



# Analytical Reference Materials

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# ANALYTICAL REFERENCE MATERIALS

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|--|----------------------|---|---|-----------------------|------------------|
| <b>Acetates</b>                            |                      |   |   |                       |                  |
| 30477 .....                                | .434                 | 30614 .....                                   | .461,433                                | 30096 .....           | .404,458,476     |
| 30489 .....                                | .434                 | 30624 .....                                   | .442                                    | 30097 .....           | .404,476         |
| <b>Acids, Chlorinated</b>                  |                      |   |   |                       |                  |
| 30498 .....                                | .401                 | 30625 .....                                   | .442                                    | 30098 .....           | .404,476         |
| 32429 .....                                | .419,440             | 31006 .....                                   | .424,435,444                            | 30099 .....           | .404,476         |
| 32430 .....                                | .419                 | 31206 .....                                   | .435,444,453                            | 30436 .....           | .404,476         |
| 32431 .....                                | .419,440             | 31810 .....                                   | .448                                    | 31222 .....           | .469             |
| <b>Acids, Haloacetic</b>                   |                      |   |   |                       |                  |
| 31644 .....                                | .418                 | 31885 .....                                   | .435,444                                | 31223 .....           | .469             |
| 31645 .....                                | .418                 | 31886 .....                                   | .435,444                                | 31224 .....           | .469             |
| 31646 .....                                | .419                 | 31887 .....                                   | .435,444                                | 31613 .....           | .469             |
| 31647 .....                                | .419                 | 31888 .....                                   | .435,444                                | 31674 .....           | .469             |
| 31896 .....                                | .418                 | 31889 .....                                   | .435,444                                | 31675 .....           | .469             |
| 31897 .....                                | .418                 | 33913 .....                                   | .444                                    | 31676 .....           | .456             |
| <b>Acids, Organic</b>                      |                      |   |   |                       |                  |
| 35080 .....                                | .481                 | 33918 .....                                   | .444                                    | 31677 .....           | .456             |
| 35081 .....                                | .481                 | <b>Esters, Nitrate</b>                        |   | 31678 .....           | .456             |
| <b>Alcohols</b>                            |                      |   |   | 31679 .....           | .456             |
| 30214 .....                                | .432                 | 31498 .....                                   | .403                                    | 32008 .....           | .399,425,438,451 |
| 30466 .....                                | .401,434,463         | 31600 .....                                   | .403                                    | 32009 .....           | .399,425,438,451 |
| 30467 .....                                | .402,434,463         | 31601 .....                                   | .401                                    | 32010 .....           | .399,425,438     |
| <b>Amphetamines &amp; Metabolites</b>      |                      |   |   | 32011 .....           | .399,425,438,451 |
| 34020 .....                                | .399,478             | <b>Esters, Phthalate</b>                      |   | 32012 .....           | .399,438,451     |
| 34021 .....                                | .402,478             | 31031 .....                                   | .420                                    | 32039 .....           | .425,438,451     |
| <b>Barbiturates</b>                        |                      |   |   | 32064 .....           | .399,425,438,451 |
| 34028 .....                                | .399,478             | 31844 .....                                   | .409                                    | 32065 .....           | .399,425,438,451 |
| 34029 .....                                | .399,478             | 31845 .....                                   | .409                                    | 32066 .....           | .399,425,438,451 |
| 34030 .....                                | .399,478             | 33227 .....                                   | .428                                    | 32067 .....           | .399,425,438,451 |
| 34031 .....                                | .399,478             | 33228 .....                                   | .428                                    | 32068 .....           | .399,425,438,451 |
| 34032 .....                                | .399,478             | 33229 .....                                   | .428                                    | 32069 .....           | .399,425,438,451 |
| 34033 .....                                | .402,478             | <b>Ethers</b>                                 |   | 32070 .....           | .399,425,438,451 |
| 34034 .....                                | .402,478             | 30617 .....                                   | .399,434                                | 32299 .....           | .425,438,451     |
| 34035 .....                                | .402,478             | <b>Ethers, Alcohol</b>                        |   | 32409 .....           | .399,425,438,451 |
| 34036 .....                                | .403,478             | 30626 .....                                   | .434                                    | 32410 .....           | .399,425,438,451 |
| 34037 .....                                | .403,478             | 30627 .....                                   | .401,434                                | 32456 .....           | .425,438,451     |
| 34038 .....                                | .404,478             | 30628 .....                                   | .401,434                                | 31697 .....           | .416             |
| 34039 .....                                | .404,478             | 30629 .....                                   | .399,434                                |                       |                  |
| 34040 .....                                | .404,478             | 30631 .....                                   | .399,434                                |                       |                  |
| 34041 .....                                | .404,478             | <b>Ethers-Haloethers</b>                      |   |                       |                  |
| 34058 .....                                | .402,478             | 30456 .....                                   | .443                                    |                       |                  |
| <b>Benzidines</b>                          |                      | 30475 .....                                   | .433                                    |                       |                  |
| 31030 .....                                | .420,436,438,447     | 31034 .....                                   | .421                                    |                       |                  |
| 31688 .....                                | .436,447             | <b>Explosives</b>                             |   |                       |                  |
| 31834 .....                                | .420,436,438,446,447 | 31450 .....                                   | .440                                    |                       |                  |
| 31835 .....                                | .401,447,448         | 31451 .....                                   | .440                                    |                       |                  |
| 31852 .....                                | .436,447             | 31607 .....                                   | .429                                    |                       |                  |
| <b>Benzodiazepines</b>                     |                      | 31608 .....                                   | .429                                    |                       |                  |
| 34042 .....                                | .399,478             | 31890 .....                                   | .399                                    |                       |                  |
| 34043 .....                                | .399,478             | 33204 .....                                   | .440                                    |                       |                  |
| 34044 .....                                | .400,478             | 33205 .....                                   | .401,440                                |                       |                  |
| 34045 .....                                | .400,478             | 33900 .....                                   | .416                                    |                       |                  |
| 34046 .....                                | .400,478             | 33901 .....                                   | .401,416                                |                       |                  |
| 34047 .....                                | .400,478             | 33902 .....                                   | .403,416                                |                       |                  |
| 34049 .....                                | .402,478             | 33903 .....                                   | .404,416                                |                       |                  |
| 34053 .....                                | .403,478             | 33904 .....                                   | .403,416                                |                       |                  |
| 34054 .....                                | .403,478             | 33905 .....                                   | .440                                    |                       |                  |
| <b>Cannabinoid &amp; Metabolites</b>       |                      | <b>Glycols</b>                                |   |                       |                  |
| 34010 .....                                | .400,478             | 30471 .....                                   | .432,463,465                            |                       |                  |
| 34011 .....                                | .400,478             | <b>Herbicides, Chlorinated Acids</b>          |   |                       |                  |
| <b>Carbamates</b>                          |                      | 32054 .....                                   | .411,422,431                            |                       |                  |
| 32273 .....                                | .417                 | 32055 .....                                   | .411,422                                |                       |                  |
| 32435 .....                                | .417                 | 32056 .....                                   | .400,411,419,422,431,440                |                       |                  |
| <b>Chlorinated Disinfection Biproducts</b> |                      | 32057 .....                                   | .400,411,419,422,431                    |                       |                  |
| 30609 .....                                | .400                 | 32058 .....                                   | .422,431                                |                       |                  |
| 30615 .....                                | .418                 | 32059 .....                                   | .422,431                                |                       |                  |
| 30616 .....                                | .418                 | 32061 .....                                   | .411,431                                |                       |                  |
| <b>Chlorinated Pesticides/Herbicides</b>   |                      | 32062 .....                                   | .411,431                                |                       |                  |
| 32438 .....                                | .418                 | 32443 .....                                   | .411                                    |                       |                  |
| <b>Cocaine &amp; Metabolites</b>           |                      | 32444 .....                                   | .411                                    |                       |                  |
| 34015 .....                                | .400,478             | <b>Herbicides, Paraquat/Diquat</b>            |   |                       |                  |
| 34016 .....                                | .399,478             | 32437 .....                                   | .417                                    |                       |                  |
| 34017 .....                                | .401,478             | <b>Herbicides, Phenoxycacid</b>               |   |                       |                  |
| 34018 .....                                | .401,478             | 31868 .....                                   | .454                                    |                       |                  |
| <b>Hydrocarbons</b>                        |                      | 32014 .....                                   | .426                                    |                       |                  |
|  |                      | 32054 .....                                   | .411,422,431                            |                       |                  |
|  |                      | 32055 .....                                   | .411,422,431                            |                       |                  |
|  |                      | 32058 .....                                   | .422,431                                |                       |                  |
|  |                      | 32431 .....                                   | .419,440                                |                       |                  |
|  |                      | 32431 .....                                   | .419,440                                |                       |                  |
|  |                      | <b>Hydrocarbons (cont'd)</b>                  |   |                       |                  |
|  |                      | 31266 .....                                   | .462,463                                |                       |                  |
|  |                      | 31459 .....                                   | .464                                    |                       |                  |
|  |                      | 31489 .....                                   | .467                                    |                       |                  |
|  |                      | 31614 .....                                   | .463                                    |                       |                  |
|  |                      | 31674 .....                                   | .469                                    |                       |                  |
|  |                      | 31675 .....                                   | .469                                    |                       |                  |
|  |                      | 31678 .....                                   | .456                                    |                       |                  |
|  |                      | 31698 .....                                   | .457,466                                |                       |                  |
|  |                      | 31814 .....                                   | .466                                    |                       |                  |
|  |                      | 31819 .....                                   | .457,461                                |                       |                  |
|  |                      | 31830 .....                                   | .463                                    |                       |                  |
|  |                      | 31832 .....                                   | .463                                    |                       |                  |
|  |                      | 31838 .....                                   | .400,458                                |                       |                  |
|  |                      | 31877 .....                                   | .403,463                                |                       |                  |
|  |                      | 31878 .....                                   | .463                                    |                       |                  |
|  |                      | 31880 .....                                   | .401,458,460,471                        |                       |                  |
|  |                      | 33906 .....                                   | .487                                    |                       |                  |
|  |                      | 33908 .....                                   | .487                                    |                       |                  |
|  |                      | <b>Hydrocarbons, Aromatic</b>                 |   |                       |                  |
|  |                      | 30001 .....                                   | .442                                    |                       |                  |
|  |                      | 30035 .....                                   | .420                                    |                       |                  |
|  |                      | 30051 .....                                   | .427,432,459                            |                       |                  |
|  |                      | 30095 .....                                   | .459,467                                |                       |                  |
|  |                      | 30488 .....                                   | .427,432,459                            |                       |                  |
|  |                      | 30496 .....                                   | .463                                    |                       |                  |
|  |                      | 30213 .....                                   | .427,432,459                            |                       |                  |
|  |                      | 30222 .....                                   | .427                                    |                       |                  |
|  |                      | <b>Hydrocarbons, Halogenated</b>              |   |                       |                  |
|  |                      | 30010 .....                                   | .443,444                                |                       |                  |
|  |                      | 30020 .....                                   | .422                                    |                       |                  |
|  |                      | 30042 .....                                   | .408,413,417,427,432,433,443            |                       |                  |
|  |                      | 31035 .....                                   | .421                                    |                       |                  |
|  |                      | <b>Hydrocarbons, Halogenated Polyaromatic</b> |   |                       |                  |
|  |                      | 31842 .....                                   | .400,439                                |                       |                  |
|  |                      | <b>Isocyanates</b>                            |   |                       |                  |
|  |                      | 33000 .....                                   | .404,470                                |                       |                  |
|  |                      | 33001 .....                                   | .404,470                                |                       |                  |
|  |                      | 33002 .....                                   | .402,470                                |                       |                  |
|  |                      | 33003 .....                                   | .402,470                                |                       |                  |
|  |                      | <b>Ketones-Aldehydes</b>                      |   |                       |                  |
|  |                      | 30006 .....                                   | .432,434,443,444                        |                       |                  |
|  |                      | 30602 .....                                   | .413                                    |                       |                  |
|  |                      | 31808 .....                                   | .439                                    |                       |                  |
|  |                      | 31833 .....                                   | .400                                    |                       |                  |
|  |                      | 31837 .....                                   | .402,439                                |                       |                  |
|  |                      | <b>Methadone &amp; Metabolites</b>            |   |                       |                  |
|  |                      | 34005 .....                                   | .402,478                                |                       |                  |
|  |                      | <b>Nitroaromatics</b>                         |   |                       |                  |
|  |                      | 31033 .....                                   | .421                                    |                       |                  |
|  |                      | <b>Nitrosamines</b>                           |   |                       |                  |
|  |                      | 31032 .....                                   | .421                                    |                       |                  |
|  |                      | 31898 .....                                   | .412                                    |                       |                  |
|  |                      | 33009 .....                                   | .415                                    |                       |                  |
|  |                      | 33910 .....                                   | .403,412                                |                       |                  |
|  |                      | 33911 .....                                   | .403                                    |                       |                  |
|  |                      | <b>Opiates &amp; Metabolites</b>              |   |                       |                  |
|  |                      | 34000 .....                                   | .400,478                                |                       |                  |
|  |                      | 34002 .....                                   | .402,478                                |                       |                  |
|  |                      | 34006 .....                                   | .403,478                                |                       |                  |
|  |                      | 34007 .....                                   | .403,478                                |                       |                  |
|  |                      | 34063 .....                                   | .402,478                                |                       |                  |
|  |                      | 34065 .....                                   | .403,478                                |                       |                  |
|  |                      | <b>Organometallic/Organotin</b>               |   |                       |                  |
|  |                      | 31472 .....                                   | .452                                    |                       |                  |
|  |                      | 31473 .....                                   | .452                                    |                       |                  |
|  |                      | 31474 .....                                   | .404,452                                |                       |                  |
|  |                      | 31475 .....                                   | .404,452                                |                       |                  |
|  |                      | 31476 .....                                   | .404,452                                |                       |                  |
|  |                      | 31477 .....                                   | .404,452                                |                       |                  |
|  |                      | 31478 .....                                   | .404,452                                |                       |                  |
|  |                      | <b>Oxygenates</b>                             |   |                       |                  |
|  |                      | 30619 .....                                   | .413                                    |                       |                  |
|  |                      | <b>Pesticides, Organophosphorus</b>           |   |                       |                  |
|  |                      | 32415 .....                                   | .414,429,437,450                        |                       |                  |
|  |                      | 32417 .....                                   | .410,421,449                            |                       |                  |
|  |                      | <b>Pesticides, Organohalide</b>               |   |                       |                  |
|  |                      | 31012 .....                                   | .447                                    |                       |                  |
|  |                      | 32003 .....                                   | .451                                    |                       |                  |
|  |                      | 32004 .....                                   | .451                                    |                       |                  |
|  |                      | 32013 .....                                   | .426                                    |                       |                  |
|  |                      | 32022 .....                                   | .421                                    |                       |                  |
|  |                      | 32024 .....                                   | .409                                    |                       |                  |
|  |                      | 32033 .....                                   | .450                                    |                       |                  |
|  |                      | 32034 .....                                   | .450                                    |                       |                  |
|  |                      | 32040 .....                                   | .450                                    |                       |                  |
|  |                      | 32094 .....                                   | .410                                    |                       |                  |
|  |                      | 32095 .....                                   | .410                                    |                       |                  |
|  |                      | 32291 .....                                   | .428,450                                |                       |                  |
|  |                      | 32292 .....                                   | .429,450                                |                       |                  |
|  |                      | 32297 .....                                   | .450                                    |                       |                  |
|  |                      | 32298 .....                                   | .450                                    |                       |                  |
|  |                      | 32415 .....                                   | .414,429,437,450                        |                       |                  |
|  |                      | 32436 .....                                   | .403                                    |                       |                  |
|  |                      | 33008 .....                                   | .415                                    |                       |                  |
|  |                      | 33013 .....                                   | .410,414                                |                       |                  |



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# ANALYTICAL REFERENCE MATERIALS NEAT & SINGLE ANALYTE SOLUTIONS

Individual Compounds ..... 399-404



Top: Mike Moore, Shipping Technician  
Bottom: Matt Hepfer, Manufacturing Technician



**ANALYTICAL REFERENCE MATERIALS**  
**Neat & Single Analyte Solutions**

| Compound<br>Packaged 1mL/ampul*       | CAS#        | Solvent<br>Code | Individual<br>µg/mL* | cat.# | price   |
|---------------------------------------|-------------|-----------------|----------------------|-------|---------|
| 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 |         |
| acetochlor                            | 34256-82-1  | M               | 100                  | 33208 |         |
| acetochlor ESA sodium salt            | 187022-11-3 | M               | 100                  | 33092 |         |
| acetochlor OA                         | 184992-44-4 | M               | 100                  | 33094 |         |
| acetone                               | 67-64-1     | PTM             | 5,000                | 30245 |         |
| acetone-2,4-DNPH                      | 1567-89-1   | ACN             | 100                  | 33075 |         |
| acetonitrile                          | 75-05-8     | DMSO            | 2.05mg/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             | 10,000               | 30499 |         |
| acrolein                              | 107-02-8    | W               | 10,000               | 30478 |         |
| acrolein-2,4-DNPH                     | 888-54-0    | ACN             | 100                  | 33076 |         |
| acrylamide                            | 79-06-1     | M               | 1,000                | 30494 |         |
| acrylonitrile                         | 107-13-1    | PTM             | 2,000                | 30246 |         |
| alachlor                              | 15972-60-8  | M               | 1,000                | 32204 |         |
| alachlor                              | 15972-60-8  | M               | 100                  | 33207 |         |
| alachlor ESA sodium salt              | 142363-53-9 | M               | 100                  | 33096 |         |
| alachlor OA                           | 171262-17-2 | M               | 100                  | 33099 |         |
| 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 | enquire |
| 2-amino-4,6-dinitrotoluene            | 35572-78-2  | ACN             | 1,000                | 31670 | enquire |
| 4-amino-2,6-dinitrotoluene            | 19406-51-0  | ACN             | 1,000                | 31671 | enquire |
| aminomethyl phosphonic acid<br>(AMPA) | 1066-51-9   | W               | 100                  | 32428 |         |
| ammonium picrate                      | 131-74-8    | ACN             | 2,000                | 31890 | enquire |
| amobarbital                           | 64-43-7     | PTM             | 1,000                | 34028 | enquire |
| d-amphetamine                         | 51-63-8     | PTM             | 1,000                | 34020 | enquire |
| tert-amyl alcohol                     | 75-85-4     | PTM             | 10,000               | 30631 |         |
| tert-amyl ethyl ether (TAAE)          | 919-94-8    | PTM             | 2,000                | 30617 |         |
| tert-amyl methyl ether (TAME)         | 994-05-8    | PTM             | 2,000                | 30629 |         |
| 5- $\alpha$ -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 |         |
| antifoam agent for purge & trap       | N/A         | Neat            | 1mL                  | 31822 |         |
| aprobarbital                          | 77-02-1     | PTM             | 1,000                | 34029 | enquire |
| Aramite                               | 140-57-8    | H               | 2,000                | 31624 |         |
| Aroclor 1016                          | 12674-11-2  | H               | 1,000                | 32006 |         |
| Aroclor 1016                          | 12674-11-2  | I               | 200                  | 32064 |         |
| Aroclor 1016                          | 12674-11-2  | TO              | 500mg/kg             | 32076 |         |
| Aroclor 1016                          | 12674-11-2  | TO              | 50mg/kg              | 32075 |         |
| Aroclor 1221                          | 11104-28-2  | H               | 1,000                | 32007 |         |
| Aroclor 1221                          | 11104-28-2  | I               | 200                  | 32065 |         |
| Aroclor 1221                          | 11104-28-2  | TO              | 500mg/kg             | 32078 |         |
| Aroclor 1221                          | 11104-28-2  | TO              | 50mg/kg              | 32077 |         |
| Aroclor 1232                          | 11141-16-5  | H               | 1,000                | 32008 |         |
| Aroclor 1232                          | 11141-16-5  | I               | 200                  | 32066 |         |
| Aroclor 1232                          | 11141-16-5  | TO              | 500mg/kg             | 32080 |         |
| Aroclor 1232                          | 11141-16-5  | TO              | 50mg/kg              | 32079 |         |
| Aroclor 1242                          | 53469-21-9  | H               | 1,000                | 32009 |         |
| Aroclor 1242                          | 53469-21-9  | I               | 200                  | 32067 |         |
| Aroclor 1242                          | 53469-21-9  | TO              | 500mg/kg             | 32082 |         |
| Aroclor 1242                          | 53469-21-9  | TO              | 50mg/kg              | 32081 |         |
| Aroclor 1248                          | 12672-29-6  | H               | 1,000                | 32010 |         |
| Aroclor 1248                          | 12672-29-6  | I               | 200                  | 32068 |         |
| Aroclor 1248                          | 12672-29-6  | TO              | 500mg/kg             | 32084 |         |
| Aroclor 1248                          | 12672-29-6  | TO              | 50mg/kg              | 32083 |         |
| Aroclor 1254                          | 11097-69-1  | H               | 1,000                | 32011 |         |
| Aroclor 1254                          | 11097-69-1  | I               | 200                  | 32069 |         |
| Aroclor 1254                          | 11097-69-1  | TO              | 500mg/kg             | 32086 |         |
| Aroclor 1254                          | 11097-69-1  | TO              | 50mg/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              | 500mg/kg             | 32088 |         |
| Aroclor 1260                          | 11096-82-5  | TO              | 50mg/kg              | 32087 |         |

| Compound<br>Packaged 1mL/ampul*                     | CAS#       | Solvent<br>Code | Individual<br>µg/mL* | cat.# | price   |
|---|------------|-----------------|----------------------|-------|---------|
| 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 |         |
| aviation gas (5mL)                                  | 8006-69-1  | PTM             | 50,000               | 30208 |         |
| aviation gas  | 8006-69-1  | PTM             | 2,500                | 30094 |         |
| 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 | enquire |
| bentazon  | 25057-89-0 | M               | 1,000                | 32257 |         |
| benzaldehyde  | 100-52-7   | D               | 2,000                | 33017 |         |
| benzaldehyde-2,4-DNPH                               | 1157-84-2  | ACN             | 100                  | 33077 |         |
| benzene   | 71-43-2    | DMSO            | 10mg/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 |         |
| benzidine   | 92-87-5    | M               | 1,000                | 31441 |         |
| benzo(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 |         |
| benzoic acid  | 65-85-0    | D               | 2,000                | 31879 |         |
| benzoic acid  | 65-85-0    | M               | 1,000                | 31415 |         |
| benzoyllecgonine                                    | 519-09-5   | PTM             | 1,000                | 34016 | enquire |
| benzphetamine                                       | 5411-22-3  | PTM             | 1,000                | 34022 | enquire |
| benzyl benzoate                                     | 120-51-4   | H               | 5,000                | 31847 |         |
| $\alpha$ -BHC                                       | 319-84-6   | M               | 1,000                | 32206 |         |
| $\beta$ -BHC  | 319-85-7   | A               | 1,000                | 32209 |         |
| $\gamma$ -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 | enquire |
| 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) | 3766-81-2  | M               | 100                  | 32274 |         |
| 1-bromo-4-fluorobenzene                             | 460-00-4   | A               | 1,000                | 31854 |         |
| 4-bromofluorobenzene                                | 460-00-4   | PTM             | 2,000                | 30026 |         |
| 4-bromofluorobenzene                                | 460-00-4   | PTM             | 2,500                | 30067 |         |
| 4-bromofluorobenzene                                | 460-00-4   | PTM             | 5,000                | 30003 |         |
| 4-bromofluorobenzene                                | 460-00-4   | PTM             | 10,000               | 30082 |         |
| bromform  | 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 | enquire |
| butachlor ESA sodium salt                           |            | M               | 100                  | 33202 |         |
| 1,3-butadiene                                       | 106-99-0   | PTM             | 1,000                | 30622 |         |
| butalbital  | 77-26-9    | PTM             | 1,000                | 34032 | enquire |
| 1,4-butanediol                                      | 110-63-4   | M               | 1,000                | 34078 | enquire |
| (s)-(-)-1,2,4-butanetriol                           | 42890-76-6 | pyridine        | 1,000                | 33024 |         |
| (s)-(-)-1,2,4-butanetriol (5mL)                     | 42890-76-6 | pyridine        | 1,000                | 33032 |         |
| 1-butanol   | 71-36-3    | D               | 250                  | 35260 |         |
| 1-butanol   | 71-36-3    | PTM             | 50,000               | 30474 |         |
| tert-butanol  | 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 |         |
| 2-butanone-2,4-DNPH                                 | 958-60-1   | ACN             | 100                  | 33078 |         |
| n-butyraldehyde-2,4-DNPH                            | 1527-98-6  | ACN             | 100                  | 33079 |         |
| $\gamma$ -butyrolactone (GBL)                       | 96-48-0    | ACN             | 1,000                | 34077 | enquire |

**Solvent code:**

I=isoctane

Ip=isopropanol

M=methanol

MTBE=methyl *tert*-butyl ether

PTM=purge & trap grade methanol

T=toluene

TO=transformer oil

W=water (DI)

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

## ANALYTICAL REFERENCE MATERIALS

### Neat & Single Analyte Solutions

| Compound<br>Packaged 1mL/ampul*  | CAS#       | Solvent<br>Code | Individual<br>µg/mL* | cat.# | price   |
|----------------------------------|------------|-----------------|----------------------|-------|---------|
| caffeine                         | 74051-80-2 | W               | 5                    | 31804 |         |
| caffeine                         | 74051-80-2 | W               | 25                   | 31803 |         |
| caffeine                         | 74051-80-2 | W               | 125                  | 31802 |         |
| caffeine                         | 74051-80-2 | W               | 250                  | 31801 |         |
| caffeine                         | 74051-80-2 | W               | 500                  | 31800 |         |
| caffeine                         | 58-08-2    | M               | 1,000                | 34084 | enquire |
| cannabidiol                      | 13956-24-1 | PTM             | 1,000                | 34011 | enquire |
| cannabinol                       | 521-35-7   | PTM             | 1,000                | 34010 | enquire |
| ε-caprolactam                    | 105-60-2   | D               | 2,000                | 31833 |         |
| carbazole                        | 86-74-8    | D               | 1,000                | 31836 |         |
| carbazole                        | 86-74-8    | M               | 1,000                | 31430 |         |
| carbon disulfide                 | 75-15-0    | PTM             | 2,000                | 30258 |         |
| carbon tetrachloride             | 56-23-5    | DMSO            | 20mg/mL              | 36283 |         |
| carbon tetrachloride             | 56-23-5    | PTM             | 2,000                | 30259 |         |
| chloral hydrate                  | 302-17-0   | ACN             | 1,000                | 30609 |         |
| chlordane (technical)            | 57-74-9    | H               | 1,000                | 32021 |         |
| chlordane (technical)            | 57-74-9    | I               | 5,000                | 32072 |         |
| α-chlordanane                    | 5103-71-9  | M               | 2,000                | 32016 |         |
| γ-chlordanane                    | 5566-34-7  | M               | 1,000                | 32227 |         |
| chlor diazepoxide                | 438-41-5   | PTM             | 1,000                | 34044 | enquire |
| 4-chloroaniline                  | 106-47-8   | D               | 2,000                | 31211 |         |
| chlorobenzene                    | 108-90-7   | DMSO            | 1.8mg/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            | 0.3mg/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 |         |
| 1-chloro-3-nitrobenzene          | 121-73-3   | H               | 1,000                | 31875 |         |
| 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 |         |
| 4-chlorotoluene                  | 106-43-4   | PTM             | 2,000                | 30269 |         |
| chlorpyrifos                     | 2921-88-2  | M               | 1,000                | 32212 |         |
| chrysene                         | 218-01-9   | A               | 1,000                | 31275 |         |
| clobazam                         | 22316-47-8 | PTM             | 1,000                | 34045 | enquire |
| clonazepam                       | 1622-61-3  | PTM             | 1,000                | 34046 | enquire |
| cocaethylene                     | 529-38-4   | ACN             | 1,000                | 34066 | enquire |
| cocaine                          | 53-21-4    | PTM             | 1,000                | 34015 | enquire |
| codeine                          | 76-57-3    | PTM             | 1,000                | 34000 | enquire |
| continine                        | 486-56-6   | M               | 1,000                | 34086 | enquire |
| creosote oil                     | 8001-58-9  | D               | 50,000               | 31838 |         |
| crotonaldehyde-2,4-DNPH          | 1527-96-4  | ACN             | 100                  | 33080 |         |
| cyanazine                        | 21725-46-2 | A               | 1,000                | 32215 |         |
| cyclohexane                      | 110-82-7   | DMSO            | 19.4mg/mL            | 36286 |         |

| Compound<br>Packaged 1mL/ampul*                      | CAS#       | Solvent<br>Code | Individual<br>µg/mL* | cat.# | price   |
|--|------------|-----------------|----------------------|-------|---------|
| 2,4-D<br>(2,4-dichlorophenylacetic acid)             | 94-75-7    | M               | 1,000                | 32239 |         |
| 2,4-D methyl ester                                   | 1928-38-7  | M               | 1,000                | 32240 |         |
| Dacthal (DCPA dimethyl ester)                        | 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 |         |
| dalapon methyl ester                                 | 17640-02-7 | M               | 1,000                | 32254 |         |
| 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 |         |
| decachlorobiphenyl<br>(BZ #209) (5mL)                | 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<br>(DFTPP)              | 5074-71-5  | D               | 2,500                | 31001 |         |
| n-decane   | 124-18-5   | Neat            | 1mL                  | 31858 |         |
| desethyl-atrazine                                    | 6190-65-4  | A               | 1,000                | 32445 |         |
| desisopropylatrazine                                 | 1007-28-9  | A               | 1,000                | 32446 |         |
| dextromethorphan HBr<br>monohydrate                  | 125-69-9   | M               | 1,000                | 34081 | enquire |
| dextro-propoxyphene                                  | 1639-60-7  | PTM             | 1,000                | 34008 | enquire |
| diazepam   | 439-14-5   | PTM             | 1,000                | 34047 | enquire |
| dibenzo(a,h)anthracene                               | 53-70-3    | D               | 1,000                | 31276 |         |
| 4,4'-dibromobiphenyl                                 | 92-86-4    | D               | 2,000                | 31039 |         |
| 4,4'-dibromobiphenyl                                 | 92-86-4    | EA              | 500                  | 32092 |         |
| dibromochloromethane<br>(chlorodibromochloromethane) | 124-48-1   | PTM             | 2,000                | 30271 |         |
| 1,2-dibromo-3-chloropropane<br>(DBCP)                | 96-12-8    | PTM             | 2,000                | 30270 |         |
| dibromofluoromethane                                 | 1868-53-7  | Neat            | 100mg                | 30634 |         |
| 1,2-dibromoethane                                    | 106-93-4   | PTM             | 2,000                | 30272 |         |
| dibromomethane                                       | 74-95-3    | PTM             | 2,000                | 30430 |         |
| 4,4'-dibromoctafluorobiphenyl                        | 10386-84-2 | D               | 2,000                | 31040 |         |
| 4,4'-dibromoctafluorobiphenyl                        | 10386-84-2 | H               | 250                  | 32053 |         |
| 4,4'-dibromoctafluorobiphenyl                        | 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 |         |
| dibutylchloroendate                                  | 1770-80-5  | A               | 200                  | 32025 |         |
| dicamba  | 1918-00-9  | M               | 1,000                | 32247 |         |
| dicamba methyl ester                                 | 6597-78-0  | M               | 1,000                | 32248 |         |

### free data

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



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**ANALYTICAL REFERENCE MATERIALS**  
**Neat & Single Analyte Solutions**

| Compound<br>Packaged 1mL/ampul*                | CAS#       | Solvent<br>Code | Individual<br>µg/mL* | cat.# | price |
|--|------------|-----------------|----------------------|-------|-------|
| 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 |       |
| 3,3'-dichlorobenzidine-free base               | 91-94-1    | Neat            | 100mg                | 31884 |       |
| 3,5-dichlorobenzoic acid                       | 51-36-5    | MTBE            | 1,000                | 31652 |       |
| 3,5-dichlorobenzoic acid<br>methyl ester       | 2905-67-1  | M               | 1,000                | 32264 |       |
| 3,5-dichlorobenzoic acid<br>methyl ester       | 2905-67-1  | MTBE            | 1,000                | 31649 |       |
| 1,4-dichlorobutane                             | 110-56-5   | PTM             | 2,000                | 30227 |       |
| trans-1,4-dichloro-2-butene                    | 110-57-6   | PTM             | 2,000                | 30274 |       |
| dichlorodifluoromethane<br>(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            | 25mg/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-dichloroethylene                           | 75-35-4    | DMSO            | 40mg/mL              | 36287 |       |
| 1,1-dichloroethylene                           | 75-35-4    | PTM             | 2,000                | 30278 |       |
| cis-1,2-dichloroethylene                       | 156-59-2   | PTM             | 2,000                | 30279 |       |
| trans-1,2-dichloroethylene                     | 156-60-5   | PTM             | 2,000                | 30280 |       |
| cis-1,2-dichloroethylene                       | 156-59-2   | DMSO            | 4.67mg/mL            | 36289 |       |
| trans-1,2-dichloroethylene                     | 156-60-5   | DMSO            | 4.67mg/mL            | 36290 |       |
| 2,6-dichlorophenol                             | 87-65-0    | M               | 1,000                | 31409 |       |
| 2,4-dichlorophenylacetic acid                  | 19719-28-9 | M               | 200                  | 32049 |       |
| 2,4-dichlorophenyl acetic acid<br>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 |       |
| 2,3-dichloropropionic acid<br>methyl ester     | 3674-09-7  | MTBE            | 1,000                | 31651 |       |
| 1,2-dichlorotetrafluoroethane<br>(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 |       |
| dieldrin                                       | 60-57-1    | M               | 1,000                | 32218 |       |
| diesel fuel #2 composite (5mL)                 | 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 |       |

| Compound<br>Packaged 1mL/ampul*               | CAS#        | Solvent<br>Code | Individual<br>µg/mL* | cat.# | price   |
|---|-------------|-----------------|----------------------|-------|---------|
| 1,2-dimethoxyethane                           | 173201-80-4 | DMSO            | 0.5mg/mL             | 36291 |         |
| N,N-dimethylacetamide                         | 127-19-5    | DMSO            | 5.45mg/mL            | 36292 |         |
| 2,5-dimethylbenzaldehyde-<br>2,4-DNPH         | 152477-96-8 | ACN             | 100                  | 33081 |         |
| dimethylchlorosilane<br>(DMDCS) (20mL)        | 75-78-5     | Neat            | 20mL                 | 31840 |         |
| N,N-dimethylformamide                         | 68-12-2     | DMSO            | 4.4mg/mL             | 36293 |         |
| 2,6-dimethylphenol                            | 576-26-1    | M               | 1,000                | 31410 |         |
| 3,5-dinitroaniline                            | 618-87-1    | ACN             | 1,000                | 31661 | enquire |
| 1,2-dinitrobenzene                            | 528-29-0    | M               | 1,000                | 31453 | enquire |
| 1,3-dinitrobenzene                            | 99-65-0     | ACN             | 1,000                | 31662 | enquire |
| 1,4-dinitrobenzene                            | 100-25-4    | ACN             | 2,000                | 33205 | enquire |
| 2,4-dinitrophenol                             | 51-28-5     | M               | 1,000                | 31291 |         |
| 2,4-dinitrotoluene                            | 121-14-2    | ACN             | 1,000                | 31663 | enquire |
| 2,6-dinitrotoluene                            | 606-20-2    | ACN             | 1,000                | 31664 | enquire |
| 3,4-dinitrotoluene                            | 610-39-9    | EA              | 2,000                | 33901 | enquire |
| 3,4-dinitrotoluene                            | 610-39-9    | M               | 1,000                | 31452 | enquire |
| 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            | 1.9mg/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 |         |
| ecgonine                                      | 5796-31-6   | PTM             | 1,000                | 34017 | enquire |
| ecgonine methyl ester                         | 38969-40-3  | PTM             | 1,000                | 34018 | enquire |
| EDDP perchlorate                              | 66729-78-0  | M               | 1,000                | 34069 | enquire |
| EDDN  | 628-96-6    | M               | 1,000                | 31601 | enquire |
| endosulfan I                                  | 959-98-8    | M               | 1,000                | 32221 |         |
| endosulfan II                                 | 33213-65-9  | M               | 1,000                | 32222 |         |
| endosulfan sulfate                            | 1031-07-8   | M               | 1,000                | 32223 |         |
| endrin  | 72-20-8     | M               | 1,000                | 32219 |         |
| endrin aldehyde                               | 7421-93-4   | M               | 1,000                | 32224 |         |
| endrin ketone                                 | 53494-70-5  | M               | 1,000                | 32220 |         |
| ethanol                                       | 64-17-5     | PTM             | 2,000                | 30288 |         |
| ethanol                                       | 64-17-5     | W               | 10,000               | 30466 |         |
| 2-ethoxyethanol                               | 110-80-5    | DMSO            | 0.8mg/mL             | 36295 |         |
| ethylbenzene                                  | 100-41-4    | DMSO            | 1.84mg/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<br>(ETBE)              | 637-92-3    | PTM             | 2,000                | 30628 |         |
| ethylenediamine                               | 107-15-3    | M               | 540                  | 35222 |         |
| ethylene glycol                               | 3775-85-7   | DMSO            | 3.1mg/mL             | 36297 |         |
| ethylene oxide                                | 75-21-8     | DMSO            | 500                  | 36005 |         |
| ethyl methacrylate                            | 97-63-2     | PTM             | 2,000                | 30289 |         |
| fenfluramine                                  | 16105-77-4  | PTM             | 1,000                | 34023 | enquire |
| fentanyl                                      | 437-38-7    | M               | 1,000                | 34082 | enquire |
| nor-fentanyl oxalate                          | 1609-66-1   | M               | 1,000                | 34083 | enquire |

