (1113-02-6)	1,000
Demeton-S-methyl (919-86-8)	200	Pirimiphos methyl (29232-93-7)	100
Dichlorvos (DDVP) (62-73-7)	500	Profenofos (41198-08-7)	200
Dimethoate (60-51-5)	200	Prothiofos (34643-46-4)	200
Ethion (563-12-2)	200	Pyrazophos (13457-18-6)	500
Malathion (121-75-5)	200	Tolclofos-methyl (57018-04-9)	100

In acetone, 1 mL/ampul

cat.# 32418 (ea.)

PCB Congener Standard #1 (6 components)

2,4,4'-Trichlorobiphenyl (BZ #28) (7012-37-5)
2,2',5,5'-Tetrachlorobiphenyl (BZ #52) (35693-99-3)
2,2',4,5,5'-Pentachlorobiphenyl (BZ #101) (37680-73-2)
2,2',3,4,4',5'-Hexachlorobiphenyl (BZ #138) (35065-28-2)
2,2',4,4',5,5'-Hexachlorobiphenyl (BZ #153) (35065-27-1)
2,2',3,4,4',5,5'-Heptachlorobiphenyl (BZ #180) (35065-29-3)

10 µg/mL each in isooctane, 1 mL/ampul

cat.# 32290 (ea.)

PCB Congener Standard #2 (7 components)

2,4,4'-Trichlorobiphenyl (BZ #28) (7012-37-5)
2,2',5,5'-Tetrachlorobiphenyl (BZ #52) (35693-99-3)
2,2',4,5,5'-Pentachlorobiphenyl (BZ #101) (37680-73-2)
2,3',4,4',5-Pentachlorobiphenyl (BZ #118) (31508-00-6)
2,2',3,4,4',5'-Hexachlorobiphenyl (BZ #138) (35065-28-2)
2,2',4,4',5,5'-Hexachlorobiphenyl (BZ #153) (35065-27-1)
2,2',3,4,4',5,5'-Heptachlorobiphenyl (BZ #180) (35065-29-3)

10 µg/mL each in isooctane, 1 mL/ampul

cat.# 32294 (ea.)

Japan

Japan Calibration Mix (9 components)

Acrylonitrile
Benzene
1,3-Butadiene
Chloroform
1,2-Dichloroethane
Dichloromethane
Tetrachloroethylene
Trichloroethylene
Vinyl chloride

cylinder design

Cylinder Construction: aluminum
Cylinder Fitting: CGA-180 outlet

Spectra (Linde) 104 L Cylinders:

Size: 8 x 24 cm
Volume/Pressure:
104 liters of gas
@ 1,800 psi
Weight: 1.5 lb/0.7 kg



Scotty (Air Liquide) 110 L Cylinders:

Size: 8.3 x 29.5 cm
Volume/Pressure:
110 liters of gas
@ 1,800 psi
Weight: 2.2 lb/1 kg
U.S. DOT Specs: 3AL2216



1 ppm in nitrogen, 104 liters @ 1,800 psi

cat.# 34418 (ea.)

1 ppm in nitrogen, 110 liters @ 1,800 psi

cat.# 26367 (ea.)

1 ppm in nitrogen, 110 liters @ 1,800 psi (Pi-marked cylinder)

cat.# 34418-PI (ea.)

No data pack available.

Gas standards are subject to hazardous materials shipping fees by most freight carriers. All calibration gas standards are nonreturnable due to DOT hazardous shipping requirements.

also available

High-Purity VOC Regulators

See **page 453.**



Drinking Water Odor Standard (2 components)

- Reference mix of the two most common odor-causing compounds.
- Convenient concentration for purge-and-trap analysis: 100 µg/mL in methanol.

Unpleasant odor in drinking water is associated with the growth and decay of microorganisms. The threshold value for these compounds is low (10 ppt), and purge-and-trap analyses usually are used to quantify them.

(+/–)-Geosmin (16423-19-1)
2-Methylisoborneol (MIB) (2371-42-8)

100 µg/mL in P&T methanol, 1 mL/ampul

cat.# 30608 (ea.)

International-Specific, *cont.*

ISO/DIS 9377 Water Quality Testing

- For GC analysis of total petroleum hydrocarbons (TPH) in water.
- Calibration standard available as diesel #2/motor oil and diesel #2/mineral oil.

Reference mixtures for ISO/DIS 9377 (German H-53), a gas chromatography–flame ionization detection (GC-FID) method.

Diesel #2/Motor Oil (2 components)

Diesel fuel #2 composite (68334-30-5)
Motor oil (64742-65-0)

5,000 µg/mL each in hexane, 1 mL/ampul
cat.# 31682 (ea.)

Diesel #2/Mineral Oil (2 components)

Diesel fuel #2 composite (68334-30-5)
Mineral oil (8042-47-5)

5,000 µg/mL each in hexane, 1 mL/ampul
cat.# 31676 (ea.)

Standard Mixture Stock Solution (2 components)

Diesel #2 (additive-free) (68334-30-5)
Mineral oil (additive-free [i.e., USP grade] bp 325–460 or C18–C32 retention time range) (8042-47-5)

5,000 µg/mL each in cyclohexane, 1 mL/ampul (prepares 8 mL of 1.25 µg/µL calibration curve high point). Total hydrocarbon concentration is 10,000 µg/mL.
cat.# 31630 (ea.)

Quality Control Standard Mixture, Revised (2 components)

- Updated reference materials for GC analysis of TPH in water.
- Determination of hydrocarbon oil index—applicable to drinking, surface, waste, and treated water.

Diesel #2 (additive-free) (68334-30-5)
Motor oil (additive-free bp 325–460 or C18–C32 retention time range) (64742-65-0)

500 µg/mL each in acetone, 1 mL/ampul (1 mL is enough mix to spike one 900 mL quality control sample). Total hydrocarbon concentration is 1,000 µg/mL.
cat.# 31641 (ea.)

Quality Control Standard Mixture (2 components)

- For GC analysis of total petroleum hydrocarbons (TPH) in water.
- Environmentally safer than previous methods.
- Calibration standard available as diesel #2/motor oil and diesel #2/mineral oil.

Diesel #2 (additive-free) (68334-30-5)
Mineral oil (additive-free [i.e., USP grade] bp 391–522 or C24–C40 retention time range) (8042-47-5)

500 µg/mL each in acetone, 1 mL/ampul (1 mL is enough mix to spike one quality control sample). Total hydrocarbon concentration is 1,000 µg/mL.
cat.# 31631 (ea.)

System Performance Test Standard Mixture of *n*-Alkanes (16 components)

n-Decane (C10) (124-18-5)
n-Dodecane (C12) (112-40-3)
n-Tetradecane (C14) (629-59-4)
n-Hexadecane (C16) (544-76-3)
n-Octadecane (C18) (593-45-3)
n-Eicosane (C20) (112-95-8)
n-Docosane (C22) (629-97-0)
n-Tetracosane (C24) (646-31-1)
n-Hexacosane (C26) (630-01-3)
n-Octacosane (C28) (630-02-4)
n-Triacontane (C30) (638-68-6)
n-Dotriacontane (C32) (544-85-4)
n-Tetratriacontane (C34) (14167-59-0)
n-Hexatriacontane (C36) (630-06-8)
n-Octatriacontane (C38) (7194-85-6)
n-Tetracontane (C40) (4181-95-7)

50 µg/mL each in hexane, 1 mL/ampul
cat.# 31678 (ea.)

Extraction Solvent Stock Solution #1 (2 components)

n-Decane (C10) (124-18-5) 20 µL/L
n-Tetracontane (C40) (4181-95-7) 20 mg/L

In hexane, 5 mL/ampul
cat.# 31679 (ea.)

Extraction Solvent Stock Solution #2 (2 components)

n-Decane (C10) (124-18-5) 20 µL/L
n-Tetracontane (C40) (4181-95-7) 20 mg/L

In hexane, 20 mL/ampul
cat.# 31680 (ea.)

Stearyl Stearate Test Solution

Stearyl stearate (2778-96-3)

2,000 µg/mL in hexane, 10 mL/ampul
cat.# 31681 (ea.)

2,000 µg/mL in cyclohexane, 10 mL/ampul (enough to check one Florisil cartridge)
cat.# 31636 (ea.)

Florisil® Cartridge Quality Control Standard Mixture, Rev. 2 (2 components)

Diesel fuel #2 composite (68334-30-5)
Mineral oil (8042-47-5)

1,000 µg/mL each in hexane, 10 mL/ampul
cat.# 31677 (ea.)

n-Tetracontane (C40)

n-Tetracontane (C40) (4181-95-7)

Neat, 100 mg
cat.# 31859 (ea.)

n-Decane (C10)

n-Decane (C10) (124-18-5)

Neat, 1 mL/ampul
cat.# 31858 (ea.)

Stearyl Stearate

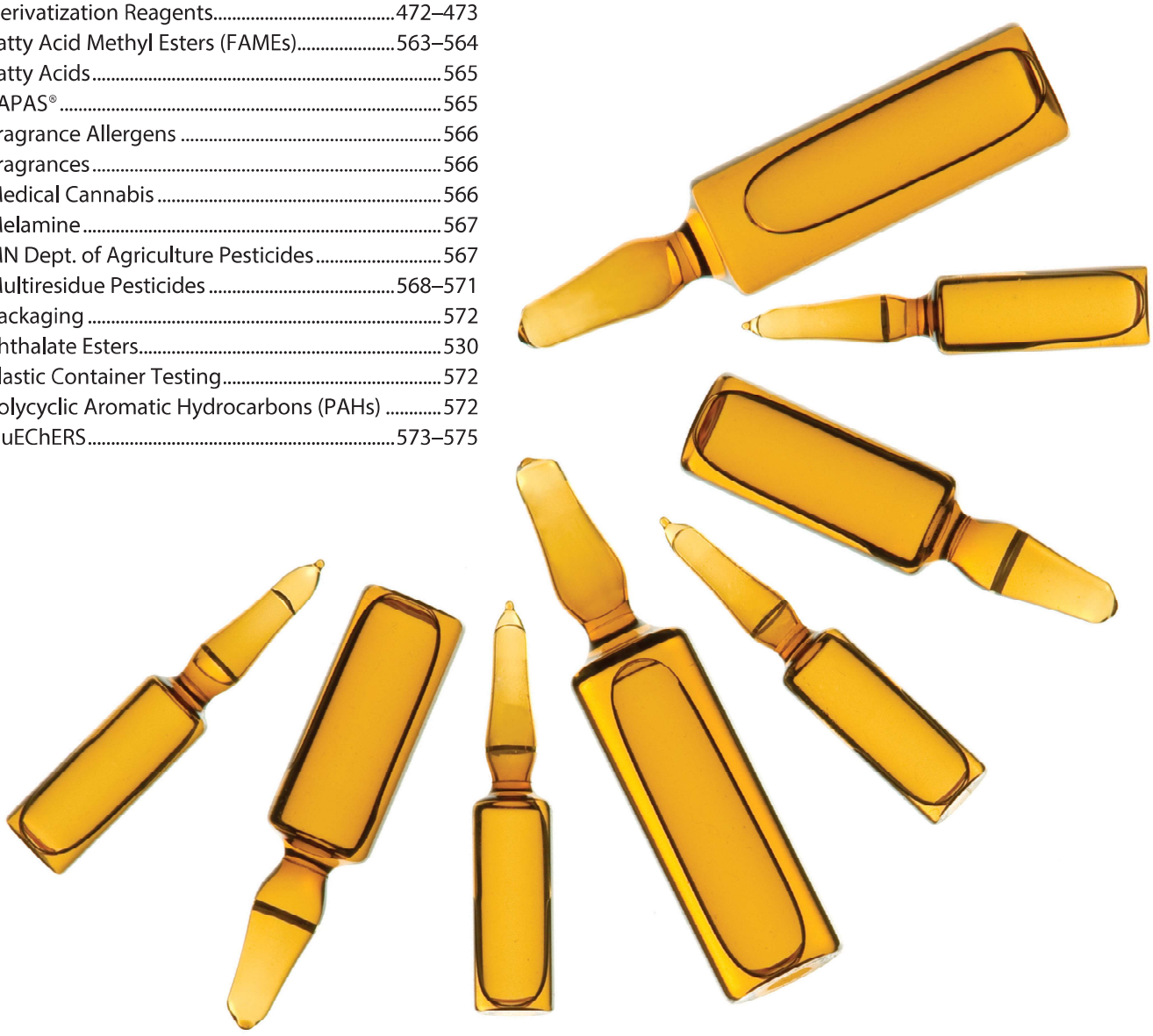
Stearyl stearate (2778-96-3)

Neat, 100 mg
cat.# 31860 (ea.)

Reference Standards

Foods, Flavors & Fragrances

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Derivatization Reagents

See pages 472–473.

Fatty Acid Methyl Esters (FAMEs)

Marine Oil FAME Mix (20 components)

Chain	Description	% by Weight
C14:0	Methyl myristate (124-10-7)	6.0
C14:1	Methyl myristoleate (56219-06-8)	1.0
C16:0	Methyl palmitate (112-39-0)	16.0
C16:1	Methyl palmitoleate (1120-25-8)	5.0
C18:0	Methyl stearate (112-61-8)	8.0
C18:1	Methyl oleate (112-62-9)	13.0
C18:1	Methyl vaccenate (1937-63-9)	4.0
C18:2	Methyl linoleate (112-63-0)	2.0
C18:3	Methyl linolenate (301-00-8)	2.0
C20:0	Methyl arachidate (1120-28-1)	1.0
C20:1	Methyl 11-eicosenoate (2390-09-2)	9.0
C20:2	Methyl 11,14-eicosadienoate (2493-02-7)	1.0
C20:4	Methyl arachidonate (2566-89-4)	3.0
C20:3	Methyl 11,14,17-eicosatrienoate (55682-88-7)	1.0
C20:5	Methyl eicosapentaenoate (2734-47-6)	10.0
C22:0	Methyl behenate (929-77-1)	1.0
C22:1	Methyl erucate (1120-34-9)	3.0
C22:6	Methyl docosahexaenoate (301-01-9)	12.0
C24:0	Methyl lignocerate (2442-49-1)	1.0
C24:1	Methyl nervonate (2733-88-2)	1.0

cat.# 35066 (100 mg)

No data pack available.

cis/trans FAME Mix (8 components)

Description	% by Weight
methyl elaidate (C18:1 *trans*-9)	10.0
methyl linoleate (C18:2 *cis*-9,12)	20.0
methyl oleate (C18:1 *cis*-9)	10.0
methyl petroselinate (C18:1 *cis*-6)	8.0
methyl petroselaidate (C18:1 *trans*-6)	8.0
methyl stearate (C18:0)	20.0
methyl transvaccenate (C18:1 *trans*-11)	12.0
methyl vaccenate (C18:1 *cis*-11)	12.0

10 mg/mL total in methylene chloride, 1 mL/ampul
cat.# 35079 (ea.)

No data pack available.

NLEA FAME Mix (28 components)

Chain	% by Weight	Chain	% by Weight
C4:0	1.5	C18:1 (*trans*-9)	2.5
C6:0	1.5	C18:1 (*cis*-9)	15.0
C8:0	2.0	C18:2 (all-*trans*-9,12)	2.5
C10:0	2.5	C18:2 (all-*cis*-9,12)	10.0
C11:0	2.5	C18:3 (all-*cis*-9,12,15)	5.0
C12:0	5.0	C20:0	2.5
C13:0	2.5	C20:1 (*cis*-11)	1.5
C14:0	2.5	C20:5 (all-*cis*-5,8,11,14,17)	2.5
C14:1 (*cis*-9)	1.5	C22:0	2.5
C15:0	1.5	C22:1 (*cis*-13)	1.5
C16:0	10.0	C22:6 (all-*cis*-4,7,10,13,16,19)	2.5
C16:1 (*cis*-9)	5.0	C23:0	1.5
C17:0	2.5	C24:0	2.5
C18:0	5.0	C24:1 (*cis*-15)	2.5

30 mg/mL total in methylene chloride, 1 mL/ampul
cat.# 35078 (ea.)

No data pack available.

Fatty Acid Methyl Esters (FAMEs), *cont.*

Food Industry FAME Mix (37 components)

Chain	% by Weight	Chain	% by Weight
C4:0	4.0	C18:2 (all-*cis*-9,12)	2.0
C6:0	4.0	C18:3 (all-*cis*-6,9,12)	2.0
C8:0	4.0	C18:3 (all-*cis*-9,12,15)	2.0
C10:0	4.0	C20:0	4.0
C11:0	2.0	C20:1 (*cis*-11)	2.0
C12:0	4.0	C20:2 (all-*cis*-11,14,)	2.0
C13:0	2.0	C20:3 (all-*cis*-8,11,14)	2.0
C14:0	4.0	C20:3 (all-*cis*-11,14,17)	2.0
C14:1 (*cis*-9)	2.0	C20:4 (all-*cis*-5,8,11,14)	2.0
C15:0	2.0	C20:5 (all-*cis*-5,8,11,14,17)	2.0
C15:1 (*cis*-10)	2.0	C21:0	2.0
C16:0	6.0	C22:0	4.0
C16:1 (*cis*-9)	2.0	C22:1 (*cis*-13)	2.0
C17:0	2.0	C22:2 (all-*cis*-13,16)	2.0
C17:1 (*cis*-10)	2.0	C22:6 (all-*cis*-4,7,10,13,16,19)	2.0
C18:0	4.0	C23:0	2.0
C18:1 (*trans*-9)	2.0	C24:0	4.0
C18:1 (*cis*-9)	4.0	C24:1 (*cis*-15)	2.0
C18:2 (all-*trans*-9,12)	2.0		

30 mg/mL total in methylene chloride, 1 mL/ampul
cat.# 35077 (ea.)

No data pack available.

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Fatty Acid Methyl Esters (FAMEs), *cont.*

Neat Fatty Acid Methyl Esters

Use these materials to prepare specific mixtures not commercially available. These products are of the highest purity available, typically 99% by GC-FID analysis. Each compound is packaged under a nitrogen blanket to ensure product stability. A certificate of analysis is provided with each ampul.

Chain	Description	CAS #	qty.	cat.#
C6:0	Methyl caproate	106-70-7	100 mg	35037
C8:0	Methyl caprylate	111-11-5	100 mg	35039
C10:0	Methyl caprate	110-42-9	100 mg	35041
C11:0	Methyl undecanoate	1731-86-8	100 mg	35042
C12:0	Methyl laurate	111-82-0	100 mg	35043
C13:0	Methyl tridecanoate	1731-88-0	100 mg	35044
C14:0	Methyl myristate	124-10-7	100 mg	35045
C16:0	Methyl palmitate	112-39-0	100 mg	35048
C16:1 Δ 9 *cis*	Methyl palmitoleate	1120-25-8	100 mg	35049
C17:0	Methyl heptadecanoate	1731-92-6	100 mg	35050
C18:0	Methyl stearate	112-61-8	100 mg	35051
C18:1 Δ 9 *cis*	Methyl oleate	112-62-9	100 mg	35052
C18:2 Δ 9,12 *cis*	Methyl linoleate	112-63-0	100 mg	35053
C18:3 Δ 9,12,15 *cis*	Methyl linolenate	301-00-8	100 mg	35054
C19:0	Methyl nonadecanoate	1731-94-8	100 mg	35055
C20:0	Methyl arachidate	1120-28-1	100 mg	35056
C20:1 Δ 11 *cis*	Methyl eicosenoate	2390-09-2	100 mg	35057
C20:3 Δ 11,14,17 *cis*	Methyl eicosatrienoate	55682-88-7	100 mg	35059
C21:0	Methyl heneicosanoate	6064-90-0	100 mg	35061
C22:0	Methyl behenate	929-77-1	100 mg	35062
C22:1 Δ 13 *cis*	Methyl erucate	1120-34-9	100 mg	35063
C24:0	Methyl lignocerate	2442-49-1	100 mg	35064

No data pack available.

Quantitative Fatty Acid Methyl Ester (FAME) Mixtures

These mixtures can be used for quantification (AOCS Method CE 1–62) and approximate the compositions of the following types of oils:

AOCS #1: corn, poppy seed, cotton seed, soybean, walnut, safflower, sunflower, rice, bran, and sesame oil
AOCS #2: linseed, perilla, hempseed, and rubberseed oil
AOCS #3: peanut, rapeseed, and mustard seed oil
AOCS #4: olive, teaseed, and neatsfoot oil
AOCS #5: coconut, palm kernel, babassu, and ouricuri oil
AOCS #6: lard, beef or mutton tallow, and palm oil

FAME #1: oils of mid-range chain lengths (C16–C18)
FAME #2: oils of short- to mid-range chain lengths (C6–C14)
FAME #3: oils of short- to mid-range chain lengths (C8–C16)
FAME #4: oils of mid-range to long chain lengths (C16–C24)
FAME #5: oils of mid-range to long chain lengths (C16–C24)
FAME #6: oils of long chain lengths (C20–C21)
FAME #13: mustard seed oil
FAME #14: cocoa butter

Mix	cat.#	methyl caproate (6:0)	methyl heptanoate (7:0)	methyl caprylate (8:0)	methyl nonanoate (9:0)	methyl caprate (10:0)	methyl undecanoate (11:0)	methyl laurate (12:0)	methyl tridecanoate (13:0)	methyl myristate (14:0)	methyl pentadecanoate (15:0)	methyl palmitate (16:0)	methyl palmitoleate (16:1)	methyl heptadecanoate (17:0)	methyl stearate (18:0)	methyl oleate (18:1)	methyl linoleate (18:2)	methyl linolenate (18:3)	methyl nonadecanoate (19:0)	methyl arachidate (20:0)	methyl eicosenoate (20:1)	methyl eicosadienoate (20:2)	methyl homo γ-linolenate (20:3)	methyl arachidonate (20:4)	methyl heneicosanoate (21:0)	methyl behenate (22:0)	methyl erucate (22:1)	methyl docosadienoate (22:2)	methyl lignocerate (24:0)	methyl nervonate (24:1)
		Composition of each mixture listed as a weight/weight % basis (minimum 50 mg/ampul)																												
AOCS #1	35022											6.0			3.0	35.0	50.0	3.0		3.0										
AOCS #2	35023											7.0			5.0	18.0	36.0	34.0												
AOCS #3	35024									1.0		4.0			3.0	45.0	15.0	3.0		3.0							3.0	20.0		3.0	
AOCS #4	35025											11.0			3.0	80.0	6.0													
AOCS #5	35026			7.0		5.0		48.0		15.0		7.0			3.0	12.0	3.0													
AOCS #6	35027									2.0		30.0	3.0		14.0	41.0	7.0	3.0												
FAME #1	35010											20.0			20.0	20.0	20.0	20.0												
FAME #2	35011	20.0		20.0		20.0		20.0		20.0																				
FAME #3	35012			20.0		20.0		20.0		20.0		20.0																		
FAME #4	35013											20.0			20.0					20.0							20.0			20.0	
FAME #5	35014												20.0			20.0					20.0							20.0			20.0
FAME #6	35015																			20.0	20.0	20.0	20.0	20.0						
FAME #13	35034											3.0	1.0		2.0	20.0	15.0	10.0		1.0	10.0	2.0					1.0	30.0	2.0	1.0	2.0
FAME #14	35035									0.1		26.3	0.4	0.3	33.7	34.3	3.1	0.2		1.3	0.1						0.2				

Composition of each compound listed as a weight/weight % basis.

Fatty Acids

EP 2.4.22 Composition of Fatty Acids by GC Mix 1

(6 components)

Description	% by Weight	Description	% by Weight
Methyl arachidate (C20:0)	40	Methyl oleate (C18:1 [*cis*9])	20
Methyl dodecanoate (C12:0)	5	Methyl palmitate (C16:0)	10
Methyl myristate (C14:0)	5	Methyl stearate (C18:0)	20

100 mg total

cat.# 35100 (ea.)

No data pack available.

EP 2.4.22 Composition of Fatty Acids by GC Mix 2

(5 components)

Description	% by Weight	Description	% by Weight
Methyl caproate (C6:0)	10	Methyl dodecanoate (C12:0)	20
Methyl caprylate (C8:0)	10	Methyl myristate (C14:0)	40
Methyl decanoate (C10:0)	20		

100 mg total

cat.# 35101 (ea.)

No data pack available.

Standard Methods for the Examination of Water and Wastewater Method 5560: Organic and Volatile Acids

The measurement of organic acids, either by adsorption and elution from a chromatographic column or by distillation, can be used as a control test for anaerobic digestion. The chromatographic separation method is presented for organic acids (5560B), while a method using distillation (5560C) is presented for volatile acids. A new method using gas chromatography is included for the determination of acetic, propionic, butyric, isobutyric, valeric, and isovaleric acids (5560D).

Free Fatty Acids Test Standard (6 components)

Acetic acid (64-19-7)
Butyric acid (C4:0) (107-92-6)
Isobutyric acid (79-31-2)
Isovaleric acid (503-74-2)
Propionic acid (79-09-4)
Valeric acid (109-52-4)

1,000 µg/mL each in water, 1 mL/ampul

cat.# 35272 (ea.)



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Food Analysis Performance Assessment Scheme (FAPAS®)

FAPAS® Food Testing Program*

FAPAS® Series 5 OC Pesticide Mix 1 (19 components)

Equal concentration of all compounds. Suitable for GC-MS analysis.

Aldrin (309-00-2)
α-BHC (319-84-6)
β-BHC (319-85-7)
γ-BHC (Lindane) (58-89-9)
cis-Chlordane (5103-71-9)
trans-Chlordane (5103-74-2)
4,4'-DDD (72-54-8)
4,4'-DDE (72-55-9)
2,4'-DDT (789-02-6)
4,4'-DDT (50-29-3)
Dieldrin (60-57-1)
α-Endosulfan (I) (959-98-8)
β-Endosulfan (II) (33213-65-9)
Endosulfan sulfate (1031-07-8)
Endrin (72-20-8)
Heptachlor (76-44-8)
Heptachlor epoxide (isomer B) (1024-57-3)
Hexachlorobenzene (118-74-1)
Oxychlordane (27304-13-8)

100 µg/mL each in acetone, 1 mL/ampul

cat.# 32412 (ea.)

FAPAS® Series 5 OC Pesticide Mix 2 (19 components)

Varied concentrations. Suitable for GC-ECD analysis.

Aldrin (309-00-2)	10 µg/mL	Dieldrin (60-57-1)	20
α-BHC (319-84-6)	10	α-Endosulfan (I) (959-98-8)	10
β-BHC (319-85-7)	10	β-Endosulfan (II) (33213-65-9)	20
γ-BHC (Lindane) (58-89-9)	10	Endosulfan sulfate (1031-07-8)	20
cis-Chlordane (5103-71-9)	10	Endrin (72-20-8)	20
trans-Chlordane (5103-74-2)	10	Heptachlor (76-44-8)	10
4,4'-DDD (72-54-8)	20	Heptachlor epoxide (isomer B) (1024-57-3)	10
4,4'-DDE (72-55-9)	20	Hexachlorobenzene (118-74-1)	10
2,4'-DDT (789-02-6)	20	Oxychlordane (27304-13-8)	10
4,4'-DDT (50-29-3)	20		

In acetone, 1 mL/ampul

cat.# 32414 (ea.)

FAPAS® Series 9 OP Pesticide Mix 1 (10 components)

Equal concentration of all compounds. Suitable for GC-FPD, GC-NPD, and GC-MS analysis.

Chlorpyriphos (2921-88-2)
Chlorpyriphos-methyl (5598-13-0)
Diazinon (333-41-5)
Dichlorvos (DDVP) (62-73-7)
Etrimphos (38260-54-7)
Fenitrothion (122-14-5)
Malathion (121-75-5)
Methacriphos (62610-77-9)
Phosphamidon (13171-21-6)
Pirimiphos-methyl (29232-93-7)

100 µg/mL each in acetone, 1 mL/ampul

cat.# 32413 (ea.)

*Use of Restek® calibration mixtures by laboratories participating in the FAPAS® program is voluntary; no endorsement of any Restek® product has been made by the Central Science Laboratory. To obtain further information regarding the FAPAS® program, or to participate, contact fapas@csl.gov.uk

Fragrance Allergens

Fragrance Allergen Standards Kit

- Highly stable formulation has a minimum shelf life of 18 months.
- Fully resolves 31 fragrance allergens with one analysis on an Rxi®-17 column.
- Ideal for GC-MS analysis following IFRA methodology.
- Helps you meet EU requirements defined in the European Cosmetics Directive.
- All components included at 400 ppm to allow dilution for calibration curves and use with different solvents.
- Exceeds purity requirements outlined in IFRA method.

MTBE Solvent Blank	
methyl *tert*-butyl ether (MTBE) (1634-04-4)	Neat
1-Fluoronaphthalene (Internal Standard)	
1-fluoronaphthalene (321-38-0)	20 µg/mL
Fragrance Allergen Standard A (Includes Internal Standard)	
α-amylcinnamaldehyde*† (122-40-7)	400 µg/mL
cinnamal* (104-55-2)	400
citral*† (5392-40-5)	400
3,7-dimethyl-7-hydroxyoctanal* (107-75-5)	400
1-fluoronaphthalene (321-38-0)	20
α-hexylcinnamaldehyde*† (101-86-0)	400
lilial* (80-54-6)	400
lyral*† (31906-04-4)	400
phenylacetaldehyde** (122-78-1)	400
Fragrance Allergen Standard B (Includes Internal Standard)	
α-amylcinnamic alcohol*† (101-85-9)	400 µg/mL
benzyl alcohol* (100-51-6)	400
cinnamyl alcohol* (104-54-1)	400
citronellol* (106-22-9)	400
eugenol* (97-53-0)	400
farnesol*† (4602-84-0)	400
1-fluoronaphthalene (321-38-0)	20
geraniol* (106-24-1)	400
isoeugenol* (97-54-1)	400
linalool* (78-70-6)	400
4-methoxybenzyl alcohol* (105-13-5)	400
methyl eugenol** (93-15-2)	400
Fragrance Allergen Standard C (Includes Internal Standard)	
4-allylanisole** (140-67-0)	400 µg/mL
benzyl benzoate* (120-51-4)	400
benzyl cinnamate* (103-41-3)	400
benzyl salicylate* (118-58-1)	400
camphor** (76-22-2)	400
1,8-cineole** (470-82-6)	400
coumarin* (91-64-5)	400
1-fluoronaphthalene (321-38-0)	20
limonene* (138-86-3)	400
iso-α-methylionone* (127-51-5)	400
methyl 2-nonynoate** (111-80-8)	400
methyl 2-octynoate* (111-12-6)	400
safrole** (94-59-7)	400

*Compound listed in 7th Amendment to the European Cosmetics Directive.
**Additional potential allergens included in this formulation.
†Compounds defined as two isomers resulting in two chromatographic peaks.

Contains 1 mL each of these mixtures (in methyl *tert*-butyl ether).
cat.# 33105 (kit)

kit

Fragrances

Fragrance Materials Test Mix (12 components)

- Performance evaluation for essential oils and fragrance chemicals.
- System suitability mixture for GC systems and analytical columns.
- Convenient 0.5 mL quantity for easy dilution to recommended working solution.

The Fragrance Materials Association (FMA) has proposed a method for analyzing essential oils on polar and nonpolar capillary GC columns. A performance evaluation mixture should be used to aid in detecting inlet problems, stationary phase degradation, loss of resolution, changes in sensitivity, and the presence of reactive sites in the sample pathway. Our test mix is consistent with the mixture proposed by the FMA. The required 5% test solution is made by diluting the 0.5 mL of neat mixture to 10 mL with acetone. The working solution will be stable for up to one week if transferred to a dark container and stored refrigerated.