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**Solvent code:**

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

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

# ANALYTICAL REFERENCE MATERIALS

## Neat & Single Analyte Solutions

| Compound<br>Packaged 1mL/ampul*                 | CAS#       | Solvent<br>Code | Individual<br>µg/mL* | cat.# | price   |
|---|------------|-----------------|----------------------|-------|---------|
| flunitrazepam                                   | 1622-62-4  | PTM             | 1,000                | 34049 | enquire |
| 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 |         |
| 1-fluoronaphthalene                             | 321-38-0   | D               | 2,000                | 31092 |         |
| 2-fluorophenol                                  | 367-12-4   | D               | 2,000                | 31047 |         |
| flurazepam                                      | 1172-18-5  | PTM             | 1,000                | 34050 | enquire |
| formaldehyde-DNPH                               | 1081-15-8  | ACN             | 500                  | 31837 |         |
| formaldehyde-2,4-DNPH                           | 1081-15-8  | ACN             | 100                  | 33082 |         |
| formaldehyde oxazolidine                        | —          | T               | 2,000                | 33004 |         |
| formamide                                       | 75-12-7    | DMSO            | 1.1mg/mL             | 36298 |         |
| fuel oil # 4                                    | 68476-31-3 | D               | 5,000                | 31216 |         |
| fuel oil # 4                                    | 68476-31-3 | D               | 50,000               | 31244 |         |
| fuel oil # 5                                    | 70892-11-4 | D               | 5,000                | 31217 |         |
| fuel oil # 5                                    | 70892-11-4 | D               | 50,000               | 31246 |         |
| fuel oil # 6 (5mL)                              | 68553-00-4 | D               | 50,000               | 31249 |         |
| 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 | enquire |
| glycerin  | 56-81-5    | pyridine        | 500                  | 33020 |         |
| glycolaldehyde-2,4-DNPH                         | —          | ACN             | 100                  | 33091 |         |
| glyphosate (5mL)                                | 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 |         |
| 2,2',3,4,4',5'-heptachlorobiphenyl<br>(BZ #180) | 35065-29-3 | I               | 10                   | 32288 |         |
| hexachlorobenzene                               | 118-74-1   | A               | 1,000                | 32231 |         |
| 2,2',3,4,4',5'-hexachlorobiphenyl<br>(BZ #138)  | 35065-28-2 | I               | 10                   | 32286 |         |
| 2,2',4,4',5,5'-hexachlorobiphenyl<br>(BZ #153)  | 35065-27-1 | I               | 10                   | 32287 |         |
| 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 |         |
| hexaldehyde-2,4-DNPH                            | 1527-97-5  | ACN             | 100                  | 33083 |         |
| hexane  | 8031-34-3  | DMSO            | 1.45mg/mL            | 36299 |         |
| hexobarbital                                    | 56-29-1    | PTM             | 1,000                | 34033 | enquire |
| hexyl 2-ethylhexyl phthalate                    | 75673-16-4 | H:A             | 1,000                | 33228 |         |
| HMX   | 2691-41-0  | ACN             | 1,000                | 31665 | enquire |
| hydraulic oil                                   | 64741-89-5 | D               | 50,000               | 31839 |         |
| hydrocodone                                     | 34195-34-1 | PTM             | 1,000                | 34002 | enquire |
| hydromorphone                                   | 71-68-1    | PTM             | 1,000                | 34063 | enquire |
| 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 |         |
| isobutylaldehyde-2,4-DNPH                       | 2057-82-1  | ACN             | 100                  | 33084 |         |
| isopropylbenzene                                | 98-82-8    | PTM             | 2,000                | 30294 |         |
| isovaleraldehyde-2,4-DNPH                       | 2256-01-1  | ACN             | 100                  | 33085 |         |
| jet fuel A (5mL)                                | 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-4 military fuel                              | 8008-20-6  | D               | 5,000                | 31219 |         |
| JP-4 military fuel                              | 8008-20-6  | D               | 50,000               | 31250 |         |
| JP-4 military fuel                              | 8008-20-6  | PTM             | 50,000               | 30472 |         |

| Compound<br>Packaged 1mL/ampul*        | CAS#       | Solvent<br>Code | Individual<br>µg/mL* | cat.# | price   |
|--|------------|-----------------|----------------------|-------|---------|
| JP-5 military fuel (5mL)               | 8008-20-6  | D               | 50,000               | 31253 |         |
| JP-5 military fuel                     | 8008-20-6  | D               | 5,000                | 31220 |         |
| JP-5 military fuel                     | 8008-20-6  | D               | 50,000               | 31252 |         |
| JP-8 military fuel                     | 8008-20-6  | D               | 5,000                | 31262 |         |
| JP-8 military fuel                     | 8008-20-6  | D               | 50,000               | 31254 |         |
| kerosene composite (5mL)               | 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 |         |
| LAMPA                                  | 4015-98-3  | ACN             | 1,000                | 34075 | enquire |
| levorphanol                            | 5985-38-6  | PTM             | 1,000                | 34003 | enquire |
| lorazepam                              | 846-49-1   | PTM             | 1,000                | 34051 | enquire |
| LSD                                    | 50-37-3    | ACN             | 25                   | 34089 | enquire |
| LSD                                    | 50-37-3    | ACN             | 100                  | 34088 | enquire |
| MCPA                                   | 97-74-6    | M               | 1,000                | 32269 |         |
| MCPP                                   | 93-65-2    | M               | 1,000                | 32271 |         |
| 3,4-MDA HCl                            | 4764-17-4  | M               | 1,000                | 34070 | enquire |
| 3,4-MDEA HCl                           | 82801-81-8 | M               | 1,000                | 34072 | enquire |
| 4,4'-MDIP                              | 72375-24-7 | DMSO            | 1,000                | 33003 |         |
| 3,4-MDMA HCl                           | 42542-10-9 | M               | 1,000                | 34071 | enquire |
| meperidine                             | 50-13-5    | PTM             | 1,000                | 34004 | enquire |
| mephobarbital                          | 115-38-8   | PTM             | 1,000                | 34034 | enquire |
| meprabamate                            | 57-53-4    | PTM             | 1,000                | 34059 | enquire |
| methacrolein-2,4-DNPH                  | 5077-73-6  | ACN             | 100                  | 33095 |         |
| methacrylonitrile                      | 126-98-7   | PTM             | 2,000                | 30297 |         |
| methadone                              | 1095-90-5  | PTM             | 1,000                | 34005 | enquire |
| (+)-methamphetamine                    | 51-57-0    | PTM             | 1,000                | 34021 | enquire |
| methanol                               | 67-56-1    | DMSO            | 15mg/mL              | 36401 |         |
| methanol                               | 67-56-1    | W               | 10,000               | 30467 |         |
| methaqualone                           | 340-56-7   | PTM             | 1,000                | 34064 | enquire |
| methohexital                           | 151-83-7   | PTM             | 1,000                | 34035 | enquire |
| methoxychlor                           | 72-43-5    | M               | 1,000                | 32233 |         |
| 2-methoxyethanol                       | 109-86-4   | DMSO            | 0.25mg/mL            | 36402 |         |
| 1-(methylamino)anthraquinone           | 82-38-3    | D               | 100                  | 31823 |         |
| methyl arachidate                      | 1120-28-1  | Neat            |                      | 35056 |         |
| methyl arachidonate                    | 2566-89-4  | Neat            |                      | 35060 |         |
| methyl behenate                        | 929-77-1   | Neat            |                      | 35062 |         |
| methyl 2-bromopropionate               | 5445-17-0  | MTBE            | 1,000                | 31654 |         |
| methyl <i>tert</i> -butyl ether (MTBE) | 1634-04-4  | PTM             | 2,000                | 30402 |         |
| methylbutylketone                      | 591-78-6   | DMSO            | 0.25mg/mL            | 36400 |         |
| methyl caprate                         | 110-42-9   | Neat            |                      | 35041 |         |
| methyl caproate                        | 106-70-7   | Neat            |                      | 35037 |         |
| methyl caprylate                       | 111-11-5   | Neat            |                      | 35039 |         |
| methylcyclohexane                      | 108-87-2   | DMSO            | 5.9mg/mL             | 36403 | enquire |
| methyl-2,3-dibromopropionate           | 1729-67-5  | MTBE            | 1,000                | 31656 |         |
| 2-methyl-4,6-dinitrophenol             | 534-52-1   | M               | 1,000                | 31292 |         |
| methyl eicosadienoate                  | 2463-02-7  | Neat            |                      | 35058 |         |
| 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 |         |
| methyl heptanoate                      | 106-73-0   | Neat            |                      | 35038 |         |

## free data

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ANALYTICAL REFERENCE MATERIALS  
Neat & Single Analyte Solutions

| Compound<br>Packaged 1mL/ampul*                                 | CAS#        | Solvent<br>Code | Individual<br>$\mu\text{g/mL}^*$ | cat.# | price   |
|---|-------------|-----------------|----------------------------------|-------|---------|
| 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                            |       |         |
| methyl myristoleate   | 56219-06-8  | Neat            | 35046                            |       |         |
| 1-methylnaphthalene   | 90-12-0     | M               | 1,000                            | 31283 |         |
| 2-methylnaphthalene   | 91-57-6     | D               | 1,000                            | 31285 |         |
| methyl nervonate  | 2733-88-2   | Neat            | 35065                            |       |         |
| 2-methyl-4-nitroaniline   | 99-55-8     | M               | 1,000                            | 31612 | enquire |
| methyl nonadecanoate  | 1731-94-8   | Neat            | 35055                            |       |         |
| methyl nonanoate  | 1731-84-6   | Neat            | 35040                            |       |         |
| methyl oleate   | 112-62-9    | Neat            | 35052                            |       |         |
| methyl palmitate  | 112-39-0    | Neat            | 35048                            |       |         |
| methyl palmitoleate   | 1120-25-8   | Neat            | 35049                            |       |         |
| methyl pentadecanoate   | 7162-64-1   | Neat            | 35047                            |       |         |
| 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            | 2.65mg/mL                        | 36405 |         |
| methyl stearate   | 112-61-8    | Neat            | 35051                            |       |         |
| methyl tridecanoate   | 1731-88-0   | Neat            | 35044                            |       |         |
| methyl undecanoate  | 1731-86-8   | Neat            | 35042                            |       |         |
| $\alpha$ -methylene- $\gamma$ -butyrolactone<br>(AMGBL)         | 547-65-9    | ACN             | 1,000                            | 34079 | enquire |
| methylene chloride<br>(dichloromethane)                         | 75-09-2     | DMSO            | 3mg/mL                           | 36404 |         |
| methylene chloride<br>(dichloromethane)                         | 75-09-2     | PTM             | 2,000                            | 30401 |         |
| methylypyron  | 125-64-4    | PTM             | 1,000                            | 34060 | enquire |
| metolachlor   | 51218-45-2  | M               | 100                              | 33209 |         |
| metolachlor ESA sodium salt                                     | 171118-09-5 | M               | 100                              | 33200 |         |
| metolachlor OA  | 152019-73-3 | M               | 100                              | 33201 |         |
| metribuzin  | 21087-64-9  | A               | 1,000                            | 32436 |         |
| mineral spirits: 25% weathered                                  | 8030-30-6   | D               | 5,000                            | 31226 |         |
| mineral spirits: 50% weathered                                  | 8030-30-6   | D               | 5,000                            | 31227 |         |
| mineral spirits: 75% weathered                                  | 8030-30-6   | D               | 5,000                            | 31228 |         |
| mineral spirits: unweathered<br>(5mL)                           | 8030-30-6   | D               | 50,000                           | 31261 |         |
| mineral spirits: unweathered                                    | 8030-30-6   | D               | 5,000                            | 31225 |         |
| mineral spirits: unweathered                                    | 8030-30-6   | D               | 50,000                           | 31260 |         |
| monolein (1-mono[ <i>cis</i> -9-octadecenoyl]-<br>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 | enquire |
| 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 |         |
| nicotine  | 54-11-5     | M               | 1,000                            | 34085 | enquire |
| nitrazepam  | 146-22-5    | PTM             | 1,000                            | 34053 | enquire |
| nitrobenzene  | 99-95-3     | ACN             | 1,000                            | 31657 | enquire |
| nitrobenzene-d5   | 4165-60-0   | D               | 2,000                            | 31044 |         |
| nitrobenzene-d5   | 4165-60-0   | D               | 2,000                            | 33904 |         |
| nitroglycerin   | 55-63-0     | M               | 1,000                            | 31498 | enquire |
| nitroguanidine  | 556-88-7    | M               | 1,000                            | 31602 | enquire |
| 2-nitromethylene  | 603-71-4    | M               | 2,000                            | 33902 |         |
| nitromethane  | 75-52-5     | DMSO            | 0.25mg/mL                        | 36406 |         |
| 4-nitrophenol   | 100-02-7    | M               | 1,000                            | 31296 |         |
| 1-nitropropane  | 108-03-2    | D               | 250                              | 35263 |         |
| 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 |         |

| Compound<br>Packaged 1mL/ampul*              | CAS#       | Solvent<br>Code | Individual<br>$\mu\text{g/mL}^*$ | cat.# | price   |
|--|------------|-----------------|----------------------------------|-------|---------|
| N-nitroso-di- <i>n</i> -propylamine          | 621-64-7   | M               | 1,000                            | 31428 |         |
| N-nitrosodi- <i>n</i> -propylamine-d14       | 93951-96-3 | D               | 1,000                            | 33911 |         |
| 2-nitrotoluene                               | 88-72-2    | ACN             | 1,000                            | 31659 | enquire |
| 3-nitrotoluene                               | 99-08-1    | ACN             | 1,000                            | 31660 | enquire |
| 4-nitrotoluene                               | 99-99-0    | ACN             | 1,000                            | 31658 | enquire |
| nonatricontane (C39) (10mL)                  | 7194-86-7  | C               | 3,000                            | 31877 |         |
| <i>n</i> -nonatricontane (C39)               | 7194-86-7  | C               | 3,000                            | 31456 |         |
| <i>n</i> -octacosane (C28)                   | 630-02-4   | D               | 1,000                            | 31672 |         |
| oxazepam                                     | 604-75-1   | PTM             | 1,000                            | 34054 | enquire |
| oxycodone                                    | 124-90-3   | PTM             | 1,000                            | 34007 | enquire |
| oxymorphone                                  | 76-41-5    | PTM             | 1,000                            | 34065 | enquire |
| pentachloroanisole                           | 1825-21-4  | M               | 1,000                            | 32268 |         |
| 2,2',4,5,5'-pentachlorobiphenyl<br>(BZ #101) | 37680-73-2 | I               | 10                               | 32285 |         |
| 2,3',4,4',5-pentachlorobiphenyl<br>(BZ #118) | 31508-00-6 | I               | 10                               | 32293 |         |
| pentachloroethane                            | 76-01-7    | PTM             | 2,000                            | 30404 |         |
| pentachloronitrobenzene                      | 82-68-8    | EA              | 100                              | 32091 |         |
| pentachlorophenol                            | 87-86-5    | M               | 1,000                            | 31297 |         |
| <i>n</i> -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 |         |
| 2-pentanone                                  | 107-87-9   | D               | 250                              | 35261 |         |
| pentazocine                                  | 64024-15-3 | PTM             | 1,000                            | 34062 | enquire |
| pentobarbital                                | 76-74-4    | PTM             | 1,000                            | 34036 | enquire |
| perfluorotributylamine (PFTBA)               | 311-89-7   | Neat            | 1mL                              | 30482 |         |
| perfluorotributylamine (PFTBA)               | 311-89-7   | Neat            | 1g                               | 33027 |         |
| PETN<br>(pentaerythritol tetranitrate)       | 78-11-5    | M               | 1,000                            | 31600 | enquire |
| 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 | enquire |
| phendimetrazine                              | 50-58-8    | PTM             | 1,000                            | 34025 | enquire |
| phenmetrazine                                | 1707-14-8  | PTM             | 1,000                            | 34026 | enquire |
| phenobarbital                                | 50-06-6    | PTM             | 1,000                            | 34037 | enquire |
| 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 | enquire |
| phenylpropanolamine HCl                      | 154-41-6   | M               | 1,000                            | 34073 | enquire |
| 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 | enquire |
| Polywax 500                                  | 9002-88-4  | Neat            | 1g                               | 36224 |         |
| Polywax 655                                  | 9002-88-4  | Neat            | 1g                               | 36225 |         |
| Polywax 850                                  | 9002-88-4  | Neat            | 1g                               | 36226 |         |
| Polywax 1000                                 | 9002-88-4  | Neat            | 1g                               | 36227 |         |
| prazepam                                     | 2955-38-6  | PTM             | 1,000                            | 34055 | enquire |
| prometryne                                   | 7287-19-6  | A               | 1,000                            | 32449 |         |
| propachlor                                   | 1918-16-7  | M               | 1,000                            | 32235 |         |
| 2-propanol                                   | 67-63-0    | W               | 50,000                           | 30473 |         |
| propazine                                    | 139-40-2   | A               | 1,000                            | 32448 |         |
| propionaldehyde-2,4-DNPH                     | 725-00-8   | ACN             | 100                              | 33086 |         |
| propionitrile                                | 107-12-0   | PTM             | 2,000                            | 30407 |         |
| propylene glycol dinitrate<br>(PGDN)         | 6423-43-4  | M               | 1,000                            | 31821 | enquire |
| pyrene                                       | 129-00-0   | M               | 1,000                            | 31282 |         |
| pyridine                                     | 85404-20-2 | DMSO            | 1mg/mL                           | 36407 |         |
| pyridine                                     | 110-86-1   | PTM             | 2,000                            | 30409 |         |
| pyridine-d5                                  | 7291-22-7  | D               | 2,000                            | 31046 |         |

A=acetone  
ACN=acetonitrile  
C=carbon disulfide  
Cy=cyclohexane

D=methylene chloride  
DMSO=dimethyl sulfoxide  
EA=ethyl acetate  
H=hexane

Solvent code:  
I=isoctane  
Ip=isopropanol  
M=methanol  
MTBE=methyl *tert*-butyl ether

PTM=purge & trap grade methanol  
T=toluene  
TO-transformer oil  
W=water (DI)

\*Volume is 1mL/ampul unless otherwise noted. Concentration is  $\mu\text{g/mL}$  unless otherwise noted.

# ANALYTICAL REFERENCE MATERIALS

## Neat & Single Analyte Solutions

| Compound<br>Packaged 1mL/ampul*             | CAS#        | Solvent<br>Code | Individual<br>µg/mL* | cat.# | price   |
|---|-------------|-----------------|----------------------|-------|---------|
| RDX   | 121-82-4    | ACN             | 1,000                | 31666 | enquire |
| secobarbital                                | 29071-21-4  | PTM             | 1,000                | 34038 | enquire |
| simazine                                    | 122-34-9    | A               | 1,000                | 32236 |         |
| stearyl stearate (10mL)                     | 2778-96-3   | Cy              | 2,000                | 31636 |         |
| stearyl stearate (10mL)                     | 2778-96-3   | H               | 2,000                | 31681 |         |
| stearyl stearate                            | 2778-96-3   | Neat            | 100mg                | 31860 |         |
| Stoddard solvent                            | 8052-41-3   | PTM             | 10,000               | 30487 |         |
| styrene                                     | 100-42-5    | PTM             | 2,000                | 30410 |         |
| sulfolan                                    | 126-33-0    | DMSO            | 0.8mg/mL             | 36413 |         |
| 2,4,5-T                                     | 93-76-5     | M               | 200                  | 32243 |         |
| 2,4,5-T methyl ester                        | 1928-37-6   | M               | 1,000                | 32244 |         |
| talbutal                                    | 115-44-6    | PTM             | 1,000                | 34039 | enquire |
| 2,4-TDIP                                    | 72375-21-4  | DMSO            | 1,000                | 33001 |         |
| 2,6-TDIP                                    | 195625-39-9 | DMSO            | 1,000                | 33000 |         |
| temazepam                                   | 896-50-4    | PTM             | 1,000                | 34056 | enquire |
| terbutylazine                               | 5915-41-3   | A               | 1,000                | 32447 |         |
| <i>o</i> -terphenyl                         | 84-15-1     | A               | 2,000                | 31066 |         |
| <i>o</i> -terphenyl                         | 84-15-1     | D               | 10,000               | 31097 |         |
| <i>p</i> -terphenyl                         | 92-94-4     | D               | 10,000               | 31095 |         |
| <i>p</i> -terphenyl-d14                     | 1718-51-0   | D               | 1,000                | 31828 |         |
| <i>α</i> -terpineol                         | 98-55-5     | D               | 2,000                | 33912 |         |
| 2,2',5,5'-tetrachlorobiphenyl<br>(BZ #52)   | 35693-99-3  | I               | 10                   | 32284 |         |
| 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- <i>m</i> -xylene (5mL) | 877-09-8    | A               | 200                  | 32028 |         |
| 2,4,5,6-tetrachloro- <i>m</i> -xylene       | 877-09-8    | A               | 200                  | 32027 |         |
| <i>n</i> -tetracontane (C40)                | 4181-95-7   | Neat            | 100mg                | 31859 |         |
| tetrahydrofuran (THF)                       | 109-99-9    | DMSO            | 3.6mg/mL             | 36408 |         |
| tetrahydrofuran (THF)                       | 109-99-9    | PTM             | 2,000                | 30414 |         |
| tetralin                                    | 119-64-2    | DMSO            | 0.5mg/mL             | 36409 |         |
| tetrapentyltin                              | 3765-65-9   | D               | 2,000                | 31475 |         |
| tetra- <i>n</i> -propyltin                  | 2176-98-9   | D               | 2,000                | 31474 |         |
| teryl                                       | 479-45-8    | ACN             | 1,000                | 31667 | enquire |
| Δ <sup>9</sup> -THC                         | 1972-08-3   | M               | 1,000                | 34067 | enquire |
| (±)11-nor-9-carboxy-Δ <sup>9</sup> -THC     | 104874-50-2 | M               | 100                  | 34068 | enquire |
| thebaine                                    | 115-37-7    | PTM             | 1,000                | 34009 | enquire |
| thiamylal                                   | 337-47-3    | PTM             | 1,000                | 34040 | enquire |
| thiopental                                  | 71-73-8     | PTM             | 1,000                | 34041 | enquire |
| Tinuvin P                                   | 2440-22-4   | Ip              | 51.8                 | 31629 |         |
| <i>m</i> -tolualdehyde-2,4-DNPH             | 2880-05-9   | ACN             | 100                  | 33088 |         |
| <i>o</i> -tolualdehyde-2,4-DNPH             | 1773-44-0   | ACN             | 100                  | 33087 |         |
| <i>p</i> -tolualdehyde-2,4-DNPH             | 2571-00-8   | ACN             | 100                  | 33089 |         |
| toluene                                     | 108-88-3    | DMSO            | 4.45mg/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            | 50mL                 | 32425 |         |
| transformer oil (PCB-free)                  | 64742-53-6  | 5mL             | 32424                |       |         |
| <i>n</i> -triactane-d62 (C30)               | 638-68-6    | D               | 500                  | 31816 |         |
| triazolam                                   | 28911-01-5  | PTM             | 1,000                | 34057 | enquire |
| 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 |         |

| Compound<br>Packaged 1mL/ampul*                             | CAS#                         | Solvent<br>Code | Individual<br>µg/mL* | cat.# | price   |
|---|------------------------------|-----------------|----------------------|-------|---------|
| tricaprin   | (1,2,3-tricaprinoylglycerol) | 621-71-6        | pyridine             | 8,000 | 33025   |
| tricaprin (1,2,3-tricaprinoylglycerol)<br>(5mL)             |                              | 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 |         |
| 2,4,4'-trichlorobiphenyl (BZ #28)                           | 7012-37-5                    | I               | 10                   | 32283 |         |
| 1,1,1-trichloroethane                                       | 74552-83-3                   | DMSO            | 50mg/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            | 0.4mg/mL             | 36412 |         |
| trichloroethene   | 79-01-6                      | PTM             | 2,000                | 30420 |         |
| 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<br>(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 |         |
| trifuralin  | 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 |         |
| 1,2,4-trimethyl-5-nitrobenzene                              | 610-91-3                     | M               | 2,000                | 33903 |         |
| 1,3,5-trinitrobenzene                                       | 99-35-4                      | ACN             | 1,000                | 31668 | enquire |
| 2,4,6-trinitrotoluene                                       | 118-96-7                     | ACN             | 1,000                | 31669 | enquire |
| tri- <i>n</i> -propyltin chloride                           | 995-25-5                     | D               | 2,000                | 31476 |         |
| triolein (1,2,3-Tri[ <i>cis</i> -octadecenoyl]<br>glycerol) | 122-32-7                     | pyridine        | 5,000                | 33023 |         |
| tripentyltin chloride                                       | 3342-67-4                    | D               | 2,000                | 31477 |         |
| triphenylphosphate  | 115-86-6                     | A               | 1,000                | 32281 |         |
| unleaded gasoline composite<br>(5mL)                        | 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:<br>25% weathered                         | 8006-61-9                    | PTM             | 5,000                | 30097 |         |
| unleaded gasoline:<br>50% weathered                         | 8006-61-9                    | PTM             | 5,000                | 30098 |         |
| unleaded gasoline:<br>75% weathered                         | 8006-61-9                    | PTM             | 5,000                | 30099 |         |
| unleaded gasoline:<br>99% weathered                         | 8006-61-9                    | PTM             | 5,000                | 30436 |         |
| unleaded gasoline:<br>unweathered                           | 8006-61-9                    | PTM             | 5,000                | 30096 |         |
| used motor oil composite                                    | 64742-65-0                   | D               | 50,000               | 31465 |         |
| valeraldehyde-2,4-DNPH                                      | 2057-84-3                    | ACN             | 100                  | 33090 |         |
| γ-valerolactone   | 108-29-2                     | ACN             | 1,000                | 34080 | enquire |
| 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 |         |
| <i>m</i> -xylene  | 108-38-3                     | DMSO            | 6.51mg/mL            | 36414 |         |
| <i>m</i> -xylene  | 108-38-3                     | PTM             | 2,000                | 30424 |         |
| <i>o</i> -xylene  | 95-47-6                      | DMSO            | 0.97mg/mL            | 36415 |         |
| <i>o</i> -xylene  | 95-47-6                      | PTM             | 2,000                | 30425 |         |
| <i>p</i> -xylene  | 106-42-3                     | DMSO            | 1.52mg/mL            | 36416 |         |
| <i>p</i> -xylene  | 106-42-3                     | PTM             | 2,000                | 30426 |         |

## free data

### Available on Our Website: Lot Certificates, Data Packs, and MSDSs

For complete information detailing manufacturing and testing for Restek inventoried reference standards, visit our website at [www.restek.com/datapacks](http://www.restek.com/datapacks).

To view certificates and/or an MSDS, enter the catalog number of the product in the Search feature. For a free data pack (Adobe® PDF file), enter the catalog number and lot number of the product.

### Solvent code:

|                    |                         |                                      |                                 |
|--------------------|-------------------------|--------------------------------------|---------------------------------|
| A=acetone          | D=methylene chloride    | I=isoctane                           | PTM=purge & trap grade methanol |
| ACN=acetonitrile   | DMSO=dimethyl sulfoxide | Ip=isopropanol                       | T=toluene                       |
| C=carbon disulfide | EA=ethyl acetate        | M=methanol                           | TO=transformer oil              |
| Cy=cyclohexane     | H=hexane                | MTBE=methyl <i>tert</i> -butyl ether | W=water (DI)                    |

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

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\* Availability of raw materials and final product testing requested may affect delivery of some mixtures.



Restek's Analytical Reference Materials Group

pictured: Mike Maye, Rebecca Lauver, Randy Fisher, John Lidgett, Joe Tallon, Joe Moodler, Andrea Gill, Matt Hepfer, Kim Dawson, Jessie Emel, Jason Fisher, Mary Ellen Martin, Marty Rockey, Dave Krantz, (not pictured: Ann Glace)

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# ANALYTICAL REFERENCE MATERIALS ENVIRONMENTAL MATERIALS

|   |          |
|---|----------|
| 500 Series Drinking Water Analyses .....        | .407-419 |
| 600 Series Wastewater Analyses .....            | .420-425 |
| Method 418.1 .....                              | .426     |
| Method 1311 .....                               | .426     |
| Method 1664 .....                               | .426     |
| Method 3500 .....                               | .426     |
| 8000 Series Solid Waste Analyses .....          | .427-441 |
| Contract Lab Program .....                      | .442-451 |
| PCBs .....                                      | .451-452 |
| Organotins .....                                | .452     |
| Minnesota Dept. of Agriculture Pesticides ..... | .453     |
| International Environmental Mixes .....         | .454-456 |
| Underground Storage Tank Monitoring .....       | .457-467 |



Top: Joe Tallon, Manufacturing Technician  
Bottom: Don McCandless, Head Coach



**500 Series Methods - US EPA Safe Drinking Water Act (SDWA)**

| US EPA Method No.   | Compound Class   | US EPA Method No.   | Compound Class                          |
|---------------------|--|---|---|
| 501.1, 501.2, 501.3 | .Trihalomethanes   | 527   | .Pesticides & Flame Retardants (GC/MS)  |
| 502.1, 502.2        | .Volatile Halogenated Organics   | 528   | .Phenols                                |
| 504.1               | .Ethylene Dibromide/Dibromochloropropane   | 529   | .Nitroaromatics & Nitramines            |
| 505                 | .Organohalide Pesticides & PCBs  | 531.1, 531.2  | .Carbamates                             |
| 506                 | .Phthalate & Adipate Esters  | 532   | .Phenylurea Pesticides                  |
| 507                 | .Nitrogen & Phosphorus Pesticides  | 535  | .Chloroacetanilide Herbicide Degradates |
| 508, 508.1, 508A    | .Chlorinated Pesticides  | 547   | .Glyphosate                             |
| 515, 515.4          | .Chlorinated Acid Herbicides   | 549.2   | .Paraquat/Diquat                        |
| 521                 | .Nitrosamines  | 551.1   | .Chlorinated Pesticides & Herbicides    |
| 524.1, 524.2        | .Volatile Organics   | 552, 552.1, 552.2, 552.3  | .Haloacetic Acids and Dalapon           |
| 525, 525.1, 525.2   |  .Semivolatile Organics | 555   | .Chlorinated Acids                      |
| 526                 | .Semivolatile Organics   | —   | .Drinking Water Odor Standard           |

**Method 501.1, 501.2, 501.3 (Trihalomethanes)**

**501 Trihalomethane Mix**

|  |                      |
|--|----------------------|
| bromodichloromethane                             | chloroform           |
| bromoform  | dibromochloromethane |
| 200 $\mu$ g/mL each in P&T methanol, 1mL/ampul   |                      |
| cat. # 30036 (ea.)                               |                      |
| 2,000 $\mu$ g/mL each in P&T methanol, 1mL/ampul |                      |
| cat. # 30211 (ea.)                               |                      |

**DW-VOC Mix #1 (8 components)**

|  |                       |
|--|-----------------------|
| benzene  | 1,1-dichloroethene    |
| carbon tetrachloride                             | 1,1,1-trichloroethane |
| 1,4-dichlorobenzene                              | trichloroethene       |
| 1,2-dichloroethane                               | vinyl chloride        |
| 200 $\mu$ g/mL each in P&T methanol, 1mL/ampul   |                       |
| cat. # 30037 (ea.)                               |                       |
| 2,000 $\mu$ g/mL each in P&T methanol, 1mL/ampul |                       |
| cat. # 30219 (ea.)                               |                       |

**DW-VOC Mix #2 (12 components)**

|  |                   |
|--|-------------------|
| chlorobenzene                                    | styrene           |
| 1,2-dichlorobenzene                              | tetrachloroethene |
| cis-1,2-dichloroethene                           | toluene           |
| trans-1,2-dichloroethene                         | m-xylene          |
| 1,2-dichloropropane                              | o-xylene          |
| ethylbenzene                                     | p-xylene          |
| 200 $\mu$ g/mL each in P&T methanol, 1mL/ampul   |                   |
| cat. # 30038 (ea.)                               |                   |
| 2,000 $\mu$ g/mL each in P&T methanol, 1mL/ampul |                   |
| cat. # 30220 (ea.)                               |                   |

**DW-VOC Mix #3**

|  |                       |
|--|-----------------------|
| methylene chloride                               | 1,1,2-trichloroethane |
| 1,2,4-trichlorobenzene                           |                       |
| 200 $\mu$ g/mL each in P&T methanol, 1mL/ampul   |                       |
| cat. # 30209 (ea.)                               |                       |
| 2,000 $\mu$ g/mL each in P&T methanol, 1mL/ampul |                       |
| cat. # 30235 (ea.)                               |                       |

**Revised DW-VOC Kit (200 $\mu$ g/mL)**

|                                      |
|--------------------------------------|
| 30036: 501 Trihalomethane Mix        |
| 30037: DW-VOC Mix #1                 |
| 30038: DW-VOC Mix #2                 |
| 30209: DW-VOC Mix #3                 |
| Contains 1mL each of these mixtures. |

cat. # 30210 (kit)



**DW-VOC Kit #2 (2,000 $\mu$ g/mL)**

|                                      |
|--------------------------------------|
| 30211: 501 Trihalomethane Mix        |
| 30219: DW-VOC Mix #1                 |
| 30220: DW-VOC Mix #2                 |
| 30235: DW-VOC Mix #3                 |
| Contains 1mL each of these mixtures. |

cat. # 30221 (kit)



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**also available**

**Rb®-502.2 GC Columns**  
 See page 92 for details.

## 500 Series Methods

## Method 502.1, 502.2 (Volatile Halogenated Organics)

**502.2 Internal Standard #1**

1-chloro-2-fluorobenzene  
2,000 $\mu$ g/mL in P&T methanol, 1mL/ampul  
cat. # 30040 (ea.)

**502.2 Internal Standard Mix #2**

2-bromo-1-chloropropane      fluorobenzene  
2,000 $\mu$ g/mL each in P&T methanol, 1mL/ampul  
cat. # 30041 (ea.)

**8021/502.2 Surrogate Mix #1**

1-bromo-2-chloroethane      fluorobenzene  
1-chloro-3-fluorobenzene  
2,000 $\mu$ g/mL each in P&T methanol, 1mL/ampul  
cat. # 30463 (ea.)

**8021/502.2 Surrogate Mix #2**

1-bromo-2-chloroethane      1-chloro-3-fluorobenzene  
4-bromochlorobenzene      fluorobenzene  
2,000 $\mu$ g/mL each in P&T methanol, 1mL/ampul  
cat. # 30464 (ea.)

**Volatiles MegaMix® with Gases**

(60 components)

benzene  
bromobenzene  
bromochloromethane  
bromodichloromethane  
bromoform  
bromomethane (methyl bromide)  
*n*-butylbenzene  
*sec*-butylbenzene  
*tert*-butylbenzene  
carbon tetrachloride  
chlorobenzene  
chloroethane (ethyl chloride)  
chloroform  
chloromethane (methyl chloride)  
2-chlorotoluene  
4-chlorotoluene  
dibromochloromethane  
1,2-dibromo-3-chloropropane (DBCP)  
1,2-dibromoethane (EDB)  
dibromomethane  
1,2-dichlorobenzene  
1,3-dichlorobenzene  
1,4-dichlorobenzene  
dichlorodifluoromethane (CFC-12)  
1,1-dichloroethane  
1,2-dichloroethane  
1,1-dichloroethene  
*cis*-1,2-dichloroethene  
*trans*-1,2-dichloroethene  
1,2-dichloropropane  
1,3-dichloropropane  
2,2-dichloropropane  
2,2-dichloropropane  
1,1-dichloropropene  
*cis*-1,3-dichloropropene  
*trans*-1,3-dichloropropene  
ethylbenzene  
hexachloro-1,3-butadiene  
(hexachlorobutadiene)  
isopropylbenzene (cumene)  
4-isopropyltoluene (*p*-cymene)

200 $\mu$ g/mL each in P&T methanol, 1mL/ampul  
cat. # 30603 (ea.)