Benzoic acid (65-85-0)	1.0%	Geraniol (106-24-1)	0.6%
Benzyl salicylate (118-58-1)	36.2%	Hydroxycitronellal (3,7-Dimethyl-7-hydroxyoctanal) (107-75-5)	5.0%
1,8-Cineole (Eucalyptol) (470-82-6)	0.5%	d-Limonene (5989-27-5)	20.0%
trans Cinnamaldehyde (14371-10-9)	0.5%	Thymol (89-83-8)	0.3%
Cinnamyl acetate (103-54-8)	0.3%	Vanillin (121-33-5)	0.1%
Cinnamyl alcohol (104-54-1)	0.3%		
Ethyl butyrate (105-54-4)	36.2%		

Neat, 0.5 mL in an amber ampul
cat.# 31807 (ea.)

No data pack available.

Medical Cannabis

Cannabinoids Standard (3 components)

Cannabidiol (13956-29-1)
Cannabinol (521-35-7)
delta-9-Tetrahydrocannabinol (Δ^9-THC) (1972-08-3)

1,000 µg/mL each in P&T methanol, 1 mL/ampul
cat.# 34014 (ea.)

Medical Marijuana Singles

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

Compound	CAS #	Solvent	Conc.	cat.#
Cannabichromene (CBC)	20675-51-8	PTM	1,000	34092
Cannabidiol (CBD)	13956-29-1	PTM	1,000	34011
Cannabidiolic Acid (CBDA)	1244-58-2	ACN	1,000	34094
Cannabigerol (CBG)	25654-31-3	PTM	1,000	34091
Cannabinol (CBN)	521-35-7	PTM	1,000	34010
delta-8-Tetrahydrocannabinol (Δ^8-THC)	5957-75-5	PTM	1,000	34090
delta-9-Tetrahydrocannabinol (Δ^9-THC)	1972-08-3	M	1,000	34067
delta-9-Tetrahydrocannabinolic acid A (Δ^9-THCA-A)	23978-85-0	PTM	1,000	34093
Tetrahydrofuran-d8	1693-74-9	PTM	2,000	30112
(±)11-nor-9-carboxy-Δ^9-THC	104874-50-2	M	100	34068

ACN = acetronitrile; M = methanol; PTM = purge-and-trap grade methanol

Melamine

Melamine Analysis Kit

Kit includes:
Column:
Rxi-5Sil MS w/5-meter Integra-Guard
Standards:

33247: 1 mL Melamine Stock Standard	(1,000 µg/mL)
33248: 1 mL Cyanuric Acid Stock Standard	(1,000 µg/mL)
33249: 1 mL Ammelide Stock Standard	(1,000 µg/mL)
33250: 1 mL Ammeline Stock Standard	(1,000 µg/mL)
33251: 1 mL Benzoguanamine Internal Standard	(1,000 µg/mL)
33253: 1 mL Melamine Mix Standard	(1,000 µg/mL)

Derivatization Reagent:
35607: BSTFA w/1% TMCS, 25 g vial
Accessories:
50 mL empty centrifuge tubes, 10-pk.
13 mm, 0.45 µm nylon syringe filters, 20-pk.
Easy-to-follow instructions with procedural checklists to assist with laboratory documentation.

Contains contents listed above.
cat.# 33254 (kit) kit

*Kit contains a 10-pk. of tubes and 20-pk. of filters. 50-pk. of tubes (cat.# 26239) and 100-pk. of filters (cat.# 26147) sold separately.

Melamine and Related Analogs Stock Standard

(4 components)

Ammelide (645-93-2)
Ammeline (645-92-1)
Cyanuric Acid (108-80-5)
Melamine (108-78-1)

1,000 µg/mL each in diethylamine:water (20:80), 1 mL/ampul
cat.# 33253 (ea.)

Melamine Stock Standard

Melamine (108-78-1)

1,000 µg/mL in diethylamine:water (20:80), 1 mL/ampul
cat.# 33247 (ea.)

Cyanuric Acid Stock Standard

Cyanuric acid (108-80-5)

1,000 µg/mL in diethylamine:water (20:80), 1 mL/ampul
cat.# 33248 (ea.)

Ammelide Stock Standard

Ammelide (645-93-2)

1,000 µg/mL in diethylamine:water (20:80), 1 mL/ampul
cat.# 33249 (ea.)

Ammeline Stock Standard

Ammeline (645-92-1)

1,000 µg/mL in diethylamine:water (20:80), 1 mL/ampul
cat.# 33250 (ea.)

Benzoguanamine Internal Standard

Benzoguanamine (91-76-9)

1,000 µg/mL in pyridine, 1 mL/ampul
cat.# 33251 (ea.)

MN Dept. of Agriculture Pesticides

Minnesota Ag List 1 Pesticides Mix A (16 components)

Acetochlor (34256-82-1)
Alachlor (15972-60-8)
Atrazine (1912-24-9)
Cyanazine (Bladex) (21725-46-2)
Desethylatrazine (6190-65-4)
Desisopropylatrazine (1007-28-9)
Dimethenamid (87674-68-8)*
Ethalfluralin (55283-68-6)
Metolachlor (51218-45-2)
Metribuzin (21087-64-9)
Pendimethalin (40487-42-1)
Prometon (1610-18-0)
Propachlor (1918-16-7)
Propazine (139-40-2)
Simazine (122-34-9)
Trifluralin (1582-09-8)

200 ppm each in acetone, 1 mL/ampul
cat.# 32406 (ea.)

*Added to Minnesota Department of Agriculture List 1 pesticide (neutrals) incident investigation requirements, effective January 1, 2000.[1] CAS # 87674-68-8 manufactured by several companies under various trade names.
[1]Analytical Lists for Pesticide Incident Investigations, Minnesota Department of Agriculture, Guidance Document 26 (3/99), St. Paul, MN. For a copy, visit their website at: www.mda.state.mn.us

Minnesota Ag List 1 Pesticides Mix B (6 components)

Chlorpyrifos (2921-88-2)
EPTC (759-94-4)
Fonofos (944-22-9)
Phorate (298-02-2)
Terbufos (13071-79-9)
Triallate (2303-17-5)

200 ppm each in acetone, 1 mL/ampul
cat.# 32407 (ea.)

Minnesota Ag List 1 Pesticide Kit

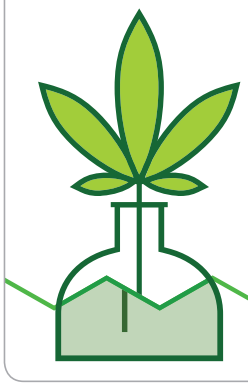
Contains 1 mL each of these mixtures.
32406: Minnesota Ag List Pesticides Mix A
32407: Minnesota Ag List Pesticides Mix B
Contains 1 mL each of these mixtures.
cat.# 32408 (kit) kit

also available

Rxi®-5Sil MS Column
Ideal for pesticide and melamine analysis.

See **page 32**.





Growing Analytical Solutions for Medical Cannabis Labs

Products and expertise for accurate, reliable results every time

www.restek.com/cannabis

Multiresidue Pesticides



GC Multiresidue Pesticide Kit

- Accurately identify and quantify pesticide residues by GC-MS/MS in fruits, vegetables, botanicals, and herbals like tea, ginseng, ginger, Echinacea, and dietary supplements.
- Comprehensive 203-compound kit covers food safety lists by the FDA, USDA, and other global governmental agencies; individual ampuls also sold separately.
- Formulated and grouped for maximum long-term stability* and well-balanced chromatographic performance, even for early eluting compounds.
- Quantitatively tested to confirm composition; detailed support documentation provided.
- Optimized multiresidue pesticide method is offered free of charge; downloadable XLS file includes conditions and transition tables.
- Certified reference material (CRM) manufactured and QC-tested in Restek's ISO-accredited labs satisfies your ISO requirements.
- Restek is your complete supplier for world-class GC-MS/MS multiresidue pesticide analysis: reference and internal standards, Rxi®-5ms GC columns, Q-sep® QuEChERS sample prep, Sky® inlet liners, accessories, and more!

Cat.# 32563: GC Multiresidue Pesticide Standard #1 (16 components)
Organophosphorus Compounds
Azinphos ethyl (2642-71-9)
Azinphos methyl (86-50-0)
Chlorpyrifos (2921-88-2)
Chlorpyrifos methyl (5598-13-0)
Diazinon (333-41-5)
EPN (2104-64-5)
Fenitrothion (122-14-5)
Isazophos (42509-80-8)
Phosalone (2310-17-0)
Phosmet (732-11-6)
Pirimiphos ethyl (23505-41-1)
Pirimiphos methyl (29232-93-7)
Pyraclofos (77458-01-6)
Pyrazophos (13457-18-6)
Pyridaphenthion (119-12-0)
Quinalphos (13593-03-8)

Cat.# 32564: GC Multiresidue Pesticide Standard #2 (40 components)
Organochlorine Compounds
Aldrin (309-00-2)
alpha-BHC (319-84-6)
beta-BHC (319-85-7)
delta-BHC (319-86-8)
gamma-BHC (Lindane) (58-89-9)
Chlorbenside (103-17-3)
cis-Chlordane (5103-71-9)
trans-Chlordane (5103-74-2)
Chlorfenson (Ovex) (80-33-1)
Chloroneb (2675-77-6)
2,4'-DDD (53-19-0)
4,4'-DDD (72-54-8)
2,4'-DDE (3424-82-6)
4,4'-DDE (72-55-9)
2,4'-DDT (789-02-6)
4,4'-DDT (50-29-3)
4,4'-Dichlorobenzophenone (90-98-2)
Dieldrin (60-57-1)
Endosulfan I (959-98-8)
Endosulfan II (33213-65-9)
Endosulfan ether (3369-52-6)
Endosulfan sulfate (1031-07-8)
Endrin (72-20-8)
Endrin aldehyde (7421-93-4)
Endrin ketone (53494-70-5)
Ethylan (Perthane) (72-56-0)
Fenson (80-38-6)
Heptachlor (76-44-8)
Heptachlor epoxide (Isomer B) (1024-57-3)
Hexachlorobenzene (118-74-1)
Isodrin (465-73-6)
2,4'-Methoxychlor (30667-99-3)
4,4'-Methoxychlor olefin (2132-70-9)
Mirex (2385-85-5)
cis-Nonachlor (5103-73-1)
trans-Nonachlor (39765-80-5)
Pentachloroanisole (1825-21-4)
Pentachlorobenzene (608-93-5)
Pentachlorothioanisole (1825-19-0)
Tetradifon (116-29-0)

Cat.# 32565: GC Multiresidue Pesticide Standard #3 (25 components)
Organonitrogen Compounds
Benfluralin (1861-40-1)
Biphenyl (92-52-4)
Chlorothalonil (1897-45-6)
Dichlofluanid (1085-98-9)
Dichloran (99-30-9)
3,4-Dichloroaniline (95-76-1)
2,6-Dichlorobenzonitrile (Dichlobenil) (1194-65-6)
Diphenylamine (122-39-4)
Ethalfluralin (55283-68-6)
Fluchloralin (33245-39-5)
Isopropalin (33820-53-0)
Nitralin (4726-14-1)
Nitrofen (1836-75-5)
Oxyfluorfen (42874-03-3)
Pendimethalin (40487-42-1)
Pentachloroaniline (527-20-8)
Pentachlorobenzonitrile (20925-85-3)
Pentachloronitrobenzene (Quintozene) (82-68-8)
Prodiamine (29091-21-2)
Profluralin (26399-36-0)
2,3,5,6-Tetrachloroaniline (3481-20-7)
Tetrachloronitrobenzene (Tecnazene) (117-18-0)
THPI (Tetrahydrophthalimide) (1469-48-3)
Tolylfluanid (731-27-1)
Trifluralin (1582-09-8)

Cat.# 32566: GC Multiresidue Pesticide Standard #4 (28 components)
Organonitrogen Compounds
Acetochlor (34256-82-1)
Alachlor (15972-60-8)
Allidochlor (93-71-0)
Clomazone (Command) (81777-89-1)
Cycloate (1134-23-2)
Diallate (*cis* & *trans*) (2303-16-4)
Dimethachlor (50563-36-5)
Diphenamid (957-51-7)
Fenpropathrin (39515-41-8)
Fluquinconazole (136426-54-5)
Flutolanil (66332-96-5)
Linuron (330-55-2)
Metazachlor (67129-08-2)
Methoxychlor (72-43-5)
Metolachlor (51218-45-2)
N-(2,4-Dimethylphenyl)formamide (60397-77-5)
Norflurazon (27314-13-2)
Oxadiazon (19666-30-9)
Pebulate (1114-71-2)
Pretilachlor (51218-49-6)
Prochloraz (67747-09-5)
Propachlor (1918-16-7)
Propanil (709-98-8)
Propisochlor (86763-47-5)
Propyzamide (23950-58-5)
Pyridaben (96489-71-3)
Tebufenpyrad (119168-77-3)
Triallate (2303-17-5)

Cat.# 32567: GC Multiresidue Pesticide Standard #5 (34 components)
Organonitrogen Compounds
Atrazine (1912-24-9)
Bupirimate (41483-43-6)
Captafol (2425-06-1)
Captan (133-06-2)
Chlorfenapyr (122453-73-0)
Cyprodinil (121552-61-2)
Etofenprox (80844-07-1)
Etridiazole (2593-15-9)
Fenarimol (60168-88-9)
Fipronil (120068-37-3)
Fludioxonil (131341-86-1)
Fluridone (Sonar) (59756-60-4)
Flusilazole (85509-19-9)
Flutriafol (76674-21-0)
Folpet (133-07-3)
Hexazinone (Velpar) (51235-04-2)
Iprodione (36734-19-7)
Lenacil (2164-08-1)
MGK-264 (113-48-4)
Myclobutanil (88671-89-0)
Paclobutrazol (76738-62-0)
Penconazole (66246-88-6)
Procymidone (32809-16-8)
Propargite (2312-35-8)
Pyrimethanil (53112-28-0)
Pyriproxyfen (95737-68-1)
Tebuconazole (107534-96-3)
Terbacil (5902-51-2)
Terbuthylazine (5915-41-3)
Triadimefon (43121-43-3)
Triadimenol (55219-65-3)
Tricyclazole (Beam) (41814-78-2)
Triflumizole (68694-11-1)
Vinclozolin (50471-44-8)

Cat.# 32568: GC Multiresidue Pesticide Standard #6 (18 components)
Synthetic Pyrethroid Compounds
Acrinathrin (101007-06-1)
Anthraquinone (84-65-1)
Bifenthrin (82657-04-3)
Bioallethrin (584-79-2)
Cyfluthrin (68359-37-5)
lambda-Cyhalothrin (91465-08-6)
Cypermethrin (52315-07-8)
Deltamethrin (52918-63-5)
Fenvalerate (51630-58-1)
Flucythrinate (70124-77-5)
tau-Fluvalinate (102851-06-9)
cis-Permethrin (61949-76-6)
trans-Permethrin (61949-77-7)
Phenothrin (*cis* & *trans*) (26002-80-2)
Resmethrin (10453-86-8)
Tefluthrin (79538-32-2)
Tetramethrin (7696-12-0)
Transfluthrin (118712-89-3)

Cat.# 32569: GC Multiresidue Pesticide Standard #7 (10 components)
Herbicide Methyl Esters
Acequinocyl (57960-19-7)
Bromopropylate (18181-80-1)
Carfentrazone ethyl (128639-02-1)
Chlorobenzilate (510-15-6)
Chlorpropham (101-21-3)
Chlozolinate (84332-86-5)
DCPA methyl ester (Chlorthal-dimethyl) (1861-32-1)
Fluazifop-*p*-butyl (79241-46-6)
Metalaxyl (57837-19-1)
2-Phenylphenol (90-43-7)

Cat.# 32570: GC Multiresidue Pesticide Standard #8 (24 components)
Organophosphorus Compounds
Bromfenvinfos-methyl (13104-21-7)
Bromfenvinphos (33399-00-7)
Bromophos ethyl (4824-78-6)
Bromophos methyl (2104-96-3)
Carbophenothion (786-19-6)
Chlorfenvinphos (470-90-6)
Chlorthiophos (60238-56-4)
Coumaphos (56-72-4)
Edifenphos (17109-49-8)
Ethion (563-12-2)
Fenamiphos (22224-92-6)
Fenchlorphos (Ronnel) (299-84-3)
Fenthion (55-38-9)
Iodofenphos (18181-70-9)
Leptophos (21609-90-5)
Malathion (121-75-5)
Methacrifos (62610-77-9)
Profenofos (41198-08-7)
Prothiofos (34643-46-4)
Sulfotepp (3689-24-5)
Sulprofos (35400-43-2)
Terbufos (13071-79-9)
Tetrachlorvinfos (22248-79-9)
Tolclofos-methyl (57018-04-9)

Cat.# 32571: GC Multiresidue Pesticide Standard #9 (8 components)
Organophosphorus Compounds
Disulfoton (298-04-4)
Fonofos (944-22-9)
Methyl parathion (298-00-0)
Mevinphos (7786-34-7)
Parathion (Ethyl parathion) (56-38-2)
Phorate (298-02-2)
Piperonyl butoxide (51-03-6)
Triazophos (24017-47-8)

Contains 1 mL each of these mixtures.

cat.# 32562 (kit)

kit

* NOTE: When combining a large number of compounds with different chemical functionalities, mix stability can be an issue. In formulating these standards, we extensively studied the 203 compounds involved, then grouped them into as few mixes as possible while still ensuring maximum long-term stability and reliability. For quantitative analysis, we recommend analyzing each mix separately to ensure accurate results for every compound.

Multiresidue Pesticides, *cont.*

GC Multiresidue Pesticide Standard #1 (16 components)
Organophosphorus Compounds
100 µg/mL each in toluene, 1 mL/ampul
cat.# 32563 (ea.) NEW!

GC Multiresidue Pesticide Standard #2 (40 components)
Organochlorine Compounds
100 µg/mL each in toluene, 1 mL/ampul
cat.# 32564 (ea.) NEW!

GC Multiresidue Pesticide Standard #3 (25 components)
Organonitrogen Compounds
100 µg/mL each in toluene:acetonitrile (99:1), 1 mL/ampul
cat.# 32565 (ea.) NEW!

GC Multiresidue Pesticide Standard #4 (28 components)
Organonitrogen Compounds
100 µg/mL each in toluene, 1 mL/ampul
cat.# 32566 (ea.) NEW!

GC Multiresidue Pesticide Standard #5 (34 components)
Organonitrogen Compounds
100 µg/mL each in toluene, 1 mL/ampul
cat.# 32567 (ea.) NEW!

GC Multiresidue Pesticide Standard #6 (18 components)
Synthetic Pyrethroid Compounds
100 µg/mL each in toluene, 1 mL/ampul
cat.# 32568 (ea.) NEW!

GC Multiresidue Pesticide Standard #7 (10 components)
Herbicide Methyl Esters
100 µg/mL each in toluene, 1 mL/ampul
cat.# 32569 (ea.) NEW!

GC Multiresidue Pesticide Standard #8 (24 components)
Organophosphorus Compounds
100 µg/mL each in toluene, 1 mL/ampul
cat.# 32570 (ea.) NEW!

GC Multiresidue Pesticide Standard #9 (8 components)
Organophosphorus Compounds
100 µg/mL each in toluene, 1 mL/ampul
cat.# 32571 (ea.) NEW!

Labeled Pesticide Residue Internal Standards for Food Analysis

- Isotopically labeled to provide the best approach for pesticide residue quantification.
- Multiple options let you choose internal and surrogate standards that will mitigate matrix effects.
- Economically priced and compatible with both LC-MS and GC-MS applications; even helpful for optimizing LC-MS/MS system performance.
- Certified reference material (CRM) manufactured and QC-tested in Restek's ISO-accredited labs—satisfy your ISO requirements.
- Restek is your complete supplier for world-class food safety analysis: pesticide reference standard mixes and internal/surrogate standards, GC and LC columns, QuEChERS, and more!

Compound	CAS #	Solvent	Conc.	cat.#
Atrazine-d5	163165-75-1	ACN	100	31984
Carbaryl-d7	362049-56-7	ACN	100	31985
Diazinon-d10 (diethyl-d10)	100155-47-3	ACN	100	31986
Dichlorvos-d6	203645-53-8	A	100	31987
Dimethoate-d6	1219794-81-6	ACN	100	31988
Diuron-d6	1007536-67-5	ACN	100	31989
Linuron-d6	330-55-2	ACN	100	31990

A = acetone; ACN = acetonitrile
Volume is 1 mL/ampul. Concentration is µg/mL.

Quantity Discounts Available

— Buy 3 Standards, Get 10% Off
— Buy 5 Standards, Get 20% Off

Not available for all standards. Contact your local Restek® representative for more details.


also **available:** LC Multiresidue Pesticide Kit | See **page 570.**

Multiresidue Pesticides, *cont.*



LC Multiresidue Pesticide Kit

- Accurately detect and quantify pesticides of global food safety concern in a wide range of fruits, vegetables, and other commodities by LC-MS/MS.
- Full kit contains 204 compounds of interest, covering many LC-determined pesticides listed by government agencies; individual ampuls also sold separately.
- Formulated and grouped for maximum long-term stability* and well-balanced chromatographic performance, even for early eluting compounds.
- Quantitatively tested to confirm composition; detailed support documentation provided.
- Optimized multiresidue pesticide method is offered free of charge; downloadable XLS file includes conditions and transition tables.
- Certified reference material (CRM) manufactured and QC-tested in Restek's ISO-accredited labs satisfies your ISO requirements.
- Restek is your complete supplier for world-class LC-MS/MS multiresidue pesticide analysis: reference and internal standards, Ultra and Pinnacle® DB LC columns, Q-sep® QuEChERS sample prep products, accessories, and more!

Cat.# 31972: LC Multiresidue Pesticide Standard #1 (13 components)
Organophosphorus Compounds
Acephate (30560-19-1)
Carbaryl (Sevin) (63-25-2)
Dicrotophos (141-66-2)
Dimethoate (60-51-5)
Dimethomorph (110488-70-5)
Isocarbophos (24353-61-5)
Methamidophos (10265-92-6)
Mevinphos (7786-34-7)
Monocrotophos (6923-22-4)
Omethoate (1113-02-6)
Temephos (Abate) (3383-96-8)
Trichlorfon (Dylox) (52-68-6)
Vamidothion (Vamidoate) (2275-23-2)

Cat.# 31973: LC Multiresidue Pesticide Standard #2 (16 components)
Carbamate/Uron Compounds
Alanycarb (83130-01-2)
Aldicarb (116-06-3)
Aldicarb sulfone (1646-88-4)
Aldicarb sulfoxide (1646-87-3)
Benfuracarb (82560-54-1)
Butocarboxim (34681-10-2)
Butoxycarboxim (34681-23-7)
Ethiofencarb (29973-13-5)
Furathiocarb (65907-30-4)
Methabenzthiazuron (18691-97-9)
Methiocarb (2032-65-7)
Methomyl (16752-77-5)
Oxamyl (23135-22-0)
Tebuthiuron (34014-18-1)
Thidiazuron (51707-55-2)
Thiophanate-methyl (23564-05-8)

Cat.# 31974: LC Multiresidue Pesticide Standard #3 (38 components)
Carbamate/Uron Compounds
Bendiocarb (22781-23-3)
Bifenazate (149877-41-8)
Carbofuran (1563-66-2)
Chlorfluazuron (71422-67-8)
Chloroxuron (1982-47-4)
Chlortoluron (15545-48-9)
Cycluron (2163-69-1)
Diethofencarb (87130-20-9)
Diflubenzuron (35367-38-5)
Dioxacarb (6988-21-2)
Diuron (330-54-1)
Fenobucarb (BPMC) (3766-81-2)
Fenoxycarb (79127-80-3)
Fenuron (101-42-8)
Flufenoxuron (101463-69-8)
Fluometuron (2164-17-2)
Forchlorfenuron (68157-60-8)
Hexaflumuron (86479-06-3)
3-Hydroxycarbofuran (16655-82-6)
Indoxacarb (173584-44-6)
Iprovalicarb (140923-17-7)
Isoprocarb (2631-40-5)
Isoproturon (34123-59-6)
Linuron (330-55-2)
Lufenuron (103055-07-8)
Metobromuron (3060-89-7)
Monolinuron (1746-81-2)
Neburon (555-37-3)
Novaluron (116714-46-6)
Pirimicarb (23103-98-2)
Promecarb (2631-37-0)
Propham (122-42-9)
Propoxur (Baygon) (114-26-1)
Pyraclostrobin (175013-18-0)
Siduron (1982-49-6)
Teflubenzuron (83121-18-0)
Thiobencarb (28249-77-6)
Triflumuron (64628-44-0)

Cat.# 31975: LC Multiresidue Pesticide Standard #4 (63 components)
Organonitrogen Compounds
Abamectin (71751-41-2)
Acetamiprid (135410-20-7)
Ametryn (834-12-8)
Amitraz (33089-61-1)
Azoxystrobin (131860-33-8)
Benalaxyl (71626-11-4)
Benzoximate (29104-30-1)
Boscalid (188425-85-6)
Butafenacil (134605-64-4)
Carbetamide (16118-49-3)
Carfentrazone-ethyl (128639-02-1)
Chlorantraniliprole (500008-45-7)
Clofentezine (74115-24-5)
Cymoxanil (57966-95-7)
Cyprodinil (121552-61-2)
Cyromazine (66215-27-8)
Dimoxystrobin (149961-52-4)
Dinotefuran (165252-70-0)
Doramectin (117704-25-3)
Eprinomectin (123997-26-2)
Famoxadon (131807-57-3)
Fenazaquin (120928-09-8)
Fenhexamid (126833-17-8)
Fenpyroximate (111812-58-9)
Flonicamid (158062-67-0)
Fluazinam** (79622-59-6)
Fludioxonil (131341-86-1)
Fluoxastrobin (361377-29-9)
Flutolanil (66332-96-5)
Furalaxyl (57646-30-7)
Halofenozide (112226-61-6)
Imazalil (35554-44-0)
Imidacloprid (138261-41-3)
Ivermectin (70288-86-7)
Kresoxim-methyl (143390-89-0)
Mandipropamid (374726-62-2)
Mepanipyrim (110235-47-7)
Mepronil (55814-41-0)
Metaflumizone (139968-49-3)
Metalaxyl (57837-19-1)
Methoxyfenozide (161050-58-4)
Moxidectin (113507-06-5)
Myclobutanil (88671-89-0)
Nitenpyram (120738-89-8)
Oxadixyl (77732-09-3)
Picoxystrobin (117428-22-5)
Piperonyl butoxide (51-03-6)
Prochloraz (67747-09-5)
Prometon (1610-18-0)
Pymetrozine (123312-89-0)
Pyracarbolid (24691-76-7)
Pyrimethanil (53112-28-0)
Pyriproxyfen (95737-68-1)
Quinoxyfen (124495-18-7)
Rotenone (83-79-4)
Secbumeton (26259-45-0)
Spiroxamine (118134-30-8)
Tebufenozide (112410-23-8)
Tebufenpyrad (119168-77-3)
Terbumeton (33693-04-8)
Triadimefon (43121-43-3)
Trifloxystrobin (141517-21-7)
Zoxamide (156052-68-5)

Cat.# 31976: LC Multiresidue Pesticide Standard #5 (30 components)
Organonitrogen Compounds
Acibenzolar-S-methyl (135158-54-2)
Bupirimate (41483-43-6)
Buprofezin (69327-76-0)
Carboxin (5234-68-4)
Clethodim (99129-21-2)
Clothianidin (210880-92-5)
Cyazofamid (120116-88-3)
Ethiprole (181587-01-9)
Ethofumesate (26225-79-6)
Fenamidone (161326-34-7)
Fipronil (120068-37-3)
Flubendimide (272451-65-7)
Flufenacet (Fluthiamide) (142459-58-3)
Hexythiazox (78587-05-0)
Mefenacet (73250-68-7)
Mesotrione (104206-82-8)
Methoprotryne (841-06-5)
Metribuzin (21087-64-9)
Prometryne (7287-19-6)
Propargite (2312-35-8)
Prothioconazole (178928-70-6)
Pyridaben (96489-71-3)
Simetryn (1014-70-6)
Sulfentrazone (122836-35-5)
Terbutryn (886-50-0)
Thiabendazole (148-79-8)
Thiacloprid (111988-49-9)
Thiamethoxam (153719-23-4)
Thiofanox (39196-18-4)
Tricyclazole (Beam) (41814-78-2)

Cat.# 31977: LC Multiresidue Pesticide Standard #6 (28 components)
Organonitrogen Compounds
Baycor (Bitertanol) (55179-31-2)
Bromuconazole (116255-48-2)
Cyproconazole (113096-99-4)
Diclobutrazol (75736-33-3)
Difenoconazole (119446-68-3)
Diniconazole (83657-24-3)
Epoxiconazole (135319-73-2)
Etaconazole (60207-93-4)
Ethirimol (23947-60-6)
Etoxazole (153233-91-1)
Fenarimol (60168-88-9)
Fenbuconazole (114369-43-6)
Fluquinconazole (136426-54-5)
Flusilazole (85509-19-9)
Flutriafol (76674-21-0)
Fuberidazole (3878-19-1)
Hexaconazole (79983-71-4)
Ipconazole (125225-28-7)
Metconazole (125116-23-6)
Nuarimol (63284-71-9)
Paclobutrazol (76738-62-0)
Penconazole (66246-88-6)
Propiconazole (Tilt) (60207-90-1)
Tebuconazole (107534-96-3)
Tetraconazole (112281-77-3)
Triadimenol (55219-65-3)
Triflumizole (68694-11-1)
Triticonazole (131983-72-7)

Cat.# 31978: LC Multiresidue Pesticide Standard #7 (7 components)
Organonitrogen Compounds
Emamectin-benzoate (155569-91-8)
Fenpropimorph (67564-91-4)
Spirodiclofen (148477-71-8)
Spinosad (168316-95-8)
Spirotetramat (203313-25-1)
Spinetoram (J&L) (187166-40-1)
Spiromesifen (283594-90-1)

Cat.# 31979: LC Multiresidue Pesticide Standard #8
Organonitrogen Compounds
Hydramethylnon (67485-29-4)

Cat.# 31980: LC Multiresidue Pesticide Standard #9 (7 components)
Carbamate/Uron Compounds
Aminocarb (2032-59-9)
Desmedipham (13684-56-5)
Formetanate HCL (23422-53-9)
Mexacarbate (Zectran) (315-18-4)
Monceren (Pencycuron) (66063-05-6)
Phenmedipham (13684-63-4)
Propamocarb free base (24579-73-5)

Cat.# 31981: LC Multiresidue Pesticide Standard #10
Carbamate/Uron Compounds
Carbendazim (10605-21-7)

Contains 1 mL each of these mixtures.

cat.# 31971 (kit)

kit

* NOTE: When combining a large number of compounds with different chemical functionalities, mix stability can be an issue. In formulating these standards, we extensively studied the 204 compounds involved, then grouped them into as few mixes as possible while still ensuring maximum long-term stability and reliability. For quantitative analysis, we recommend analyzing each mix separately to ensure accurate results for every compound.
** NOTE: In this standard, fluazinam should only be used for qualitative analysis. A single-component standard (cat.# 31982) is available for quantitative analysis.

Multiresidue Pesticides, *cont.*

LC Multiresidue Pesticide Standard #1 (13 components)
Organophosphorus Compounds
100 µg/mL each in acetonitrile, 1 mL/ampul
cat.# 31972 (ea.)

LC Multiresidue Pesticide Standard #2 (16 components)
Carbamate/Uron Compounds
100 µg/mL each in acetonitrile, 1 mL/ampul
cat.# 31973 (ea.)

LC Multiresidue Pesticide Standard #3 (38 components)
Carbamate/Uron Compounds
100 µg/mL each in acetonitrile, 1 mL/ampul
cat.# 31974 (ea.)