**502.2 MegaMix® (54 components)**

Includes all target analytes except the six gases, which are available separately as 502.2 Calibration Mix #1.

|                                    |  |
|------------------------------------|--|
| benzene                            | 1,1-dichloropropene                    |
| bromobenzene                       | <i>cis</i> -1,3-dichloropropene        |
| bromochloromethane                 | <i>trans</i> -1,3-dichloropropene      |
| bromodichloromethane               | ethylbenzene                           |
| bromoform                          | hexachloro-1,3-butadiene               |
| <i>n</i> -butylbenzene             | (hexachlorobutadiene)                  |
| <i>sec</i> -butylbenzene           | isopropylbenzene (cumene)              |
| <i>tert</i> -butylbenzene          | 4-isopropyltoluene ( <i>p</i> -cymene) |
| carbon tetrachloride               | methylene chloride (dichloromethane)   |
| chlorobenzene                      | naphthalene                            |
| chloroform                         | <i>n</i> -propylbenzene                |
| 2-chlorotoluene                    | styrene                                |
| 4-chlorotoluene                    | 1,1,1,2-tetrachloroethane              |
| dibromochloromethane               | 1,1,2,2-tetrachloroethane              |
| 1,2-dibromo-3-chloropropane (DBCP) | tetrachloroethene                      |
| 1,2-dibromoethane                  | toluene                                |
| dibromomethane                     | 1,2,3-trichlorobenzene                 |
| 1,2-dichlorobenzene                | 1,2,4-trichlorobenzene                 |
| 1,3-dichlorobenzene                | 1,1,1-trichloroethane                  |
| 1,4-dichlorobenzene                | 1,1,2-trichloroethane                  |
| 1,1-dichloroethane                 | trichloroethene                        |
| 1,2-dichloroethane                 | 1,2,3-trichloropropane                 |
| 1,1-dichloroethene                 | 1,2,4-trimethylbenzene                 |
| <i>cis</i> -1,2-dichloroethene     | 1,3,5-trimethylbenzene                 |
| <i>trans</i> -1,2-dichloroethene   | <i>m</i> -xylene                       |
| 1,2-dichloropropane                | <i>o</i> -xylene                       |
| 1,3-dichloropropane                | <i>p</i> -xylene                       |
| 2,2-dichloropropane                |  |

200 $\mu$ g/mL each in P&T methanol, 1mL/ampul  
cat. # 30432 (ea.)

2,000 $\mu$ g/mL each in P&T methanol, 1mL/ampul  
cat. # 30431 (ea.)

**502.2 Calibration Mix #1 (gases)**

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

200 $\mu$ g/mL each in P&T methanol, 1mL/ampul  
cat. # 30439 (ea.)

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

**502.2 Calibration Mix #2 (14 components)**

|                                   |                                   |
|-----------------------------------|-----------------------------------|
| bromodichloromethane              | 1,3-dichloropropene               |
| bromoform                         | 2,2-dichloropropane               |
| carbon tetrachloride              | <i>cis</i> -1,3-dichloropropene   |
| chloroform                        | <i>trans</i> -1,3-dichloropropene |
| 1,1-dichloroethane                | methylene chloride                |
| 1,1-dichloroethene                | 1,1,1-trichloroethane             |
| <i>cis</i> -1,2-dichloroethene    | trichloroethene                   |
| <i>trans</i> -1,2-dichloroethene  |                                   |
| 1,2-dichloropropane               |                                   |
| 1,3-dichloropropane               |                                   |
| 2,2-dichloropropane               |                                   |
| 1,1-dichloropropene               |                                   |
| <i>cis</i> -1,3-dichloropropene   |                                   |
| <i>trans</i> -1,3-dichloropropene |                                   |

2,000 $\mu$ g/mL each in P&T methanol, 1mL/ampul  
cat. # 30043 (ea.)

**Antifoam Agent for Purge & Trap Samples**

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

Neat, 1mL/ampul  
cat. # 31822 (ea.)

No data pack available.

Method 502.1, 502.2 (Volatile Halogenated Organics),  
cont'd

**502.2 Calibration Mix #3** (14 components)

|  |                           |
|--|---------------------------|
| bromochloromethane                               | 1,2-dichloropropane       |
| dibromochloromethane                             | 1,1-dichloropropene       |
| 1,2-dibromo-3-chloropropane                      | 1,1,1,2-tetrachloroethane |
| 1,2-dibromoethane                                | 1,1,2,2-tetrachloroethane |
| dibromomethane                                   | tetrachloroethene         |
| 1,2-dichloroethane                               | 1,1,2-trichloroethane     |
| cis-1,2-dichloroethene                           | 1,2,3-trichloropropane    |
| 2,000 $\mu$ g/mL each in P&T methanol, 1mL/ampul |                           |
|  | cat. # 30044 (ea.)        |

**502.2 Calibration Mix #4** (9 components)

|  |                        |
|--|------------------------|
| benzene  | styrene                |
| tert-butylbenzene                                | toluene                |
| chlorobenzene                                    | 1,3,5-trimethylbenzene |
| isopropylbenzene                                 | m-xylene               |
| n-propylbenzene                                  |                        |
| 2,000 $\mu$ g/mL each in P&T methanol, 1mL/ampul |                        |
|  | cat. # 30045 (ea.)     |

**502.2 Calibration Mix #5** (10 components)

|  |                        |
|--|------------------------|
| bromobenzene                                     | ethylbenzene           |
| n-butylbenzene                                   | 1,2,4-trichlorobenzene |
| sec-butylbenzene                                 | 1,2,4-trimethylbenzene |
| 2-chlorotoluene                                  | <i>o</i> -xylene       |
| 1,3-dichlorobenzene                              | <i>p</i> -xylene       |
| 2,000 $\mu$ g/mL each in P&T methanol, 1mL/ampul |                        |
|  | cat. # 30046 (ea.)     |

**502.2 Calibration Mix #6** (7 components)

|  |                        |
|--|------------------------|
| 4-chlorotoluene                                  | 4-isopropyltoluene     |
| 1,2-dichlorobenzene                              | naphthalene            |
| 1,4-dichlorobenzene                              | 1,2,3-trichlorobenzene |
| hexachlorobutadiene                              |                        |
| 2,000 $\mu$ g/mL each in P&T methanol, 1mL/ampul |                        |
|  | cat. # 30047 (ea.)     |

**502.2 VOA Calibration Kit #1 (2,000 $\mu$ g/mL)**

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

Contains 1mL each of these mixtures.

cat. # 30444 (kit)



**502.2 VOA Calibration Kit #2 (2,000 $\mu$ g/mL)**

30042: 502.2 Calibration Mix #1  
 30431: 502.2 MegaMix

Contains 1mL each of these mixtures.

cat. # 30445 (kit)



**502.2 VOA Calibration Kit #3 (200 $\mu$ g/mL)**

30439: 502.2 Calibration Mix #1  
 30432: 502.2 MegaMix

Contains 1mL each of these mixtures.

cat. # 30446 (kit)



**Method 504.1 (Ethylene Dibromide/  
Dibromochloropropane)**

**504.1 Calibration Mix**

|  |                        |
|--|------------------------|
| 1,2-dibromo-3-chloropropane                    | 1,2,3-trichloropropane |
| 1,2-dibromoethane                              |                        |
| 200 $\mu$ g/mL each in P&T methanol, 1mL/ampul | cat. # 30239 (ea.)     |

**Method 505 (Organohalide Pesticides & PCBs)**

**505 Organohalide Pesticide Mix** (16 components)

|  |                               |
|--|-------------------------------|
| aldrin                                       | heptachlor                    |
| alachlor                                     | heptachlor epoxide (isomer B) |
| atrazine                                     | hexachlorobenzene             |
| $\gamma$ -BHC (lindane)                      | hexachlorocyclopentadiene     |
| $\alpha$ -chlordane                          | methoxychlor                  |
| $\gamma$ -chlordane                          | cis-nonachlor                 |
| die�din                                      | trans-nonachlor               |
| endrin                                       | simazine                      |
| 2,000 $\mu$ g/mL each in methanol, 1mL/ampul |                               |
|  | cat. # 32024 (ea.)            |

**Toxaphene Solutions**

|   |                    |
|---|--------------------|
| 1,000 $\mu$ g/mL in hexane, 1mL/ampul   | cat. # 32005 (ea.) |
| 2,000 $\mu$ g/mL in methanol, 1mL/ampul | cat. # 32015 (ea.) |
| 5,000 $\mu$ g/mL in isoctane, 1mL/ampul | cat. # 32071 (ea.) |

**Method 506 (Phthalate & Adipate Esters)**

**506 Calibration Mix** (7 components)

|   |                      |
|---|----------------------|
| benzyl butyl phthalate                  | di-n-octyl phthalate |
| bis(2-ethylhexyl)adipate                | diethylphthalate     |
| bis(2-ethylhexyl)phthalate              | dimethylphthalate    |
| di-n-butylphthalate                     |                      |
| 1,000 $\mu$ g/mL in isoctane, 1mL/ampul | cat. # 31845 (ea.)   |

**506 Laboratory Performance Check Mix** (7 components)

|                            |                |                      |     |
|----------------------------|----------------|----------------------|-----|
| benzyl butyl phthalate     | 250 $\mu$ g/mL | di-n-octyl phthalate | 650 |
| bis(2-ethylhexyl)adipate   | 1,200          | diethylphthalate     | 100 |
| bis(2-ethylhexyl)phthalate | 250            | dimethylphthalate    | 100 |
| di-n-butylphthalate        | 100            |                      |     |
| In P&T methanol, 1mL/ampul |                | cat. # 31844 (ea.)   |     |

**free data**

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## 500 Series Methods

## Method 507 (Nitrogen &amp; Phosphorus Pesticides)

## Organonitrogen Pesticide Mix #1 (Rev), Method 525.2

(37 components)

|                         |                         |
|-------------------------|-------------------------|
| alachlor                | molinate                |
| ametryn                 | napropamide (Devrinol)  |
| atraton                 | norflurazon             |
| atrazine                | pebulate                |
| bromacil                | prometon                |
| butachlor               | prometryne              |
| butylate                | pronamide (propyzamide) |
| chlorpropham            | propachlor              |
| cyanazine (Bladex)      | propazine               |
| cycloate                | simazine                |
| diphenamid              | simetryn                |
| EPTC                    | tebuthiuron             |
| etridiazole (Terrazole) | terbacil                |
| fenarimol               | terbutryn               |
| fluridone (Sonar)       | triadimefon             |
| hexazinone (Velpar)     | tricyclazole (Beam)     |
| metolachlor             | trifluralin             |
| metribuzin              | vernolate               |
| MGK-264                 |                         |

500µg/mL each in acetone, 1mL/ampul

cat. # 33012 (ea.)

## Organophosphorus Pesticide Mix #1 (Rev), Method 525.2

(7 components)

|                        |   |
|------------------------|---|
| chlorpyrifos (Dursban) | methyl paraoxon (parathion methyl-O-analog) |
| dichlorvos (DDVP)      | mevinphos (phosdrin)                        |
| disulfoton sulfone     | stirofos (tetrachlorvinphos)                |
| ethoprop (ethoprophos) |   |

500µg/mL each in acetone, 1mL/ampul

cat. # 33013 (ea.)

## Method 525.2 Nitrogen/Phosphorus Pesticide Mix #2

(6 components)

|            |            |
|------------|------------|
| carboxin   | fenamiphos |
| diazinon   | merphos    |
| disulfoton | terbufos   |

1,000µg/mL each in acetone, 1mL/ampul

cat. # 32423 (ea.)

## Method 508, 508.1, 508A (Chlorinated Pesticides)

## 508.1 Internal Standard

pentachloronitrobenzene

100µg/mL in ethyl acetate, 1mL/ampul

cat. # 32091 (ea.)

## 508.1 Surrogate

4,4'-dibromobiphenyl

500µg/mL in ethyl acetate, 1mL/ampul

cat. # 32092 (ea.)

## 508.1 GC Degradation Check Mix

4,4'-DDT endrin

100µg/mL each in ethyl acetate, 1mL/ampul

cat. # 32093 (ea.)

## did you know?

We have more than 2,000 pure, characterized, neat compounds in our inventory! If you do not see the EXACT mixture you need listed on any of these pages, contact us for a custom standard.

## Method 508, 508.1, 508A (Chlorinated Pesticides)

cont'd

## 508 Performance Check Mix

|  |          |                |      |
|--|----------|----------------|------|
| δ-BHC  | 0.4µg/mL | chlorpyrifos   | 0.02 |
| chlorothalonil   | 0.5      | DCPA (Dacthal) | 0.5  |
| At concentrations listed in methyl <i>tert</i> -butyl ether, 1mL/ampul |          |                |      |

cat. # 32045 (ea.)

## 508.1 Calibration Mix #1 (17 components)

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

500µg/mL each in ethyl acetate, 1mL/ampul

cat. # 32094 (ea.)

## 508.1 Calibration Mix #2 (11 components)

|                |                   |
|----------------|-------------------|
| chlorbenzilate | hexachlorobenzene |
| α-chlordane    | cis-permethrin*   |
| γ-chlordane    | trans-permethrin* |
| chlorneb       | propachlor        |
| DCPA (Dacthal) | trifluralin       |
| etridiazole    |                   |

500µg/mL each in ethyl acetate, 1mL/ampul

cat. # 32095 (ea.)

\*1,000µg/mL total permethrin. Exact content of each isomer listed on certificate of analysis.

## 508.1 Calibration Mix #3 (8 components)

|               |                           |
|---------------|---------------------------|
| alachlor      | hexachlorocyclopentadiene |
| atrazine      | metolachlor               |
| chlorthalonil | metribuzin                |
| cyanazine     | simazine                  |

500µg/mL each in ethyl acetate, 1mL/ampul

cat. # 32096 (ea.)

## Toxaphene Solutions

1,000µg/mL in hexane, 1mL/ampul

cat. # 32005 (ea.)

2,000µg/mL in methanol, 1mL/ampul

cat. # 32015 (ea.)

5,000µg/mL in isoctane, 1mL/ampul

cat. # 32071 (ea.)

## Organochlorine Pesticide System Evaluation Mix

4,4'-DDT 200µg/mL

100µg/mL

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

cat. # 32417 (ea.)

## Decachlorobiphenyl, 508A

200µg/mL in acetone, 1mL/ampul

cat. # 32029 (ea.)

200µg/mL in acetone, 5mL/ampul

cat. # 32030 (ea.)

10µg/mL in isoctane, 1mL/ampul

cat. # 32289 (ea.)

**Method 508, 508.1, 508A (Chlorinated Pesticides)**  
*cont'd*

**508.1 Pesticide Kit**

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

Contains 1mL each of these mixtures.

cat. # 32097 (kit)



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

**Herbicide Internal Standard**

4,4'-dibromo-octafluorobiphenyl

250 $\mu$ g/mL in hexane, 1mL/ampul

cat. # 32053 (ea.)

2,000 $\mu$ g/mL in methyl *tert*-butyl ether, 1mL/ampul

cat. # 31856 (ea.)

**Herbicide Surrogate**

**Free Acid Form:**

2,4-dichlorophenylacetic acid (DCAA)

200 $\mu$ g/mL in methanol, 1mL/ampul

cat. # 32049 (ea.)

1,000 $\mu$ g/mL in acetone, 1mL/ampul

cat. # 32439 (ea.)

**Derivatized Form:**

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

200 $\mu$ g/mL in hexane, 1mL/ampul

cat. # 32050 (ea.)

**Herbicide Lab Performance Check Mix**

|                                       |              |
|---------------------------------------|--------------|
| dinoseb methyl ether                  | 4 $\mu$ g/mL |
| DCAA methyl ester                     | 500          |
| 4,4'-dibromo-octafluorobiphenyl       | 250          |
| 3,5-dichlorobenzoic acid methyl ester | 600          |
| 4-nitroanisole                        | 1,600        |

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

cat. # 32063 (ea.)

**Herbicide Mix #1 (7 components)**

**Free Acid Form:**

|         |             |
|---------|-------------|
| 2,4-D   | dicamba     |
| 2,4-DB  | dichlorprop |
| 2,4,5-T | dinoseb     |

200 $\mu$ g/mL each in methanol, 1mL/ampul

cat. # 32054 (ea.)

**Derivatized Form:**

|                      |                          |
|----------------------|--------------------------|
| 2,4-D methyl ester   | dicamba methyl ester     |
| 2,4-DB methyl ester  | dichlorprop methyl ester |
| 2,4,5-T methyl ester | dinoseb methyl ester     |

200 $\mu$ g/mL each in hexane, 1mL/ampul

cat. # 32055 (ea.)

**Method 515, 515.4 (Chlorinated Acid Herbicides)**  
*cont'd*

**Herbicide Mix #2**

**Free Acid Form:**

dalapon

2,000 $\mu$ g/mL in methanol, 1mL/ampul

cat. # 32056 (ea.)

**Derivatized Form:**

dalapon methyl ester

2,000 $\mu$ g/mL in hexane, 1mL/ampul

cat. # 32057 (ea.)

**Herbicide Mix #4 (8 components)**

**Free Acid Form:**

acifluorfen

3,5-dichlorobenzoic acid

bentazon

4-nitrophenol

chloramben

pentachlorophenol

DCPA diacid

picloram

200 $\mu$ g/mL each in methanol, 1mL/ampul

cat. # 32061 (ea.)

**Derivatized Form:**

acifluorfen methyl ester

3,5-dichlorobenzoic acid methyl ester

bentazon methyl ester

4-nitroanisole

chloramben methyl ester

pentachloroanisole

DCPA (Dacthal)

picloram methyl ester

200 $\mu$ g/mL each in hexane, 1mL/ampul

cat. # 32062 (ea.)

**515.4 Calibration Mix (16 components)**

|                                |               |                          |     |
|--------------------------------|---------------|--------------------------|-----|
| acifluorfen (Blazer)           | 50 $\mu$ g/mL | 3,5-dichlorobenzoic acid | 50  |
| bentazon                       | 100           | dichlorprop              | 100 |
| chloramben                     | 50            | dinoseb                  | 100 |
| 2,4-D                          | 100           | pentachlorophenol        | 10  |
| dalapon                        | 100           | picloram                 | 50  |
| 2,4-DB                         | 100           | quinclorac               | 50  |
| DCPA diacid                    | 50            | 2,4,5-T                  | 25  |
| (tetrachloroterephthalic acid) | 50            | 2,4,5-TP (Silvex)        | 25  |
| dicamba                        | 50            |                          |     |
| In acetone, 1mL/ampul          |               |                          |     |
|                                |               | cat. # 32443 (ea.)       |     |

**515.4 Methylated Chlorinated Acids Mix (16 components)**

|   |               |                                |     |
|---|---------------|--------------------------------|-----|
| acifluorfen methyl ester                      | 50 $\mu$ g/mL | dichlorprop methyl ester       | 100 |
| bentazon methyl ester                         | 100           | dinoseb methyl ether           | 100 |
| chloramben methyl ester                       | 50            | pentachloroanisole             | 10  |
| dalapon methyl ester                          | 100           | picloram methyl ester          | 50  |
| 2,4-D methyl ester                            | 100           | quinclorac methyl ester        | 50  |
| 2,4-DB methyl ester                           | 100           | 2,4,5-T methyl ester           | 25  |
| DCPA (Dacthal)                                | 100           | 2,4,5-TP (Silvex) methyl ester | 25  |
| dicamba methyl ester                          | 50            |                                |     |
| 3,5-dichlorobenzoic acid methyl ester         | 50            |                                |     |
|   |               |                                |     |
| In methyl <i>tert</i> -butyl ether, 1mL/ampul |               |                                |     |
|   |               | cat. # 32444 (ea.)             |     |

**also available**

Additional chlorinated acid herbicides mixes:

see Method 555, page 419.

and Method 8321, page 440.

## 500 Series Methods

## Method 521 (Nitrosamines)

**Nitrosamine Calibration Mix, Method 521** (7 components)

|  |                           |
|--|---------------------------|
| N-nitrosodiemethylamine                                | N-nitrosomethylmethyamine |
| N-nitrosodimethylamine                                 | N-nitrosopiperidine       |
| N-nitrosodi- <i>n</i> -butylamine                      | N-nitrosopyrrolidine      |
| N-nitrosodi- <i>n</i> -propylamine                     |                           |
| 1,000 $\mu$ g/mL each in methylene chloride, 1mL/ampul |                           |
| cat. # 31898 (ea.)                                     |                           |

**N-Nitrosodimethylamine-d6**

|   |  |
|---|--|
| N-nitrosodimethylamine-d6                         | $\alpha,\alpha,\alpha$ -trifluorotoluene         |
| 1,000 $\mu$ g/mL in methylene chloride, 1mL/ampul | 2,500 $\mu$ g/mL each in P&T methanol, 1mL/ampul |

cat. # 33910 (ea.)

**N-Nitrosodi-*n*-propylamine-d14**

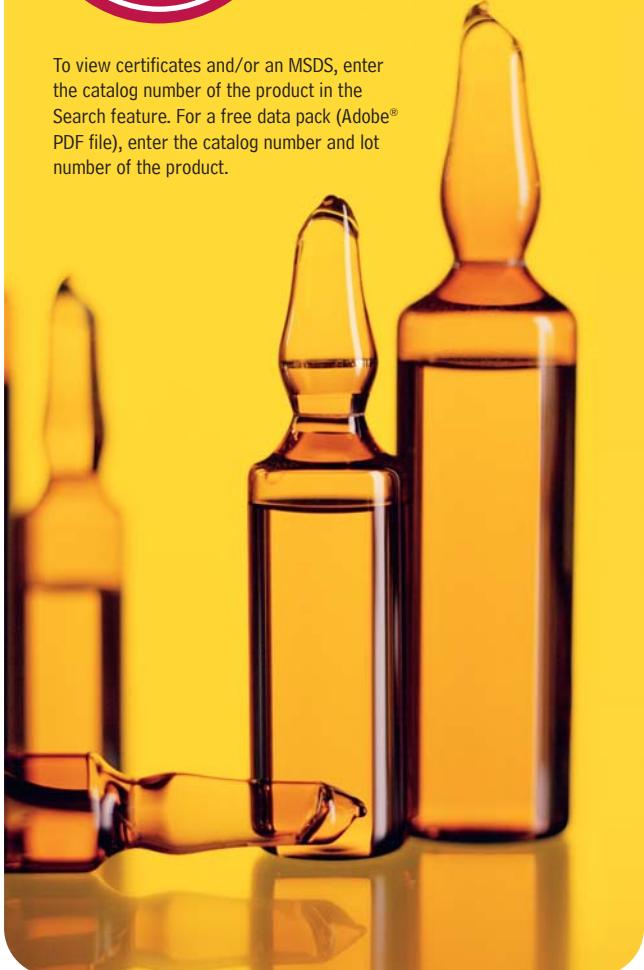
|   |   |
|---|---|
| N-nitrosodi- <i>n</i> -propylamine-d14            | 1,2-dichlorobenzene-d4                      |
| 1,000 $\mu$ g/mL in methylene chloride, 1mL/ampul | 2,000 $\mu$ g/mL in P&T methanol, 1mL/ampul |

cat. # 33911 (ea.)

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## Method 524.1, 524.2 (Volatile Organics)

**524 Internal Standard/Surrogate Mix**

|  |                    |
|--|--------------------|
| 4-bromofluorobenzene                             | fluorobenzene      |
| 1,2-dichlorobenzene-d4                           |                    |
| 2,000 $\mu$ g/mL each in P&T methanol, 1mL/ampul | cat. # 30201 (ea.) |

**Surrogate Standard**

|  |  |
|--|--|
| 4-bromofluorobenzene                             | $\alpha,\alpha,\alpha$ -trifluorotoluene |
| 2,500 $\mu$ g/mL each in P&T methanol, 1mL/ampul | cat. # 30484 (ea.)                       |

**524.2 Surrogate Standard**

|   |                        |
|---|------------------------|
| 1-bromo-4-fluorobenzene                     | 1,2-dichlorobenzene-d4 |
| 2,000 $\mu$ g/mL in P&T methanol, 1mL/ampul | cat. # 30607 (ea.)     |

**PFTBA (MS Tuning Compound)**

|                                |                    |
|--------------------------------|--------------------|
| perfluorotributylamine (PFTBA) |                    |
| Neat, 1mL/ampul                | cat. # 30482 (ea.) |
| Neat, 1g                       | cat. # 33027 (ea.) |

No data pack available.

**Volatiles MegaMix® with Gases** (60 components)

|                                    |  |
|------------------------------------|--|
| benzene                            | 2,2-dichloropropane                    |
| bromobenzene                       | 1,1-dichloropropene                    |
| bromochloromethane                 | <i>cis</i> -1,3-dichloropropene        |
| bromodichloromethane               | <i>trans</i> -1,3-dichloropropene      |
| bromoform                          | ethylbenzene                           |
| bromomethane (methyl bromide)      | hexachloro-1,3-butadiene               |
| <i>n</i> -butylbenzene             | (hexachlorobutadiene)                  |
| <i>sec</i> -butylbenzene           | isopropylbenzene (cumene)              |
| <i>tert</i> -butylbenzene          | 4-isopropyltoluene ( <i>p</i> -cymene) |
| carbon tetrachloride               | methylene chloride (dichloromethane)   |
| chlorobenzene                      | naphthalene                            |
| chloroethane (ethyl chloride)      | <i>n</i> -propylbenzene                |
| chloroform                         | styrene                                |
| chloromethane (methyl chloride)    | 1,1,1,2-tetrachloroethane              |
| 2-chlorotoluene                    | 1,1,2,2-tetrachloroethane              |
| 4-chlorotoluene                    | tetrachloroethene                      |
| dibromochloromethane               | toluene                                |
| 1,2-dibromo-3-chloropropane (DBCP) | 1,2,3-trichlorobenzene                 |
| 1,2-dibromoethane (EDB)            | 1,2,4-trichlorobenzene                 |
| dibromomethane                     | 1,1,1-trichloroethane                  |
| 1,2-dichlorobenzene                | 1,1,2-trichloroethane                  |
| 1,3-dichlorobenzene                | trichloroethene                        |
| 1,4-dichlorobenzene                | trichlorofluoromethane (CFC-11)        |
| dichlorodifluoromethane (CFC-12)   | 1,2,3-trichloropropane                 |
| 1,1-dichloroethane                 | 1,2,4-trimethylbenzene                 |
| 1,2-dichloroethane                 | 1,3,5-trimethylbenzene                 |
| 1,1-dichloroethene                 | vinyl chloride                         |
| <i>cis</i> -1,2-dichloroethene     | <i>m</i> -xylene                       |
| <i>trans</i> -1,2-dichloroethene   | <i>o</i> -xylene                       |
| 1,2-dichloropropane                | <i>p</i> -xylene                       |
| 1,3-dichloropropane                |  |

200 $\mu$ g/mL each in P&T methanol, 1mL/ampul  
cat. # 30603 (ea.)

**Method 524.1, 524.2 (Volatile Organics) cont'd**

**Drinking Water VOA MegaMix®, 524.2 Rev. 4.1** (73 components)

|                                     |  |
|-------------------------------------|--|
| acrylonitrile                       | <i>trans</i> -1,3-dichloropropene      |
| allyl chloride                      | diethyl ether (ethyl ether)            |
| benzene                             | ethylbenzene                           |
| bromobenzene                        | ethyl methacrylate                     |
| bromoform                           | hexachloro-1,3-butadiene               |
| <i>n</i> -butylbenzene              | hexachloroethane                       |
| <i>sec</i> -butylbenzene            | iodomethane (methyl iodide)            |
| <i>tert</i> -butylbenzene           | isopropylbenzene (cumene)              |
| carbon disulfide                    | 4-isopropyltoluene ( <i>p</i> -cymene) |
| carbon tetrachloride                | methacrylonitrile                      |
| chloroacetonitrile                  | methyl acrylate                        |
| chlorobenzene                       | methyl <i>tert</i> -butyl ether (MTBE) |
| 1-chlorobutane                      | methylene chloride (dichloromethane)   |
| chlorodibromomethane                | methyl methacrylate                    |
| (dibromochloromethane)              | naphthalene                            |
| chloroform                          | nitrobenzene                           |
| 2-chlorotoluene                     | 2-nitropropane                         |
| 4-chlorotoluene                     | pentachloroethane                      |
| 1,2-dibromo-3-chloropropane (DBCP)  | propionitrile (ethylcyanide)           |
| 1,2-dibromoethane                   | <i>n</i> -propylbenzene                |
| (ethylene dibromide)                | styrene                                |
| dibromomethane                      | 1,1,1,2-tetrachloroethane              |
| 1,2-dichlorobenzene                 | 1,1,2,2-tetrachloroethane              |
| 1,3-dichlorobenzene                 | tetrachloroethene                      |
| 1,4-dichlorobenzene                 | tetrahydrofuran                        |
| <i>trans</i> -1,4-dichloro-2-butene | toluene                                |
| 1,1-dichloroethane                  | 1,2,3-trichlorobenzene                 |
| 1,2-dichloroethane                  | 1,2,4-trichlorobenzene                 |
| 1,1-dichloroethene                  | 1,1,1-trichloroethane                  |
| <i>cis</i> -1,2-dichloroethene      | 1,1,2-trichloroethane                  |
| <i>trans</i> -1,2-dichloroethene    | trichloroethene                        |
| 1,2-dichloropropane                 | 1,2,3-trichloropropane                 |
| 1,3-dichloropropane                 | 1,2,4-trimethylbenzene                 |
| 2,2-dichloropropane                 | 1,3,5-trimethylbenzene                 |
| 1,1-dichloropropene                 | <i>m</i> -xylene                       |
| <i>cis</i> -1,3-dichloropropene     | <i>o</i> -xylene                       |
|                                     | <i>p</i> -xylene                       |

2,000µg/mL each in P&T methanol, 1mL/ampul  
 cat. # 30601 (ea.)

**502.2 Calibration Mix #1 (gases)**

|  |                                  |
|--|----------------------------------|
| bromomethane                               | dichlorodifluoromethane (CFC-12) |
| chloroethane                               | trichlorofluoromethane (CFC-11)  |
| chloromethane                              | vinyl chloride                   |
| 200µg/mL each in P&T methanol, 1mL/ampul   |                                  |
|  | cat. # 30439 (ea.)               |
| 2,000µg/mL each in P&T methanol, 1mL/ampul |                                  |
|  | cat. # 30042 (ea.)               |

**Ketones Mix, 524.2 Rev. 4.1** (5 components)

|  |                             |
|--|-----------------------------|
| acetone  | 2-hexanone                  |
| 2-butanone (MEK)   | 4-methyl-2-pentanone (MIBK) |
| 1,1-dichloro-2-propanone                                 |                             |
| 5,000µg/mL each in 90% P&T methanol:10% water, 1mL/ampul |                             |
|  | cat. # 30602 (ea.)          |



**also available**

SPE Cartridges and Disks  
 See pages 356 and 361 for details.

**Oxygenates Standard**

|  |                    |
|--|--------------------|
| diisopropyl ether (DIPE)               | 2,000µg/mL         |
| ethyl- <i>tert</i> -butyl ether (ETBE) | 2,000              |
| <i>tert</i> -amyl ethyl ether (TAE)    | 2,000              |
| <i>tert</i> -amyl methyl ether (TAME)  | 2,000              |
| <i>tert</i> -butyl alcohol (TBA)       | 10,000             |
| In P&T methanol, 1mL/ampul             |                    |
|  | cat. # 30619 (ea.) |

**524 Calibration Mix #7** (12 components)

Note: Due to compound interactions, this mixture is a two ampul set.

**Ampul 1:**

|                  |                             |
|------------------|-----------------------------|
| acetone          | 4-methyl-2-pentanone (MIBK) |
| 2-butanone (MEK) | tetrahydrofuran             |
| 2-hexanone       |                             |

**Ampul 2:**

|                    |                     |
|--------------------|---------------------|
| acrylonitrile      | methyl methacrylate |
| allyl chloride     | nitrobenzene        |
| ethyl methacrylate | pentachloroethane   |
| methyl acrylate    |                     |

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

cat. # 30202 (ea.)

**524 Calibration Mix #8** (12 components)

|                                     |                                 |
|-------------------------------------|---------------------------------|
| carbon disulfide                    | hexachloroethane                |
| chloroacetonitrile                  | iodomethane (methyl iodide)     |
| 1-chlorobutane                      | methacrylonitrile               |
| <i>trans</i> -1,4-dichloro-2-butene | methyl <i>tert</i> -butyl ether |
| 1,1-dichloroethane                  | 2-nitropropane                  |
| 1,1-dichloroethene                  | diethyl ether                   |
| <i>cis</i> -1,2-dichloroethene      | propionitrile                   |
| <i>trans</i> -1,2-dichloroethene    |                                 |
| 1,2-dichloropropane                 |                                 |
| 1,3-dichloropropane                 |                                 |
| 2,2-dichloropropane                 |                                 |
| 1,1-dichloropropene                 |                                 |
| <i>cis</i> -1,3-dichloropropene     |                                 |

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

cat. # 30203 (ea.)



**524 Rev. 4.0 Volatile Organics Kit (2,000µg/mL)**

|  |  |
|--|--|
| 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            |  |
| 30202: 524 Calibration Mix #7              |  |
| 30203: 524 Calibration Mix #8              |  |

Contains 1mL each of these mixtures.

cat. # 30204 (kit)



**524 Rev. 4.0 VOA Kit #2 (2,000µg/mL)**

|  |  |
|--|--|
| 30042: 502.2 Calibration Mix #1            |  |
| 30431: 502.2 MegaMix                       |  |
| 30202: 524 Calibration Mix #7              |  |
| 30203: 524 Calibration Mix #8              |  |
| 30201: 524 Surrogate/Internal Standard Mix |  |

Contains 1mL each of these mixtures.

cat. # 30447 (kit)



Note: For a listing of additional individual VOA surrogate and internal standards, see page 423.

**did you know?**

We have more than 2,000 pure, characterized, neat compounds in our inventory! If you do not see the EXACT mixture you need listed on any of these pages, contact us for a custom standard.

## 500 Series Methods

## Method 525, 525.1, 525.2 (Semivolatile Organics)

**Method 525.2 Internal Standard Mix**

acenaphthene-d10 phenanthrene-d10  
 chrysene-d12  
 1,000 $\mu$ g/mL each in acetone, 1mL/ampul  
 cat. # 31825 (ea.)

**Method 525.2 Surrogate Standard Mix**

2-nitro-*m*-xylene pyrene-d10  
 perylene-d12 triphenylphosphate  
 1,000 $\mu$ g/mL each in acetone, 1mL/ampul  
 cat. # 31826 (ea.)

**Method 525.2 Herbicide Analytes**

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

| Compound    | Solvent | Conc. | cat.# (ea.) | price |
|-------------|---------|-------|-------------|-------|
| acetochlor  | M       | 100   | 33208       |       |
| alachlor    | M       | 100   | 33207       |       |
| metolachlor | M       | 100   | 33209       |       |

M=methanol

**Method 525.2 Herbicide Mix**

acetochlor metolachlor  
 alachlor  
 100 $\mu$ g/mL in methanol, 1mL/ampul  
 cat. # 33211 (ea.)

**Method 525.2 Semivolatile Mix (revised)** (28 components)

|                            |                                 |
|----------------------------|---------------------------------|
| acenaphthylene             | di- <i>n</i> -butylphthalate    |
| anthracene                 | 2,4-dinitrotoluene              |
| benzo(a)anthracene         | 2,6-dinitrotoluene              |
| benzo(a)pyrene             | di- <i>n</i> -octylphthalate    |
| benzo(b)fluoranthene       | fluoranthene                    |
| benzo(ghi)perylene         | fluorene                        |
| benzo(k)fluoranthene       | hexachlorobenzene               |
| benzylbutylphthalate       | hexachlorocyclopentadiene       |
| bis(2-ethylhexyl)adipate   | indeno(1,2,3- <i>cd</i> )pyrene |
| bis(2-ethylhexyl)phthalate | isophorone                      |
| chrysene                   | naphthalene                     |
| dibenzo(a,h)anthracene     | pentachlorophenol*              |
| diethylphthalate           | phenanthrene                    |
| dimethylphthalate          | pyrene                          |

1,000 $\mu$ g/mL each in acetone, 1mL/ampul  
 cat. # 31899 (ea.)

\*pentachlorophenol at 4,000 $\mu$ g/mL.

**Method 525.2 PCB Congener Mix** (8 components)

2-chlorobiphenyl (BZ#1)  
 2,3-dichlorobiphenyl (BZ#5)  
 2,4,5-trichlorobiphenyl (BZ#29)  
 2,2',4,4'-tetrachlorobiphenyl (BZ#47)  
 2,2',3,4,6-pentachlorobiphenyl (BZ#98)  
 2,2',4,4',5,6-hexachlorobiphenyl (BZ#154)  
 2,2',3,3',4,4'-heptachlorobiphenyl (BZ#171)  
 2,2',3,3',4,5',6,6'-octachlorobiphenyl (BZ#200)  
 200 $\mu$ g/mL each in acetone, 1mL/ampul  
 cat. # 32420 (ea.)