LC Multiresidue Pesticide Standard #4 (63 components)
Organonitrogen Compounds
100 µg/mL each in acetonitrile, 1 mL/ampul
cat.# 31975 (ea.)

LC Multiresidue Pesticide Standard #5 (30 components)
Organonitrogen Compounds
100 µg/mL each in acetonitrile, 1 mL/ampul
cat.# 31976 (ea.)

LC Multiresidue Pesticide Standard #6 (28 components)
Organonitrogen Compounds
100 µg/mL each in acetonitrile, 1 mL/ampul
cat.# 31977 (ea.)

LC Multiresidue Pesticide Standard #7 (7 components)
Organonitrogen Compounds
100 µg/mL each in acetonitrile, 1 mL/ampul
cat.# 31978 (ea.)

LC Multiresidue Pesticide Standard #8 (hydramethylnon)
Organonitrogen Compounds
100 µg/mL each in acetonitrile, 1 mL/ampul
cat.# 31979 (ea.)

LC Multiresidue Pesticide Standard #9 (7 components)
Carbamate/Uron Compounds
100 µg/mL each in acetonitrile, 1 mL/ampul
cat.# 31980 (ea.)

LC Multiresidue Pesticide Standard #10 (carbendazim)
Carbamate/Uron Compounds
100 µg/mL each in methanol, 1 mL/ampul
cat.# 31981 (ea.)

Fluazinam Standard
Fluazinam (79622-59-6)
100 µg/mL in acetonitrile, 1 mL/ampul
cat.# 31982 (ea.)

Searching Online for Reference Standards?



Find a Specific **Compound**
Enter a compound name, synonym, or CAS # in our **Reference Standards Search Tool**.
www.restek.com/**reference**

Find Specific **Documentation**
Locate SDSs, certificates, & data packs by cat. # or lot # with our **Reference Standards Documentation Search**.
www.restek.com/**documentation**

also **available:** GC Multiresidue Pesticide Kit | See **page 568.**

Packaging

MOSH/MOAH Standard (9 components)

- Developed specifically for using LC coupled with GC-FID to accurately determine hydrocarbons found in mineral oils, which can migrate from packaging into food.
- This 9-component mix contains non-interfering internal standards as well as both mineral oil saturated hydrocarbon (MOSH) and mineral oil aromatic hydrocarbon (MOAH) markers to correctly cut fractions.
- Certified reference material (CRM) manufactured and QC-tested in Restek's ISO-accredited labs satisfies your ISO requirements.
- Restek is your complete supplier for world-class MOSH/MOAH analysis: reference standards, Allure® silica LC columns, Rxi®-5Sil MS GC columns, accessories, and more!

Bicyclohexyl (92-51-3)	300 µg/mL
Cholestane (5-alpha-cholestane) (481-21-0)	600
1-Methylnaphthalene (90-12-0)	300
2-Methylnaphthalene (91-57-6)	300
n-Pentylbenzene (538-68-1)	300
Perylene (198-55-0)	600
1,3,5-Tri-*tert*-butylbenzene (1460-02-2)	300
n-Tridecane (C13) (629-50-5)	150
n-Undecane (C11) (1120-21-4)	300

150-600 µg/mL each in toluene, 1 mL/ampul
cat.# 31070 (ea.)

NEW!

Phthalate Esters

See page 530.



Restek® Safe Cracker

Included with every reference standard shipment for added convenience.



Plastic Container Testing

ASTM Method D6042-96 (Plastic Container Testing)

American Society for Testing and Materials (ASTM International) Method D6042-96—Test Method for Determination of Phenolic Antioxidants and Erucamide Slip Additives in Polypropylene Homopolymer Formulations Using Liquid Chromatography—is a "consensus" or "referee" method used among plastic manufacturers and the pharmaceutical companies that purchase plastic containers. Plastic container manufacturers use this test to ensure the quality of their product for their pharmaceutical customers. Pharmaceutical companies also specify this test and provide their own lists of target compounds and concentration limits in purchase agreements.

This test calls for isopropanol extraction, LC separation, and UV detection. Restek offers a variety of reversed-phase LC columns suitable for these separations. Restek also designed a reference standard to validate this method. This mixture contains the common antioxidants and slips listed in ASTM D6042-96, along with BHT.

ASTM D6042-96 Calibration Mix (7 components)

BHT (128-37-0)
Erucamide slip (112-84-5)
Vitamin E (59-02-9)
Irgafos 168 (31570-04-4)
Irganox 3114 (27676-62-6)
Irganox 1010 (6683-19-8)
Irganox 1076 (2082-79-3)

50 µg/mL each in isopropanol, 1 mL/ampul
cat.# 31628 (ea.)

Polycyclic Aromatic Hydrocarbons (PAHs)

EFSA PAH4 Standard (4 components)

- European Food Safety Authority (EFSA) PAH4 compounds prepared in toluene solvent.
- High 1,000 µg/mL concentration—dilute as needed to economically prepare custom mixes.
- Low volatility—longer shelf life and more accurate results.
- High miscibility—compatible with QuEChERS solvents.
- Certified reference material (CRM) meets strict ISO quality requirements.
- Pair with Rxi®-PAH GC column for easy separation of EFSA PAH4 compounds from common interferences in food and environmental samples. See page 84 for more details.

Benz[a]anthracene (56-55-3)
Benzo[a]pyrene (50-32-8)
Benzo[b]fluoranthene (205-99-2)
Chrysene (218-01-9)

1,000 µg/mL each in toluene, 1 mL/ampul
cat.# 32469 (ea.)

NEW!

See pages 511–513 for additional PAH standards.

QuEChERS

QuEChERS Performance Standards

- Designed for use in all QuEChERS methods for pesticides in fruits and vegetables, including the original unbuffered method, AOAC 2007.01, and EN15662.
- Ideal for initial method evaluations and ongoing method performance validations.
- Precise formulation improves data quality and operational efficiency; spend more time running samples and less time sourcing and preparing standards.
- Quantitatively analyzed to confirm the composition and stability of each mixture.
- Produced and tested in accordance with ISO Guide 34 and 17025 accreditation.

QuEChERS Performance Standards Kit

- Kit contains organochlorine, organonitrogen, organophosphorus, and carbamate pesticides commonly used on fruits and vegetables.
- Volatile, polar, active, base-sensitive, and nonvolatile compounds are included to allow comprehensive evaluation of QuEChERS extraction and cleanup efficiencies, and optimization of GC and LC instrumental conditions.
- Analytes are divided into three ampuls based on compatibility for maximum stability and shelf life.*

Contains 1 mL each of these mixtures.
31153: QuEChERS Performance Standard A
31154: QuEChERS Performance Standard B
31155: QuEChERS Performance Standard C

NEW!

300 µg/mL each in acetonitrile/acetic acid (99.9:0.1), 1 mL/ampul.
Blend equal volumes of all three ampuls for a 100 µg/mL final solution.
cat.# 31152 (kit)

kit

*When combining compounds with different functionalities, chemical stability can be an issue. The analytes in this kit are separated into three mixes to ensure maximum long-term storage stability. For analysis, a fresh working standard should be prepared by combining the three kit mixes in a 1:1:1 ratio to prepare a 100 µg/mL working standard solution. Once blended, Restek does not recommend storing working standards or subsequent dilutions for future use.

Restek Offers a Full Line of Certified Reference Materials

See **pages 464–465**.

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QuEChERS Performance Standard A (16 components)

Acephate (30560-19-1)
Azinphos methyl (86-50-0)
Chlorpyrifos (2921-88-2)
Coumaphos (56-72-4)
Diazinon (333-41-5)
Dichlofluanid (1085-98-9)
Dichlorvos (DDVP) (62-73-7)
Dimethoate (60-51-5)
Fenthion (55-38-9)
Malathion (121-75-5)
Methamidophos (10265-92-6)
Mevinphos (7786-34-7)
Omethoate (1113-02-6)
Phosalone (2310-17-0)
Pirimiphos methyl (29232-93-7)
Propargite (2312-35-8)

300 µg/mL each in acetonitrile:acetic acid (99.9:0.1), 1 mL/ampul
cat.# 31153 (ea.)

NEW!

QuEChERS Performance Standard B (7 components)

gamma-BHC (Lindane) (58-89-9)
Chlorothalonil (1897-45-6)
4,4'-DDT (50-29-3)
Dicofol (Kelthane) (115-32-2)
Endosulfan sulfate (1031-07-8)
Endrin (72-20-8)
2-Phenylphenol (90-43-7)

300 µg/mL each in acetonitrile:acetic acid (99.9:0.1), 1 mL/ampul
cat.# 31154 (ea.)

NEW!

QuEChERS Performance Standard C (17 components)

Bifenthrin (82657-04-3)
Captan (133-06-2)
Carbaryl (sevin) (63-25-2)
Cyprodinil (121552-61-2)
Deltamethrin (52918-63-5)
Fenhexamid (126833-17-8)
Fenpropathrin (39515-41-8)
Folpet (133-07-3)
Imazalil (35554-44-0)
Iprodione (36734-19-7)
Metalaxyl (57837-19-1)
Methiocarb (2032-65-7)
Myclobutanil (88671-89-0)
cis-Permethrin (61949-76-6)
trans-Permethrin (61949-77-7)
Thiabendazole (148-79-8)
Vinclozolin (50471-44-8)

300 µg/mL each in acetonitrile:acetic acid (99.9:0.1), 1 mL/ampul
cat.# 31155 (ea.)

NEW!

QuEChERS, *cont.*

QuEChERS Standards

- Ready to use for QuEChERS extractions—no dilutions necessary.
- Support for GC and LC with MS, MS/MS, and selective detectors.

Pesticide analysis is fast and simple using QuEChERS methods. Use these cost-effective QuEChERS standards for even greater lab efficiency. Standards are compatible with all major methods, including mini-multiresidue, AOAC, and European procedures. Save time with convenient mixes or make your own blend using our full line of single-component solutions.

QuEChERS Internal Standard Mix for GC-ECD Analysis

(4 components)

PCB 18 (37680-65-2)
PCB 28 (7012-37-5)
PCB 52 (35693-99-3)
Tris-(1,3-dichloroisopropyl)phosphate (13674-87-8)

50 µg/mL each in acetonitrile, 5 mL/ampul

cat.# 33265 (ea.)

QuEChERS Internal Standard Mix for GC-NPD and LC-MS/MS Analysis (2 components)

Triphenylphosphate (115-86-6) 20 µg/mL
Tris-(1,3-dichloroisopropyl)phosphate (13674-87-8) 50 µg/mL

In acetonitrile, 5 mL/ampul

cat.# 33266 (ea.)

QuEChERS Internal Standard Mix for GC-MS Analysis

(6 components)

PCB 18 (37680-65-2)	50 µg/mL	Triphenylphosphate (115-86-6)	20
PCB 28 (7012-37-5)	50	Tris-(1,3-dichloroisopropyl)phosphate (13674-87-8)	50
PCB 52 (35693-99-3)	50		
Triphenylmethane (519-73-3)	10		

In acetonitrile, 5 mL/ampul

cat.# 33267 (ea.)

QuEChERS Internal Standard Mix for LC-MS/MS Analysis

Nicarbazin (bis-nitrophenyl urea) (330-95-0)

10 µg/mL in acetonitrile, 5 mL/ampul

cat.# 33261 (ea.)

QuEChERS Quality Control Standards for GC-MS Analysis

Cat.# 33268:
PCB 138 (35065-28-2)
PCB 153 (35065-27-1)

50 µg/mL each in acetonitrile, 5 mL/ampul

cat.# 33268 (ea.)

Cat.# 33264:
Anthracene (120-12-7)

100 µg/mL in acetonitrile, 5 mL/ampul

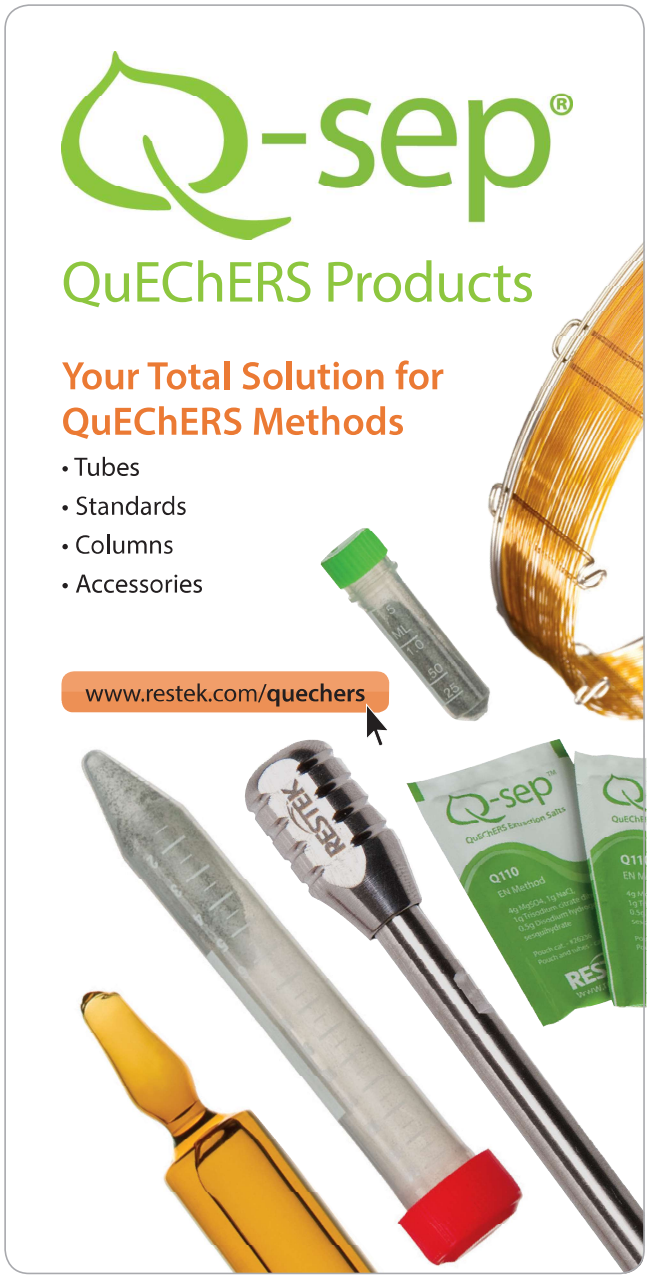
cat.# 33264 (ea.)

QuEChERS Single-Component Reference Standards

Concentration is µg/mL.

Compound	CAS #	Solvent	Conc.	cat.#
PCB 18 (5 mL)	37680-65-2	ACN	50	33255
PCB 28 (5 mL)	7012-37-5	ACN	50	33256
PCB 52 (5 mL)	35693-99-3	ACN	50	33257
PCB 138 (5 mL)	35065-28-2	ACN	50	33262
PCB 153 (5 mL)	35065-27-1	ACN	50	33263
triphenylmethane (5 mL)	519-73-3	ACN	10	33260
triphenylphosphate (5 mL)	115-86-6	ACN	20	33258
tris(1,3-dichloroisopropyl)phosphate (5 mL)	13674-87-8	ACN	50	33259

ACN = acetonitrile



QuEChERS, *cont.*

QuEChERS Standards for AOAC Official Method 2007.01

- Ready to use for generating test mixes, calibration standards, and spiking experiments.
- Reliable standards produced according to specifications defined in AOAC Official Method 2007.01.
- Cost-effective QuEChERS standards can be used without dilutions for greater lab efficiency.

Following QuEChERS methods is even quicker and easier when you use Restek® method-specific chemical standards for AOAC Official Method 2007.01 (Pesticide Residues in Foods by Acetonitrile Extraction and Partitioning with Magnesium Sulfate). Our suite of AOAC QuEChERS standards includes internal standards mix, triphenylphosphate (TPP) solution, and QC spike mix. Each standard can be used directly without dilutions because they are formulated to the exact concentrations prescribed by AOAC Method 2007.01.