**Organochlorine Pesticide Mix AB # 3** (20 components)

|                         |                               |
|-------------------------|-------------------------------|
| aldrin                  | dieleadrin                    |
| $\alpha$ -BHC           | endosulfan I                  |
| $\beta$ -BHC            | endosulfan II                 |
| $\delta$ -BHC           | endosulfan sulfate            |
| $\gamma$ -BHC (lindane) | endrin                        |
| $\alpha$ -chlordane     | endrin aldehyde               |
| $\gamma$ -chlordane     | endrin ketone                 |
| 4,4'-DDD                | heptachlor                    |
| 4,4'-DDE                | heptachlor epoxide (isomer B) |
| 4,4'-DDT                | methoxychlor                  |

2,000 $\mu$ g/mL each in hexane:toluene (1:1), 1mL/ampul  
 cat. # 32415 (ea.)

**Organonitrogen Pesticide Mix #1 (Rev), Method 525.2**

(37 components)

|                         |                         |
|-------------------------|-------------------------|
| alachlor                | molinate                |
| ametryn                 | napropamide (Devrinol)  |
| atraton                 | norflurazon             |
| atrazine                | pebulate                |
| bromacil                | prometon                |
| butachlor               | prometryne              |
| butylate                | pronamide (propyzamide) |
| chlorpropham            | propachlor              |
| cyanazine (Bladex)      | propazine               |
| cycloate                | simazine                |
| diphenamid              | simetryn                |
| EPTC                    | tebuthiuron             |
| etridiazole (Terrazole) | terbacil                |
| fenarimol               | terbutryn               |
| fluridone (Sonar)       | triadimenfon            |
| hexazinone (Velpar)     | tricyclazole (Beam)     |
| metolachlor             | trifluralin             |
| metribuzin              | vernolate               |
| MGK-264                 |                         |

500 $\mu$ g/mL each in acetone, 1mL/ampul  
 cat. # 33012 (ea.)

**Organophosphorus Pesticide Mix #1 (Rev), Method 525.2**

(7 components)

|                        |   |
|------------------------|---|
| chlorpyrifos (Dursban) | methyl paraoxon (parathion methyl-O-analog) |
| dichlorvos (DDVP)      | mevinphos (phosdrin)                        |
| disulfoton sulfone     | stirofos (tetrachlorvinphos)                |
| ethoprop (ethoprophos) |   |

500 $\mu$ g/mL each in acetone, 1mL/ampul  
 cat. # 33013 (ea.)

**Method 525.2 Nitrogen/Phosphorus Pesticide Mix #2**

(6 components)

|            |            |
|------------|------------|
| carboxin   | fenamiphos |
| diazinon   | merphos    |
| disulfoton | terbufos   |

1,000 $\mu$ g/mL each in acetone, 1mL/ampul  
 cat. # 32423 (ea.)



also available

Try our CLPesticides columns for these applications.

See pages 80-82 for details.

also available

See pages 408-409 for 502.2 MegaMix® and 502.2 calibration mixes.

**Method 525, 525.1, 525.2 (Semivolatile Organics)**  
*cont'd*

**Organochlorine Pesticide Mix #2 (Rev), Method 525.2**

(8 components)

|   |                               |
|---|-------------------------------|
| chlorobenzilate                           | heptachlor epoxide (isomer A) |
| chloroneb                                 | <i>trans</i> -nonachlor       |
| chlorothalonil                            | <i>cis</i> -permethrin        |
| DCPA (Dacthal)                            | <i>trans</i> -permethrin      |
| 500 $\mu$ g/mL each in acetone, 1mL/ampul |                               |
|   | cat. # 33011 (ea.)            |

**Method 525.2 Fortification Recovery Standard**

*p*-terphenyl-d14

|   |                    |
|---|--------------------|
| 1,000 $\mu$ g/mL in methylene chloride, 1mL/ampul |                    |
|   | cat. # 31828 (ea.) |

**Method 525.2 GC/MS Performance Check Mix**

4,4'-DDT

|                                      |  |
|--------------------------------------|--|
| DFTPP (decafluorotriphenylphosphine) |  |
| endrin                               |  |

1,000 $\mu$ g/mL each in acetone, 1mL/ampul

cat. # 31827 (ea.)

**Method 526 (Semivolatile Organics)**

**Internal Standard Mix, EPA 526**

|   |                  |
|---|------------------|
| acenaphthene-d10                          | phenanthrene-d10 |
| chrysene-d12                              |                  |
| 500 $\mu$ g/mL each in acetone, 1mL/ampul |                  |

cat. # 31692 (ea.)

**Surrogate Standard Mix, EPA 526**

|   |                    |
|---|--------------------|
| 2-nitro- <i>m</i> -xylene                 | triphenylphosphate |
| 500 $\mu$ g/mL each in acetone, 1mL/ampul |                    |

cat. # 31693 (ea.)

**Semivolatile Calibration Mix, EPA 526 (11 components)**

|   |                       |
|---|-----------------------|
| acetochlor                                      | fonofos               |
| cyanazine                                       | nitrobenzene          |
| diazinon  | prometon              |
| 2,4-dichlorophenol                              | terbufos              |
| 1,2-diphenylhydrazine                           | 2,4,6-trichlorophenol |
| disulfoton                                      |                       |
| 200 $\mu$ g/mL each in ethyl acetate, 1mL/ampul |                       |

cat. # 31691 (ea.)

**Antifoam Agent for Purge & Trap Samples**

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

Neat, 1mL/ampul

cat. # 31822 (ea.)

No data pack available.

**Method 527 (Pesticides & Flame Retardants-GC/MS)**

**Internal Standard, Method 527**

|   |                    |
|---|--------------------|
| acenaphthene-d10                          | phenanthrene-d10   |
| chrysene-d12                              |                    |
| 500 $\mu$ g/mL each in acetone, 1mL/ampul | cat. # 33010 (ea.) |

**Method 525.2 Internal Standard Mix**

|   |                    |
|---|--------------------|
| acenaphthene-d10                            | phenanthrene-d10   |
| chrysene-d12                                |                    |
| 1,000 $\mu$ g/mL each in acetone, 1mL/ampul | cat. # 31825 (ea.) |

**Surrogate Standard, Method 527**

|   |                    |
|---|--------------------|
| 1,3-dimethyl-2-nitrobenzene               | triphenylphosphate |
| perylene-d12                              |                    |
| 500 $\mu$ g/mL each in acetone, 1mL/ampul | cat. # 33009 (ea.) |

**Method 525.2 Surrogate Standard Mix**

|   |                    |
|---|--------------------|
| 2-nitro- <i>m</i> -xylene                   | pyrene-d10         |
| perylene-d12                                | triphenylphosphate |
| 1,000 $\mu$ g/mL each in acetone, 1mL/ampul | cat. # 31826 (ea.) |

**PBDE Mix**

|   |  |
|---|--|
| 2,2',4,4',5-pentabromodiphenyl ether (BDE-99)                 |  |
| 2,2',4,4',5,5'-hexabromobiphenyl                              |  |
| 2,2',4,4',5,5'-hexabromodiphenyl ether (BDE-153)              |  |
| 2,2',4,4',6-pentabromodiphenyl ether (BDE-100)                |  |
| 2,2',4,4'-tetrabromodiphenyl ether (BDE-47)                   |  |
| 50 $\mu$ g/mL each in isoctane:ethyl acetate (4:1), 1mL/ampul |  |

cat. # 33098 (ea.)

**Pesticides Mix #1, Method 527 (16 components)**

|   |              |
|---|--------------|
| atrazine  | mirex        |
| bifenthrin                                      | nitrofen     |
| esbiol (Bioallethrin, S-cyclopentyl isomer)     | norflurazon  |
| bromacil  | oxychlordane |
| esfenvalerate                                   | prometryne   |
| fenvvalorate                                    | propazine    |
| hexazinone                                      | thiobencarb  |
| kepone  | vinclozolin  |
| 500 $\mu$ g/mL each in ethyl acetate, 1mL/ampul |              |

cat. # 33007 (ea.)

**Pesticides Mix #2, Method 527**

|   |                  |
|---|------------------|
| chloropyrifos (Dursban)                         | parathion        |
| dimethoate                                      | terbufos sulfone |
| malathion                                       |                  |
| 500 $\mu$ g/mL each in ethyl acetate, 1mL/ampul |                  |

cat. # 33008 (ea.)

**free data**

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## 500 Series Methods

## Method 528 (Phenols)

**Internal Standard Mix, EPA 528**

|                                  |                  |
|----------------------------------|------------------|
| 3-nitro-o-xylene                 | 1,000 $\mu$ g/mL |
| 2,3,4,5-tetrachlorophenol        | 2,000            |
| In methylene chloride, 1mL/ampul |                  |

cat. # 31696 (ea.)

**Surrogate Standard Mix, EPA 528**

|                             |                  |
|-----------------------------|------------------|
| 2-chlorophenol-d4           | 1,000 $\mu$ g/mL |
| 2,4-dimethylphenol-3,5,6-d3 | 1,000            |
| 2,4,6-tribromophenol        | 2,000            |

In methanol, 1mL/ampul

cat. # 31697 (ea.)

**Phenol Calibration Mix, EPA 528** (12 components)

|  |                            |
|--|----------------------------|
| 4-chloro-3-methylphenol                                | 2-methyl-4,6-dinitrophenol |
| 2-chlorophenol   | 2-nitrophenol              |
| <i>o</i> -cresol                                       | 4-nitrophenol              |
| 2,4-dichlorophenol                                     | pentachlorophenol          |
| 2,4-dimethylphenol                                     | phenol                     |
| 2,4-dinitrophenol                                      | 2,4,6-trichlorophenol      |
| 2,000 $\mu$ g/mL each in methylene chloride, 1mL/ampul |                            |
|  | cat. # 31694 (ea.)         |

**Phenols Fortification Mix, EPA 528** (12 components)

|                         |                |                            |     |
|-------------------------|----------------|----------------------------|-----|
| 4-chloro-3-methylphenol | 100 $\mu$ g/mL | 2-methyl-4,6-dinitrophenol | 500 |
| 2-chlorophenol          | 100            | 2-nitrophenol              | 100 |
| <i>o</i> -cresol        | 100            | 4-nitrophenol              | 500 |
| 2,4-dichlorophenol      | 100            | pentachlorophenol          | 500 |
| 2,4-dimethylphenol      | 100            | phenol                     | 100 |
| 2,4-dinitrophenol       | 500            | 2,4,6-trichlorophenol      | 100 |

In methanol, 1mL/ampul

cat. # 31695 (ea.)

**Method 529 (Nitroaromatics & Nitramines)****529 Internal Standard Mix**

|  |                            |
|--|----------------------------|
| 3,4-dinitrotoluene                           |                            |
| 2,000 $\mu$ g/mL in ethyl acetate, 1mL/ampul | cat. # 33901 (ea.) inquire |

**529 Surrogate Standard #1**

|   |                    |
|---|--------------------|
| 2-nitromesitylene                       |                    |
| 2,000 $\mu$ g/mL in methanol, 1mL/ampul | cat. # 33902 (ea.) |

**529 Surrogate Standard #2**

|   |                    |
|---|--------------------|
| 1,2,4-trimethyl-5-nitrobenzene          |                    |
| 2,000 $\mu$ g/mL in methanol, 1mL/ampul | cat. # 33903 (ea.) |

**529 Surrogate Standard #3**

|   |                    |
|---|--------------------|
| nitrobenzene-d5                                   |                    |
| 2,000 $\mu$ g/mL in methylene chloride, 1mL/ampul | cat. # 33904 (ea.) |

**Nitroaromatics and Nitramine Explosives in Drinking Water**

(14 components)

|  |                            |
|--|----------------------------|
| 3,5-dinitroaniline                               | 2-nitrotoluene             |
| 1,3-dinitrobenzene                               | 3-nitrotoluene             |
| 2-amino-4,6-dinitrotoluene                       | 4-nitrotoluene             |
| 4-amino-2,6-dinitrotoluene                       | RDX                        |
| 2,4-dinitrotoluene                               | tetryl                     |
| 2,6-dinitrotoluene                               | 1,3,5-trinitrobenzene      |
| nitrobenzene                                     | 2,4,6-trinitrotoluene      |
| 1,000 $\mu$ g/mL each in acetonitrile, 1mL/ampul | cat. # 33900 (ea.) inquire |

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**did you know?**

We have more than 2,000 pure, characterized, neat compounds in our inventory! If you do not see the EXACT mixture you need listed on any of these pages, contact us for a custom standard.

## Method 531.1, 531.2 (Carbamates)

### Internal Standard

4-bromo-3,5-dimethylphenyl-N-methylcarbamate (BDMC)  
 100 $\mu$ g/mL in methanol, 1mL/ampul  
 cat. # 32274 (ea.)

### 531.1 Performance Check Mix

|                        |                |                     |   |
|------------------------|----------------|---------------------|---|
| aldicarb sulfoxide     | 100 $\mu$ g/mL | 3-hydroxycarbofuran | 2 |
| BDMC                   | 10             | methiocarb          |   |
| In methanol, 1mL/ampul |                |                     |   |

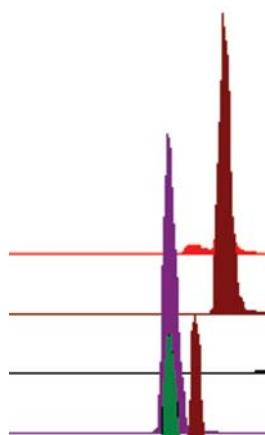
cat. # 32275 (ea.)

### 531.1 Carbamate Pesticide Calibration Mixture (10 components)

|  |                     |
|--|---------------------|
| aldicarb                                   | 3-hydroxycarbofuran |
| aldicarb sulfone                           | methiocarb          |
| aldicarb sulfoxide                         | methomyl            |
| carbaryl (Sevin)                           | oxamyl              |
| carbofuran                                 | propoxur (Baygon)   |
| 100 $\mu$ g/mL each in methanol, 1mL/ampul |                     |
|  | cat. # 32273 (ea.)  |

### 531.2 Carbamate Pesticide Calibration Mixture (11 components)

|   |                    |
|---|--------------------|
| aldicarb                                  | methiocarb         |
| aldicarb sulfone                          | methomyl           |
| aldicarb sulfoxide                        | 1-naphthol         |
| carbaryl (Sevin)                          | oxamyl             |
| carbofuran                                | propoxur (Baygon)  |
| 3-hydroxycarbofuran                       |                    |
| 100 $\mu$ g/mL in acetonitrile, 1mL/ampul |                    |
|   | cat. # 32435 (ea.) |



also available

See the LC Applications section for carbamate pesticides chromatograms page 507.

## Method 532 (Phenylurea Pesticides)

### Phenylurea Surrogate Mixture

carbazole monuron  
 500 $\mu$ g/mL each in methanol:acetonitrile (50:50), 1mL/ampul  
 cat. # 32433 (ea.)

### Phenylurea Pesticide Mixture (8 components)

|  |                    |
|--|--------------------|
| diflubenzuron  | propanil           |
| diuron   | siduron            |
| fluometuron  | tebuthiuron        |
| linuron  | thidiazuron        |
| 200 $\mu$ g/mL each in acetonitrile:acetone (90:10), 1mL/ampul |                    |
|  | cat. # 32434 (ea.) |

## Method 535 (Chloroacetanilide Herbicide Degradates)

### Method 535 Internal Standard

butachlor ESA sodium salt  
 100 $\mu$ g/mL in methanol, 1mL/ampul  
 cat. # 33202 (ea.)



### Method 535 Surrogate Standard

dimethachlor ESA sodium salt  
 100 $\mu$ g/mL in methanol, 1mL/ampul  
 cat. # 33203 (ea.)



### Method 535 Individual Compounds

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

| Compound                    | Solvent | Conc. | cat.# (ea.) | DICCO |
|-----------------------------|---------|-------|-------------|-------|
| acetochlor ESA sodium salt  | M       | 100   | 33092       |       |
| acetochlor OA               | M       | 100   | 33094       |       |
| alachlor ESA sodium salt    | M       | 100   | 33096       |       |
| alachlor OA                 | M       | 100   | 33099       |       |
| metolachlor ESA sodium salt | M       | 100   | 33200       |       |
| metolachlor OA              | M       | 100   | 33201       |       |

M=methanol

## Method 547 (Glyphosate)

### Glyphosate Standard

glyphosate  
 1,000 $\mu$ g/mL in DI water, 1mL/ampul  
 cat. # 32426 (ea.)

1,000 $\mu$ g/mL in DI water, 5mL/ampul  
 cat. # 32427 (ea.)

### AMPA (glyphosate metabolite)

aminomethyl phosphonic acid (AMPA)  
 100 $\mu$ g/mL in DI water, 1mL/ampul  
 cat. # 32428 (ea.)

## Method 549.2 (Paraquat/Diquat)

### Paraquat & Diquat Calibration Mix

diquat dibromide paraquat dichloride  
 1,000 $\mu$ g/mL each in water, 1mL/ampul  
 cat. # 32437 (ea.)

### Ultra Quat Reagent Solution

Use with Ultra Quat HPLC column. Dilute to 1 liter water, per instructions.  
 In water, 20mL/bottle  
 cat. # 32441 (ea.)



## 500 Series Methods

## Method 551.1 (Chlorinated Pesticides &amp; Herbicides)

**551.1 Internal Standard**

1-bromo-4-fluorobenzene

1,000 $\mu$ g/mL in acetone, 1mL/ampul

cat. # 31854 (ea.)

**551.1 Surrogate Standard**

decafluorobiphenyl

1,000 $\mu$ g/mL in acetone, 1mL/ampul

cat. # 31855 (ea.)

**Method 551.1 Pesticide/Herbicide Mix** (16 components)

|   |                               |  |  |
|---|-------------------------------|--|--|
| alachlor                                    | heptachlor                    |  |  |
| atrazine                                    | heptachlor epoxide (isomer B) |  |  |
| bromacil                                    | hexachlorobenzene             |  |  |
| cyanazine (Bladex)                          | hexachlorocyclopentadiene     |  |  |
| endrin                                      | methoxychlor                  |  |  |
| endrin aldehyde                             | metolachlor                   |  |  |
| endrin ketone                               | simazine                      |  |  |
| $\gamma$ -BHC (lindane)                     | trifluralin                   |  |  |
| 1,000 $\mu$ g/mL each in acetone, 1mL/ampul |                               |  |  |
| cat. # 32438 (ea.)                          |                               |  |  |

**Method 551.1 MTBE Lab Performance Check Mix**

(7 components)

|                         |               |                           |    |
|-------------------------|---------------|---------------------------|----|
| alachlor                | 83 $\mu$ g/mL | endrin                    | 30 |
| $\gamma$ -BHC (lindane) | 0.2           | hexachlorocyclopentadiene | 20 |
| bromacil                | 83            | trichloroethylene         | 30 |
| bromodichloromethane    | 30            |                           |    |

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

cat. # 32440 (ea.)

**Disinfection By-Product and Chlorinated Solvents Mix**

(19 components)

|   |                             |  |  |
|---|-----------------------------|--|--|
| bromochloroacetonitrile                     | dichloroacetonitrile        |  |  |
| bromodichloromethane                        | 1,1-dichloro-2-propane      |  |  |
| bromoform                                   | tetrachloroethylene         |  |  |
| carbon tetrachloride                        | trichloroacetonitrile       |  |  |
| chloroform                                  | 1,1,1-trichloroethane       |  |  |
| chloropicrin                                | 1,1,2-trichloroethane       |  |  |
| dibromoacetonitrile                         | trichloroethylene           |  |  |
| dibromochloromethane                        | 1,2,3-trichloropropane      |  |  |
| 1,2-dibromo-3-chloropropane (DBCP)          | 1,1,1-trichloro-2-propanone |  |  |
| 1,2-dibromoethane (EDB)                     |                             |  |  |
| 2,000 $\mu$ g/mL each in acetone, 1mL/ampul |                             |  |  |
| cat. # 30615 (ea.)                          |                             |  |  |

**Chloral Hydrate**

chloral hydrate

1,000 $\mu$ g/mL in acetonitrile, 1mL/ampul

cat. # 30609 (ea.)

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**Method 551.1 (Chlorinated Pesticides & Herbicides)***cont'd***Disinfection By-Product Mix** (7 components)

|                         |                             |
|-------------------------|-----------------------------|
| bromochloroacetonitrile | 1,1-dichloro-2-propanone    |
| chloropicrin            | trichloroacetonitrile       |
| dibromoacetonitrile     | 1,1,1-trichloro-2-propanone |
| dichloroacetonitrile    |                             |

2,000 $\mu$ g/mL each in acetone, 1mL/ampul

cat. # 30616 (ea.)

**Laboratory Performance Check Solution/ Pentane Extract**

(7 components)

|                       |               |                           |    |
|-----------------------|---------------|---------------------------|----|
| alachlor              | 83 $\mu$ g/mL | endrin                    | 30 |
| $\gamma$ -BHC         | 0.2           | hexachlorocyclopentadiene | 20 |
| bromacil              | 83            | trichloroethylene         | 30 |
| bromodichloromethane  | 30            |                           |    |
| In pentane, 1mL/ampul |               |                           |    |
|                       |               | cat. # 32442 (ea.)        |    |

**Methods 552, 552.1, 552.2, 552.3 (Haloacetic Acids and Dalapon)****Haloacetic Acid Mix** (9 components)

|                           |                       |
|---------------------------|-----------------------|
| bromochloroacetic acid    | monobromooacetic acid |
| bromodichloroacetic acid  | monochloroacetic acid |
| chlorodibromooacetic acid | tribromoacetic acid   |
| dibromoacetic acid        | trichloroacetic acid  |
| dichloroacetic acid       |                       |

1,000 $\mu$ g/mL each in methyl *tert*-butyl ether, 1mL/ampul

cat. # 31896 (ea.)

**Haloacetic Acid Methyl Ester Mix** (9 components)

|                              |                          |
|------------------------------|--------------------------|
| methyl bromochloroacetate    | methyl monobromoacetate  |
| methyl bromodichloroacetate  | methyl monochloroacetate |
| methyl chlorodibromooacetate | methyl tribromoacetate   |
| methyl dibromoacetate        | methyl trichloroacetate  |
| methyl dichloroacetate       |                          |

1,000 $\mu$ g/mL each in methyl *tert*-butyl ether, 1mL/ampul

cat. # 31897 (ea.)

**Haloacetic Acid Mix #1** (6 components)

|                        |                       |
|------------------------|-----------------------|
| bromochloroacetic acid | monobromooacetic acid |
| dibromoacetic acid     | monochloroacetic acid |
| dichloroacetic acid    | trichloroacetic acid  |

2,000 $\mu$ g/mL each in methyl *tert*-butyl ether, 1mL/ampul

cat. # 31644 (ea.)

**Haloacetic Acid Methyl Ester Mix #1** (6 components)

|                           |                          |
|---------------------------|--------------------------|
| methyl bromochloroacetate | methyl monobromoacetate  |
| methyl dibromoacetate     | methyl monochloroacetate |
| methyl dichloroacetate    | methyl trichloroacetate  |

1,000 $\mu$ g/mL each in methyl *tert*-butyl ether, 1mL/ampul

cat. # 31645 (ea.)

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

**Haloacetic Acid Mix #2 (9 components)**

|   |                |                       |       |
|---|----------------|-----------------------|-------|
| bromochloroacetic acid                        | 400 $\mu$ g/mL | monobromoacetic acid  | 400   |
| bromodichloroacetic acid                      | 400            | monochloroacetic acid | 600   |
| chlorodibromoacetic acid                      | 1,000          | tribromoacetic acid   | 2,000 |
| dibromoacetic acid                            | 200            | trichloroacetic acid  | 200   |
| dichloroacetic acid                           | 600            |                       |       |
| In methyl <i>tert</i> -butyl ether, 1mL/ampul |                |                       |       |
|   |                | cat. # 31646 (ea.)    |       |

**Haloacetic Acid Methyl Ester Mix #2 (9 components)**

|   |                |                          |       |
|---|----------------|--------------------------|-------|
| methyl bromochloroacetate                     | 400 $\mu$ g/mL | methyl dichloroacetate   | 600   |
| methyl bromodichloroacetate                   | 400            | methyl monobromoacetate  | 400   |
| methyl chlorodibromoacetate                   | 1,000          | methyl monochloroacetate | 600   |
| methyl dibromoacetate                         | 200            | methyl tribromoacetate   | 2,000 |
|   |                | methyl trichloroacetate  | 200   |
| In methyl <i>tert</i> -butyl ether, 1mL/ampul |                |                          |       |
|   |                | cat. # 31647 (ea.)       |       |

**Dalapon (2,2-dichloropropionic acid)**

dalapon

1,000 $\mu$ g/mL in acetonitrile, 1mL/ampul

cat. # 32432 (ea.)

1,000 $\mu$ g/mL in methanol, 1mL/ampul

cat. # 32253 (ea.)

2,000 $\mu$ g/mL in methanol, 1mL/ampul

cat. # 32056 (ea.)

**Dalapon Methyl Ester**

dalapon methyl ester

1,000 $\mu$ g/mL in methanol, 1mL/ampul

cat. # 32254 (ea.)

2,000 $\mu$ g/mL in hexane, 1mL/ampul

cat. # 32057 (ea.)

**Internal Standards and Surrogates**

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

| Compound                  | Solvent | Conc. | cat.# (ea.) | price |
|---------------------------|---------|-------|-------------|-------|
| <b>Internal Standard:</b> |         |       |             |       |
| 1,2,3-trichloropropane    | MTBE    | 1,000 | 31648       |       |

**Surrogates for Method 552, 552.1:**

|   |      |       |       |
|---|------|-------|-------|
| 2,3-dichloropropionic acid              | MTBE | 1,000 | 31650 |
| 3,5-dichlorobenzoic acid                | MTBE | 1,000 | 31652 |
| 3,5-dichlorobenzoic acid methyl ester   | MTBE | 1,000 | 31649 |
| 2,3-dichloropropionic acid methyl ester | MTBE | 1,000 | 31651 |

**Surrogates for Method 552.2:**

|                              |      |       |       |
|------------------------------|------|-------|-------|
| 2-bromopropionic acid        | MTBE | 1,000 | 31653 |
| 2,3-dibromopropionic acid    | MTBE | 1,000 | 31655 |
| methyl 2-bromopropionate     | MTBE | 1,000 | 31654 |
| methyl-2,3-dibromopropionate | MTBE | 1,000 | 31656 |

**Surrogates for Method 552.3:**

|                      |      |       |       |
|----------------------|------|-------|-------|
| 2-bromobutanoic acid | MTBE | 2,000 | 31881 |
| 2-bromobutyrate      | MTBE | 2,000 | 31882 |

MTBE = methyl *tert*-butyl ether

**Method 555 (Chlorinated Acids)**

**Chlorinated Acids by HPLC, Mix A (8 components)**

|  |                    |
|--|--------------------|
| acifluorfen (Blazer)                             | dicamba            |
| bentazon   | diclorprop         |
| chloramben                                       | picloram           |
| 2,4-D  | 2,4,5-TP (Silvex)  |
| 1,000 $\mu$ g/mL each in acetonitrile, 1mL/ampul |                    |
|  | cat. # 32431 (ea.) |

**Chlorinated Acids by HPLC, Mix B (8 components)**

|  |                    |
|--|--------------------|
| 2,4-DB   | MCPP (mecoprop)    |
| 3,5-dichlorobenzoic acid                         | 4-nitrophenol      |
| dinoseb  | pentachlorophenol  |
| MCPA   | 2,4,5-T            |
| 1,000 $\mu$ g/mL each in acetonitrile, 1mL/ampul |                    |
|  | cat. # 32430 (ea.) |

**Chlorinated Acid Herbicide Mix**

|  |                    |
|--|--------------------|
| 2,4-dichlorophenoxyacetic acid (2,4-D)           | 2,4,5-TP (Silvex)  |
| 1,000 $\mu$ g/mL each in acetonitrile, 1mL/ampul |                    |
|  | cat. # 32429 (ea.) |

**Drinking Water Odor Standard**

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

(+/-)-geosmin 2-methyisoborneol

|   |                    |
|---|--------------------|
| 100 $\mu$ g/mL in P&T methanol, 1mL/ampul | cat. # 30608 (ea.) |
|---|--------------------|

**did you know?**

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## 600 Series Methods

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

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

## Method 601 (Purgeable Hydrocarbons)

**VOA Purgeable Halocarbon Mix #1** (23 components)

|                           |                                   |
|---------------------------|-----------------------------------|
| bromodichloromethane      | 1,1-dichloroethene                |
| bromoform                 | <i>trans</i> -1,2-dichloroethene  |
| carbon tetrachloride      | 1,2-dichloropropane               |
| chlorobenzene             | <i>cis</i> -1,3-dichloropropene   |
| 2-chloroethyl vinyl ether | <i>trans</i> -1,3-dichloropropene |
| chloroform                | methylene chloride                |
| dibromochloromethane      | 1,1,2,2-tetrachloroethane         |
| 1,2-dichlorobenzene       | tetrachloroethene                 |
| 1,3-dichlorobenzene       | 1,1,1-trichloroethane             |
| 1,4-dichlorobenzene       | 1,1,2-trichloroethane             |
| 1,1-dichloroethane        | trichloroethene                   |
| 1,2-dichloroethane        |                                   |

2,000µg/mL each in P&T methanol, 1mL/ampul  
cat. # 30212 (ea.)

## Method 602 (Purgeable Aromatics)

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

|                     |                     |
|---------------------|---------------------|
| benzene             | 1,4-dichlorobenzene |
| chlorobenzene       | ethylbenzene        |
| 1,2-dichlorobenzene |                     |
| 1,3-dichlorobenzene | toluene             |

2,000µg/mL each in P&T methanol, 1mL/ampul  
cat. # 30035 (ea.)

## Method 603 (Acrolein/Acrylonitrile)

**Acrolein/Acrylonitrile**

|  |               |
|--|---------------|
| acrolein                               | acrylonitrile |
| 2,000µg/mL each in DI water, 1mL/ampul |               |

cat. # 30600 (ea.)

**Acrolein**

|  |  |
|--|--|
| 10,000µg/mL in P&T methanol, 1mL/ampul |  |
| cat. # 30499 (ea.)                     |  |

10,000µg/mL in water, 1mL/ampul  
cat. # 30478 (ea.)

**Acrylonitrile**

|                                       |  |
|---------------------------------------|--|
| 2,000µg/mL in P&T methanol, 1mL/ampul |  |
| cat. # 30246 (ea.)                    |  |

## free data

## Available on Our Website: Lot Certificates, Data Packs, and MSDSs

For complete information detailing manufacturing and testing for Restek inventoried reference standards, visit our website at [www.restek.com/datapacks](http://www.restek.com/datapacks). To view certificates and/or an MSDS, enter the catalog number of the product in the Search feature. For a free data pack (Adobe® PDF file), enter the catalog number and lot number of the product.

## Method 607 (Nitrosamines)

### 607 Nitrosamines Calibration Mix

|  |                        |
|--|------------------------|
| N-nitrosodimethylamine                       | N-nitrosodiphenylamine |
| N-nitroso-di- <i>n</i> -propylamine          |                        |
| 2,000 $\mu$ g/mL each in methanol, 1mL/ampul |                        |
| cat. # 31032 (ea.)                           |                        |

## Method 608 (Organochlorine Pesticides & PCBs)

### 608 Calibration Mix (16 components)

|  |                               |
|--|-------------------------------|
| aldrin   | dieldrin                      |
| $\alpha$ -BHC  | endosulfan I                  |
| $\beta$ -BHC   | endosulfan II                 |
| $\delta$ -BHC  | endosulfan sulfate            |
| $\gamma$ -BHC (lindane)                                | endrin                        |
| 4,4'-DDD   | endrin aldehyde               |
| 4,4'-DDE   | heptachlor                    |
| 4,4'-DDT   | heptachlor epoxide (isomer B) |
| 200 $\mu$ g/mL each in hexane:toluene (1:1), 1mL/ampul |                               |
| cat. # 32022 (ea.)                                     |                               |

### Organochlorine Pesticide System Evaluation Mix

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

### 608 Complete Kit

|                              |
|------------------------------|
| 32022: 608 Calibration Mix   |
| 32006: Aroclor 1016          |
| 32007: Aroclor 1221          |
| 32008: Aroclor 1232          |
| 32009: Aroclor 1242          |
| 32010: Aroclor 1248          |
| 32011: Aroclor 1254          |
| 32012: Aroclor 1260          |
| 32005: toxaphene             |
| 32021: chlordane (technical) |



Contains 1mL each of these mixtures.

cat. # 32060 (kit)

Please see page 425 for individual Aroclor, toxaphene, and chlordane information.

## Method 609 (Nitroaromatics/Isophorone)

### 609 Nitroaromatics & Isophorone Calibration Mix

|  |                    |
|--|--------------------|
| 2,4-dinitrotoluene                         | 2,6-dinitrotoluene |
| isophorone                                 | nitrobenzene       |
| 2,000 $\mu$ g/mL each in hexane, 1mL/ampul |                    |
| cat. # 31033 (ea.)                         |                    |

## did you know?

We have more than 2,000 pure, characterized, neat compounds in our inventory! If you do not see the EXACT mixture you need listed on any of these pages, contact us for a custom standard.

## Method 610 (Polycyclic Aromatic Hydrocarbons [PAHs])

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

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

2,000 $\mu$ g/mL each in methylene chloride, 1mL/ampul  
 cat. # 31011 (ea.)

### 610 PAH Calibration Mix A (16 components)

For HPLC/fluorescence detection.

|                      |                  |                        |       |
|----------------------|------------------|------------------------|-------|
| acenaphthene         | 1,000 $\mu$ g/mL | chrysene               | 500   |
| acenaphthylene       | 1,000            | dibenzo(a,h)anthracene | 500   |
| anthracene           | 1,000            | fluoranthene           | 500   |
| benzo(a)anthracene   | 500              | fluorene               | 1,000 |
| benzo(a)pyrene       | 500              | indeno(1,2,3-cd)pyrene | 500   |
| benzo(b)fluoranthene | 500              | naphthalene            | 1,000 |
| benzo(k)fluoranthene | 500              | phenanthrene           | 500   |
| benzo(ghi)perylene   | 500              | pyrene                 | 500   |

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

### 610 PAH Calibration Mix B (16 components)

For HPLC/UV detection.

|                      |                  |                        |       |
|----------------------|------------------|------------------------|-------|
| acenaphthene         | 1,000 $\mu$ g/mL | chrysene               | 100   |
| acenaphthylene       | 2,000            | dibenzo(a,h)anthracene | 200   |
| anthracene           | 100              | fluoranthene           | 200   |
| benzo(a)anthracene   | 100              | fluorene               | 200   |
| benzo(a)pyrene       | 100              | indeno(1,2,3-cd)pyrene | 100   |
| benzo(b)fluoranthene | 200              | naphthalene            | 1,000 |
| benzo(k)fluoranthene | 100              | phenanthrene           | 100   |
| benzo(ghi)perylene   | 200              | pyrene                 | 100   |

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

## Method 611 (Haloethers)

### 611 Haloethers Calibration Mix

|   |                             |
|---|-----------------------------|
| bis(2-chloroethoxy)methane                  | 4-bromophenyl phenyl ether  |
| bis(2-chloroethyl)ether                     | 4-chlorophenyl phenyl ether |
| bis(2-chloroisopropyl)ether                 |                             |
| 2,000 $\mu$ g/mL each in acetone, 1mL/ampul |                             |

cat. # 31034 (ea.)

## Method 612 (Chlorinated Hydrocarbons)

### 612 Chlorinated Hydrocarbons Calibration Mix (9 components)

|                     |                           |
|---------------------|---------------------------|
| 2-chloronaphthalene | hexachlorobutadiene       |
| 1,2-dichlorobenzene | hexachlorocyclopentadiene |
| 1,3-dichlorobenzene | hexachloroethane          |
| 1,4-dichlorobenzene | 1,2,4-trichlorobenzene    |
| hexachlorobenzene   |                           |

2,000 $\mu$ g/mL each in isoctane, 1mL/ampul  
 cat. # 31035 (ea.)

## 600 Series Methods

## Method 615 (Chlorinated Acid Herbicides)

**Herbicide Surrogate****Free Acid Form:**

2,4-dichlorophenylacetic acid (DCAA)

200 $\mu$ g/mL in methanol, 1mL/ampul

cat. # 32049 (ea.)

1,000 $\mu$ g/mL in acetone, 1mL/ampul

cat. # 32439 (ea.)

**Derivatized Form:**

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

200 $\mu$ g/mL in hexane, 1mL/ampul

cat. # 32050 (ea.)

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

2,4-D

dicamba

2,4-DB

dichlorprop

2,4,5-T

dinoseb

2,4,5-TP

200 $\mu$ g/mL each in methanol, 1mL/ampul

cat. # 32054 (ea.)

**Derivatized Form:**

2,4-D methyl ester

dicamba methyl ester

2,4-DB methyl ester

dichlorprop methyl ester

2,4,5-T methyl ester

dinoseb methyl ether

2,4,5-TP methyl ester

200 $\mu$ g/mL each in hexane, 1mL/ampul

cat. # 32055 (ea.)

**Herbicide Mix #2****Free Acid Form:**

dalapon

2,000 $\mu$ g/mL in methanol, 1mL/ampul

cat. # 32056 (ea.)

**Derivatized Form:**

dalapon methyl ester

2,000 $\mu$ g/mL in hexane, 1mL/ampul

cat. # 32057 (ea.)

**Herbicide Mix #3****Free Acid Form:**

MCPP

MCPP

20,000 $\mu$ g/mL each in methanol, 1mL/ampul

cat. # 32058 (ea.)

**Derivatized Form:**

MCPP methyl ester

MCPP methyl ester

20,000 $\mu$ g/mL each in hexane, 1mL/ampul

cat. # 32059 (ea.)

**also available**

Additional chlorinated acid herbicides mixes:

see Method 555, page 419

and Method 8321, page 440

## Method 624 (Purgeable Halocarbons)

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

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

**624 Internal Standard Mix**

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

**624 Surrogate Standard Mix**

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

**Surrogate Standard**

|  |  |
|--|--|
| 4-bromofluorobenzene                             | $\alpha,\alpha,\alpha$ -trifluorotoluene |
| 2,500 $\mu$ g/mL each in P&T methanol, 1mL/ampul | cat. # 30484 (ea.)                       |

**624 Calibration Mix #1 (gases)**

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

**624 Calibration Mix #2** (12 components)

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

**624 Calibration Mix #3** (14 components)

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

### Method 624 (Purgeable Halocarbons) cont'd

#### 624 Complete Kit

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

Contains 1mL each of these mixtures.

cat. # 30244 (kit)



#### 624 Kit

30020: 624 Calibration Mix #1  
 30021: 624 Calibration Mix #2  
 30022: 624 Calibration Mix #3  
 30023: 624 Internal Standard Mix

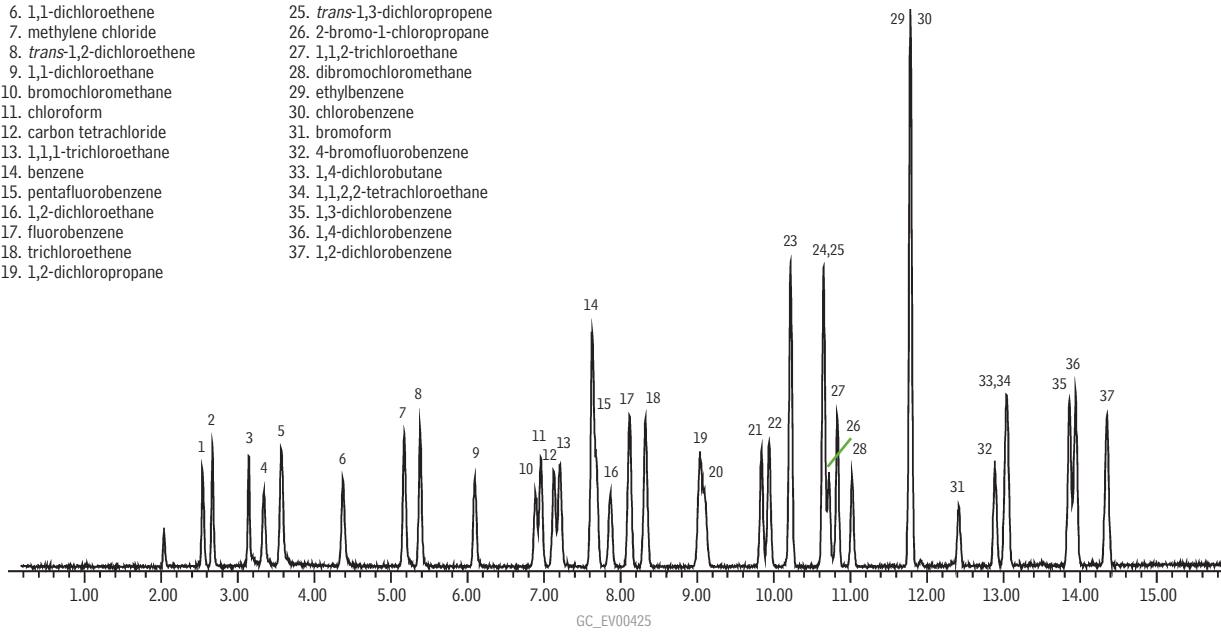
Contains 1mL each of these mixtures.

cat. # 30055 (kit)



### EPA Method 624 on an Rtx®-VMS column.

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



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

See page 90 for more information.

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

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

## 600 Series Methods

## Method 625 (Semivolatiles)

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

|                             |                            |
|-----------------------------|----------------------------|
| acenaphthene                | di-n-butylphthalate        |
| acenaphthylene              | 4,6-dinitro-2-methylphenol |
| anthracene                  | 2,4-dinitrophenol          |
| benzo(a)anthracene          | 2,4-dinitrotoluene         |
| benzo(a)pyrene              | 2,6-dinitrotoluene         |
| benzo(b)fluoranthene        | di-n-octylphthalate        |
| benzo(ghi)perylene          | diphenylamine*             |
| benzo(k)fluoranthene        | fluoranthene               |
| benzyl butyl phthalate      | fluorene                   |
| bis(2-chloroethoxy)methane  | hexachlorobenzene          |
| bis(2-chloroethyl)ether     | hexachloro-1,3-butadiene   |
| bis(2-chloroisopropyl)ether | hexachlorocyclopentadiene* |
| bis(2-ethylhexyl)phthalate  | hexachloroethane           |
| 4-bromophenyl phenyl ether  | indeno(1,2,3-cd)pyrene     |
| 4-chloro-3-methylphenol     | isophorone                 |
| 2-chloronaphthalene         | naphthalene                |
| 2-chlorophenol              | nitrobenzene               |
| 4-chlorophenyl phenyl ether | 2-nitrophenol              |
| chrysene                    | 4-nitrophenol              |
| dibenzo(a,h)anthracene      | N-nitrosodimethylamine*    |
| 1,2-dichlorobenzene         | N-nitroso-di-n-propylamine |
| 1,3-dichlorobenzene         | pentachlorophenol          |
| 1,4-dichlorobenzene         | phenanthrene               |
| 2,4-dichlorophenol          | phenol                     |
| diethylphthalate            | pyrene                     |
| 2,4-dimethylphenol          | 1,2,4-trichlorobenzene     |
| dimethylphthalate           | 2,4,6-trichlorophenol      |

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

\*Listed as an "additional compound" in Method 625 (listed compound N-nitrosodiphenylamine decomposes to MegaMix component diphenylamine). The six other "additional compounds" are components in other Restek reference mixes used for Method 625: benzidine is included in cat. # 31030 (page 420); β-BHC, δ-BHC, endosulfan I, endosulfan II, endrin are in cat. # 32291 (page 428) and cat. # 32415 (page 429).

**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 (cat. # 32060, page 421).

|        |                                     |
|--------|-------------------------------------|
| 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    |

Contains 1mL each of these mixtures.

cat. # 31036 (kit)



Kit components described on pages 420–421.

**Individual Semivolatile Surrogate and Internal Standards for EPA Methods**

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

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

D= methylene chloride

M = methanol

**SV Internal Standard Mix**

|  |                    |
|--|--------------------|
| acenaphthene-d10                                 | naphthalene-d8     |
| chrysene-d12                                     | perylene-d12       |
| 1,4-dichlorobenzene-d4                           | phenanthrene-d10   |
| 2,000µg/mL each in methylene chloride, 1mL/ampul | cat. # 31206 (ea.) |

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

**Antifoam Agent for Purge & Trap Samples**

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

Neat, 1mL/ampul

cat. # 31822 (ea.)

No data pack available.

**also available**

Try Restek's 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 78 for more information.

## Tuning Mixtures

### VOA Tuning Compound

4-bromofluorobenzene

5,000 $\mu$ g/mL in P&T methanol, 1mL/ampul

cat. # 30003 (ea.)

### SV Tuning Compound

decafluorotriphenylphosphine (DFTPP)

2,500 $\mu$ g/mL in methylene chloride, 1mL/ampul

cat. # 31001 (ea.)

### PFTBA (MS Tuning Compound)

perfluorotributylamine (PFTBA)

Neat, 1mL/ampul

cat. # 30482 (ea.)

Neat, 1g

cat. # 33027 (ea.)

No data pack available.

### GC/MS Tuning Mixture

benzidine

DFTPP

4,4'-DDT

pentachlorophenol

1,000 $\mu$ g/mL each in methylene chloride, 1mL/ampul

cat. # 31615 (ea.)

## Technical Chlordane, Toxaphene Solutions

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

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

H = hexane

I = isoctane

M = methanol

## also available

For a complete listing of solutions of individual environmental compounds, please see **pages 399-404**.

## Aroclor Solutions

Volume is 1mL/ampul. Concentration is  $\mu$ g/mL unless otherwise noted.

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

A = acetone

H = hexane

I = isoctane

TO = transformer oil (PCB-free)



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## 8000 Series Methods

## 8000 Series Methods - Resource Conservation and Recovery Act (RCRA)

| US EPA Method No. | Compound Class                                     | US EPA Method No.  | Compound Class                          |
|-------------------|--|--------------------|---|
| 418.1             | Total Recoverable Petroleum Hydrocarbons (TRPH)    | 8095               | Explosives by GC                        |
| 1311              | Toxicity Characteristics Leaching Procedure (TCLP) | 8100               | Polycyclic Aromatic Hydrocarbons        |
| 1664              | Oil & Grease                                       | 8140, 8141         | Organophosphorus Pesticides             |
| 3500              | Organic Extraction Surrogates                      | 8150, 8151, 8151A  | Chlorinated Acid Herbicides             |
| 8010              | Halogenated Volatile Organics                      | 8240               | Volatile Organic Compounds (VOC)        |
| 8011              | 1,2-Dibromoethane, 1,2-Dibromo-3-Chloropropane     | 8260, 8260A, 8260B | Volatile Organic Compounds (VOC)        |
| 8020              | Aromatic Volatile Organics                         | 8270D, 8270C       | Semivolatile Organic Compounds          |
| 8021              | Volatile Organics                                  | 8310               | Polycyclic Aromatic Hydrocarbons (PAHs) |
| 8040              | Phenols  | 8315               | Aldehydes/Ketones-DNPH by HPLC          |
| 8061A             | Phthalate Esters                                   | 8321               | Chlorinated Acids by HPLC               |
| 8080, 8081        | Chlorinated Pesticides                             | 8330               | Nitroaromatics and Nitramines by HPLC   |
| 8082, 8082A       | PCBs   |                    |   |

## Method 418.1 (Total Recoverable Petroleum Hydrocarbons [TRPH])

**418.1 Calibration Mix**

|               |             |          |       |
|---------------|-------------|----------|-------|
| chlorobenzene | 25.0% (v/v) | isoctane | 37.5% |
| n-hexadecane  | 37.5%       |          |       |
| 1mL/ampul     |             |          |       |

cat. # 30080 (ea.)

## Method 1311 (Toxicity Characteristics Leaching Procedure [TCLP])

**TCLP VOA Mix** (11 components)

|  |                    |
|--|--------------------|
| benzene  | 1,2-dichloroethane |
| 2-butanol (MEK)  | 1,1-dichloroethene |
| carbon tetrachloride                                     | tetrachloroethene  |
| chlorobenzene  | trichloroethene    |
| chloroform   | vinyl chloride     |
| 1,4-dichlorobenzene                                      |                    |
| 2,000µg/mL each in P&T methanol:water (90:10), 1mL/ampul |                    |
| cat. # 30024 (ea.)                                       |                    |

**TCLP Acid Mix**

|  |                       |
|--|-----------------------|
| 2-methylphenol                         | pentachlorophenol     |
| 3-methylphenol                         | 2,4,5-trichlorophenol |
| 4-methylphenol                         | 2,4,6-trichlorophenol |
| 2,000µg/mL each in methanol, 1mL/ampul |                       |

cat. # 31027 (ea.)

**TCLP B/N Mix** (7 components)

|                                       |                  |
|---------------------------------------|------------------|
| 1,4-dichlorobenzene                   | hexachloroethane |
| 2,4-dinitrotoluene                    | nitrobenzene     |
| hexachlorobenzene                     | pyridine         |
| hexachlorobutadiene                   |                  |
| 2,000µg/mL each in acetone, 1mL/ampul |                  |
| cat. # 31028 (ea.)                    |                  |

**TCLP Pesticide Mix**

|                 |                               |
|-----------------|-------------------------------|
| γ-BHC (lindane) | heptachlor epoxide (isomer B) |
| endrin          | methoxychlor                  |
| heptachlor      |                               |

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

cat. # 32013 (ea.)

## Method 1311 (Toxicity Characteristics Leaching Procedure [TCLP]) cont'd

**TCLP Herbicide Mix**

|  |                    |
|--|--------------------|
| 2,4-D (free acid)                      | Silvex (free acid) |
| 2,000µg/mL each in methanol, 1mL/ampul | cat. # 32014 (ea.) |

**TCLP Toxaphene Mix**

|                                   |                    |
|-----------------------------------|--------------------|
| toxaphene                         |                    |
| 2,000µg/mL in methanol, 1mL/ampul | cat. # 32015 (ea.) |

**TCLP Chlordane Mix**

|                                   |                    |
|-----------------------------------|--------------------|
| chlordane (technical)             |                    |
| 2,000µg/mL in methanol, 1mL/ampul | cat. # 32016 (ea.) |

## Method 1664 (Oil &amp; Grease)

**1664 Oil & Grease Mix**

|                                       |                    |
|---------------------------------------|--------------------|
| hexadecane                            | stearic acid       |
| 4,000µg/mL each in acetone, 5mL/ampul | cat. # 31457 (ea.) |

See page 361 for Resprep Oil &amp; Grease SPE Disks.

## 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 1mL and 5mL packaging.

See Method 8270, pages 435-438.

## did you know?

Restek reference materials include a silanized vial for sample transfer.

### Method 8010 (Halogenated Volatile Organics)

**Note:** Method 8010 does not specify internal standards to be used. The analyst must select appropriate internal standards based on the particular samples being analyzed. Potential internal standards are listed on page 423.

#### 624 Internal Standard Mix

|  |                    |
|--|--------------------|
| bromochloromethane   | 1,4-dichlorobutane |
| 2-bromo-1-chloropropane  |                    |
| 1,500 $\mu$ g/mL each in P&T methanol, 1mL/ampul<br>cat. # 30023 (ea.) |                    |

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

|  |                                  |
|--|----------------------------------|
| bromomethane   | dichlorodifluoromethane (CFC-12) |
| chloroethane   | trichlorofluoromethane (CFC-11)  |
| chloromethane  | vinyl chloride                   |
| 200 $\mu$ g/mL each in P&T methanol, 1mL/ampul<br>cat. # 30439 (ea.)   |                                  |
| 2,000 $\mu$ g/mL each in P&T methanol, 1mL/ampul<br>cat. # 30042 (ea.) |                                  |

#### 8010A Calibration Mix #2 (15 components)

|  |                                   |
|--|-----------------------------------|
| benzyl chloride  | <i>trans</i> -1,2-dichloroethene  |
| bromodichloromethane   | <i>cis</i> -1,3-dichloropropene   |
| bromoform  | <i>trans</i> -1,3-dichloropropene |
| carbon tetrachloride   | methylene chloride                |
| chlorobenzene  | tetrachloroethene                 |
| 1,2-dichlorobenzene  | trichloroethene                   |
| 1,3-dichlorobenzene  | 1,2,3-trichloropropane            |
| 1,1-dichloroethene   |                                   |
| 2,000 $\mu$ g/mL each in P&T methanol, 1mL/ampul<br>cat. # 30056 (ea.) |                                   |

#### 8010A Calibration Mix #3 (13 components)

|  |                           |
|--|---------------------------|
| bromobenzene   | 1,2-dichloroethane        |
| 2-chloroethyl vinyl ether  | 1,2-dichloropropane       |
| chloroform   | 1,1,1,2-tetrachloroethane |
| dibromochloromethane   | 1,1,2,2-tetrachloroethane |
| dibromomethane   | 1,1,1-trichloroethane     |
| 1,4-dichlorobenzene  | 1,1,2-trichloroethane     |
| 1,1-dichloroethane   |                           |
| 2,000 $\mu$ g/mL each in P&T methanol, 1mL/ampul<br>cat. # 30057 (ea.) |                           |

#### 8010B Calibration Mix #4

|                             |                                     |
|-----------------------------|-------------------------------------|
| allyl chloride              | 1,2-dibromoethane                   |
| 1-chlorohexane              | <i>cis</i> -1,4-dichloro-2-butene   |
| 4-chlorotoluene             | <i>trans</i> -1,4-dichloro-2-butene |
| 1,2-dibromo-3-chloropropane |                                     |

2,000 $\mu$ g/mL each in P&T methanol, 1mL/ampul

cat. # 30058 (ea.)

#### BTEX Standard

|   |                  |
|---|------------------|
| benzene   | <i>m</i> -xylene |
| ethylbenzene  | <i>o</i> -xylene |
| toluene   | <i>p</i> -xylene |
| 200 $\mu$ g/mL each in P&T methanol, 1mL/ampul<br>cat. # 30051 (ea.)  |                  |
| 2,000 $\mu$ g/mL each in P&T methanol, 1mL/ampul<br>cat. # 30213 (ea.)  |                  |
| 2,000 $\mu$ g/mL each in P&T methanol ( <i>m</i> -xylene and <i>p</i> -xylene at 1,000 $\mu$ g/mL), 1mL/ampul<br>cat. # 30488 (ea.) |                  |



To analyze compounds listed in Methods 8010 and 8020 concurrently, add BTEX Standard to the calibration curve mix (see above).

### Method 8010 (Halogenated Volatile Organics) cont'd

#### BTEX Gas Mix

|              |                  |
|--------------|------------------|
| benzene      | <i>m</i> -xylene |
| ethylbenzene | <i>o</i> -xylene |
| toluene      | <i>p</i> -xylene |

#### Cylinder Construction: Cylinder Fitting:

aluminum  
CGA-180 outlet

#### Spectra 104L Cylinders:

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



#### Scotty 110L Cylinders (Pi-marked Cylinders for EU Regulations):

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



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

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

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

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

Requires a high-purity VOC single-stage regulator. See page 386.  
No data pack available.

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

#### 8011 Calibration Mix—EDB/DBCP

|  |  |
|--|--|
| 1,2-dibromo-3-chloropropane (DBCP)                                     |  |
| 1,2-dibromoethane (EDB)  |  |
| 2,000 $\mu$ g/mL each in P&T methanol, 1mL/ampul<br>cat. # 30062 (ea.) |  |

### Method 8020 (Aromatic Volatile Organics)

#### Internal and Surrogate Standards

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

| Compound                                 | Solvent | Conc. | cat.# (ea.) | PRICE |
|--|---------|-------|-------------|-------|
| 4-bromofluorobenzene                     | PTM     | 2,000 | 30026       |       |
| 1,4-difluorobenzene                      | PTM     | 2,000 | 30032       |       |
| fluorobenzene                            | PTM     | 2,000 | 30030       |       |
| $\alpha,\alpha,\alpha$ -trifluorotoluene | PTM     | 2,000 | 30048       |       |

PTM = Purge & trap grade methanol

#### 8020A Calibration Mix (10 components)

|  |                  |
|--|------------------|
| benzene  | ethylbenzene     |
| chlorobenzene  | toluene          |
| 1,2-dichlorobenzene  | <i>m</i> -xylene |
| 1,3-dichlorobenzene  | <i>o</i> -xylene |
| 1,4-dichlorobenzene  | <i>p</i> -xylene |
| 2,000 $\mu$ g/mL each in P&T methanol, 1mL/ampul<br>cat. # 30222 (ea.) |                  |



## 8000 Series Methods

## Method 8021 (Volatile Organics)

**502.2 Internal Standard Mix #2**

2-bromo-1-chloropropane      fluorobenzene  
 2,000 $\mu$ g/mL each in P&T methanol, 1mL/ampul  
 cat. # 30041 (ea.)

**8021 Surrogate Mix**

2-bromochlorobenzene      1,4-dichlorobutane  
 1,500 $\mu$ g/mL each in P&T methanol, 1mL/ampul  
 cat. # 30086 (ea.)

**8021/502.2 Surrogate Mix #1**

1-bromo-2-chloroethane      fluorobenzene  
 1-chloro-3-fluorobenzene  
 2,000 $\mu$ g/mL each in P&T methanol, 1mL/ampul  
 cat. # 30463 (ea.)

**8021/502.2 Surrogate Mix #2**

1-bromo-2-chloroethane      1-chloro-3-fluorobenzene  
 4-bromochlorobenzene      fluorobenzene  
 2,000 $\mu$ g/mL each in P&T methanol, 1mL/ampul  
 cat. # 30464 (ea.)

## Method 8040 (Phenols)

**8040 Surrogate Mix**

2-fluorophenol      2,4,6-tribromophenol  
 2,000 $\mu$ g/mL each in isopropanol, 1mL/ampul  
 cat. # 31090 (ea.)

**8040 Phenols Mix #1** (9 components)

4-chloro-3-methylphenol      4-nitrophenol  
 2,4-dichlorophenol      pentachlorophenol  
 2-methyl-4,6-dinitrophenol      phenol  
 3-methylphenol      2,4,6-trichlorophenol  
 2-nitrophenol  
 2,000 $\mu$ g/mL each in isopropanol, 1mL/ampul  
 cat. # 31088 (ea.)

**8040 Phenols Mix #2** (9 components)

*sec*-butyl-4,6-dinitrophenol (dinoseb)      2-methylphenol  
 2-chlorophenol      4-methylphenol  
 2,6-dichlorophenol      2,3,4,6-tetrachlorophenol  
 2,4-dimethylphenol      2,4,5-trichlorophenol  
 2,4-dinitrophenol  
 2,000 $\mu$ g/mL each in isopropanol, 1mL/ampul  
 cat. # 31089 (ea.)

## Method 8061A (Phthalate Esters)

**8061A Matrix Spike Solution**

benzyl butyl phthalate      bis(2-ethylhexyl)phthalate  
 2,000 $\mu$ g/mL each in acetone, 1mL/ampul  
 cat. # 31846 (ea.)

**Benzyl Benzoate (Internal Standard)**

5,000 $\mu$ g/mL in hexane, 1mL/ampul  
 cat. # 31847 (ea.)

**Method 8061A (Phthalate Esters) cont'd****8061A Surrogate Standard**

dibenzyl phthalate      diphenyl phthalate  
 diphenyl isophthalate  
 500 $\mu$ g/mL each in acetone, 1mL/ampul  
 cat. # 31848 (ea.)

**EPA 8061A Phthalate Esters Mixture** (15 components)

benzyl butyl phthalate      di-*n*-hexyl phthalate  
 bis(2-*n*-butyloxyethyl)phthalate      dimethylphthalate  
 bis(2-ethoxyethyl)phthalate      di-nonyl phthalate  
 bis(2-ethylhexyl)phthalate (diocyl)      di-*n*-octyl phthalate  
 bis(2-methoxyethyl)phthalate      dipentylphthalate  
 bis(4-methyl-2-pentyl)phthalate      phthalic acid dicyclohexyl ester  
 di-*n*-butylphthalate      phthalic acid diisobutyl ester  
 diethylphthalate  
 1,000 $\mu$ g/mL each in hexane:acetone (80:20), 1mL/ampul  
 cat. # 33227 (ea.)

**NEW!****EPA 8061A Hexyl 2-Ethylhexyl Phthalate Standard**

hexyl 2-ethylhexyl phthalate  
 1,000 $\mu$ g/mL in hexane:acetone (80:20), 1mL/ampul  
 cat. # 33228 (ea.)

**NEW!****EPA 8061A Phthalate Esters Kit**

33227: EPA 8061A Phthalate Esters Mixture  
 33228: EPA 8061A Hexyl 2-Ethylhexyl Phthalate Standard  
 Contains 1mL each of these mixtures.  
 cat. # 33229 (kit)

**NEW!**

## Method 8080, 8081 (Chlorinated Pesticides)

**Organochlorine Pesticide Mix AB #1** (20 components)

aldrin      dieleadrin  
 $\alpha$ -BHC      endosulfan I  
 $\beta$ -BHC      endosulfan II  
 $\delta$ -BHC      endosulfan sulfate  
 $\gamma$ -BHC (lindane)      endrin  
 $\alpha$ -chlordane      endrin aldehyde  
 $\gamma$ -chlordane      endrin ketone  
 4,4'-DDD      heptachlor  
 4,4'-DDE      heptachlor epoxide (isomer B)  
 4,4'-DDT      methoxychlor  
 200 $\mu$ g/mL each in hexane:toluene (1:1), 1mL/ampul  
 cat. # 32291 (ea.)

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**Method 8080, 8081 (Chlorinated Pesticides) cont'd**

**Organochlorine Pesticide Mix AB #2** (20 components)

|                         |              |                               |    |
|-------------------------|--------------|-------------------------------|----|
| aldrin                  | 8 $\mu$ g/mL | dieldrin                      | 16 |
| $\alpha$ -BHC           | 8            | endosulfan I                  | 8  |
| $\beta$ -BHC            | 8            | endosulfan II                 | 16 |
| $\delta$ -BHC           | 8            | endosulfan sulfate            | 16 |
| $\gamma$ -BHC (lindane) | 8            | endrin                        | 16 |
| $\alpha$ -chlordane     | 8            | endrin aldehyde               | 16 |
| $\gamma$ -chlordane     | 8            | endrin ketone                 | 16 |
| 4,4'-DDD                | 16           | heptachlor                    | 8  |
| 4,4'-DDE                | 16           | heptachlor epoxide (isomer B) | 8  |
| 4,4'-DDT                | 16           | methoxychlor                  | 80 |

In hexane:toluene (1:1), 1mL/ampul

cat. # 32292 (ea.)

**Organochlorine Pesticide Mix AB # 3** (20 components)

|                         |                               |
|-------------------------|-------------------------------|
| aldrin                  | dieldrin                      |
| $\alpha$ -BHC           | endosulfan I                  |
| $\beta$ -BHC            | endosulfan II                 |
| $\delta$ -BHC           | endosulfan sulfate            |
| $\gamma$ -BHC (lindane) | endrin                        |
| $\alpha$ -chlordane     | endrin aldehyde               |
| $\gamma$ -chlordane     | endrin ketone                 |
| 4,4'-DDD                | heptachlor                    |
| 4,4'-DDE                | heptachlor epoxide (isomer B) |
| 4,4'-DDT                | methoxychlor                  |

2,000 $\mu$ g/mL each in hexane:toluene (1:1), 1mL/ampul

cat. # 32415 (ea.)

**Pesticide Surrogate Mix**

decachlorobiphenyl 2,4,5,6-tetrachloro-*m*-xylene

200 $\mu$ g/mL each in acetone, 1mL/ampul

cat. # 32000 (ea.)

200 $\mu$ g/mL each in acetone, 5mL/ampul

cat. # 32457 (ea.)

**NEW!**

**Pesticide Surrogate Mix**

decachlorobiphenyl 200 $\mu$ g/mL 2,4,5,6-tetrachloro-*m*-xylene 100

In acetone, 1mL/ampul

cat. # 32453 (ea.)

**Method 8082, 8082A (PCBs)**

**PCB Congener Mix, Method 8082A** (19 components)

|  |
|--|
| 2-chlorobiphenyl (BZ #1)                           |
| 2,2-dichlorobiphenyl (BZ #5)                       |
| 2,2',5-trichlorobiphenyl (BZ #18)                  |
| 2,4',5-trichlorobiphenyl (BZ #31)                  |
| 2,2',3,5-tetrachlorobiphenyl (BZ #44)              |
| 2,2',5,5'-tetrachlorobiphenyl (BZ #52)             |
| 2,3',4,4'-tetrachlorobiphenyl (BZ #66)             |
| 2,2',3,4,5'-pentachlorobiphenyl (BZ #87)           |
| 2,2',4,5,5'-pentachlorobiphenyl (BZ #101)          |
| 2,3,3',4,6-pentachlorobiphenyl (BZ #110)           |
| 2,2',3,4,4',5'-hexachlorobiphenyl (BZ #138)        |
| 2,2',3,4,5,5'-hexachlorobiphenyl (BZ #141)         |
| 2,2',3,5,5,6-hexachlorobiphenyl (BZ #151)          |
| 2,2',4,4',5,5'-hexachlorobiphenyl (BZ #153)        |
| 2,2',3,3',4,4',5-heptachlorobiphenyl (BZ #170)     |
| 2,2',3,4,4',5,5'-heptachlorobiphenyl (BZ #180)     |
| 2,2',3,4,4',5,6-heptachlorobiphenyl (BZ #183)      |
| 2,2',3,4,5,6-heptachlorobiphenyl (BZ #187)         |
| 2,2',3,3',4,4',5,5',6-nonachlorobiphenyl (BZ #206) |

100 $\mu$ g/mL each in isoctane, 1mL/ampul

cat. # 32416 (ea.)

**Method 8095 (Explosives by GC)**

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

**8095 Surrogate**

3,4-dinitrotoluene

1,000 $\mu$ g/mL in methanol, 1mL/ampul

cat. # 31452 (ea.) enquire

**8095 Surrogate**

2-methyl-4-nitroaniline

1,000 $\mu$ g/mL in methanol, 1mL/ampul

cat. # 31612 (ea.) enquire

**8095 Matrix Spike Mix A** (10 components)

|   |                            |
|---|----------------------------|
| 2-amino-4,6-dinitrotoluene  | HMX*                       |
| 4-amino-2,6-dinitrotoluene  | RDX                        |
| 1,3-dinitrobenzene  | tetryl                     |
| 2,4-dinitrotoluene  | 1,3,5-trinitrobenzene      |
| 2,6-dinitrotoluene  | 2,4,6-trinitrotoluene      |
| 200 $\mu$ g/mL each in acetonitrile (*HMX at 2,000 $\mu$ g/mL), 1mL/ampul |                            |
|   | cat. # 31609 (ea.) enquire |

**8095 Matrix Spike Mix B** (7 components)

|  |                            |
|--|----------------------------|
| 3,5-dinitroaniline*  | 3-nitrotoluene             |
| nitrobenzene   | 4-nitrotoluene             |
| nitroglycerine   | PETN                       |
| 2-nitrotoluene   |                            |
| 1,000 $\mu$ g/mL each in acetonitrile (*3,5-dinitroaniline at 200 $\mu$ g/mL), 1mL/ampul |                            |
|  | cat. # 31610 (ea.) enquire |

**8095 Calibration Mix A** (10 components)

|  |                            |
|--|----------------------------|
| 2-amino-4,6-dinitrotoluene                       | HMX                        |
| 4-amino-2,6-dinitrotoluene                       | RDX                        |
| 1,3-dinitrobenzene                               | tetryl                     |
| 2,4-dinitrotoluene                               | 1,3,5-trinitrobenzene      |
| 2,6-dinitrotoluene                               | 2,4,6-trinitrotoluene      |
| 1,000 $\mu$ g/mL each in acetonitrile, 1mL/ampul |                            |
|  | cat. # 31607 (ea.) enquire |

**8095 Calibration Mix B** (7 components)

|  |                            |
|--|----------------------------|
| 3,5-dinitroaniline*  | 3-nitrotoluene             |
| nitrobenzene   | 4-nitrotoluene             |
| nitroglycerine   | PETN                       |
| 2-nitrotoluene   |                            |
| 5,000 $\mu$ g/mL each in acetonitrile (*3,5-dinitroaniline at 1,000 $\mu$ g/mL), 1mL/ampul |                            |
|  | cat. # 31608 (ea.) enquire |

**References (Not available from Restek)**

<sup>1</sup>US 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.

<sup>2</sup>M. E. Walsh, T. Ranney, J. Chromatogr. Sci., Vol. 36, pp. 406-416, August 1998.

**also available**

Method 8095 single-component explosives solutions. See next page.

## 8000 Series Methods

## Method 8095 (Explosives by GC) cont'd

**Single-Component Explosives Solutions**Volume is 1mL/ampul. Concentration is  $\mu\text{g}/\text{mL}$ .

| Compound                            | Solvent | Conc. | cat.# (ea.) | price   |
|-------------------------------------|---------|-------|-------------|---------|
| 2-amino-4,6-dinitrotoluene          | ACN     | 1,000 | 31670       | enquire |
| 4-amino-2,6-dinitrotoluene          | ACN     | 1,000 | 31671       | enquire |
| ammonium picrate                    | ACN     | 2,000 | 31890       | enquire |
| 3,5-dinitroaniline                  | ACN     | 1,000 | 31661       | enquire |
| 1,3-dinitrobenzene                  | ACN     | 1,000 | 31662       | enquire |
| 1,4-dinitrobenzene                  | ACN     | 2,000 | 33205       | enquire |
| 2,4-dinitrotoluene                  | ACN     | 1,000 | 31663       | enquire |
| 2,6-dinitrotoluene                  | ACN     | 1,000 | 31664       | enquire |
| EGDN                                | M       | 1,000 | 31601       | enquire |
| HMX                                 | ACN     | 1,000 | 31665       | enquire |
| nitrobenzene                        | ACN     | 1,000 | 31657       | enquire |
| nitroglycerin                       | M       | 1,000 | 31498       | enquire |
| nitroguanidine                      | M       | 1,000 | 31602       | enquire |
| 2-nitrotoluene                      | ACN     | 1,000 | 31659       | enquire |
| 3-nitrotoluene                      | ACN     | 1,000 | 31660       | enquire |
| 4-nitrotoluene                      | ACN     | 1,000 | 31658       | enquire |
| PETN (pentaerythritol tetranitrate) | M       | 1,000 | 31600       | enquire |
| picric acid                         | M       | 1,000 | 31499       | enquire |
| propylene glycol dinitrate (PGDN)   | M       | 1,000 | 31821       | enquire |
| RDX                                 | ACN     | 1,000 | 31666       | enquire |
| tetryl                              | ACN     | 1,000 | 31667       | enquire |
| 1,3,5-trinitrobenzene               | ACN     | 1,000 | 31668       | enquire |
| 2,4,6-trinitrotoluene               | ACN     | 1,000 | 31669       | enquire |

ACN = acetonitrile

M = methanol

## Method 8100 (Polycyclic Aromatic Hydrocarbons)

**PAH Supplement Mix for Method 8100** (8 components)

|   |                      |
|---|----------------------|
| benzo(j)fluoranthene  | dibenzo(a,e)pyrene   |
| dibeno(a,h)acridine   | dibenzo(a,h)pyrene   |
| dibenzo(a,i)acridine  | dibenzo(a,i)pyrene   |
| 7H-dibenzo(c,g)carbazole  | 3-methylcholanthrene |
| 1,000 $\mu\text{g}/\text{mL}$ each in methylene chloride, 1mL/ampul |                      |
|   | cat. # 31857 (ea.)   |
|   |                      |

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

|   |                        |
|---|------------------------|
| acenaphthene  | chrysene               |
| acenaphthylene  | dibenzo(a,h)anthracene |
| anthracene  | fluoranthene           |
| benzo(a)anthracene  | fluorene               |
| benzo(a)pyrene  | indeno(1,2,3-cd)pyrene |
| benzo(b)fluoranthene  | naphthalene            |
| benzo(k)fluoranthene  | phenanthrene           |
| benzo(ghi)perylene  | pyrene                 |
| 2,000 $\mu\text{g}/\text{mL}$ each in methylene chloride, 1mL/ampul |                        |
|   | cat. # 31011 (ea.)     |
|   |                        |

**also available**

Our 30m, 0.32mm ID, 0.50 $\mu\text{m}$  Rtx®-OPPesticides column provides fast analyses, low bleed, and better resolution than alternative choices.

See page 79 for details.



## Methods 8140, 8141 (Organophosphorus Pesticides)

The preparation of accurate and stable OP pesticide standards is complicated by their sensitivity to light, pH, heat, and water. Restek has spent many years researching OP pesticide mixtures. Based on this research, our procedures include:

- Solvents are assayed to ensure low water content.
- Reference mixtures are packaged in deactivated amber ampules, under an inert atmosphere.
- Purity is determined by a combination of GC/FID, GC/FPD, GC/NPD, DSC, or HPLC/UV.

**8140/8141 Internal Standards & Surrogates****NPD Detector:**

Internal Standard: 1-bromo-2-nitrobenzene (cat.# 32279)

Surrogate: 4-chloro-3-nitrobenzotrifluoride (cat.# 32282)

1,000 $\mu\text{g}/\text{mL}$  in acetone, 1mL/ampul

cat. # 32279 (ea.)