AOAC QuEChERS IS Solution (2 components)

α-BHC-d6 (α-HCH-d6) (86194-41-4)
Parathion-d10 (350820-04-1)

40 µg/mL each in acetonitrile, 5 mL/ampul
cat.# 31963 (ea.)

AOAC QuEChERS Triphenylphosphate Solution

Triphenylphosphate (115-86-6)

2 µg/mL in acetonitrile:acetic acid (99:1), 5 mL/ampul
cat.# 31964 (ea.)

AOAC QuEChERS QC Spike Mix (27 components)

Atrazine (1912-24-9)
Azoxystrobin (131860-33-8)
Bifenthrin (82657-04-3)
Carbaryl (Sevin) (63-25-2)
Chlorothalonil (1897-45-6)
Chlorpyrifos (2921-88-2)
Chlorpyrifos methyl (5598-13-0)
lambda-Cyhalothrin (91465-08-6)
Cyprodinil (121552-61-2)
2,4'-DDD (53-19-0)
Dichlorvos (DDVP) (62-73-7)
Endosulfan sulfate (1031-07-8)
Ethion (563-12-2)
Imazalil (35554-44-0)
Imidacloprid (138261-41-3)
Kresoxim methyl (143390-89-0)
Linuron (330-55-2)
Methamidophos (10265-92-6)
Methomyl (16752-77-5)
cis-Permethrin (61949-76-6)
trans-Permethrin (61949-77-7)
Procymidone (32809-16-8)
Pymetrozine (123312-89-0)
Tebuconazole (107534-96-3)
Thiabendazole (148-79-8)
Tolylfluanid (731-27-1)
Trifluralin (1582-09-8)

40 µg/mL each in acetonitrile:acetic acid (99.9:0.1), 5 mL/ampul
cat.# 31999 (ea.)

Reference Standards Documentation Search

Search by cat.# or lot #

- SDSs
- Certificates
- Data packs

www.restek.com/**documentation**



Reference Standards

Petroleum & Petrochemical

Biodiesel 577
Finished Motor Oil & Aviation Gasoline 578
Leaking Underground Storage Tank (LUST) .. 497–510
PCBs in Transformer Oil 578
Simulated Distillation 579
Spark Ignition Engine Fuels 580–581



Biodiesel

ASTM Method D6584-10 and EN14105 (Biodiesel)

Determining Free and Total Glycerin in B100 Biodiesel Methyl Esters by GC

In the manufacture of biodiesel fuel, triglycerides are split into their monoalkyl ester components via transesterification. The fatty acid monoalkyl esters can be used as fuel in diesel engines. Amounts of free glycerin and total glycerin indicate the quality of the conversion of the oil or fat to monoalkyl esters. D6584-10 and DIN EN14105 are test methods for quantitative determination of free glycerin, total glycerin, and mono-, di-, and triglycerides in biodiesel fuel methyl esters by GC, after silylation of the sample with N-methyl-N-(trimethylsilyl) trifluoroacetamide (MSTFA).

(s)-(-)-1,2,4-Butanetriol

(s)-(-)-1,2,4-Butanetriol (42890-76-6)

1,000 µg/mL in pyridine, 1 mL/ampul
cat.# 33024 (ea.)

1,000 µg/mL in pyridine, 5 mL/ampul
cat.# 33032 (ea.)

Diolein (1,3-di[*cis*-octadecenoyl]glycerol)

Diolein (1,3-di[*cis*-octadecenoyl]glycerol) (2465-32-9)

5,000 µg/mL in pyridine, 1 mL/ampul
cat.# 33022 (ea.)

Glycerin

Glycerin (56-81-5)

500 µg/mL in pyridine, 1 mL/ampul
cat.# 33020 (ea.)

Monolein (1-mono[*cis*-9-octadecenoyl]-rac-glycerol)

Monolein (1-mono[*cis*-9-octadecenoyl]-rac-glycerol) (111-03-5)

5,000 µg/mL in pyridine, 1 mL/ampul
cat.# 33021 (ea.)

Monopalmitin

Monopalmitin (524-44-9)

5,000 µg/mL in pyridine, 1 mL/ampul
cat.# 33026 (ea.)

Tricaprin (1,2,3-tricaprinoylglycerol)

Tricaprin (1,2,3-tricaprinoylglycerol) (621-71-6)

8,000 µg/mL in pyridine, 1 mL/ampul
cat.# 33025 (ea.)

8,000 µg/mL in pyridine, 5 mL/ampul
cat.# 33033 (ea.)

Triolein (1,2,3-tri[*cis*-octadecenoyl]glycerol)

Triolein (1,2,3-tri[*cis*-octadecenoyl]glycerol) (122-32-7)

5,000 µg/mL in pyridine, 1 mL/ampul
cat.# 33023 (ea.)

Diesel:Biodiesel (80:20) Blend Standard

The biodiesel component is methyl soyate.

Diesel:biodiesel (80:20) (67784-80-9)

5,000 µg/mL in methylene chloride, 1 mL/ampul
cat.# 31880 (ea.)



MXT® Capillary Columns

Ideal for High-Temperature GC Analysis

- Metal tubing won't become brittle at high temperatures (430 °C).*
- Exclusive Siltek® layer provides an internal surface with excellent inertness.
- Can be tightly coiled well under 4.5" without breaking, even under stress.

*Maximum temperature of finished column may vary by phase.

See **page 104**.

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Finished Motor Oil & Aviation Gasoline

ASTM D3606-10 (Determination of Benzene & Toluene in Finished Motor & Aviation Gasoline by GC)

ASTM D3606 Calibration Kit Without Internal Standard

Contains 25 mL each of these mixtures.
30647: ASTM D3606 Calibration Standard #1 Without Internal Standard
30648: ASTM D3606 Calibration Standard #2 Without Internal Standard
30649: ASTM D3606 Calibration Standard #3 Without Internal Standard
30650: ASTM D3606 Calibration Standard #4 Without Internal Standard
30651: ASTM D3606 Calibration Standard #5 Without Internal Standard
30652: ASTM D3606 Calibration Standard #6 Without Internal Standard
30653: ASTM D3606 Calibration Standard #7 Without Internal Standard

cat.# 30672 (kit) — kit

Find complete compound lists for our **D3606 reference standards** at

www.restek.com/**D3606standards**

ASTM D3606 Calibration Kit With MEK Internal Standard

Contains 1 mL each of these mixtures.
30654: ASTM D3606 Calibration Standard #1 With MEK Internal Standard
30655: ASTM D3606 Calibration Standard #2 With MEK Internal Standard
30656: ASTM D3606 Calibration Standard #3 With MEK Internal Standard
30657: ASTM D3606 Calibration Standard #4 With MEK Internal Standard
30658: ASTM D3606 Calibration Standard #5 With MEK Internal Standard
30659: ASTM D3606 Calibration Standard #6 With MEK Internal Standard
30660: ASTM D3606 Calibration Standard #7 With MEK Internal Standard

cat.# 30673 (kit) — kit

ASTM D3606 Calibration Kit With *sec*-Butanol Internal Standard

Contains 1 mL each of these mixtures.
30661: ASTM D3606 Calibration Standard #1 With *sec*-Butanol Internal Standard
30662: ASTM D3606 Calibration Standard #2 With *sec*-Butanol Internal Standard
30663: ASTM D3606 Calibration Standard #3 With *sec*-Butanol Internal Standard
30664: ASTM D3606 Calibration Standard #4 With *sec*-Butanol Internal Standard
30665: ASTM D3606 Calibration Standard #5 With *sec*-Butanol Internal Standard
30666: ASTM D3606 Calibration Standard #6 With *sec*-Butanol Internal Standard
30667: ASTM D3606 Calibration Standard #7 With *sec*-Butanol Internal Standard

cat.# 30674 (kit) — kit

ASTM D3606 Backflush Standard

2,2,4-Trimethylpentane (isooctane) (540-84-1)

5% vol/vol in nonane, 1 mL/ampul

cat.# 30671 (ea.)

PCBs in Transformer Oil

ASTM Method D4059-00 (PCB Standards in Oil)

ASTM Method D4059-00 is used for determining PCB concentrations in various types of transformer oil using GC-ECD detection. The analyst must dilute transformer oil samples in a solvent prior to injection. The oil in the sample has been shown to quench the ECD. Calibration mixtures of PCBs in transformer oil must be prepared and diluted identically to eliminate the detector quenching bias resulting when samples are analyzed.

We prepare these solutions in a mineral oil–based transformer oil (Exxon® Univolt® N-61), which has been tested to ensure it is PCB-free.

PCB-Free Transformer Oil

Neat, 5 mL
cat.# 32424 (ea.)

Neat, 50 mL
cat.# 32425 (ea.)

No data pack available.

Aroclor Standards

Volume is 1 mL/ampul.

Compound	CAS #	Solvent	Conc.	cat.#
Aroclor 1016	12674-11-2	TO	500 mg/kg	32076
Aroclor 1242	53469-21-9	TO	50 mg/kg	32081
Aroclor 1242	53469-21-9	TO	500 mg/kg	32082
Aroclor 1254	11097-69-1	TO	50 mg/kg	32085
Aroclor 1254	11097-69-1	TO	500 mg/kg	32086
Aroclor 1260	11096-82-5	TO	50 mg/kg	32087
Aroclor 1260	11096-82-5	TO	500 mg/kg	32088

TO = transformer oil (PCB-free)

also available

D3606 Application Column (2 column set)

See **page 138** for details.



Simulated Distillation

ASTM Simulated Distillation Petroleum Fractions

ASTM D2887-12 Calibration Standard (20 components)

American Society for Testing and Materials (ASTM International) Method D2887-12 is used to determine the boiling range distribution of petroleum products and fractions having a final boiling point of 538 °C (1,000 °F) or lower, a boiling range greater than 55 °C (131 °F), and a vapor pressure sufficiently low to permit sampling at ambient temperature.

n-Pentane (C5) (109-66-0)
n-Hexane (C6) (110-54-3)
n-Heptane (C7) (142-82-5)
n-Octane (C8) (111-65-9)
n-Nonane (C9) (111-84-2)
n-Decane (C10) (124-18-5)
n-Undecane (C11) (1120-21-4)
n-Dodecane (C12) (112-40-3)
n-Tetradecane (C14) (629-59-4)
n-Pentadecane (C15) (629-62-9)
n-Hexadecane (C16) (544-76-3)
n-Heptadecane (C17) (629-78-7)
n-Octadecane (C18) (593-45-3)
n-Eicosane (C20) (112-95-8)
n-Tetracosane (C24) (646-31-1)
n-Octacosane (C28) (630-02-4)
n-Dotriacontane (C32) (544-85-4)
n-Hexatriacontane (C36) (630-06-8)
n-Tetracontane (C40) (4181-95-7)
n-Tetratetracontane (C44) (7098-22-8)

1% w/w in carbon disulfide, 1 g solution/ampul
cat.# 31674 (ea.)

5% w/w, Neat, 1 g /ampul
cat.# 31675 (ea.)

No data pack available.

ASTM Methods D2887 and D3710-95

These calibration mixtures are made with pure, highly characterized neat material and are prepared using NIST-traceable balances and weights. Each ampul is supplied with a data sheet indicating the exact concentration and a sample chromatogram.

D2887 Calibration Mix (17 components)

Compound	Conc. (% w/w)	Compound	Conc. (% w/w)
n-Hexane (C6) (110-54-3)	6	*n*-Octadecane (C18) (593-45-3)	5
n-Heptane (C7) (142-82-5)	6	*n*-Eicosane (C20) (112-95-8)	2
n-Octane (C8) (111-65-9)	8	*n*-Tetracosane (C24) (646-31-1)	2
n-Nonane (C9) (111-84-2)	8	*n*-Octacosane (C28) (630-02-4)	1
n-Decane (C10) (124-18-5)	12	*n*-Dotriacontane (C32) (544-85-4)	1
n-Undecane (C11) (1120-21-4)	12	*n*-Hexatriacontane (C36) (630-06-8)	1
n-Dodecane (C12) (112-40-3)	12	*n*-Tetracontane (C40) (4181-95-7)	1
n-Tetradecane (C14) (629-59-4)	12	*n*-Tetratetracontane (C44) (7098-22-8)	1
n-Hexadecane (C16) (544-76-3)	10		

Packaged 1 mL/ampul
cat.# 31222 (ea.)

No data pack available.

D3710-95 Calibration Mix (16 components)

Compound	Conc. (% vol/vol)	Compound	Conc. (% w/w)
n-Pentane (C5) (109-66-0)	8	*n*-Pentadecane (C15) (629-62-9)	2
n-Hexane (C6) (110-54-3)	6	*n*-Butylbenzene (104-51-8)	4
n-Heptane (C7) (142-82-5)	10	2,4-Dimethylpentane (108-08-7)	6
n-Octane (C8) (111-65-9)	5	2-Methylbutane (Isopentane) (78-78-4)	10
n-Decane (C10) (124-18-5)	4	2-Methylpentane (107-83-5)	6
n-Dodecane (C12) (112-40-3)	4	*n*-Propylbenzene (103-65-1)	5
n-Tridecane (C13) (629-50-5)	2	Toluene (108-88-3)	12
n-Tetradecane (C14) (629-59-4)	2	*p*-Xylene (106-42-3)	14

Packaged 1 mL/ampul
cat.# 31223 (ea.)

No data pack available.

ASTM Method 6352-04 (Polywax® Standards)

Polywax® Standards

These high molecular weight hydrocarbon waxes are useful for simulated distillation and other high-temperature GC work.

Supports ASTM Methods D2887, D6352, D7169, D7398, and D7500.

Volume is 1 mL/ampul.

Compound	CAS #	Solvent	Conc.	cat.#
Polywax 500	9002-88-4	Neat	1 g	36224
Polywax 655	9002-88-4	Neat	1 g	36225
Polywax 850	9002-88-4	Neat	1 g	36226
Polywax 1,000	9002-88-4	Neat	1 g	36227

No data pack available.

Petroleum Standards

These petroleum standards are gravimetrically prepared, NIST-traceable by weight, and have been verified by one or more analytical methods.

Sulfur Simulated Distillation Standard (SSDS)

30 ppm total sulfur by weight from ethanethiol
60 ppm total sulfur by weight from 1-propanethiol
30 ppm total sulfur by weight from 1-butanethiol
60 ppm total sulfur by weight from 1-pentanethiol
30 ppm total sulfur by weight from 1-hexanethiol
60 ppm total sulfur by weight from 1-heptanethiol
30 ppm total sulfur by weight from 3,5-dimethlybenzenethiol
60 ppm total sulfur by weight from 1-octanethiol
30 ppm total sulfur by weight from 1-nonanethiol
60 ppm total sulfur by weight from 1-decanethiol
30 ppm total sulfur by weight from 1-pentadecanethiolol
60 ppm total sulfur by weight from 1-hexadecanethiol
30 ppm total sulfur by weight from 1-octadecanethiol
Balance: toluene:isooctane (1:15)

1 mL amber ampul.
cat.# 33049 (ea.)

Speciated Sulfur System Suitability Checkout Standard (SSSSCS)

0.50 ppm total sulfur by weight from dimethylsulfide
35.0 ppm total sulfur by weight from tertiary butyl mercaptan
50.0 ppm total sulfur by weight from thiopene
15.0 ppm total sulfur by weight from dimethyl disulfide
25.0 ppm total sulfur by weight from benzothiopene
Balance: isooctane

1 mL amber ampul.
cat.# 33050 (ea.)

Restek Offers a Full Line of Certified Reference Materials
See **pages 464–465**.
QUALITY ISO 9001 • 17025 • Guide 34
www.restek.com/iso

Spark Ignition Engine Fuels

ASTM Method D6730-01 (Determination of Individual Components in Spark Ignition Engine Fuels)

ASTM Methods D6729, D6730, and D6733 are designed for the determination of the individual hydrocarbons present in spark engine ignition fuels, as well as fuel blends containing oxygenates such as methyl *tert*-butyl ether, ethyl *tert*-butyl ether, *tert*-butanol, ethanol, etc.