1,000 $\mu\text{g}/\text{mL}$  in acetone, 1mL/ampul

cat. # 32282 (ea.)

**FPD Detector:**

Internal Standard: none recommended

Surrogate: tributylphosphate (cat.# 32280) and triphenylphosphate (cat.# 32281)

1,000 $\mu\text{g}/\text{mL}$  in acetone, 1mL/ampul

cat. # 32280 (ea.)

1,000 $\mu\text{g}/\text{mL}$  in acetone, 1mL/ampul

cat. # 32281 (ea.)

**8140/8141 OP Pesticide Calibration Mix A** (20 components)

|  |                        |
|--|------------------------|
| azinphos methyl  | fenthion               |
| bolstar (sulprofos)  | merphos                |
| chlorpyrifos   | methyl parathion       |
| coumaphos  | mevinphos              |
| demeton, O & S   | naled                  |
| diazinon   | phorate                |
| dichlorvos   | ronnel                 |
| disulfoton   | stirofos               |
| ethoprop   | tokuthion (prothiofos) |
| fensulfothion  | trichloronate          |
| 200 $\mu\text{g}/\text{mL}$ each in hexane:acetone (95:5), 1mL/ampul |                        |
|  | cat. # 32277 (ea.)     |
|  |                        |

**8141 OP Pesticide Calibration Mix B** (7 components)

|  |                    |
|--|--------------------|
| dimethoate   | parathion          |
| EPN  | sulfotep           |
| malathion  | TEPP               |
| monocrotophos  |                    |
| 200 $\mu\text{g}/\text{mL}$ each in hexane:acetone (95:5), 1mL/ampul |                    |
|  | cat. # 32278 (ea.) |
|  |                    |

Restek OPP standards are stable for at least 12 months.

**also available**

Additional nitrogen/phosphorus pesticide mixes are listed on page 414.

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

### Herbicide Internal Standard

|  |  |
|--|--|
| 4,4'-dibromo octafluorobiphenyl                                |  |
| 250 $\mu$ g/mL in hexane, 1mL/ampul                            |  |
| cat. # 32053 (ea.)   |  |
| 2,000 $\mu$ g/mL in methylene chloride, 1mL/ampul              |  |
| cat. # 31040 (ea.)   |  |
| 2,000 $\mu$ g/mL in methyl <i>tert</i> -butyl ether, 1mL/ampul |  |
| cat. # 31856 (ea.)   |  |

### Herbicide Surrogate

|  |  |
|--|--|
| <b>Free Acid Form:</b>                 |  |
| 2,4-dichlorophenylacetic acid (DCAA)   |  |
| 200 $\mu$ g/mL in methanol, 1mL/ampul  |  |
| cat. # 32049 (ea.)                     |  |
| 1,000 $\mu$ g/mL in acetone, 1mL/ampul |  |
| cat. # 32439 (ea.)                     |  |

### Derivatized Form:

|   |  |
|---|--|
| 2,4-dichlorophenyl acetic acid methyl ester (DCAA methyl ester) |  |
| 200 $\mu$ g/mL in hexane, 1mL/ampul                             |  |
| cat. # 32050 (ea.)  |  |

### Herbicide Mix #1 (7 components)

|  |             |
|--|-------------|
| <b>Free Acid Form:</b>                     |             |
| 2,4-D                                      | dicamba     |
| 2,4-DB                                     | dichlorprop |
| 2,4,5-T                                    |             |
| 2,4,5-TP                                   | dinoseb     |
| 200 $\mu$ g/mL each in methanol, 1mL/ampul |             |
| cat. # 32054 (ea.)                         |             |

|  |                          |
|--|--------------------------|
| <b>Derivatized Form:</b>                 |                          |
| 2,4-D methyl ester                       | dicamba methyl ester     |
| 2,4-DB methyl ester                      | dichlorprop methyl ester |
| 2,4,5-T methyl ester                     |                          |
| 2,4,5-TP methyl ester                    | dinoseb methyl ether     |
| 200 $\mu$ g/mL each in hexane, 1mL/ampul |                          |
| cat. # 32055 (ea.)                       |                          |

### Herbicide Mix #2

|   |  |
|---|--|
| <b>Free Acid Form:</b>                      |  |
| dalapon                                     |  |
| 1,000 $\mu$ g/mL in acetonitrile, 1mL/ampul |  |
| cat. # 32432 (ea.)                          |  |
| 1,000 $\mu$ g/mL in methanol, 1mL/ampul     |  |
| cat. # 32253 (ea.)                          |  |
| 2,000 $\mu$ g/mL in methanol, 1mL/ampul     |  |
| cat. # 32056 (ea.)                          |  |

### Derivatized Form:

|   |  |
|---|--|
| dalapon methyl ester                    |  |
| 2,000 $\mu$ g/mL in hexane, 1mL/ampul   |  |
| cat. # 32057 (ea.)                      |  |
| 1,000 $\mu$ g/mL in methanol, 1mL/ampul |  |
| cat. # 32254 (ea.)                      |  |

### did you know?

We have more than 2,000 pure, characterized, neat compounds in our inventory! If you do not see the EXACT mixture you need listed on any of these pages, contact us for a custom standard.

### Herbicide Mix #3

|   |      |
|---|------|
| <b>Free Acid Form:</b>                        |      |
| MCPA  | MCPP |
| 20,000 $\mu$ g/mL each in methanol, 1mL/ampul |      |
| cat. # 32058 (ea.)                            |      |

|   |                   |
|---|-------------------|
| <b>Derivatized Form:</b>                    |                   |
| MCPA methyl ester                           | MCPP methyl ester |
| 20,000 $\mu$ g/mL each in hexane, 1mL/ampul |                   |
| cat. # 32059 (ea.)                          |                   |

### MCPA

|   |  |
|---|--|
| 1,000 $\mu$ g/mL in methanol, 1mL/ampul |  |
| cat. # 32269 (ea.)                      |  |

### MCPP

|   |  |
|---|--|
| 1,000 $\mu$ g/mL in methanol, 1mL/ampul |  |
| cat. # 32271 (ea.)                      |  |

### Herbicide Mix #4 (8 components)

|  |                          |
|--|--------------------------|
| <b>Free Acid Form:</b>                     |                          |
| acifluorfen                                | 3,5-dichlorobenzoic acid |
| bentazon                                   | 4-nitrophenol            |
| chloramben                                 | pentachlorophenol        |
| DCPA diacid                                | picloram                 |
| 200 $\mu$ g/mL each in methanol, 1mL/ampul |                          |
| cat. # 32061 (ea.)                         |                          |

### Derivatized Form:

|  |                                       |
|--|---------------------------------------|
| acifluorfen methyl ester                 | 3,5-dichlorobenzoic acid methyl ester |
| bentazon methyl ester                    | 4-nitroanisole                        |
| chloramben methyl ester                  | pentachloroanisole                    |
| DCPA (Dacthal)                           | picloram methyl ester                 |
| 200 $\mu$ g/mL each in hexane, 1mL/ampul |                                       |
| cat. # 32062 (ea.)                       |                                       |

### Picloram

|   |  |
|---|--|
| 1,000 $\mu$ g/mL in methanol, 1mL/ampul |  |
| cat. # 32265 (ea.)                      |  |

### 3,5-Dichlorobenzoic Acid Surrogate Standard

|  |  |
|--|--|
| 3,5-dichlorobenzoic acid                                       |  |
| 1,000 $\mu$ g/mL in methyl <i>tert</i> -butyl ether, 1mL/ampul |  |
| cat. # 31652 (ea.)   |  |

### 3,5-Dichlorobenzoic Acid Methyl Ester Surrogate Standard

|  |  |
|--|--|
| 3,5-dichlorobenzoic acid methyl ester                          |  |
| 1,000 $\mu$ g/mL in methyl <i>tert</i> -butyl ether, 1mL/ampul |  |
| cat. # 31649 (ea.)   |  |
| 1,000 $\mu$ g/mL in methanol, 1mL/ampul                        |  |
| cat. # 32264 (ea.)   |  |

### also available

Additional chlorinated acid herbicides mixes:

see Method 555, page 419  
 and Method 8321, page 440



## 8000 Series Methods

## Method 8240 (Volatile Organic Compounds [VOC])

**502.2 Calibration Mix #1 (gases)**

|  |                                  |
|--|----------------------------------|
| bromomethane                                     | dichlorodifluoromethane (CFC-12) |
| chloroethane                                     | trichlorofluoromethane (CFC-11)  |
| chloromethane                                    | vinyl chloride                   |
| 200 $\mu$ g/mL each in P&T methanol, 1mL/ampul   |                                  |
| cat. # 30439 (ea.)                               |                                  |
| 2,000 $\mu$ g/mL each in P&T methanol, 1mL/ampul |                                  |
| cat. # 30042 (ea.)                               |                                  |

**VOA Calibration Mix #1 (ketones)**

|  |                             |
|--|-----------------------------|
| acetone  | 2-hexanone                  |
| 2-butanon (MEK)  | 4-methyl-2-pentanone (MIBK) |
| 5,000 $\mu$ g/mL each in P&T methanol:water (90:10), 1mL/ampul |                             |
| cat. # 30006 (ea.)   |                             |

**VOA Purgeable Halocarbon Mix #1** (23 components)

|  |                                   |
|--|-----------------------------------|
| bromodichloromethane                             | 1,1-dichloroethene                |
| bromoform  | <i>trans</i> -1,2-dichloroethene  |
| carbon tetrachloride                             | 1,2-dichloropropane               |
| chlorobenzene                                    | <i>cis</i> -1,3-dichloropropene   |
| 2-chloroethyl vinyl ether                        | <i>trans</i> -1,3-dichloropropene |
| chloroform                                       | methylene chloride                |
| dibromochemicalmethane                           | 1,1,2,2-tetrachloroethane         |
| 1,2-dichlorobenzene                              | tetrachloroethene                 |
| 1,3-dichlorobenzene                              | 1,1,1-trichloroethane             |
| 1,4-dichlorobenzene                              | 1,1,2-trichloroethane             |
| 1,1-dichloroethane                               | trichloroethene                   |
| 1,2-dichloroethane                               |                                   |
| 2,000 $\mu$ g/mL each in P&T methanol, 1mL/ampul |                                   |
| cat. # 30212 (ea.)                               |                                   |

**8240 Volatiles Mix #1A** (12 components)

|  |                                     |
|--|-------------------------------------|
| allyl chloride                                   | <i>trans</i> -1,4-dichloro-2-butene |
| benzyl chloride                                  | 1,4-dioxane                         |
| 1,2-dibromo-3-chloropropane                      | iodomethane                         |
| 1,2-dibromoethane                                | pentachloroethane                   |
| dibromomethane                                   | 1,1,1,2-tetrachloroethane           |
| <i>cis</i> -1,4-dichloro-2-butene                | 1,2,3-trichloropropane              |
| 2,000 $\mu$ g/mL each in P&T methanol, 1mL/ampul |                                     |
| cat. # 30217 (ea.)                               |                                     |

**8240 Volatiles Mix #2A**

|  |          |
|--|----------|
| carbon disulfide                                 | pyridine |
| 2-picoline                                       |          |
| 2,000 $\mu$ g/mL each in P&T methanol, 1mL/ampul |          |
| cat. # 30218 (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 & 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 & 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 433.

**8240 Nitriles Mix** (7 components)

|  |                     |
|--|---------------------|
| acrylonitrile                                    | methyl methacrylate |
| ethyl methacrylate                               | propionitrile       |
| malononitrile                                    | styrene             |
| methacrylonitrile                                |                     |
| 2,000 $\mu$ g/mL each in P&T methanol, 1mL/ampul |                     |
| cat. # 30215 (ea.)                               |                     |

**8240 Alcohols Mix**

|  |                   |
|--|-------------------|
| allyl alcohol                                    | isobutyl alcohol  |
| 2-chloroethanol                                  | propargyl alcohol |
| ethanol  |                   |
| 2,000 $\mu$ g/mL each in P&T methanol, 1mL/ampul |                   |
| cat. # 30214 (ea.)                               |                   |

**Glycols Standard**

|   |                  |
|---|------------------|
| ethylene glycol                               | propylene glycol |
| 50,000 $\mu$ g/mL each in DI water, 1mL/ampul |                  |
| cat. # 30471 (ea.)                            |                  |

**BTEX Standard**

|   |                  |
|---|------------------|
| benzene   | <i>m</i> -xylene |
| ethylbenzene  | <i>o</i> -xylene |
| toluene   | <i>p</i> -xylene |
| 200 $\mu$ g/mL each in P&T methanol, 1mL/ampul  |                  |
| cat. # 30051 (ea.)  |                  |
| 2,000 $\mu$ g/mL each in P&T methanol, 1mL/ampul  |                  |
| cat. # 30213 (ea.)  |                  |
| 2,000 $\mu$ g/mL each in P&T methanol ( <i>m</i> -xylene and <i>p</i> -xylene at 1,000 $\mu$ g/mL), 1mL/ampul |                  |
| cat. # 30488 (ea.)  |                  |

**BTEX Gas Mix**

|              |                  |
|--------------|------------------|
| benzene      | <i>m</i> -xylene |
| ethylbenzene | <i>o</i> -xylene |
| toluene      | <i>p</i> -xylene |

**Cylinder Construction:**

aluminum  
CGA-180 outlet

**Cylinder Fitting:****Spectra 104L Cylinders:**

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

**Scotty 110L Cylinders  
(Pi-marked Cylinders  
for EU Regulations):**

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



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

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

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

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

Requires a high-purity VOC single-stage regulator. See page 386.  
No data pack available.

**Method 8260, 8260A, 8260B (Volatile Organic Compounds [VOC])**

**8260A Internal Standard Mix**

|  |               |
|--|---------------|
| chlorobenzene-d5                                 | fluorobenzene |
| 1,4-dichlorobenzene-d4                           |               |
| 2,500 $\mu$ g/mL each in P&T methanol, 1mL/ampul |               |
| cat. # 30241 (ea.)                               |               |

**8260 Internal Standard Mix**

|  |                     |
|--|---------------------|
| chlorobenzene-d5                                 | 1,4-difluorobenzene |
| 1,4-dichlorobenzene-d4                           | pentafluorobenzene  |
| 2,500 $\mu$ g/mL each in P&T methanol, 1mL/ampul |                     |
| cat. # 30074 (ea.)                               |                     |

**8260A Surrogate Mix**

|  |                       |
|--|-----------------------|
| 4-bromofluorobenzene                             | 1,2-dichloroethane-d4 |
| dibromofluoromethane                             | toluene-d8            |
| 2,500 $\mu$ g/mL each in P&T methanol, 1mL/ampul |                       |
| cat. # 30240 (ea.)                               |                       |

**8260 Surrogate Mix**

|  |            |
|--|------------|
| 4-bromofluorobenzene                             | toluene-d8 |
| dibromofluoromethane                             |            |
| 2,500 $\mu$ g/mL each in P&T methanol, 1mL/ampul |            |
| cat. # 30073 (ea.)                               |            |

**8260B Matrix Spike Mix**

|  |                   |
|--|-------------------|
| benzene  | toluene           |
| chlorobenzene                                    | trichloroethylene |
| 1,1-dichloroethene                               |                   |
| 2,500 $\mu$ g/mL each in P&T methanol, 1mL/ampul |                   |
| cat. # 30479 (ea.)                               |                   |

**8240/8260 System Performance Check Mix**

|  |                           |
|--|---------------------------|
| bromoform  | 1,1-dichloroethane        |
| chlorobenzene                                    | 1,1,2,2-tetrachloroethane |
| chloromethane                                    |                           |
| 2,000 $\mu$ g/mL each in P&T methanol, 1mL/ampul |                           |
| cat. # 30075 (ea.)                               |                           |

**4-Bromofluorobenzene**

|  |  |
|--|--|
| 2,500 $\mu$ g/mL in P&T methanol, 1mL/ampul  |  |
| cat. # 30067 (ea.)                           |  |
| 10,000 $\mu$ g/mL in P&T methanol, 1mL/ampul |  |
| cat. # 30082 (ea.)                           |  |

**1,4-Dioxane-d8**

|   |  |
|---|--|
| 2,000 $\mu$ g/mL in P&T methanol, 1mL/ampul |  |
| cat. # 30614 (ea.)                          |  |

**PFTBA (MS Tuning Compound)**

perfluorotributylamine (PFTBA)

|                    |  |
|--------------------|--|
| Neat, 1mL/ampul    |  |
| cat. # 30482 (ea.) |  |
| Neat, 1g           |  |
| cat. # 33027 (ea.) |  |

No data pack available.

**8260B MegaMix® Calibration Mix (76 components)**

|                                     |  |
|-------------------------------------|--|
| acetone                             | <i>trans</i> -1,3-dichloropropene        |
| acrylonitrile                       | diethyl ether (ethyl ether)              |
| allyl chloride                      | 1,4-dioxane                              |
| benzene                             | ethylbenzene                             |
| bromobenzene                        | ethyl methacrylate                       |
| bromochloromethane                  | hexachloro-1,3-butadiene                 |
| bromodichloromethane                | iodomethane                              |
| bromoform                           | isobutyl alcohol                         |
| <i>n</i> -butylbenzene              | isopropylbenzene (cumene)                |
| <i>sec</i> -butylbenzene            | 4-isopropyl toluene ( <i>p</i> -cymene)  |
| <i>tert</i> -butylbenzene           | methacrylonitrile                        |
| carbon disulfide                    | methyl acrylate                          |
| carbon tetrachloride                | methyl methacrylate                      |
| chlorobenzene                       | methylene chloride (dichloromethane)     |
| 2-chloroethanol                     | naphthalene                              |
| chloroform                          | nitrobenzene                             |
| chloroprene                         | 2-nitropropane                           |
| 2-chlorotoluene                     | pentachloroethane                        |
| 4-chlorotoluene                     | propionitrile                            |
| dibromochloromethane                | <i>n</i> -propylbenzene                  |
| 1,2-dibromo-3-chloropropane (DBCP)  | styrene                                  |
| 1,2-dibromoethane (EDB)             | 1,1,1,2-tetrachloroethane                |
| dibromomethane                      | 1,1,2,2-tetrachloroethane                |
| 1,2-dichlorobenzene                 | tetrachloroethene                        |
| 1,3-dichlorobenzene                 | tetrahydrofuran                          |
| 1,4-dichlorobenzene                 | toluene                                  |
| <i>cis</i> -1,4-dichloro-2-butene   | 1,2,3-trichlorobenzene                   |
| <i>trans</i> -1,4-dichloro-2-butene | 1,2,4-trichlorobenzene                   |
| 1,1-dichloroethane                  | 1,1,1-trichloroethane                    |
| 1,2-dichloroethane                  | 1,1,2-trichloroethane                    |
| 1,1-dichloroethene                  | trichloroethene                          |
| <i>cis</i> -1,2-dichloroethene      | 1,2,3-trichloropropane                   |
| <i>trans</i> -1,2-dichloroethene    | 1,1,2-trichlorotrifluoroethane (CFC-113) |
| 1,2-dichloropropane                 | 1,2,4-trimethylbenzene                   |
| 1,3-dichloropropane                 | 1,3,5-trimethylbenzene                   |
| 2,2-dichloropropane                 | <i>m</i> -xylene                         |
| 1,1-dichloropropene                 | <i>o</i> -xylene                         |
| <i>cis</i> -1,3-dichloropropene     | <i>p</i> -xylene                         |

2,000 $\mu$ g/mL each in P&T methanol, 1mL/ampul  
 cat. # 30633 (ea.)

**2-Chloroethyl Vinyl Ether**

2,000 $\mu$ g/mL in P&T methanol, 1mL/ampul  
 cat. # 30265 (ea.)



**8260B MegaMix® Calibration Mix Kit**

30633: 8260B MegaMix  
 30265: 2-chloroethyl vinyl ether

Contains 1mL each of these mixtures.  
 cat. # 30475 (kit)

**8240/8260 Calibration Check Mix**

|  |                |
|--|----------------|
| chloroform                                       | ethylbenzene   |
| 1,1-dichloroethene                               | toluene        |
| 1,2-dichloropropane                              | vinyl chloride |
| 2,000 $\mu$ g/mL each in P&T methanol, 1mL/ampul |                |
| cat. # 30427 (ea.)                               |                |

**502.2 Calibration Mix #1 (gases)**

|  |                                  |
|--|----------------------------------|
| bromomethane                                     | dichlorodifluoromethane (CFC-12) |
| chloroethane                                     | trichlorofluoromethane (CFC-11)  |
| chloromethane                                    | vinyl chloride                   |
| 200 $\mu$ g/mL each in P&T methanol, 1mL/ampul   |                                  |
| cat. # 30439 (ea.)                               |                                  |
| 2,000 $\mu$ g/mL each in P&T methanol, 1mL/ampul |                                  |
| cat. # 30042 (ea.)                               |                                  |



## 8000 Series Methods

## Method 8260, 8260A, 8260B (Volatile Organic Compounds [VOC]) cont'd

**VOA Calibration Mix #1 (ketones)**

|  |                             |
|--|-----------------------------|
| acetone  | 2-hexanone                  |
| 2-butaneone (MEK)  | 4-methyl-2-pentanone (MIBK) |
| 5,000 $\mu$ g/mL each in P&T methanol:water (90:10), 1mL/ampul |                             |

cat. # 30006 (ea.)

**Acrolein**

|  |                    |
|--|--------------------|
| 10,000 $\mu$ g/mL in P&T methanol, 1mL/ampul | cat. # 30499 (ea.) |
| 10,000 $\mu$ g/mL in water, 1mL/ampul        | cat. # 30478 (ea.) |

**8260B Acetate Mix**

|                   |                          |
|-------------------|--------------------------|
| vinyl acetate     | <i>n</i> -propyl acetate |
| ethyl acetate     | <i>n</i> -butyl acetate  |
| isopropyl acetate |                          |

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

**8260B Acetate Mix (Revised) (7 components)**

|                        |                |
|------------------------|----------------|
| <i>n</i> -amyl acetate | methyl acetate |
| butyl acetate          | propyl acetate |
| ethyl acetate          | vinyl acetate  |
| isopropyl acetate      |                |

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

**California Oxygenates Mix**

|  |                  |  |        |
|--|------------------|--|--------|
| diisopropyl ether (DIPE)               | 2,000 $\mu$ g/mL | <i>tert</i> -butyl alcohol             | 10,000 |
| ethyl- <i>tert</i> -butyl ether (ETBE) | 2,000            | methyl <i>tert</i> -butyl ether (MTBE) | 2,000  |
| <i>tert</i> -amyl methyl ether (TAME)  | 2,000            |  |        |

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

**Oxygenates**

|                                       |                  |  |       |
|---------------------------------------|------------------|--|-------|
| <i>tert</i> -amyl ethyl ether (TAAE)  | 2,000 $\mu$ g/mL | diisopropyl ether (DIPE)               | 2,000 |
| <i>tert</i> -amyl methyl ether (TAME) | 2,000            | ethyl- <i>tert</i> -butyl ether (ETBE) | 2,000 |
| <i>tert</i> -butyl alcohol (TBA)      | 10,000           | methyl <i>tert</i> -butyl ether (MTBE) | 2,000 |

In P&T methanol, 1mL/ampul  
cat. # 30626 (ea.)

**Single-Component Oxygenates Solutions**Volume is 1mL/ampul. Concentration is  $\mu$ g/mL.

| Compound                               | Solvent | Conc.  | cat.# (ea.) | price |
|--|---------|--------|-------------|-------|
| ethanol                                | W       | 10,000 | 30466       |       |
| methanol                               | W       | 10,000 | 30467       |       |
| <i>tert</i> -amyl alcohol              | PTM     | 10,000 | 30631       |       |
| ethanol                                | PTM     | 2,000  | 30288       |       |
| methyl <i>tert</i> -butyl ether (MTBE) | PTM     | 2,000  | 30402       |       |
| <i>tert</i> -amyl ethyl ether (TAAE)   | PTM     | 2,000  | 30617       |       |
| diisopropyl ether (DIPE)               | PTM     | 2,000  | 30627       |       |
| ethyl- <i>tert</i> -butyl ether (ETBE) | PTM     | 2,000  | 30628       |       |
| <i>tert</i> -amyl methyl ether (TAME)  | PTM     | 2,000  | 30629       |       |
| <i>tert</i> -butanol-d9                | PTM     | 20,000 | 30618       |       |
| <i>tert</i> -butanol                   | PTM     | 50,000 | 30470       |       |

PTM = purge &amp; trap grade methanol

W = DI water

**also available**

Our Rtx®-VMS column is your best choice for EPA Method 8260.

- Fastest cycle times for VOCs.
- Tuned selectivity for VOCs.
- Excellent separation of gases.

See page 90 for more information.

**1,2-Dichlorotetrafluoroethane (CFC-114)**

|   |                    |
|---|--------------------|
| 2,000 $\mu$ g/mL in P&T methanol, 1mL/ampul | cat. # 30476 (ea.) |
|---|--------------------|

**Chloroprene**

|   |                    |
|---|--------------------|
| 5,000 $\mu$ g/mL in P&T methanol, 1mL/ampul | cat. # 30238 (ea.) |
|---|--------------------|

**Vinyl Acetate**

|   |                    |
|---|--------------------|
| 2,000 $\mu$ g/mL in P&T methanol, 1mL/ampul | cat. # 30216 (ea.) |
|---|--------------------|

**8260A Volatile Organics Kit (2,000 $\mu$ g/mL)**

Changes in this revision of the method include modification of the recommended internal standard and surrogate solutions.

|   |
|---|
| 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 $\mu$ g/mL)        |
| 30240: 8260A Surrogate Mix (2,500 $\mu$ g/mL)         |
| 30241: 8260A Internal Standard Mix (2,500 $\mu$ g/mL) |
| 30075: 8240/8260 System Performance Check Mix         |
| 30005: VOA Matrix Spike Mix (2,500 $\mu$ g/mL)        |

Contains 1mL each of these mixtures.  
cat. # 30242 (kit)

Components are listed on pages 408, 409, 433, and 442.

**8260 Volatile Organics Kit (2,000 $\mu$ g/mL)**

|  |
|--|
| 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 $\mu$ g/mL)       |
| 30073: 8260 Surrogate Mix (2,500 $\mu$ g/mL)         |
| 30074: 8260 Internal Standard Mix (2,500 $\mu$ g/mL) |
| 30075: 8240/8260 System Performance Check Mix        |
| 30005: VOA Matrix Spike Mix (2,500 $\mu$ g/mL)       |

Contains 1mL each of these mixtures.  
cat. # 30076 (kit)

Components are listed on pages 408, 409, 433, and 442.

**free data****Available on Our Website: Lot Certificates, Data Packs, and MSDSs**For complete information detailing manufacturing and testing for Restek inventoried reference standards, visit our website at [www.restek.com/datapacks](http://www.restek.com/datapacks). To view certificates and/or an MSDS, enter the catalog number of the product in the Search feature. For a free data pack (Adobe® PDF file), enter the catalog number and lot number of the product.

**Method 8270D, 8270C (Semivolatile Organic Compounds)**

**SV Internal Standard Mix**

|  |                  |
|--|------------------|
| acenaphthene-d10                                       | naphthalene-d8   |
| chrysene-d12   | perylene-d12     |
| 1,4-dichlorobenzene-d4                                 | phenanthrene-d10 |
| 2,000 $\mu$ g/mL each in methylene chloride, 1mL/ampul |                  |
| cat. # 31206 (ea.)                                     |                  |
| 4,000 $\mu$ g/mL each in methylene chloride, 1mL/ampul |                  |
| cat. # 31006 (ea.)                                     |                  |

**Revised SV Internal Standard Mix (7 components)**

|  |                  |
|--|------------------|
| acenaphthene-d10                                       | naphthalene-d8   |
| chrysene-d12   | perylene-d12     |
| 1,4-dichlorobenzene-d4                                 | phenanthrene-d10 |
| 1,4-dioxane-d8   |                  |
| 2,000 $\mu$ g/mL each in methylene chloride, 1mL/ampul |                  |
| cat. # 31885 (ea.)                                     |                  |
| 4,000 $\mu$ g/mL each in methylene chloride, 1mL/ampul |                  |
| cat. # 31886 (ea.)                                     |                  |

**B/N Surrogate Mix (4/89 SOW)**

|   |                 |
|---|-----------------|
| 2-fluorobiphenyl  | p-terphenyl-d14 |
| nitrobenzene-d5   |                 |
| 1,000 $\mu$ g/mL each in methylene chloride, 1mL/ampul  |                 |
| cat. # 31024 (ea.)                                      |                 |
| 5,000 $\mu$ g/mL each in methylene chloride, 1mL/ampul  |                 |
| cat. # 31062 (ea.)                                      |                 |
| 5,000 $\mu$ g/mL each in methylene chloride, 5mL/ampul  |                 |
| cat. # 31084 (ea.)                                      |                 |
| 5,000 $\mu$ g/mL each in methylene chloride, 10mL/ampul |                 |
| cat. # 33028 (ea.)                                      |                 |

**Revised B/N Surrogate Mix**

|  |                 |
|--|-----------------|
| 2-fluorobiphenyl                                       | p-terphenyl-d14 |
| nitrobenzene-d5  | pyrene-d10      |
| 1,000 $\mu$ g/mL each in methylene chloride, 1mL/ampul |                 |
| cat. # 31887 (ea.)                                     |                 |
| 5,000 $\mu$ g/mL each in methylene chloride, 1mL/ampul |                 |
| cat. # 31888 (ea.)                                     |                 |
| 5,000 $\mu$ g/mL each in methylene chloride, 5mL/ampul |                 |
| cat. # 31889 (ea.)                                     |                 |

**Acid Surrogate Mix (4/89 SOW)**

|  |                      |
|--|----------------------|
| 2-fluorophenol                                 | 2,4,6-tribromophenol |
| phenol-d6                                      |                      |
| 2,000 $\mu$ g/mL each in methanol, 1mL/ampul   |                      |
| cat. # 31025 (ea.)                             |                      |
| 10,000 $\mu$ g/mL each in methanol, 1mL/ampul  |                      |
| cat. # 31063 (ea.)                             |                      |
| 10,000 $\mu$ g/mL each in methanol, 5mL/ampul  |                      |
| cat. # 31087 (ea.)                             |                      |
| 10,000 $\mu$ g/mL each in methanol, 10mL/ampul |                      |
| cat. # 33029 (ea.)                             |                      |

**did you know?**

We have more than 2,000 pure, characterized, neat compounds in our inventory! If you do not see the EXACT mixture you need listed on any of these pages, contact us for a custom standard.

**B/N Matrix Spike Mix**

|   |                            |
|---|----------------------------|
| acenaphthene                                  | N-nitroso-di-n-propylamine |
| 1,4-dichlorobenzene                           | pyrene                     |
| 2,4-dinitrotoluene                            | 1,2,4-trichlorobenzene     |
| 1,000 $\mu$ g/mL each in methanol, 1mL/ampul  |                            |
| cat. # 31004 (ea.)                            |                            |
| 5,000 $\mu$ g/mL each in methanol, 1mL/ampul  |                            |
| cat. # 31074 (ea.)                            |                            |
| 5,000 $\mu$ g/mL each in methanol, 5mL/ampul  |                            |
| cat. # 31084 (ea.)                            |                            |
| 5,000 $\mu$ g/mL each in methanol, 10mL/ampul |                            |
| cat. # 33030 (ea.)                            |                            |

**Acid Matrix Spike Mix**

|  |                   |
|--|-------------------|
| 4-chloro-3-methylphenol                        | pentachlorophenol |
| 2-chlorophenol                                 | phenol            |
| 4-nitrophenol                                  |                   |
| 2,000 $\mu$ g/mL each in methanol, 1mL/ampul   |                   |
| cat. # 31014 (ea.)                             |                   |
| 10,000 $\mu$ g/mL each in methanol, 1mL/ampul  |                   |
| cat. # 31061 (ea.)                             |                   |
| 10,000 $\mu$ g/mL each in methanol, 5mL/ampul  |                   |
| cat. # 31071 (ea.)                             |                   |
| 10,000 $\mu$ g/mL each in methanol, 10mL/ampul |                   |
| cat. # 33031 (ea.)                             |                   |

**GC/MS Tuning Mixture**

|  |                   |
|--|-------------------|
| benzidine  | DFTPP             |
| 4,4'-DDT   | pentachlorophenol |
| 1,000 $\mu$ g/mL each in methylene chloride, 1mL/ampul |                   |
| cat. # 31615 (ea.)                                     |                   |

**SV Tuning Compound**

|   |  |
|---|--|
| decafluorotriphenylphosphine (DFTPP)              |  |
| 2,500 $\mu$ g/mL in methylene chloride, 1mL/ampul |  |
| cat. # 31001 (ea.)                                |  |

**PFTBA (MS Tuning Compound)**

|                               |  |
|-------------------------------|--|
| perfluoroributylamine (PFTBA) |  |
| Neat, 1mL/ampul               |  |
| cat. # 30482 (ea.)            |  |
| Neat, 1g                      |  |
| cat. # 33027 (ea.)            |  |

No data pack available.



## Catch the Buzz

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## 8000 Series Methods

## Method 8270D, 8270C (Semivolatile Organic Compounds) cont'd

**8270 B/N Calibration Check Mix** (7 components)

|  |                     |
|--|---------------------|
| acenaphthene   | diphenylamine       |
| benzo(a)pyrene   | fluoranthene        |
| 1,4-dichlorobenzene                                    | hexachlorobutadiene |
| di-n-octyl phthalate                                   |                     |
| 2,000 $\mu$ g/mL each in methylene chloride, 1mL/ampul |                     |
| cat. # 31616 (ea.)                                     |                     |

**8270 Acid Calibration Check Mix**

|  |                       |
|--|-----------------------|
| 4-chloro-3-methylphenol                                | pentachlorophenol     |
| 2,4-dichlorophenol                                     | phenol                |
| 2-nitrophenol  | 2,4,6-trichlorophenol |
| 2,000 $\mu$ g/mL each in methylene chloride, 1mL/ampul |                       |
| cat. # 31617 (ea.)                                     |                       |

**SV System Performance Check Mix (SPCC)**

|  |                            |
|--|----------------------------|
| 2,4-dinitrophenol                                      | 4-nitrophenol              |
| hexachlorocyclopentadiene                              | N-nitroso-di-n-propylamine |
| 2,000 $\mu$ g/mL each in methylene chloride, 1mL/ampul |                            |
| cat. # 31689 (ea.)                                     |                            |

**605 Benzidines Calibration Mix**

|  |                        |
|--|------------------------|
| benzidine  | 3,3'-dichlorobenzidine |
| 2,000 $\mu$ g/mL each in methanol, 1mL/ampul           |                        |
| cat. # 31030 (ea.)                                     |                        |
| 2,000 $\mu$ g/mL each in methylene chloride, 1mL/ampul |                        |
| cat. # 31834 (ea.)                                     |                        |

**8270 Benzidines Mix**

|  |                        |
|--|------------------------|
| benzidine  | 3,3'-dimethylbenzidine |
| 3,3'-dichlorobenzidine                                 |                        |
| 2,000 $\mu$ g/mL each in methanol, 1mL/ampul           |                        |
| cat. # 31688 (ea.)                                     |                        |
| 2,000 $\mu$ g/mL each in methylene chloride, 1mL/ampul |                        |
| cat. # 31852 (ea.)                                     |                        |

**8270 MegaMix®** (76 components)

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

1,000 $\mu$ g/mL each in methylene chloride, 1mL/ampul\*

cat. # 31850 (ea.)

<sup>1</sup>3-methylphenol and 4-methylphenol concentration is 500 $\mu$ g/mL.<sup>2</sup>1,2-diphenylhydrazine (8270-listed analyte) decomposes to azobenzene (mix component) in the injector.<sup>3</sup>N-nitrosodiphenylamine (8270-listed analyte) decomposes to diphenylamine (mix component) in the injector.

## also available

Our 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 88.

**8270 Matrix Spike Mix** (76 components)

same list as 8270 MegaMix above

|   |  |
|---|--|
| 200 $\mu$ g/mL each in methanol:methylene chloride (80:20), 5mL/ampul** |  |
| cat. # 31687 (ea.)  |  |

|  |  |
|--|--|
| 200 $\mu$ g/mL each in methanol:methylene chloride (80:20), 10mL/ampul** |  |
| cat. # 33073 (ea.)   |  |

<sup>\*\*</sup>3-methylphenol and 4-methylphenol concentration is 100 $\mu$ g/mL.

8270 MegaMix® and 8270 Matrix Spike Mix include 3-methylphenol and 4-methylphenol at  $\frac{1}{2}$  x concentration of other components.

**Method 8270D, 8270C (Semivolatile Organic Compounds) cont'd**

**8270/Appendix IX Kit**

31850: 8270 MegaMix  
 31834: 605 Benzidines Calibration Mix  
 31625: Appendix IX Mix #1  
 31806: Appendix IX Mix #2

Contains 1mL each of these mixtures.  
 cat. # 31815 (kit)



**Benzoic Acid**

2,000 $\mu$ g/mL in methylene chloride, 1mL/ampul  
 cat. # 31879 (ea.)