These standards are produced for refineries performing detailed hydrocarbon analysis (DHA) of crude oil feedstocks and fuels. They help with calibrating complex hydrocarbon analyses and provide the greatest number of gravimetrically determined values for quantitative calibration to help our customers optimize production and maximize profitability—while fulfilling requirements such as ASTM Methods D6729, D6730, and D6733.

Oxy Set-Up Blend (30 components)

Gravimetrically prepared and NIST-traceable.

Benzene	1.00%	1-Methylcyclopentene	0.50%
tert-Butanol	0.50%	1-Methyl-2-ethylbenzene	0.50%
Cyclohexane	28.9%	1-Methylnaphthalene	0.25%
n-Decane	1.00%	5-Methylnonane	0.20%
2,3-Dimethylbutane	0.50%	Naphthalene	0.50%
trans-1,2-Dimethylcyclopentane	0.50%	*n*-Nonane	2.00%
2,3-Dimethylheptane	0.20%	*n*-Octane	2.00%
Dodecane	0.25%	*n*-Pentane	2.00%
Ethanol	8.00%	1,2,3,5-Tetramethylbenzene	0.25%
Ethylbenzene	25.0%	Toluene	7.00%
3-Ethylpentane	0.20%	Tridecane	0.25%
n-Heptane	2.00%	2,2,3-Trimethylpentane	0.52%
n-Hexane	2.00%	2,3,3-Trimethylpentane	0.50%
2-Methylbutene-2	2.50%	Undecane	0.50%
Methyl *tert*-butyl ether	10.0%	*p*-Xylene	1.00%

2 mL prescored ampul

cat.# 33034 (ea.)

DHA PONA Standard (188 components)

This standard is a qualitative mixture of various gasoline and refinery materials prepared to provide nearly every component that may be encountered in feedstock and finished gasolines. Some oxygenates have been added to allow this blend to be used by refineries for detailed hydrocarbon analysis (DHA) method setup and to fulfill requirements such as ASTM Methods D6729, D6730, and D6733.

For a full component list, visit www.restek.com and search for "30731".

Neat, 0.15 mL in Autosampler Vial

cat.# 30731 (ea.)

NEW!

No data pack available.

DHA PiONA Standard (133 components)

Compound	Conc (wt/wt%)
Paraffins	
N-Decane	1.736
N-Dodecane	1.727
N-Heptane	1.723
N-Hexane	1.729
N-Nonane	1.727
N-Octane	1.721
N-Pentadecane	1.734
N-Pentane	1.728
N-Tetradecane	1.735
N-Tridecane	1.723
N-Undecane	1.723
Isoparaffins	
3,3-Diethylpentane	0.364
2,3-Dimethylbutane	0.447
2,3-Dimethylheptane	0.22
2,5-Dimethylheptane	0.733
3,3-Dimethylheptane	0.335
3,4-Dimethylheptane	0.159
3,5-Dimethylheptane	0.445
2,2-Dimethylhexane	0.149
2,4-Dimethylhexane	0.276
2,5-Dimethylhexane	1.112
2,2-Dimethyloctane	0.398
3,3-Dimethyloctane	0.153
2,2-Dimethylpentane	0.463
2,3-Dimethylpentane	0.887
2,4-Dimethylpentane	1.127
3,3-Dimethylpentane	0.438
3-Ethylhexane	0.058
3-Ethyloctane	0.203
3-Ethylpentane	0.168
Isopentane	0.304
2-Methylheptane	0.899
3-Methylheptane	1.122
4-Methylheptane	0.286
2-Methylhexane	0.891
3-Methylhexane	0.451
2-Methylnonane	0.3
3-Methylnonane	1.001
2-Methyloctane	0.245
3-Methyloctane	1.329
2-Methylpentane	1.211
3-Methylpentane	1.998
2,2,3-Trimethylbutane	0.125
2,2,3-Trimethylpentane	0.698
Olefins	
1-Decene	0.43
1-Heptene	1.29
cis-2-Heptene	0.649
trans-2-Heptene	0.101
cis-3-Heptene	0.194
trans-3-Heptene	0.712
1-Hexene	2.137
cis-2-Hexene	0.555
trans-2-Hexene	0.31
2-Methyl-1,3-Butadiene	0.699
2-Methyl-1-Butene	0.42
3-Methyl-1-Butene	0.291
2-Methyl-1-Nonene	0.648
2-Methyl-2-Pentene	0.654
4-Methyl-1-Pentene	0.646
1-Nonene	1.313
trans-2-Nonene	0.434
cis-3-Nonene	0.575
trans-3-Nonene	0.44
cis-4-Nonene	0.829
1-Octene	2.155
cis-2-Octene	0.439
trans-2-Octene	0.656
1-Pentene	1.669
cis-2-Pentene	0.21
trans-2-Pentene	0.542
Naphthenes	
Cyclohexane	0.954
Cyclopentane	1.891
cis-1,2-Dimethylcyclohexane	2.055
trans-1,2-Dimethylcyclohexane	0.328
trans-1,4-Dimethylcyclohexane	0.941
trans-1,2-Dimethylcyclopentane	0.73
cis-1,3-Dimethylcyclopentane	0.06
trans-1,3-Dimethylcyclopentane	1.16
Ethylcyclopentane	1.567
1-Ethyl-1-Methylcyclopentane	0.292
Isobutylcyclohexane	0.733
Isobutylcyclopentane	0.267
Isopropylcyclopentane	0.261
Methylcyclohexane	0.735
Methylcyclopentane	1.184
t-1-Methyl-2(4-Methylphenyl) cyclopentane	0.718
t-1-Methyl-2-N-Propylcyclo hexane	0.927
N-Propylcyclopentane	0.874
1,1,2-Trimethylcyclohexane	0.368
1,1,4-Trimethylcyclohexane	1.261
ctc-1,2,3-Trimethylcyclohexane	0.735
ctc-1,2,4-Trimethylcyclohexane	0.212
ctt-1,2,4-Trimethylcyclohexane	0.368
ccc-1,3,5-Trimethylcyclohexane	0.469
ccc-1,2,3-Trimethylcyclopentane	0.159
ctc-1,2,3-Trimethylcyclopentane	0.747
Aromatics	
Benzene	1.899
N-Butylbenzene	0.478
sec-Butylbenzene	0.711
tert-Butylbenzene	0.473
tert-1-Butyl-4-Ethylbenzene	0.478
tert-1-Butyl-2-Methylbenzene	0.478
tert-1-Butyl-3,4,5-Trimethyl benzene	0.772
1,2-Dimethyl-3-Ethylbenzene	0.495
1,2-Dimethyl-4-Ethylbenzene	0.21
1,3-Dimethyl-2-Ethylbenzene	0.184
1,3-Dimethyl-5-Ethylbenzene	0.094
1,4-Dimethyl-2-Ethylbenzene	0.478
Ethylbenzene	1.897
Hexylbenzene	1.186
Isobutylbenzene	0.713
Isopropylbenzene	0.48
2-Methylbutylbenzene	0.027
1-Methyl-2-Ethylbenzene	0.361
1-Methyl-3-Ethylbenzene	0.643
1-Methyl-4-Ethylbenzene	0.476
1-Methyl-2-Isopropylbenzene	0.645
1-Methyl-3-Isopropylbenzene	0.245
1-Methyl-4-Isopropylbenzene	0.949
1-Methyl-2-*n*-Propylbenzene	0.494
1-Methyl-3-*n*-Propylbenzene	0.479
1-Methyl-4-*n*-Propylbenzene	0.477
Pentylbenzene	0.473
N-Propylbenzene	0.711
1,2,4,5-Tetramethylbenzene	0.198
Toluene	2.839
1,2,4-Triethylbenzene	0.233
1,3,5-Triethylbenzene	0.48
1,2,4-Trimethylbenzene	0.475
1,3,5-Trimethylbenzene	0.097
m-Xylene	0.715
o-Xylene	0.719
p-Xylene	0.239

Neat, 0.15 mL in Autosampler Vial

cat.# 30730 (ea.)

NEW!

No data pack available.

Spark Ignition Engine Fuels, *cont.*

ASTM Method D6730-01 (Determination of Individual Components in Spark Ignition Engine Fuels), *cont.*

DHA Paraffins Standard (11 components)

Compound	Conc (wt/wt%)		
N-Decane	9.134	N-Octane	9.054
N-Dodecane	9.089	N-Pentadecane	9.123
N-Heptane	9.066	N-Pentane	9.094
N-Hexane	9.097	N-Tetradecane	9.128
N-Nonane	9.086	N-Tridecane	9.064
		N-Undecane	9.064

Neat, 0.15 mL in Autosampler Vial

cat.# 30725 (ea.)

NEW!

No data pack available.

DHA Isoparaffins Standard (33 components)

Compound	Conc (wt/wt%)		
3,3-Diethylpentane	1.914	3-Ethylhexane	0.307
2,3-Dimethylbutane	2.352	3-Ethyloctane	1.068
2,3-Dimethylheptane	1.16	3-Ethylpentane	0.882
2,5-Dimethylheptane	3.86	Isopentane	1.599
3,3-Dimethylheptane	1.765	2-Methylheptane	4.731
3,4-Dimethylheptane	0.839	3-Methylheptane	5.909
3,5-Dimethylheptane	2.344	4-Methylheptane	1.508
2,2-Dimethylhexane	0.786	2-Methylhexane	4.689
2,4-Dimethylhexane	1.454	3-Methylhexane	2.374
2,5-Dimethylhexane	5.854	2-Methylnonane	1.582
2,2-Dimethyloctane	2.095	3-Methylnonane	5.272
3,3-Dimethyloctane	0.804	2-Methyloctane	1.289
2,2-Dimethylpentane	2.438	3-Methyloctane	6.995
2,3-Dimethylpentane	4.668	2-Methylpentane	6.377
2,4-Dimethylpentane	5.931	3-Methylpentane	10.517
3,3-Dimethylpentane	2.305	2,2,3-Trimethylbutane	0.66
		2,2,3-Trimethylpentane	3.673

Neat, 0.15 mL in Autosampler Vial

cat.# 30726 (ea.)

NEW!

No data pack available.

DHA Olefins Standard (26 components)

Compound	Conc (wt/wt%)		
1-Decene	2.265	2-Methyl-2-Pentene	3.444
1-Heptene	6.787	4-Methyl-1-Pentene	3.398
cis-2-Heptene	3.418	1-Nonene	6.912
trans-2-Heptene	0.53	*trans*-2-Nonene	2.282
cis-3-Heptene	1.02	*cis*-3-Nonene	3.027
trans-3-Heptene	3.747	*trans*-3-Nonene	2.315
1-Hexene	11.249	*cis*-4-Nonene	4.365
cis-2-Hexene	2.921	1-Octene	11.339
trans-2-Hexene	1.632	*cis*-2-Octene	2.312
2-Methyl-1,3-Butadiene	3.68	*trans*-2-Octene	3.453
2-Methyl-1-Butene	2.211	1-Pentene	8.786
3-Methyl-1-Butene	1.534	*cis*-2-Pentene	1.107
2-Methyl-1-Nonene	3.412	*trans*-2-Pentene	2.852

Neat, 0.15 mL in Autosampler Vial

cat.# 30727 (ea.)

NEW!

No data pack available.

DHA Naphthenes Standard (26 components)

Compound	Conc (wt/wt%)		
Cyclohexane	4.773	Methylcyclopentane	5.921
Cyclopentane	9.455	t-1-Methyl-2(Methylphenyl) cyclopentane	3.592
cis-1,2-Dimethylcyclohexane	10.276	t-1-Methyl-2-N-Propyl cyclohexane	4.637
trans-1,2-Dimethylcyclohexane	1.642	N-Propylcyclopentane	4.373
trans-1,4-Dimethylcyclohexane	4.705	1,1,2-Trimethylcyclohexane	1.842
trans-1,2-Dimethylcyclopentane	3.653	1,1,4-Trimethylcyclohexane	6.304
cis-1,3-Dimethylcyclopentane	0.3	*ctc*-1,2,3-Trimethylcyclohexane	3.676
trans-1,3-Dimethylcyclopentane	5.799	*ctc*-1,2,4-Trimethylcyclohexane	1.062
Ethylcyclopentane	7.837	*ctt*-1,2,4-Trimethylcyclohexane	1.839
1-Ethyl-1-Methylcyclopentane	1.459	*ccc*-1,3,5-Trimethylcyclohexane	2.343
Isobutylcyclohexane	3.666	*ccc*-1,2,3-Trimethylcyclopentane	0.795
Isobutylcyclopentane	1.334	*ctc*-1,2,3-Trimethylcyclopentane	3.738
Isopropylcyclopentane	1.305		
Methylcyclohexane	3.677		

Neat, 0.15 mL in Autosampler Vial

cat.# 30728 (ea.)

NEW!

No data pack available.

DHA Aromatics Standard (37 components)

Compound	Conc (wt/wt%)		
Benzene	8.255	1-Methyl-3-Ethylbenzene	2.795
N-Butylbenzene	2.077	1-Methyl-4-Ethylbenzene	2.07
sec-Butylbenzene	3.09	1-Methyl-2-Isopropylbenzene	2.806
tert-Butylbenzene	2.058	1-Methyl-3-Isopropylbenzene	1.066
tert-1-Butyl-4-Ethylbenzene	2.076	1-Methyl-4-Isopropylbenzene	4.126
tert-1-Butyl-2-Methylbenzene	2.077	1-Methyl-2-*n*-Propylbenzene	2.148
tert-1-Butyl-3,4,5-Trimethyl benzene	3.355	1-Methyl-3-*n*-Propylbenzene	2.084
1,2-Dimethyl-3-Ethylbenzene	2.152	1-Methyl-4-*n*-Propylbenzene	2.073
1,2-Dimethyl-4-Ethylbenzene	0.915	Pentylbenzene	2.058
1,3-Dimethyl-2-Ethylbenzene	0.799	N-Propylbenzene	3.091
1,3-Dimethyl-5-Ethylbenzene	0.407	1,2,4,5-Tetramethylbenzene	0.86
1,4-Dimethyl-2-Ethylbenzene	2.076	Toluene	12.342
Ethylbenzene	8.248	1,2,4-Triethylbenzene	1.014
Hexylbenzene	5.155	1,3,5-Triethylbenzene	2.087
Isobutylbenzene	3.099	1,2,4-Trimethylbenzene	2.066
Isopropylbenzene	2.085	1,3,5-Trimethylbenzene	0.422
2-Methylbutylbenzene	0.118	*m*-Xylene	3.108
1-Methyl-2-Ethylbenzene	1.571	*o*-Xylene	3.125
		p-Xylene	1.041

Neat, 0.15 mL in Autosampler Vial

cat.# 30729 (ea.)

NEW!

No data pack available.

Compound Index for Reference Standards

See **pages 586–592.**



Reference Standards

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Diethylene & Ethylene Glycol

Meet FDA Guidance for Industry: Testing of Glycerin for Diethylene Glycol with our diethylene glycol (DEG) and ethylene glycol limit standards. This guidance emphasizes the importance of screening raw material for the presence of diethylene glycol. Under cGMPs, drug manufacturers—not just glycerin manufacturers—must test glycerin prior to use to prevent DEG contamination in finished products. The FDA has worked extensively with the USP to modify the glycerin monograph, and these standards support the revised USP method.

Glycerin Standard Mix (3 components)

Diethylene glycol (111-46-6)	0.5 mg/mL
Ethylene glycol (107-21-1)	0.5
Glycerin (56-81-5)	20

In P&T methanol, 1 mL/ampul

cat.# 31891 (ea.)

Propylene Glycol Standard Mix (3 components)

Diethylene glycol (111-46-6)	0.5 mg/mL
Ethylene glycol (107-21-1)	0.5
Propylene glycol (57-55-6)	20

In P&T methanol, 1 mL/ampul

cat.# 31892 (ea.)

Sorbitol Standard Mix (2 components)

Diethylene glycol (111-46-6)
Ethylene glycol (107-21-1)

0.8 mg/mL each in acetone:water (96:4), 1 mL/ampul

cat.# 31893 (ea.)

Glycol Internal Standard Mix

2,2,2-Trichloroethanol (115-20-8)

10 mg/mL in P&T methanol, 1 mL/ampul

cat.# 31894 (ea.)

Fatty Acids

Composition of Fatty Acids by GC

EP 2.4.22 Composition of Fatty Acids by GC Mix 1

(6 components)

Description	% by Weight	Description	% by Weight
Methyl arachidate (C20:0)	40	Methyl oleate (C18:1 [*cis*9])	20
Methyl dodecanoate (C12:0)	5	Methyl palmitate (C16:0)	10
Methyl myristate (C14:0)	5	Methyl stearate (C18:0)	20

100 mg total

cat.# 35100 (ea.)

No data pack available.

EP 2.4.22 Composition of Fatty Acids by GC Mix 2

(5 components)

Description	% by Weight	Description	% by Weight
Methyl caproate (C6:0)	10	Methyl dodecanoate (C12:0)	20
Methyl caprylate (C8:0)	10	Methyl myristate (C14:0)	40
Methyl decanoate (C10:0)	20		

100 mg total

cat.# 35101 (ea.)

No data pack available.

Pharmaceutical Compounds in Drinking Water

Pharmaceuticals Mix #1 (8 components)

Acetaminophen (103-90-2)
Caffeine (58-08-2)
Carbamazepine (298-46-4)
Ciprofloxacin HCL (86393-32-0)
Erythromycin USP (114-07-8)
Fluoxetine HCl (56296-78-7)
Sulfamethoxazole (723-46-6)
Trimethoprim (738-70-5)

200 µg/mL each in P&T methanol, 1 mL/ampul

cat.# 31116 (ea.)

Steroids and Mixed Pharmaceuticals Mix

(10 components)

Bisphenol A (80-05-7)
Diclofenac sodium salt (15307-79-6)
17-beta-Estradiol (50-28-2)
Estrone (53-16-7)
17-alpha-Ethynylestradiol (57-63-6)
4-para-Nonylphenol (84852-15-3)
4-*tert*-Octylphenol (140-66-9)
Primidone (125-33-7)
Progestrone (57-83-0)
Testosterone (58-22-0)

200 µg/mL each in acetonitrile, 1 mL/ampul

cat.# 31117 (ea.)

Pharmaceuticals Mix #2 (4 components)

Gemfibrozil (25812-30-0)
Ibuprofen (15687-27-1)
Naproxen (22204-53-1)
Triclosan (3380-34-5)

200 µg/mL each in P&T methanol, 1 mL/ampul

cat.# 31118 (ea.)

Plastic Container Testing

ASTM Method D6042-96 (Plastic Container Testing)

American Society for Testing and Materials (ASTM International) Method D6042-96—Test Method for Determination of Phenolic Antioxidants and Erucamide Slip Additives in Polypropylene Homopolymer Formulations Using Liquid Chromatography—is a "consensus" or "referee" method used among plastic manufacturers and the pharmaceutical companies that purchase plastic containers. Plastic container manufacturers use this test to ensure the quality of their product for their pharmaceutical customers. Pharmaceutical companies also specify this test and provide their own lists of target compounds and concentration limits in purchase agreements.

This test calls for isopropanol extraction, LC separation, and UV detection. Restek offers a variety of reversed-phase LC columns suitable for these separations. Restek also designed a reference standard to validate this method. This mixture contains the common antioxidants and slips listed in ASTM D6042-96, along with BHT.

ASTM D6042-96 Calibration Mix (7 components)

BHT (128-37-0)
Erucamide slip (112-84-5)
Vitamin E (59-02-9)
Irgafos 168 (31570-04-4)
Irganox 3114 (27676-62-6)
Irganox 1010 (6683-19-8)
Irganox 1076 (2082-79-3)

50 µg/mL each in isopropanol, 1 mL/ampul

cat.# 31628 (ea.)

Residual Solvents

USP <467>

The United States Pharmacopeia (USP) General Chapter <467> Residual Solvents is a widely used compendial method intended for identifying and quantifying residual solvents in drug substances, drug products, and excipients. In an attempt to better mirror the International Conference on Harmonization (ICH) guidelines, the USP has adopted a more comprehensive methodology in residual solvent testing—the current USP30/NF25. The ICH publishes a guideline (Q3C) listing the acceptable amounts of solvent residues that can be present. In the ICH guideline, residual solvents are summarized by class according to their toxicity. Class 1 compounds are carcinogenic compounds that pose a risk to both the consumer and the environment. The use of these solvents is to be avoided, but if they are used, they must be tightly controlled. Class 2 compounds are nongenotoxic animal carcinogens, and concentrations of these compounds should be limited. Chromatographic analysis is needed for both the Class 1 and Class 2 residual solvents.

USP <467> Singles

Volume is 1 mL/ampul.

Compound	CAS #	Solvent	Conc.	cat.#
acetonitrile	75-05-8	DMSO	2.05 mg/mL	36281
benzene	71-43-2	DMSO	10 mg/mL	36282
carbon tetrachloride	56-23-5	DMSO	20 mg/mL	36283
chlorobenzene	108-90-7	DMSO	1.8 mg/mL	36284
chloroform	67-66-3	DMSO	0.3 mg/mL	36285
cyclohexane	110-82-7	DMSO	19.4 mg/mL	36286
1,1-dichloroethene	75-35-4	DMSO	40 mg/mL	36287
1,2-dichloroethane	107-06-2	DMSO	25 mg/mL	36288
cis-1,2-dichloroethylene	156-59-2	DMSO	4.67 mg/mL	36289
trans-1,2-dichloroethylene	156-60-5	DMSO	4.67 mg/mL	36290
1,2-dimethoxyethane	110-71-4	DMSO	0.5 mg/mL	36291
N,N-dimethylacetamide	127-19-5	DMSO	5.45 mg/mL	36292
N,N-dimethylformamide	68-12-2	DMSO	4.4 mg/mL	36293
1,4-dioxane	123-91-1	DMSO	1.9 mg/mL	36294
2-ethoxyethanol	110-80-5	DMSO	0.8 mg/mL	36295
ethylbenzene	100-41-4	DMSO	1.84 mg/mL	36296
ethylene glycol	3775-85-7	DMSO	3.1 mg/mL	36297
formamide	75-12-7	DMSO	1.1 mg/mL	36298
hexane	8031-34-3	DMSO	1.45 mg/mL	36299
methanol	67-56-1	DMSO	15 mg/mL	36401
2-methoxyethanol	109-86-4	DMSO	0.25 mg/mL	36402
methylbutylketone	591-78-6	DMSO	0.25 mg/mL	36400
methylcyclohexane	108-87-2	DMSO	5.9 mg/mL	36403
methylene chloride (dichloromethane)	75-09-2	DMSO	3 mg/mL	36404
N-methylpyrrolidone	872-50-4	DMSO	2.65 mg/mL	36405
nitromethane	75-52-5	DMSO	0.25 mg/mL	36406
pyridine	110-86-1	DMSO	1 mg/mL	36407
sulfolane	126-33-0	DMSO	0.8 mg/mL	36413
tetrahydrofuran (THF)	109-99-9	DMSO	3.6 mg/mL	36408
tetralin	119-64-2	DMSO	0.5 mg/mL	36409
toluene	108-88-3	DMSO	4.45 mg/mL	36410
1,1,1-trichloroethane	71-55-6	DMSO	50 mg/mL	36411
trichloroethene	79-01-6	DMSO	0.4 mg/mL	36412
m-xylene	108-38-3	DMSO	6.51 mg/mL	36414
o-xylene	95-47-6	DMSO	0.97 mg/mL	36415
p-xylene	106-42-3	DMSO	1.52 mg/mL	36416

DMSO = dimethyl sulfoxide

Residual Solvents Class 2 - Mix A (2013 Rev)

NEW!

(16 components)

This mixture reflects the changes made in USP <467> effective August 2013 and replaces Restek® cat.# 36271.

Acetonitrile (75-05-8)	2.05 mg/mL	Methanol (67-56-1)	15
Chlorobenzene (108-90-7)	1.8	Methylcyclohexane (108-87-2)	5.9
Cyclohexane (110-82-7)	19.4	Methylene chloride (dichloromethane) (75-09-2)	3
cis-1,2-Dichloroethene (156-59-2)	4.675	Tetrahydrofuran (109-99-9)	3.6
trans-1,2-Dichloroethene (156-60-5)	4.675	Toluene (108-88-3)	4.45
1,4-Dioxane (123-91-1)	1.9	*m*-Xylene (108-38-3)	6.51
Ethylbenzene (100-41-4)	1.84	*o*-Xylene (95-47-6)	0.98
Isopropylbenzene (cumene) (98-82-8)	0.35	*p*-Xylene (106-42-3)	1.52

In dimethyl sulfoxide, 1 mL/ampul

cat.# 36012 (ea.)

These mixtures reflect the changes made in USP30/NF25 effective July 1, 2008.

Residual Solvents - Class 1 (5 components)

Benzene (71-43-2)	10 mg/mL	1,1-Dichloroethene (75-35-4)	40
Carbon tetrachloride (56-23-5)	20	1,1,1-Trichloroethane (71-55-6)	50
1,2-Dichloroethane (107-06-2)	25		

In dimethyl sulfoxide, 1 mL/ampul

cat.# 36279 (ea.)

Residual Solvents Class 2 - Mix A (15 components)

Note: The USP <467> Class 2 residual solvents list was updated to add cumene in August 2013. See cat.# 36012 (above) for our updated reference standard.

Acetonitrile (75-05-8)	2.05 mg/mL	Methylcyclohexane (108-87-2)	5.90
Chlorobenzene (108-90-7)	1.80	Methylene chloride (dichloromethane) (75-09-2)	3.00
Cyclohexane (110-82-7)	19.40	Tetrahydrofuran (109-99-9)	3.45
cis-1,2-Dichloroethene (156-59-2)	4.70	Toluene (108-88-3)	4.45
trans-1,2-Dichloroethene (156-60-5)	4.70	*m*-Xylene (108-38-3)	6.51
1,4-Dioxane (123-91-1)	1.90	*o*-Xylene (95-47-6)	0.98
Ethylbenzene (100-41-4)	1.84	*p*-Xylene (106-42-3)	1.52
Methanol (67-56-1)	15.00		

In dimethyl sulfoxide, 1 mL/ampul

cat.# 36271 (ea.)

Residual Solvents Class 2 - Mix B (8 components)

n-Hexane (C6) (110-54-3)	290 µg/mL	Nitromethane (75-52-5)	50
Chloroform (67-66-3)	60	Pyridine (110-86-1)	200
1,2-Dimethoxyethane (110-71-4)	100	Tetralin (119-64-2)	100
2-Hexanone (591-78-6)	50	Trichloroethene (79-01-6)	80

In dimethyl sulfoxide, 1 mL/ampul

cat.# 36280 (ea.)

Residual Solvents Class 2 - Mix C (8 components)

2-Ethoxyethanol (110-80-5)	800 µg/mL	2-Methoxyethanol (Methyl Cellosolve) (109-86-4)	250
Ethylene glycol (107-21-1)	3,100	N-Methylpyrrolidone (872-50-4)	2,650
Formamide (75-12-7)	1,100	Sulfolane (126-33-0)	800
N,N-Dimethylacetamide (127-19-5)	5,450		
N,N-Dimethylformamide (68-12-2)	4,400		

In dimethyl sulfoxide, 1 mL/ampul

cat.# 36273 (ea.)

Residual Solvents, *cont.*

USP <467>, *cont.*

The Class 1 mixtures below reflect the requirements of USP23/NF18 effective January 1, 1995 to December 31, 1999. While these mixtures do not meet the current USP guidelines, many still use these mixtures to obtain a detectable benzene peak for the direct injection methods, Method I and Method V.

USP <467> Calibration Mixture #3 (5 components)

Benzene (71-43-2)	100 µg/mL	Methylene chloride (dichloromethane) (75-09-2)	500
Chloroform (67-66-3)	50	Trichloroethene (79-01-6)	100
1,4-Dioxane (123-91-1)	100		

In dimethyl sulfoxide, 1 mL/ampul

cat.# 36004 (ea.)

USP <467> Calibration Mixture #4 (5 components)

Benzene (71-43-2)	2 µg/mL	Methylene chloride (dichloromethane) (75-09-2)	600
Chloroform (67-66-3)	60	Trichloroethene (79-01-6)	80
1,4-Dioxane (123-91-1)	380		

In methanol, 1 mL/ampul

cat.# 36006 (ea.)

USP <467> Calibration Mixture #5 (5 components)

Benzene (71-43-2)	2 µg/mL	Methylene chloride (dichloromethane) (75-09-2)	600
Chloroform (67-66-3)	60	Trichloroethene (79-01-6)	80
1,4-Dioxane (123-91-1)	380		

In dimethyl sulfoxide, 1 mL/ampul

cat.# 36007 (ea.)

USP <467> Calibration Mix #6 (4 components)

Chloroform (67-66-3)	60 µg/mL	Methylene chloride (dichloromethane) (75-09-2)	600
1,4-Dioxane (123-91-1)	380	Trichloroethene (79-01-6)	80

In methanol, 1 mL/ampul

cat.# 36008 (ea.)

USP <467> Calibration Mix #7 (4 components)

Chloroform (67-66-3)	60 µg/mL	Methylene chloride (dichloromethane) (75-09-2)	600
1,4-Dioxane (123-91-1)	380	Trichloroethene (79-01-6)	80

In dimethyl sulfoxide, 1 mL/ampul

cat.# 36009 (ea.)

Ethylene Oxide

The test for ethylene oxide is specified in many individual drug monographs of USP24/NF19. The limit test concentration is currently 10 ppm. While the specific test solution and method will vary depending on the particular drug monograph, the solution below is suitable for most tests.

Ethylene oxide (75-21-8)

500 µg/mL in dimethyl sulfoxide, 1 mL/ampul

cat.# 36005 (ea.)

50 mg/mL in methylene chloride, 1 mL/ampul

cat.# 30620 (ea.)

Ethylene oxide is available in other solvents and concentrations. Request your custom formulation at **www.restek.com/solutions**

European Pharmacopoeia Method

Residual Solvents - Class 1 (5 components)

Benzene (71-43-2)	10 mg/mL	1,1-Dichloroethene (75-35-4)	40
Carbon tetrachloride (56-23-5)	20	1,1,1-Trichloroethane (71-55-6)	50
1,2-Dichloroethane (107-06-2)	25		

In dimethyl sulfoxide, 1 mL/ampul

cat.# 36279 (ea.)

European Pharmacopoeia/ICH Q3C(M) Class 2 Mix A, Revised (14 components)

n-Hexane (C6) (110-54-3)	290 µg/mL	Tetrahydrofuran (109-99-9)	720
Chlorobenzene (108-90-7)	360	Toluene (108-88-3)	890
Cyclohexane (110-82-7)	3,880	Trichloroethene (79-01-6)	80
cis-1,2-Dichloroethene (156-59-2)	1,870	*m*-Xylene (108-38-3)	1,302
N,N-Dimethylformamide (68-12-2)	880	*o*-Xylene (95-47-6)	195
Ethylbenzene (100-41-4)	369	*p*-Xylene (106-42-3)	304
Methylcyclohexane (108-87-2)	1,180		
Methylene chloride (dichloromethane) (75-09-2)	600		

In dimethyl sulfoxide, 1 mL/ampul

cat.# 36274 (ea.)

European Pharmacopoeia/ICH Class 2 Mix B, Revised (10 components)

Acetonitrile (75-05-8)	410 µg/mL	2-Hexanone (591-78-6)	50
Chloroform (67-66-3)	60	Methanol (67-56-1)	3,000
1,2-Dimethoxyethane (110-71-4)	100	Nitromethane (75-52-5)	50
N,N-Dimethylacetamide (127-19-5)	1,090	Pyridine (110-86-1)	200
1,4-Dioxane (123-91-1)	380	Tetralin (119-64-2)	100

Prepared in water:dimethyl sulfoxide (80:20), 1 mL/ampul

cat.# 36270 (ea.)

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