**Appendix IX Mix #1** (18 components)

|  |                           |
|--|---------------------------|
| 2-acetylaminofluorene                                | N-nitrosodibutylamine     |
| 4-aminobiphenyl                                      | N-nitrosodiethylamine     |
| p-dimethylaminoazobenzene                            | N-nitrosomethylethylamine |
| 3,3'-dimethylbenzidine                               | N-nitrosomorpholine       |
| $\alpha,\alpha'$ -dimethylphenethylamine (free base) | N-nitrosopiperidine       |
| methaprylene (free base)                             | N-nitrosopyrrolidine      |
| 1-naphthylamine                                      | 1,4-phenylenediamine      |
| 2-naphthylamine                                      | 2-picoline                |
| 5-nitro-o-toluidine                                  | o-toluidine               |

2,000 $\mu$ g/mL each in methylene chloride, 1mL/ampul  
 cat. # 31625 (ea.)

**Appendix IX Mix #2** (32 components)

|                                |  |
|--------------------------------|--|
| acetophenone                   | hexachloropropene                        |
| Aramite                        | isodrin                                  |
| atrazine                       | isosafrole ( <i>cis</i> & <i>trans</i> ) |
| benzaldehyde                   | kepone                                   |
| biphenyl                       | 3-methylcholanthrene                     |
| $\epsilon$ -caprolactam        | methyl methanesulfonate                  |
| chlorobenzilate                | 1,4-naphthoquinone                       |
| 1-chloronaphthalene            | 4-nitroquinoline-N-oxide                 |
| diallate                       | pentachlorobenzene                       |
| dibenzo(a,j)acridine           | pentachloroethane                        |
| 2,6-dichlorophenol             | pentachloronitrobenzene                  |
| 7,12-dimethylbenz(a)anthracene | phenacetin                               |
| 1,4-dioxane                    | pronamide                                |
| diphenyl ether                 | safrole                                  |
| ethyl methacrylate             | 1,2,4,5-tetrachlorobenzene               |
| ethyl methanesulfonate         | 1,3,5-trinitrobenzene                    |

1,000 $\mu$ g/mL each in methylene chloride, 1mL/ampul  
 cat. # 31806 (ea.) enquire

**Organophosphorus Pesticide Mix, 8270/Appendix IX**

(9 components)

|                  |                             |
|------------------|-----------------------------|
| dimethoate       | parathion (ethyl parathion) |
| disulfoton       | phorate                     |
| famphur          | sulfotep                    |
| methyl parathion | zinophos (thionazine)       |

2,000 $\mu$ g/mL in methylene chloride, 1mL/ampul  
 cat. # 32419 (ea.)

**Organochlorine Pesticide Mix AB # 3** (20 components)

|                         |                               |
|-------------------------|-------------------------------|
| aldrin                  | dieldrin                      |
| $\alpha$ -BHC           | endosulfan I                  |
| $\beta$ -BHC            | endosulfan II                 |
| $\delta$ -BHC           | endosulfan sulfate            |
| $\gamma$ -BHC (lindane) | endrin                        |
| $\alpha$ -chlordane     | endrin aldehyde               |
| $\gamma$ -chlordane     | endrin ketone                 |
| 4,4'-DDD                | heptachlor                    |
| 4,4'-DDE                | heptachlor epoxide (isomer B) |
| 4,4'-DDT                | methoxychlor                  |

2,000 $\mu$ g/mL each in hexane:toluene (1:1), 1mL/ampul  
 cat. # 32415 (ea.)

**8270 Calibration Mix #1** (19 components)

|                            |                           |
|----------------------------|---------------------------|
| benzoic acid               | 3-methylphenol            |
| 4-chloro-3-methylphenol    | 4-methylphenol            |
| 2-chlorophenol             | 2-nitrophenol             |
| 2,4-dichlorophenol         | 4-nitrophenol             |
| 2,6-dichlorophenol         | pentachlorophenol         |
| 2,4-dimethylphenol         | phenol                    |
| 4,6-dinitro-2-methylphenol | 2,3,4,6-tetrachlorophenol |
| 2,4-dinitrophenol          | 2,4,5-trichlorophenol     |
| dinoseb                    | 2,4,6-trichlorophenol     |
| 2-methylphenol             |                           |

2,000 $\mu$ g/mL each in methylene chloride, 1mL/ampul  
 cat. # 31618 (ea.)

**8270 Calibration Mix #2** (11 components)

|                        |                           |
|------------------------|---------------------------|
| aniline                | 3-nitroaniline            |
| benzidine              | 4-nitroaniline            |
| 4-chloroaniline        | N-nitrosodimethylamine    |
| 3,3'-dichlorobenzidine | N-nitrosodi-n-propylamine |
| diphenylamine*         | pyridine                  |
| 2-nitroaniline         |                           |

2,000 $\mu$ g/mL each in methylene chloride:methanol (85:15), 1mL/ampul  
 cat. # 31619 (ea.)

\*N-nitrosodiphenylamine (8270-listed analyte) decomposes to diphenylamine (mix component) in the injector.

**8270 Calibration Mix #3** (23 components)

|                             |                            |
|-----------------------------|----------------------------|
| Aramite                     | hexachlorobenzene          |
| bis(2-chloroethyl)ether     | hexachlorobutadiene        |
| bis(2-chloroethoxy)methane  | hexachlorocyclopentadiene  |
| bis(2-chloroisopropyl)ether | hexachloroethane           |
| 4-bromophenyl phenyl ether  | hexachloropropene          |
| chlorobenzilate             | isodrin                    |
| 2-chloronaphthalene         | kepone                     |
| 4-chlorophenyl phenyl ether | pentachlorobenzene         |
| 1,2-dichlorobenzene         | pentachloronitrobenzene    |
| 1,3-dichlorobenzene         | 1,2,4,5-tetrachlorobenzene |
| 1,4-dichlorobenzene         | 1,2,4-trichlorobenzene     |
| 1,3-dinitrobenzene          |                            |

2,000 $\mu$ g/mL each in methylene chloride, 1mL/ampul  
 cat. # 31620 (ea.)

**did you know?**

We have more than 2,000 pure, characterized, neat compounds in our inventory! If you do not see the EXACT mixture you need listed on any of these pages, contact us for a custom standard.

## 8000 Series Methods

## Method 8270D, 8270C (Semivolatile Organic Compounds) cont'd

**8270 Calibration Mix #4** (22 components)

|                            |  |
|----------------------------|--|
| acetophenone               | 2,6-dinitrotoluene                       |
| azobenzene*                | ethyl methanesulfonate                   |
| benzyl alcohol             | isophorone                               |
| bis(2-ethylhexyl)phthalate | isosafrole ( <i>cis</i> & <i>trans</i> ) |
| butyl benzyl phthalate     | methyl methanesulfonate                  |
| dibenzofuran               | 1,4-naphthoquinone                       |
| diethyl phthalate          | nitrobenzene                             |
| dimethyl phthalate         | 4-nitroquinoline-1-oxide                 |
| di-n-butyl phthalate       | phenacetin                               |
| di-n-octyl phthalate       | safrole                                  |
| 2,4-dinitrotoluene         | 1,3,5-trinitrobenzene                    |

2,000µg/mL each in methylene chloride, 1mL/ampul  
cat. # 31621 (ea.) enquire

\*1,2-diphenylhydrazine (8270-listed analyte) decomposes to azobenzene (mix component) in the injector.

**8270 Calibration Mix #5** (19 components)

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

2,000µg/mL each in methylene chloride, 1mL/ampul  
cat. # 31622 (ea.)

**8270 Calibration Mix #6** (10 components)

|  |                                 |
|--|---------------------------------|
| diallate ( <i>cis</i> & <i>trans</i> ) | parathion                       |
| dimethoate                             | phorate                         |
| disulfoton                             | pronamide                       |
| famphur                                | thionazine (zinophos)           |
| methyl parathion                       | 0,0,0-triethyl phosphorothioate |

2,000µg/mL each in methylene chloride, 1mL/ampul  
cat. # 31623 (ea.)

**Aramite**

2,000µg/mL in hexane, 1mL/ampul  
cat. # 31624 (ea.)

**605 Benzidines Calibration Mix**

|  |                        |
|--|------------------------|
| benzidine                              | 3,3'-dichlorobenzidine |
| 2,000µg/mL each in methanol, 1mL/ampul |                        |
|  | cat. # 31030 (ea.)     |

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

**free data****Available on Our Website: Lot Certificates, Data Packs, and MSDSs**

For complete information detailing manufacturing and testing for Restek inventoried reference standards, visit our website at [www.restek.com/datapacks](http://www.restek.com/datapacks). To view certificates and/or an MSDS, enter the catalog number of the product in the Search feature. For a free data pack (Adobe® PDF file), enter the catalog number and lot number of the product.

**8270/Appendix IX Calibration Kit (2,000µg/mL)**

|                                |
|--------------------------------|
| 31618: 8270 Calibration Mix #1 |
| 31619: 8270 Calibration Mix #2 |
| 31620: 8270 Calibration Mix #3 |
| 31621: 8270 Calibration Mix #4 |
| 31622: 8270 Calibration Mix #5 |
| 31623: 8270 Calibration Mix #6 |
| 31625: Appendix IX Mix #1      |

Contains 1mL each of these mixtures.

cat. # 31627 (kit)

**8270 Calibration Kit (2,000µg/mL)**

|                                |
|--------------------------------|
| 31618: 8270 Calibration Mix #1 |
| 31619: 8270 Calibration Mix #2 |
| 31620: 8270 Calibration Mix #3 |
| 31621: 8270 Calibration Mix #4 |
| 31622: 8270 Calibration Mix #5 |

Contains 1mL each of these mixtures.

cat. # 31626 (kit)

**Aroclor Solutions**

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

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

A = acetone

H = hexane

I = isoctane

TO = transformer oil (PCB-free)

**Method 8310 (Polycyclic Aromatic Hydrocarbons [PAHs])**

**EPA Method 8310 PAH Mixture** (18 components)

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

500µg/mL each in acetonitrile, 1mL/ampul

cat. # 31841 (ea.)

**EPA Method 8310 Surrogate Standard**

decafluorobiphenyl

1,000µg/mL in acetonitrile, 1mL/ampul

cat. # 31842 (ea.)

**EPA Method 8310 Quality Control Check** (18 components)

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

In acetonitrile, 1mL/ampul

cat. # 31843 (ea.)

**did you know?**

We have more than 2,000 pure, characterized, neat compounds in our inventory! If you do not see the EXACT mixture you need listed on any of these pages, contact us for a custom standard.

**Method 8315 (Aldehydes/Ketones-DNPH by HPLC)**

**Aldehyde-Ketone-DNPH TO-11A Calibration Mix**

(15 components)

|                               |                             |
|-------------------------------|-----------------------------|
| acetaldehyde-DNPH             | hexaldehyde-DNPH            |
| acetone-DNPH                  | isovaleraldehyde-DNPH       |
| acrolein-DNPH                 | propionaldehyde-DNPH        |
| benzaldehyde-DNPH             | <i>m</i> -tolualdehyde-DNPH |
| <i>n</i> -butyraldehyde-DNPH  | <i>o</i> -tolualdehyde-DNPH |
| crotonaldehyde-DNPH           | <i>p</i> -tolualdehyde-DNPH |
| 2,5-dimethylbenzaldehyde-DNPH | valeraldehyde-DNPH          |
| formaldehyde-DNPH             |                             |

15µg/mL\* each in acetonitrile, 1mL/ampul

cat. # 31808 (ea.)

\*Concentration calculated as aldehyde.

**Formaldehyde-DNPH Mix**

formaldehyde-DNPH

500µg/mL\* in acetonitrile, 1mL/ampul

cat. # 31837 (ea.)

\*Concentration calculated as aldehyde.

**CARB 1004 Aldehyde/Ketone-DNPH Calibration Standard**

(13 components)

|                                  |                                 |
|----------------------------------|---------------------------------|
| acetaldehyde-2,4-DNPH            | hexaldehyde-2,4-DNPH            |
| acetone-2,4-DNPH                 | methacrolein-2,4-DNPH           |
| acrolein-2,4-DNPH                | methyl ethyl ketone-2,4-DNPH    |
| benzaldehyde-2,4-DNPH            | propionaldehyde-2,4-DNPH        |
| <i>n</i> -butyraldehyde-2,4-DNPH | <i>m</i> -tolualdehyde-2,4-DNPH |
| crotonaldehyde-2,4-DNPH          | valeraldehyde-2,4-DNPH          |
| formaldehyde-2,4-DNPH            |                                 |

3µg/mL each in acetonitrile, 1mL/ampul

cat. # 33093 (ea.)

**DNPH Reference Materials**

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

| Compound                          | Solvent | Conc. | cat.# (ea.) | price |
|-----------------------------------|---------|-------|-------------|-------|
| acetaldehyde-2,4-DNPH             | ACN     | 100   | 33074       |       |
| acetone-2,4-DNPH                  | ACN     | 100   | 33075       |       |
| acrolein-2,4-DNPH                 | ACN     | 100   | 33076       |       |
| benzaldehyde-2,4-DNPH             | ACN     | 100   | 33077       |       |
| 2-butanone-2,4-DNPH               | ACN     | 100   | 33078       |       |
| <i>n</i> -butyraldehyde-2,4-DNPH  | ACN     | 100   | 33079       |       |
| crotonaldehyde-2,4-DNPH           | ACN     | 100   | 33080       |       |
| 2,5-dimethylbenzaldehyde-2,4-DNPH | ACN     | 100   | 33081       |       |
| formaldehyde-2,4-DNPH             | ACN     | 100   | 33082       |       |
| glycolaldehyde-2,4-DNPH           | ACN     | 100   | 33091       |       |
| hexaldehyde-2,4-DNPH              | ACN     | 100   | 33083       |       |
| isobutyraldehyde-2,4-DNPH         | ACN     | 100   | 33084       |       |
| isovaleraldehyde-2,4-DNPH         | ACN     | 100   | 33085       |       |
| methacrolein-2,4-DNPH             | ACN     | 100   | 33095       |       |
| propionaldehyde-2,4-DNPH          | ACN     | 100   | 33086       |       |
| <i>m</i> -tolualdehyde-2,4-DNPH   | ACN     | 100   | 33088       |       |
| <i>o</i> -tolualdehyde-2,4-DNPH   | ACN     | 100   | 33087       |       |
| <i>p</i> -tolualdehyde-2,4-DNPH   | ACN     | 100   | 33089       |       |
| valeraldehyde-2,4-DNPH            | ACN     | 100   | 33090       |       |

ACN = acetonitrile

## 8000 Series Methods

## Method 8321 (Chlorinated Acids by HPLC)

**Chlorinated Acids by HPLC, Mix A** (8 components)

|  |                   |
|--|-------------------|
| acifluorfen (Blazer)                       | dicamba           |
| bentazon                                   | dichlorprop       |
| chloramben                                 | picloram          |
| 2,4-D                                      | 2,4,5-TP (Silvex) |
| 1,000µg/mL each in acetonitrile, 1mL/ampul |                   |
| cat. # 32431 (ea.)                         |                   |

**Chlorinated Acids by HPLC, Mix B** (8 components)

|  |                   |
|--|-------------------|
| 2,4-DB                                     | MCPP (mecoprop)   |
| 3,5-dichlorobenzoic acid                   | 4-nitrophenol     |
| dinoseb                                    | pentachlorophenol |
| MCPP                                       | 2,4,5-T           |
| 1,000µg/mL each in acetonitrile, 1mL/ampul |                   |
| cat. # 32430 (ea.)                         |                   |

**Chlorinated Acid Herbicide Mix**

|  |  |
|--|--|
| 2,4-dichlorophenoxyacetic acid (2,4-D)     |  |
| 2,4,5-TP (Silvex)                          |  |
| 1,000µg/mL each in acetonitrile, 1mL/ampul |  |
| cat. # 32429 (ea.)                         |  |

**Dalapon (2,2-dichloropropionic acid)**

|                                       |  |
|---------------------------------------|--|
| 1,000µg/mL in acetonitrile, 1mL/ampul |  |
| cat. # 32432 (ea.)                    |  |
| 1,000µg/mL in methanol, 1mL/ampul     |  |
| cat. # 32253 (ea.)                    |  |

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

## Method 8330

## (Nitroaromatics and Nitramines by HPLC)

EPA Method 8330 is used to measure explosives residues in water and soil samples, using HPLC with UV detection. Target analytes are nitroaromatic and nitramine explosives and their degradation products.

**8330 Internal Standards**

|                                   |  |
|-----------------------------------|--|
| 3,4-dinitrotoluene                |  |
| 1,000µg/mL in methanol, 1mL/ampul |  |

cat. # 31452 (ea.) inquire

|                                       |  |
|---------------------------------------|--|
| 1,4-dinitrobenzene                    |  |
| 2,000µg/mL in acetonitrile, 1mL/ampul |  |

cat. # 33205 (ea.) inquire

**8330 Surrogate**

|                                   |  |
|-----------------------------------|--|
| 1,2-dinitrobenzene                |  |
| 1,000µg/mL in methanol, 1mL/ampul |  |

cat. # 31453 (ea.) inquire

## Method 8330

## (Nitroaromatics and Nitramines by HPLC) cont'd

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

|  |                       |
|--|-----------------------|
| 2-amino-4,6-dinitrotoluene                 | 2-nitrotoluene        |
| 4-amino-2,6-dinitrotoluene                 | 3-nitrotoluene        |
| 3,5-dinitroaniline                         | 4-nitrotoluene        |
| 1,3-dinitrobenzene                         | PETN                  |
| 2,4-dinitrotoluene                         | RDX                   |
| 2,6-dinitrotoluene                         | tetryl                |
| HMX  | 1,3,5-trinitrobenzene |
| nitrobenzene                               | 2,4,6-trinitrotoluene |
| nitroglycerin                              |                       |
| 1,000µg/mL each in acetonitrile, 1mL/ampul |                       |
| cat. # 33204 (ea.)                         | inquire               |

**Nitroaromatics and Nitramine Explosives by HPLC**

## (14 components)

|  |                       |
|--|-----------------------|
| 1,3-dinitrobenzene                         | 2-nitrotoluene        |
| 2-amino-4,6-dinitrotoluene                 | 3-nitrotoluene        |
| 4-amino-2,6-dinitrotoluene                 | 4-nitrotoluene        |
| 2,4-dinitrotoluene                         | RDX                   |
| 2,6-dinitrotoluene                         | tetryl                |
| HMX  | 1,3,5-trinitrobenzene |
| nitrobenzene                               | 2,4,6-trinitrotoluene |
| 1,000µg/mL each in acetonitrile, 1mL/ampul |                       |
| cat. # 33905 (ea.)                         | inquire               |

**8330 Calibration Mix #1** (7 components)

|  |                       |
|--|-----------------------|
| 1,3-dinitrobenzene                         | RDX                   |
| 2,4-dinitrotoluene                         | 1,3,5-trinitrobenzene |
| HMX  | 2,4,6-trinitrotoluene |
| nitrobenzene                               |                       |
| 1,000µg/mL each in acetonitrile, 1mL/ampul |                       |
| cat. # 31450 (ea.)                         | inquire               |

**8330 Calibration Mix #2** (7 components)

|  |                |
|--|----------------|
| 2-amino-4,6-dinitrotoluene                 | 3-nitrotoluene |
| 4-amino-2,6-dinitrotoluene                 | 4-nitrotoluene |
| 2,6-dinitrotoluene                         | tetryl         |
| 2-nitrotoluene                             |                |
| 1,000µg/mL each in acetonitrile, 1mL/ampul |                |
| cat. # 31451 (ea.)                         | inquire        |

## did you know?

When you order reference materials for Method 8330, be aware that obtaining pure, neat compounds for standards can be very difficult. Some of these commercial-grade materials contain desensitizing agents such as beeswax, water, or other manufacturing by-products. Many are shipped wet and must be carefully dried before preparation. To ensure the highest quality standards, Restek chemists use multiple analytical techniques including GC, HPLC, GC/MS, or DSC to verify raw material purity. All compounds are 98% pure or higher.

## also available

See page 425 for chlordane and toxaphene reference materials.

**Method 8330 (Nitroaromatics and Nitramines by HPLC) cont'd**

**Single-Component Explosives Solutions**

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

| Compound                            | Solvent | Conc. | cat.# (ea.) | price   |
|-------------------------------------|---------|-------|-------------|---------|
| 2-amino-4,6-dinitrotoluene          | ACN     | 1,000 | 31670       | enquire |
| 4-amino-2,6-dinitrotoluene          | ACN     | 1,000 | 31671       | enquire |
| ammonium picrate                    | ACN     | 2,000 | 31890       | enquire |
| 3,5-dinitroaniline                  | ACN     | 1,000 | 31661       | enquire |
| 1,3-dinitrobenzene                  | ACN     | 1,000 | 31662       | enquire |
| 1,4-dinitrobenzene                  | ACN     | 2,000 | 33205       | enquire |
| 2,4-dinitrotoluene                  | ACN     | 1,000 | 31663       | enquire |
| 2,6-dinitrotoluene                  | ACN     | 1,000 | 31664       | enquire |
| EGDN                                | M       | 1,000 | 31601       | enquire |
| HMX                                 | ACN     | 1,000 | 31665       | enquire |
| nitrobenzene                        | ACN     | 1,000 | 31657       | enquire |
| nitroglycerin                       | M       | 1,000 | 31498       | enquire |
| nitroguanidine                      | M       | 1,000 | 31602       | enquire |
| 2-nitrotoluene                      | ACN     | 1,000 | 31659       | enquire |
| 3-nitrotoluene                      | ACN     | 1,000 | 31660       | enquire |
| 4-nitrotoluene                      | ACN     | 1,000 | 31658       | enquire |
| PETN (pentaerythritol tetranitrate) | M       | 1,000 | 31600       | enquire |
| picric acid                         | M       | 1,000 | 31499       | enquire |
| propylene glycol dinitrate (PGDN)   | M       | 1,000 | 31821       | enquire |
| RDX                                 | ACN     | 1,000 | 31666       | enquire |
| tetryl                              | ACN     | 1,000 | 31667       | enquire |
| 1,3,5-trinitrobenzene               | ACN     | 1,000 | 31668       | enquire |
| 2,4,6-trinitrotoluene               | ACN     | 1,000 | 31669       | enquire |

ACN=acetonitrile

M = methanol

**8330 Nitroaromatics Kit (1,000 $\mu\text{g}/\text{mL}$ )**

31450: 8330 Calibration Mix #1

31451: 8330 Calibration Mix #2

31452: 8330 Internal Standard Mix

31453: 8330 Surrogate Mix

Contains 1mL each of these mixtures.

cat. # 31454 (kit) inquire



**also available**

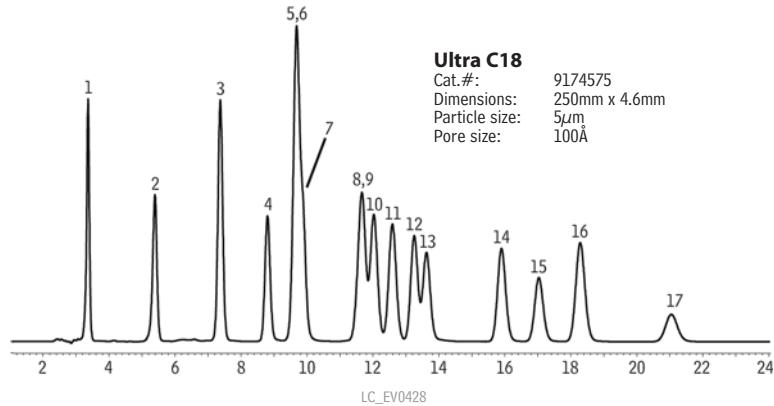
Ultra C18 HPLC columns, page 314

Pinnacle® II Biphenyl HPLC columns, page 309

**also available**

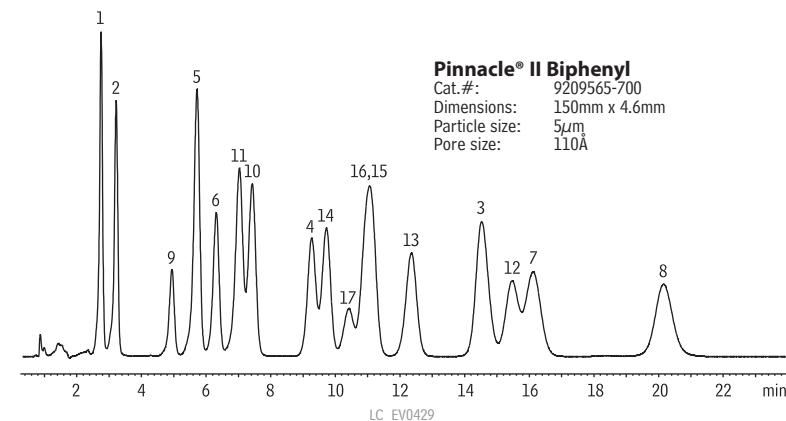
See materials for GC Method 8095 on pages 429-430.

**EPA 8330B analytes resolve well on the Ultra C18 column and Pinnacle® II Biphenyl column; differing selectivities allow true confirmational analysis.**



**Peak List**

- 1. HMX
- 2. RDX
- 3. 1,3,5-TNB
- 4. 1,3-DNB
- 5. 3,5-DNA
- 6. NB
- 7. tetryl
- 8. 2,4,6-TNT
- 9. NG
- 10. 2-A-4,6-DNT
- 11. 4-A-2,6-DNT
- 12. 2,4-DNT
- 13. 2,6-DNT
- 14. 2-NT
- 15. 4-NT
- 16. 3-NT
- 17. PETN



**Sample:** 50 $\mu\text{g}/\text{mL}$  each compound diluted in acetonitrile  
 8330 Calibration Mix #1 (cat. # 31450)  
 8330 Calibration Mix #2 (cat. # 31451)  
 PETN Standard (cat. # 31600)  
 3,5-dinitroaniline Reference Mix (cat. # 31661)  
 Nitroglycerin Standard (cat. # 31498)  
 10 $\mu\text{L}$

**Inj.:**

**Conditions:**

- Mobile phase: water:methanol (44:56 v/v)
- Flow: 1.0mL/min.
- Temp.: 30°C
- Det.: UV detection @ 210nm

**free literature**

For more information, download our *Trace-Level Explosives Analysis by HPLC* applications note from [www.restek.com](http://www.restek.com). lit. cat.# 59361A

## EPA Superfund Contract Lab Program (CLP)

| US EPA Method No.   | Compound Class | US EPA Method No.                            | Compound Class            |
|---------------------|----------------|--|---------------------------|
| SOM01.1 .....       | .Volatile      | SOM01.1 .....                                | .Semivolatiles            |
| 04.2 and 04.1 ..... | .Volatile      | 03.2 OLC .....                               | .Semivolatiles            |
| 10/92 SOW .....     | .Volatile      | 04.2 and 04.1 SOW .....                      | .Semivolatiles            |
| 3/90 SOW .....      | .Volatile      | 4/89 and 3/90 SOW .....                      | .Semivolatiles            |
| 03.2 OLC .....      | .Volatile      | SOM01.1, 04.1, 3/90, 4/89 and 2/88 SOW ..... | .Pesticides, Aroclor PCBs |

## SOM01.1 (Volatile), QA Mixes

**SOM01.1 VOA Non-Ketone Deuterated Monitoring Compounds** (11 components)

|  |                              |
|--|------------------------------|
| benzene-d6   | 1,2-dichloropropane-d6       |
| chloroethane-d5  | 1,3-dichloropropene-d4*      |
| chloroform-d   | 1,1,2,2-tetrachloroethane-d2 |
| 1,2-dichlorobenzene-d4                                   | toluene-d8                   |
| 1,2-dichloroethane-d4                                    | vinyl chloride-d3            |
| 1,1-dichloroethene-d2                                    |                              |
| 500µg/mL each in deuterated methanol (MeOD), 1mL/ampul   |                              |
| cat. # 30624 (ea.)                                       |                              |
| 1,000µg/mL each in deuterated methanol (MeOD), 1mL/ampul |                              |
| cat. # 30635 (ea.)                                       |                              |

\*Mix of *cis* and *trans* isomers. Exact proportions will be reported on the data sheet.

**SOM01.1 VOA Ketone Deuterated Monitoring Compounds**

|   |               |
|---|---------------|
| 2-butanone-d5                                     | 2-hexanone-d5 |
| 500µg/mL each in deuterium oxide (D:O), 1mL/ampul |               |
| cat. # 30625 (ea.)                                |               |

|   |  |
|---|--|
| 1,000µg/mL each in deuterium oxide (D:O), 1mL/ampul |  |
| cat. # 30636 (ea.)                                  |  |

**SOM01.1 VOA DMC Kit**

|                                       |   |
|---------------------------------------|---|
| 30624: Non-Ketones                    |  |
| 30625: Ketones                        |   |
| 500µg/mL. 1mL each of these mixtures. |   |
| cat. # 30630 (kit)                    |   |

|   |  |
|---|--|
| 1,000µg/mL. 1mL each of these mixtures. |  |
| cat. # 30637 (kit)                      |  |

## 04.2, 04.1, and 10/92 SOW (Volatile), QA Mixes

**CLP 04.1 VOA Internal Standard/SMC Spike Mix**

|  |                       |
|--|-----------------------|
| bromochloromethane                         | 1,2-dichloroethane-d4 |
| 4-bromofluorobenzene                       | 1,4-difluorobenzene   |
| chlorobenzene-d5                           | toluene-d8            |
| 2,500µg/mL each in P&T methanol, 1mL/ampul |                       |
| cat. # 30457 (ea.)                         |                       |

**VOA Internal Standard Mix**

|  |                  |
|--|------------------|
| bromochloromethane                         | chlorobenzene-d5 |
| 1,4-difluorobenzene                        |                  |
| 2,500µg/mL each in P&T methanol, 1mL/ampul |                  |
| cat. # 30011 (ea.)                         |                  |

also available

See pages 539-546 for volatiles analysis chromatograms.

**04.2, 04.1, and 10/92 SOW (Volatiles), QA Mixes cont'd**

**L/C VOA Lab Control Sample #2**

vinyl chloride  
 2,500 $\mu$ g/mL in P&T methanol, 1mL/ampul  
 cat. # 30093 (ea.)

**L/C VOA Internal Standard Mix**

chlorobenzene-d5                            1,4-difluorobenzene  
 1,4-dichlorobenzene-d4  
 2,500 $\mu$ g/mL each in P&T methanol, 1mL/ampul  
 cat. # 30091 (ea.)

**04.2 and 04.1 (Volatiles), Calibration Mixes**

**CLP 04.1 VOA CAL2000 MegaMix® (40 components)**

|                                    |  |
|------------------------------------|--|
| benzene                            | <i>trans</i> -1,3-dichloropropene                  |
| bromodichloromethane               | ethylbenzene                                       |
| bromoform                          | isopropylbenzene                                   |
| carbon disulfide                   | methyl acetate                                     |
| carbon tetrachloride               | methyl <i>tert</i> -butyl ether (MTBE)             |
| chlorobenzene                      | methylcyclohexane                                  |
| chloroform                         | methylene chloride                                 |
| cyclohexane                        | styrene  |
| dibromochloromethane               | 1,1,2,2-tetrachloroethane                          |
| 1,2-dibromo-3-chloropropane (DBCP) | tetrachloroethene                                  |
| 1,2-dibromoethane                  | toluene  |
| 1,2-dichlorobenzene                | 1,2,4-trichlorobenzene                             |
| 1,3-dichlorobenzene                | 1,1,1-trichloroethane                              |
| 1,4-dichlorobenzene                | 1,1,2-trichloroethane                              |
| 1,1-dichloroethane                 | trichloroethene                                    |
| 1,2-dichloroethane                 | 1,1,2-trichloro-1,2,2-trifluoroethane<br>(CFC-113) |
| 1,1-dichloroethene                 | <i>m</i> -xylene                                   |
| <i>cis</i> -1,2-dichloroethene     | <i>o</i> -xylene                                   |
| <i>trans</i> -1,2-dichloroethene   | <i>p</i> -xylene                                   |
| 1,2-dichloropropane                |  |
| <i>cis</i> -1,3-dichloropropene    |  |

2,000 $\mu$ g/mL each in P&T methanol, 1mL/ampul  
 cat. # 30456 (ea.)

**502.2 Calibration Mix #1 (gases)**

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

200 $\mu$ g/mL each in P&T methanol, 1mL/ampul  
 cat. # 30439 (ea.)

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

**VOA Calibration Mix #1 (ketones)**

|                  |                             |
|------------------|-----------------------------|
| acetone          | 2-hexanone                  |
| 2-butanone (MEK) | 4-methyl-2-pentanone (MIBK) |

5,000 $\mu$ g/mL each in P&T methanol:water (90:10), 1mL/ampul  
 cat. # 30006 (ea.)

**CLP 04.1 VOA Kit #3**

30006: VOA Calibration Mix #1 (ketones)  
 30042: 502.2 Calibration Mix #1 (gases)  
 30456: CLP 04.1 VOA CAL2000 MegaMix  
 Contains 1mL each of these mixtures.  
 cat. # 30460 (kit)

**3/90 SOW (Volatiles), Calibration Mixes**

**CLP VOA CAL2000 MegaMix® (28 components)**

|                                  |                                   |
|----------------------------------|-----------------------------------|
| benzene                          | <i>cis</i> -1,3-dichloropropene   |
| bromodichloromethane             | <i>trans</i> -1,3-dichloropropene |
| bromoform                        | ethylbenzene                      |
| carbon disulfide                 | methylene chloride                |
| carbon tetrachloride             | styrene                           |
| chlorobenzene                    | 1,1,2,2-tetrachloroethane         |
| chloroform                       | tetrachloroethene                 |
| dibromochloromethane             | toluene                           |
| 1,1-dichloroethane               | 1,1,1-trichloroethane             |
| 1,2-dichloroethane               | 1,1,2-trichloroethane             |
| 1,1-dichloroethene               | trichloroethene                   |
| <i>cis</i> -1,2-dichloroethene   | <i>m</i> -xylene                  |
| <i>trans</i> -1,2-dichloroethene | <i>o</i> -xylene                  |
| 1,2-dichloropropane              | <i>p</i> -xylene                  |

2,000 $\mu$ g/mL each in P&T methanol, 1mL/ampul  
 cat. # 30632 (ea.)

**Vinyl Acetate**

2,000 $\mu$ g/mL in P&T methanol, 1mL/ampul  
 cat. # 30216 (ea.)

**CLP VOA CAL2000 MegaMix® Kit**

30632: CLP VOA CAL2000 MegaMix  
 30216: vinyl acetate  
 Contains 1mL each of these mixtures.  
 cat. # 30438 (kit)



**VOA Calibration Mix #2 (7 components)**

|                  |                  |
|------------------|------------------|
| benzene          | vinyl acetate    |
| carbon disulfide | <i>o</i> -xylene |
| ethylbenzene     | <i>p</i> -xylene |
| toluene          |                  |

2,000 $\mu$ g/mL each in P&T methanol, 1mL/ampul  
 cat. # 30007 (ea.)

**VOA Calibration Mix #3 (10 components)**

|                      |                       |
|----------------------|-----------------------|
| carbon tetrachloride | 1,2-dichloropropane   |
| chlorobenzene        | methylene chloride    |
| chloroform           | 1,1,2-trichloroethane |
| 1,1-dichloroethane   | trichloroethene       |
| 1,1-dichloroethene   | <i>m</i> -xylene      |

2,000 $\mu$ g/mL each in P&T methanol, 1mL/ampul  
 cat. # 30008 (ea.)

**VOA Calibration Mix #4 (12 components)**

|                                  |                                   |
|----------------------------------|-----------------------------------|
| bromodichloromethane             | <i>cis</i> -1,3-dichloropropene   |
| bromoform                        | <i>trans</i> -1,3-dichloropropene |
| dibromochloromethane             | styrene                           |
| 1,2-dichloroethane               | 1,1,2,2-tetrachloroethane         |
| <i>cis</i> -1,2-dichloroethene   | tetrachloroethene                 |
| <i>trans</i> -1,2-dichloroethene | 1,1,1-trichloroethane             |

2,000 $\mu$ g/mL each in P&T methanol, 1mL/ampul  
 cat. # 30009 (ea.)

**VOA Calibration Mix #5 (gases)**

|              |                |
|--------------|----------------|
| bromomethane | chloromethane  |
| chloroethane | vinyl chloride |

2,000 $\mu$ g/mL each in P&T methanol, 1mL/ampul  
 cat. # 30010 (ea.)

**CLP VOA Calibration Kit #2**

30006: VOA Calibration Mix #1 (ketones)  
 30010: VOA Calibration Mix #5 (gases)  
 30632: CLP VOA CAL2000 MegaMix  
 30216: vinyl acetate  
 Contains 1mL each of these mixtures.  
 cat. # 30442 (kit)



**OLC 03.2 (Volatiles), Calibration Mixes****OLC 03.2 VOA MegaMix® (42 components)**

|  |   |
|--|---|
| benzene  | <i>cis</i> -1,3-dichloropropene             |
| bromochloromethane                             | <i>trans</i> -1,3-dichloropropene           |
| bromodichloromethane                           | ethylbenzene                                |
| bromoform                                      | isopropylbenzene (cumene)                   |
| carbon disulfide                               | methyl acetate                              |
| carbon tetrachloride                           | methylcyclohexane                           |
| chlorobenzene                                  | methyl <i>tert</i> -butyl ether (MTBE)      |
| chloroform                                     | methylene chloride (dichloromethane)        |
| cyclohexane                                    | styrene                                     |
| dibromochloromethane<br>(chlorodibromomethane) | 1,1,2,2-tetrachloroethane                   |
| 1,2-dibromo-3-chloropropane (DBCP)             | tetrachloroethene                           |
| 1,2-dibromoethane (EDB)                        | toluene                                     |
| 1,2-dichlorobenzene                            | 1,2,3-trichlorobenzene                      |
| 1,3-dichlorobenzene                            | 1,2,4-trichlorobenzene                      |
| 1,4-dichlorobenzene                            | 1,1,1-trichloroethane                       |
| 1,1-dichloroethane                             | 1,1,2-trichloroethane                       |
| 1,2-dichloroethane                             | trichloroethene                             |
| 1,1-dichloroethene                             | 1,1,2-trichlorotrifluoroethane<br>(CFC-113) |
| <i>cis</i> -1,2-dichloroethene                 | <i>m</i> -xylene*                           |
| <i>trans</i> -1,2-dichloroethene               | <i>o</i> -xylene                            |
| 1,2-dichloropropane                            | <i>p</i> -xylene*                           |

2,000µg/mL each (\**m*- & *p*-xylene at 1,000µg/mL) in P&T methanol, 1mL/ampul  
cat. # 30492 (ea.)

**L/C VOA Calibration Mix #6**

|  |                     |
|--|---------------------|
| bromochloromethane   | 1,2-dichlorobenzene |
| 1,2-dibromo-3-chloropropane (DBCP)                               | 1,3-dichlorobenzene |
| 1,2-dibromoethane  | 1,4-dichlorobenzene |
| 2,000µg/mL each in P&T methanol, 1mL/ampul<br>cat. # 30090 (ea.) |                     |

**Additional VOA Calibration Mixes Required:**

|                               |                               |
|-------------------------------|-------------------------------|
| 30006: VOA Calibration Mix #1 | 30009: VOA Calibration Mix #4 |
| 30007: VOA Calibration Mix #2 | 30010: VOA Calibration Mix #5 |
| 30008: VOA Calibration Mix #3 | 30003: VOA Tuning Compound    |

See pages 442–443 for mix compositions.

**SOM01.1 (Semivolatiles), QA Mixes****SOM01.1 Deuterated Monitoring Compound Mix****w/ SIM Compounds (18 components)**

|  |                         |
|--|-------------------------|
| acenaphthylene-d8                                | fluoranthene-d10        |
| anthracene-d10                                   | fluorene-d10            |
| benzo(a)pyrene-d12                               | 2-methylnaphthalene-d10 |
| bis(2-chloroethyl)ether-d8                       | 4-methylphenol-d8       |
| 4-chloroaniline-d4                               | nitrobenzene-d5         |
| 2-chlorophenol-d4                                | 2-nitropheno-d4         |
| 2,4-dichlorophenol-d3                            | 4-nitropheno-d4         |
| dimethylphthalate-d6                             | phenol-d5               |
| 4,6-dinitro-2-methylphenol-d                     | pyrene-d10              |
| 2,000µg/mL each in methylene chloride, 1mL/ampul |                         |
| cat. # 33918 (ea.)                               |                         |

**SOM01.1 Deuterated Monitoring Compound Mix****SIM Compounds**

|  |                         |
|--|-------------------------|
| fluoranthene-d10                                 | 2-methylnaphthalene-d10 |
| 2,000µg/mL each in methylene chloride, 1mL/ampul |                         |
| cat. # 33913 (ea.)                               |                         |

**CCME F2 Surrogate Standard**

|   |  |
|---|--|
| 2-methylnonane                              |  |
| 1,000µg/mL in methylene chloride, 1mL/ampul |  |
| cat. # 31870 (ea.)                          |  |

**SOM01.1 (Semivolatiles), QA Mixes cont'd****SOM01.1 SVOA B/N Matrix Spike Mix**

|  |                                     |
|--|-------------------------------------|
| acenaphthene                           | N-nitroso-di- <i>n</i> -propylamine |
| 2,4-dinitrotoluene                     | pyrene                              |
| 5,000µg/mL each in methanol, 1mL/ampul |                                     |
| cat. # 33916 (ea.)                     |                                     |
| 5,000µg/mL each in methanol, 5mL/ampul |                                     |
| cat. # 33917 (ea.)                     |                                     |

**04.2, 04.1, 4/89, and 3/90 SOW (Semivolatiles), QA Mixes****SV Internal Standard Mix**

|  |                  |
|--|------------------|
| acenaphthene-d10                                 | naphthalene-d8   |
| chrysene-d12                                     | perylene-d12     |
| 1,4-dichlorobenzene-d4                           | phenanthrene-d10 |
| 2,000µg/mL each in methylene chloride, 1mL/ampul |                  |
| cat. # 31206 (ea.)                               |                  |
| 4,000µg/mL each in methylene chloride, 1mL/ampul |                  |
| cat. # 31006 (ea.)                               |                  |

**Revised SV Internal Standard Mix (7 components)**

|  |                  |
|--|------------------|
| acenaphthene-d10                                 | naphthalene-d8   |
| chrysene-d12                                     | perylene-d12     |
| 1,4-dichlorobenzene-d4                           | phenanthrene-d10 |
| 1,4-dioxane-d8                                   |                  |
| 2,000µg/mL each in methylene chloride, 1mL/ampul |                  |
| cat. # 31885 (ea.)                               |                  |
| 4,000µg/mL each in methylene chloride, 1mL/ampul |                  |
| cat. # 31886 (ea.)                               |                  |

**Acid Surrogate Standard Mix (3/90 SOW)**

|  |                      |
|--|----------------------|
| 2-chlorophenol-d4                      | phenol-d6            |
| 2-fluorophenol                         | 2,4,6-tribromophenol |
| 1,500µg/mL each in methanol, 1mL/ampul |                      |
| cat. # 31003 (ea.)                     |                      |
| 7,500µg/mL each in methanol, 1mL/ampul |                      |
| cat. # 31073 (ea.)                     |                      |
| 7,500µg/mL each in methanol, 5mL/ampul |                      |
| cat. # 31083 (ea.)                     |                      |

**Acid Surrogate Mix (4/89 SOW)**

|  |                      |
|--|----------------------|
| 2-fluorophenol                           | 2,4,6-tribromophenol |
| phenol-d6                                |                      |
| 2,000µg/mL each in methanol, 1mL/ampul   |                      |
| cat. # 31025 (ea.)                       |                      |
| 10,000µg/mL each in methanol, 1mL/ampul  |                      |
| cat. # 31063 (ea.)                       |                      |
| 10,000µg/mL each in methanol, 5mL/ampul  |                      |
| cat. # 31087 (ea.)                       |                      |
| 10,000µg/mL each in methanol, 10mL/ampul |                      |
| cat. # 33029 (ea.)                       |                      |

**Revised B/N Surrogate Mix**

|  |                         |
|--|-------------------------|
| 2-fluorobiphenyl                                 | <i>p</i> -terphenyl-d14 |
| nitrobenzene-d5                                  | pyrene-d10              |
| 1,000µg/mL each in methylene chloride, 1mL/ampul |                         |
| cat. # 31887 (ea.)                               |                         |
| 5,000µg/mL each in methylene chloride, 1mL/ampul |                         |
| cat. # 31888 (ea.)                               |                         |
| 5,000µg/mL each in methylene chloride, 5mL/ampul |                         |
| cat. # 31889 (ea.)                               |                         |

**04.2, 04.1, 4/89, and 3/90 SOW (Semivolatiles),  
 QA Mixes cont'd**

**CLP 04.1 BNA Surrogate Mix** (8 components)

|                                  |                    |                      |       |
|----------------------------------|--------------------|----------------------|-------|
| 2-chlorophenol-d4                | 1,500 $\mu$ g/mL   | nitrobenzene-d5      | 1,000 |
| 1,2-dichlorobenzene-d4           | 1,000              | phenol-d6            | 1,500 |
| 2-fluorobiphenyl                 | 1,000              | p-terphenyl-d14      | 1,000 |
| 2-fluorophenol                   | 1,500              | 2,4,6-tribromophenol | 1,500 |
| In methylene chloride, 1mL/ampul |                    |                      |       |
|                                  | cat. # 31493 (ea.) |                      |       |

**B/N Surrogate Standard Mix (3/90 SOW)**

|  |                    |
|--|--------------------|
| 1,2-dichlorobenzene-d4                                 | nitrobenzene-d5    |
| 2-fluorobiphenyl                                       | p-terphenyl-d14    |
| 1,000 $\mu$ g/mL each in methylene chloride, 1mL/ampul |                    |
|  | cat. # 31002 (ea.) |
| 5,000 $\mu$ g/mL each in methylene chloride, 1mL/ampul |                    |
|  | cat. # 31072 (ea.) |
| 5,000 $\mu$ g/mL each in methylene chloride, 5mL/ampul |                    |
|  | cat. # 31082 (ea.) |

**B/N Surrogate Mix (4/89 SOW)**

|   |                    |
|---|--------------------|
| 2-fluorobiphenyl  | p-terphenyl-d14    |
| nitrobenzene-d5   |                    |
| 1,000 $\mu$ g/mL each in methylene chloride, 1mL/ampul  |                    |
|   | cat. # 31024 (ea.) |
| 5,000 $\mu$ g/mL each in methylene chloride, 1mL/ampul  |                    |
|   | cat. # 31062 (ea.) |
| 5,000 $\mu$ g/mL each in methylene chloride, 5mL/ampul  |                    |
|   | cat. # 31086 (ea.) |
| 5,000 $\mu$ g/mL each in methylene chloride, 10mL/ampul |                    |
|   | cat. # 33028 (ea.) |

**Acid Matrix Spike Mix**

|  |                    |
|--|--------------------|
| 4-chloro-3-methylphenol                      | pentachlorophenol  |
| 2-chlorophenol                               | phenol             |
| 4-nitrophenol                                |                    |
| 1,500 $\mu$ g/mL each in methanol, 1mL/ampul |                    |
|  | cat. # 31005 (ea.) |
| 7,500 $\mu$ g/mL each in methanol, 1mL/ampul |                    |
|  | cat. # 31075 (ea.) |
| 7,500 $\mu$ g/mL each in methanol, 5mL/ampul |                    |
|  | cat. # 31085 (ea.) |

**CLP 04.1 B/N Matrix Spike Mix**

|  |                            |
|--|----------------------------|
| acenaphthene                                 | N-nitroso-di-n-propylamine |
| 2,4-dinitrotoluene                           | pyrene                     |
| 1,000 $\mu$ g/mL each in methanol, 1mL/ampul |                            |
|  | cat. # 31492 (ea.)         |

**B/N Matrix Spike Mix**

|   |                            |
|---|----------------------------|
| acenaphthene                                  | N-nitroso-di-n-propylamine |
| 1,4-dichlorobenzene                           | pyrene                     |
| 2,4-dinitrotoluene                            | 1,2,4-trichlorobenzene     |
| 1,000 $\mu$ g/mL each in methanol, 1mL/ampul  |                            |
|   | cat. # 31004 (ea.)         |
| 5,000 $\mu$ g/mL each in methanol, 1mL/ampul  |                            |
|   | cat. # 31074 (ea.)         |
| 5,000 $\mu$ g/mL each in methanol, 5mL/ampul  |                            |
|   | cat. # 31084 (ea.)         |
| 5,000 $\mu$ g/mL each in methanol, 10mL/ampul |                            |
|   | cat. # 33030 (ea.)         |

**SV Screening Mix**

|  |                    |
|--|--------------------|
| di-n-octyl phthalate                                   | phenol             |
| phenanthrene   |                    |
| 2,500 $\mu$ g/mL each in methylene chloride, 1mL/ampul |                    |
|  | cat. # 31000 (ea.) |

**Low Concentration Semivolatiles, QA Mixes**

**L/C Acid Surrogate Mix**

|                        |                  |                      |                    |
|------------------------|------------------|----------------------|--------------------|
| 2-fluorophenol         | 1,000 $\mu$ g/mL | 2,4,6-tribromophenol | 3,000              |
| phenol-d6              |                  | 1,000                |                    |
| In methanol, 1mL/ampul |                  |                      | cat. # 31207 (ea.) |

**L/C Acid Lab Control Sample**

|  |                       |
|--|-----------------------|
| 2-chlorophenol                               | 2,4,6-trichlorophenol |
| phenol                                       |                       |
| 2,000 $\mu$ g/mL each in methanol, 1mL/ampul |                       |
|  | cat. # 31212 (ea.)    |

**L/C B/N Lab Control Sample** (12 components)

For extended shelf life, 4-chloroaniline is provided as a separate solution.

**Ampul 1:**

|                            |                        |
|----------------------------|------------------------|
| benzo(a)pyrene             | hexachlorethane        |
| bis(2-chloroethyl)ether    | isophorone             |
| diethyl phthalate          | naphthalene            |
| 2,4-dinitrotoluene         | N-nitrosodiphenylamine |
| N-nitroso-di-n-propylamine | 1,2,4-trichlorobenzene |
| hexachlorobenzene          |                        |

**Ampul 2:**

|                 |  |
|-----------------|--|
| 4-chloroaniline | 1,000 $\mu$ g/mL each in methylene chloride (4-chloroaniline at 2,000 $\mu$ g/mL), 1mL/ampul |
|                 | cat. # 31241 (ea.)   |

**SV Tuning Compound**

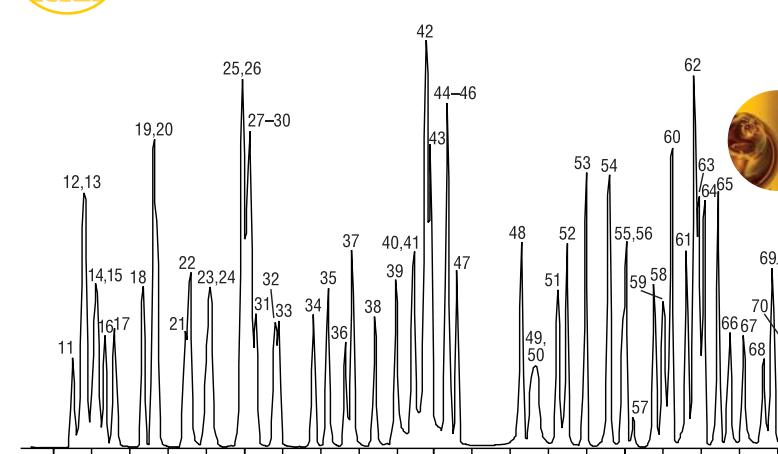
|   |                    |
|---|--------------------|
| decafluorotriphenylphosphine (DFTPP)              |                    |
| 2,500 $\mu$ g/mL in methylene chloride, 1mL/ampul |                    |
|   | cat. # 31001 (ea.) |

**PFTBA (MS Tuning Compound)**

|                                |                    |
|--------------------------------|--------------------|
| perfluorotributylamine (PFTBA) |                    |
| Neat, 1mL/ampul                |                    |
|                                | cat. # 30482 (ea.) |
| Neat, 1g                       |                    |
|                                | cat. # 33027 (ea.) |
| No data pack available.        |                    |

also available

See pages 547-565 for chromatograms of semivolatiles analysis.



**SOM01.1 (Semivolatiles), Calibration Mixes****SOM01.1 SVOA MegaMix® (67 components)**

|   |   |
|---|---|
| acenaphthene  | 2,4-dinitrophenol                                 |
| acenaphthylene  | 2,4-dinitrotoluene                                |
| acetophenone  | 2,6-dinitroluene                                  |
| anthracene  | di-n-octyl phthalate                              |
| atrazine  | diphenylamine <sup>1</sup>                        |
| benzo(a)anthracene  | fluoranthene                                      |
| benzo(a)pyrene  | fluorene  |
| benzo(b)fluoranthene  | hexachlorobenzene                                 |
| benzo(ghi)perylene  | hexachloro-1,3-butadiene<br>(hexachlorobutadiene) |
| benzo(k)fluoranthene  | hexachlorocyclopentadiene                         |
| benzyl butyl phthalate  | hexachloroethane                                  |
| biphenyl  | indeno(1,2,3-cd)pyrene                            |
| bis(2-chloroethoxy)methane                                    | isophorone  |
| bis(2-chloroethyl)ether                                       | 2-methylnaphthalene                               |
| bis(2-chloroisopropyl)ether<br>(2,2'-oxybis(1-chloropropane)) | 2-methylphenol (o-cresol)                         |
| bis(2-ethylhexyl)phthalate                                    | 3-methylphenol (m-cresol)*                        |
| 4-bromophenyl-phenylether                                     | 4-methylphenol (p-cresol)*                        |
| ε-caprolactam   | naphthalene                                       |
| carbazole   | 2-nitroaniline                                    |
| 4-chloroaniline   | 3-nitroaniline                                    |
| 4-chloro-3-methylphenol                                       | 4-nitroaniline                                    |
| 2-chloronaphthalene   | nitrobenzene                                      |
| 2-chlorophenol  | 2-nitrophenol                                     |
| 4-chlorophenyl-phenylether                                    | 4-nitrophenol                                     |
| chrysene  | N-nitroso-di-n-propylamine                        |
| dibenzo(a,h)anthracene  | pentachlorophenol                                 |
| dibenzofuran  | phenanthrene                                      |
| 3,3'-dichlorobenzidine  | phenol  |
| 2,4-dichlorophenol  | pyrene  |
| diethylphthalate  | 1,2,4,5-tetrachlorobenzene                        |
| 2,4-dimethylphenol  | 2,3,4,6-tetrachlorophenol                         |
| dimethylphthalate   | 2,4,5-trichlorophenol                             |
| di-n-butylphthalate   | 2,4,6-trichlorophenol                             |
| 4,6-dinitro-2-methylphenol                                    |   |

1,000µg/mL each in methylene chloride, 1mL/ampul  
cat. # 33019 (ea.)

\*3-methylphenol and 4-methylphenol concentration is 500µg/mL.

<sup>1</sup> N-nitrosodiphenylamine (CLP-listed analyte) decomposes to diphenylamine (mix component) in the injector.

**Benzaldehyde**

2,000µg/mL in methylene chloride, 1mL/ampul  
cat. # 33017 (ea.)

**SOM01.1 SVOA MegaMix® Kit**

33019: SOM01.1 SVOA MegaMix 1,000µg/mL  
33017: Benzaldehyde 2,000µg/mL  
Contains 1mL each of these mixtures.  
cat. # 33005 (kit)

**04.2 and 04.1 (Semivolatiles), Calibration Mixes****CLP 04.1 B/N MegaMix® (49 components)**

|   |   |
|---|---|
| acenaphthene  | diethylphthalate                                  |
| acenaphthylene  | dimethylphthalate                                 |
| acetophenone  | di-n-butyl phthalate                              |
| anthracene  | 2,4-dinitrotoluene                                |
| atrazine  | 2,6-dinitrotoluene                                |
| benzo(a)anthracene  | di-n-octyl phthalate                              |
| benzo(a)pyrene  | diphenylamine <sup>1</sup>                        |
| benzo(b)fluoranthene  | fluoranthene                                      |
| benzo(ghi)perylene  | hexachlorobenzene                                 |
| benzo(k)fluoranthene  | hexachloro-1,3-butadiene<br>(hexachlorobutadiene) |
| benzyl butyl phthalate  | hexachlorocyclopentadiene                         |
| biphenyl  | hexachloroethane                                  |
| bis(2-chloroethoxy)methane                                    | indeno(1,2,3-cd)pyrene                            |
| bis(2-chloroethyl)ether                                       | isophorone  |
| bis(2-chloroisopropyl)ether<br>(2,2'-oxybis(1-chloropropane)) | 2-methylnaphthalene                               |
| bis(2-ethylhexyl)phthalate                                    | 2-methylphenol (o-cresol)                         |
| 4-bromophenyl-phenylether                                     | 3-methylphenol (m-cresol)*                        |
| ε-caprolactam   | 4-methylphenol (p-cresol)*                        |
| carbazole   | naphthalene                                       |
| 4-chloroaniline   | 2-nitroaniline                                    |
| 4-chloro-3-methylphenol                                       | 3-nitroaniline                                    |
| 2-chloronaphthalene   | nitrobenzene                                      |
| 2-chlorophenol  | 2-nitrophenol                                     |
| 4-chlorophenyl-phenylether                                    | 4-nitrophenol                                     |
| chrysene  | N-nitroso-di-n-propylamine                        |
| dibenzo(a,h)anthracene  | phenanthrene                                      |
| dibenzofuran  | pyrene  |

1,000µg/mL each in methylene chloride, 1mL/ampul  
cat. # 33018 (ea.)

<sup>1</sup> N-nitrosodiphenylamine (CLP-listed analyte) decomposes to diphenylamine (mix component) in the injector.

**Benzaldehyde**

2,000µg/mL in methylene chloride, 1mL/ampul  
cat. # 33017 (ea.)

**CLP 04.1 B/N MegaMix® Kit**

33018: CLP 04.1 B/N MegaMix 1,000µg/mL  
33017: Benzaldehyde 2,000µg/mL

Contains 1mL each of these mixtures.

cat. # 33014 (kit)

**CLP 04.1 Phenols Calibration Mix (14 components)**

|                            |                       |
|----------------------------|-----------------------|
| 4-chloro-3-methylphenol    | 4-methylphenol        |
| 2-chlorophenol             | 2-nitrophenol         |
| 2,4-dichlorophenol         | 4-nitrophenol         |
| 2,4-dimethylphenol         | pentachlorophenol     |
| 2,4-dinitrophenol          | phenol                |
| 2-methyl-4,6-dinitrophenol | 2,4,5-trichlorophenol |
| 2-methylphenol             | 2,4,6-trichlorophenol |

2,000µg/mL each in methylene chloride, 1mL/ampul  
cat. # 31494 (ea.)

**Benzidine Mix**

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

**also available**

See page 78 for details on our Rx<sup>i</sup>-5Sil MS Capillary Columns for semivolatiles analysis.

**i tech tip****CLP OLM 04.1 Semivolatiles Dilution**

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 **CLP 04.1 B/N MegaMix®** and our **Benzaldehyde** standard 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.

**4/89 and 3/90 SOW (Semivolatiles), Calibration Mixes**

**SV Calibration Mix #1**

|  |                |
|--|----------------|
| benzyl alcohol   | 3-nitroaniline |
| 4-chloroaniline  | 4-nitroaniline |
| 2-nitroaniline   |                |
| 2,000 $\mu$ g/mL each in methylene chloride, 1mL/ampul |                |

cat. # 31007 (ea.)

**SV Calibration Mix #2 (15 components)**

|  |                       |
|--|-----------------------|
| benzoic acid   | 4-methylphenol        |
| 4-chloro-3-methylphenol                                | 2-nitrophenol         |
| 2-chlorophenol   | 4-nitrophenol         |
| 2,4-dichlorophenol                                     | pentachlorophenol     |
| 2,4-dimethylphenol                                     | phenol                |
| 2,4-dinitrophenol                                      | 2,4,5-trichlorophenol |
| 2-methyl-4,6-dinitrophenol                             | 2,4,6-trichlorophenol |
| 2-methylphenol   |                       |
| 2,000 $\mu$ g/mL each in methylene chloride, 1mL/ampul |                       |

cat. # 31008 (ea.)

**SV Calibration Mix #3 (14 components)**

|  |                             |
|--|-----------------------------|
| bis(2-chloroethoxy)methane                             | 4-chlorophenyl phenyl ether |
| bis(2-chloroethyl)ether                                | dimethylphthalate           |
| bis(2-chloroisopropyl)ether                            | di-n-butylphthalate         |
| bis(2-ethylhexyl)phthalate                             | di-n-octylphthalate         |
| 4-bromophenyl phenyl ether                             | N-nitrosodimethylamine      |
| butyl benzyl phthalate                                 | N-nitrosodi-n-propylamine   |
| 2-chloronaphthalene                                    | N-nitrosodiphenylamine      |
| 2,000 $\mu$ g/mL each in methylene chloride, 1mL/ampul |                             |

cat. # 31009 (ea.)

**SV Calibration Mix #4 (13 components)**

|  |                           |
|--|---------------------------|
| carbazole  | hexachlorocyclopentadiene |
| dibenzofuran   | hexachloroethane          |
| diethyl phthalate                                      | isophorone                |
| 2,4-dinitrotoluene                                     | 2-methylnaphthalene       |
| 2,6-dinitrotoluene                                     | nitrobenzene              |
| hexachlorobenzene                                      | 1,2,4-trichlorobenzene    |
| hexachlorobutadiene                                    |                           |
| 2,000 $\mu$ g/mL each in methylene chloride, 1mL/ampul |                           |

cat. # 31010 (ea.)

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

|  |                        |
|--|------------------------|
| acenaphthene   | chrysene               |
| acenaphthylene   | dibenzo(a,h)anthracene |
| anthracene   | fluoranthene           |
| benzo(a)anthracene                                     | fluorene               |
| benzo(a)pyrene   | indeno(1,2,3-cd)pyrene |
| benzo(b)fluoranthene                                   | naphthalene            |
| benzo(k)fluoranthene                                   | phenanthrene           |
| benzo(ghi)perylene                                     | pyrene                 |
| 2,000 $\mu$ g/mL each in methylene chloride, 1mL/ampul |                        |

cat. # 31011 (ea.)

**SV Calibration Mix #6 (18 components)**

|  |                               |
|--|-------------------------------|
| aldrin   | endosulfan I                  |
| $\alpha$ -BHC  | endosulfan II                 |
| $\beta$ -BHC   | endosulfan sulfate            |
| $\delta$ -BHC  | endrin                        |
| $\gamma$ -BHC (lindane)                                  | endrin aldehyde               |
| 4,4'-DDD   | endrin ketone                 |
| 4,4'-DDE   | heptachlor                    |
| 4,4'-DDT   | heptachlor epoxide (isomer B) |
| dieldrin   | methoxychlor                  |
| 2,000 $\mu$ g/mL each in toluene:hexane (1:1), 1mL/ampul |                               |

cat. # 31012 (ea.)

**did you know?**

We have more than 2,000 pure, characterized, neat compounds in our inventory! If you do not see the EXACT mixture you need listed on any of these pages, contact us for a custom standard.

**SV Calibration Mix #7**

|  |                     |
|--|---------------------|
| 1,2-dichlorobenzene                                    | 1,4-dichlorobenzene |
| 1,3-dichlorobenzene                                    |                     |
| 2,000 $\mu$ g/mL each in methylene chloride, 1mL/ampul |                     |

cat. # 31013 (ea.)

**3,3'-Dichlorobenzidine**

|   |  |
|---|--|
| 2,000 $\mu$ g/mL in methanol, 1mL/ampul |  |
| cat. # 31026 (ea.)                      |  |

2,000 $\mu$ g/mL in methylene chloride, 1mL/ampul

cat. # 31835 (ea.)

**605 Benzidines Calibration Mix**

|  |                        |
|--|------------------------|
| benzidine                                    | 3,3'-dichlorobenzidine |
| 2,000 $\mu$ g/mL each in methanol, 1mL/ampul |                        |
| cat. # 31030 (ea.)                           |                        |

|  |  |
|--|--|
| 2,000 $\mu$ g/mL each in methylene chloride, 1mL/ampul |  |
| cat. # 31834 (ea.)                                     |  |

**8270 Benzidines Mix**

|  |                        |
|--|------------------------|
| benzidine                                    | 3,3'-dimethylbenzidine |
| 3,3'-dichlorobenzidine                       |                        |
| 2,000 $\mu$ g/mL each in methanol, 1mL/ampul |                        |
| cat. # 31688 (ea.)                           |                        |

|  |  |
|--|--|
| 2,000 $\mu$ g/mL each in methylene chloride, 1mL/ampul |  |
| cat. # 31852 (ea.)                                     |  |

**CLP Semivolatile Calibration Kit #2 (without pesticides)**

|   |  |
|---|--|
| 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                   |  |

Contains 1mL each of these mixtures.

cat. # 31462 (kit)



**Semivolatile Calibration Kit #3 (with benzidine)**

|  |  |
|--|--|
| 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) |  |

Contains 1mL each of these mixtures.

cat. # 31463 (kit)



**free data**

**Available on Our Website: Lot Certificates, Data Packs, and MSDSs**

For complete information detailing manufacturing and testing for Restek inventoried reference standards, visit our website at [www.restek.com/datapacks](http://www.restek.com/datapacks). To view certificates and/or an MSDS, enter the catalog number of the product in the Search feature. For a free data pack (Adobe® PDF file), enter the catalog number and lot number of the product.



### 03.2 (Semivolatiles), Calibration Mixes

#### OLC 03.2 SVOA Deuterated Monitoring Compounds (DMC)

(16 components)

|  |                             |
|--|-----------------------------|
| acenaphthylene-d8                                      | 4,6-dinitro-methylphenol-d2 |
| anthracene-d10   | fluorene-d10                |
| benzo(a)pyrene-d12                                     | 4-methylphenol-d8           |
| 4-chloroaniline-d4                                     | nitrobenzene-d5             |
| bis-(2-chloroethyl)ether-d8                            | 2-nitrophenol-d4            |
| 2-chlorophenol-d4                                      | 4-nitrophenol-d4            |
| 2,4-dichlorophenol-d3                                  | phenol-d5                   |
| dimethylphthalate-d6                                   | pyrene-d10                  |
| 2,000 $\mu$ g/mL each in methylene chloride, 1mL/ampul |                             |
| cat. # 31810 (ea.)                                     |                             |

#### OLC 03.2 SVOA MegaMix® (57 components)

|  |                            |
|--|----------------------------|
| acenaphthene   | dimethylphthalate          |
| acenaphthylene   | di-n-butyl phthalate       |
| acetophenone   | 2,4-dinitrophenol          |
| anthracene   | 2,4-dinitrotoluene         |
| atrazine   | 2,6-dinitrotoluene         |
| benzaldehyde   | di-n-octyl phthalate       |
| benzo(a)anthracene                                     | fluoranthene               |
| benzo(a)pyrene   | fluorene                   |
| benzo(b)fluoranthene                                   | hexachlorobenzene          |
| benzo(ghi)perylene                                     | hexachlorobutadiene        |
| benzo(k)fluoranthene                                   | hexachlorocyclopentadiene  |
| benzyl butyl phthalate                                 | hexachloroethane           |
| biphenyl   | indeno(1,2,3-cd)pyrene     |
| bis(2-chloroethoxy)methane                             | isophorone                 |
| bis(2-chloroethyl)ether                                | 2-methylnaphthalene        |
| bis(2-chloroisopropyl)ether                            | 2-methylphenol             |
| bis(2-ethylhexyl)phthalate                             | 4-methylphenol             |
| 4-bromophenyl phenyl ether                             | naphthalene                |
| $\epsilon$ -caprolactam                                | nitrobenzene               |
| carbazole  | 2-nitrophenol              |
| 4-chloro-3-methylphenol                                | N-nitroso-di-n-propylamine |
| 2-chloronaphthalene                                    | N-nitrosodiphenylamine     |
| 2-chlorophenol   | pentachlorophenol          |
| 4-chlorophenyl phenyl ether                            | phenanthrene               |
| chrysene   | phenol                     |
| dibenzo(a,h)anthracene                                 | pyrene                     |
| dibenzofuran   | 1,2,4,5-tetrachlorobenzene |
| diethylphthalate                                       | 2,4,6-trichlorophenol      |
| 2,4-dimethylphenol                                     |                            |
| 1,000 $\mu$ g/mL each in methylene chloride, 1mL/ampul |                            |
| cat. # 31862 (ea.)                                     |                            |

#### Fortification Mix (7 components)

|  |                       |
|--|-----------------------|
| 4,6-dinitro-2-methylphenol                             | 4-nitroaniline        |
| 2,4-dinitrophenol                                      | 4-nitrophenol         |
| 2-nitroaniline   | 2,4,5-trichlorophenol |
| 3-nitroaniline   |                       |
| 2,000 $\mu$ g/mL each in methylene chloride, 1mL/ampul |                       |
| cat. # 31813 (ea.)                                     |                       |

#### 3,3'-Dichlorobenzidine

|   |  |
|---|--|
| 2,000 $\mu$ g/mL in methylene chloride, 1mL/ampul |  |
| cat. # 31835 (ea.)                                |  |

#### Hexachlorophene

|   |  |
|---|--|
| 2,000 $\mu$ g/mL in methylene chloride, 1mL/ampul |  |
| cat. # 31811 (ea.)                                |  |

### did you know?

Our **Pesticide Matrix Spike Mix** (cat.# 32018, page 450) can be used as a GPC calibration verification solution.

### Low Concentration Semivolatiles, Calibration Mixes

#### L/C Phenol Mix A

|  |                            |
|--|----------------------------|
| 2,4-dinitrophenol*                                     | pentachlorophenol*         |
| 2-methyl-4,6-dinitrophenol*                            | 2,4,6-tribromophenol (SS)* |
| 4-nitrophenol*   | 2,4,5-trichlorophenol*     |
| 2,000 $\mu$ g/mL each in methylene chloride, 1mL/ampul |                            |
| cat. # 31208 (ea.)                                     |                            |

\*Must be calibrated at a level different from the other listed semivolatile compounds.

#### L/C Phenol Mix B (11 components)

|  |                       |
|--|-----------------------|
| 4-chloro-3-methylphenol                                | 4-methylphenol        |
| 2-chlorophenol   | 2-nitrophenol         |
| 2,4-dichlorophenol                                     | phenol                |
| 2,4-dimethylphenol                                     | phenol-d6 (SS)        |
| 2-fluorophenol   | 2,4,6-trichlorophenol |
| 2-methylphenol   |                       |
| 2,000 $\mu$ g/mL each in methylene chloride, 1mL/ampul |                       |
| cat. # 31209 (ea.)                                     |                       |

#### L/C Aniline Mix A

|  |                 |
|--|-----------------|
| 2-nitroaniline*  | 4-nitroaniline* |
| 3-nitroaniline*  |                 |
| 2,000 $\mu$ g/mL each in methylene chloride, 1mL/ampul |                 |
| cat. # 31210 (ea.)                                     |                 |

\*Must be calibrated at a level different from the other listed semivolatile compounds.

#### L/C Aniline Mix B

|   |  |
|---|--|
| 4-chloroaniline                                   |  |
| 2,000 $\mu$ g/mL in methylene chloride, 1mL/ampul |  |
| cat. # 31211 (ea.)                                |  |

### Additional Required SV Calibration Mixes:

See pages 445 and 447 for mix compositions.

|                                     |  |
|-------------------------------------|--|
| 31024: B/N Surrogate Mix (4/89 SOW) |  |
| 31009: SV Calibration Mix #3        |  |
| 31010: SV Calibration Mix #4        |  |
| 31011: SV Calibration Mix #5        |  |
| 31026: 3,3'-dichlorobenzidine       |  |
| 31001: SV Tuning Compound (DFTPP)   |  |

### 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

|                                  |         |          |     |
|----------------------------------|---------|----------|-----|
| bis(2-ethylhexyl) phthalate      | 10mg/mL | perylene | 0.2 |
| corn oil                         | 250     | sulfur   | 0.8 |
| methoxychlor                     | 2.0     |          |     |
| In methylene chloride, 1mL/ampul |         |          |     |
| cat. # 32019 (ea.)               |         |          |     |
| In methylene chloride, 5mL/ampul |         |          |     |
| cat. # 32023 (ea.)               |         |          |     |

No data pack available.

#### Revised GPC Calibration Mix

|                                  |        |          |     |
|----------------------------------|--------|----------|-----|
| bis(2-ethylhexyl) phthalate      | 5mg/mL | perylene | 0.2 |
| corn oil                         | 250    | sulfur   | 0.8 |
| methoxychlor                     | 1.0    |          |     |
| In methylene chloride, 1mL/ampul |        |          |     |
| cat. # 32041 (ea.)               |        |          |     |
| In methylene chloride, 5mL/ampul |        |          |     |
| cat. # 32042 (ea.)               |        |          |     |

No data pack available.

**SOM01.1 (Pesticides), QA Mixes**

**Pesticide Surrogate Mix**

|   |                       |
|---|-----------------------|
| decachlorobiphenyl<br>2,4,5,6-tetrachloro- <i>m</i> -xylene | 200 $\mu$ g/mL<br>100 |
| In acetone, 1mL/ampul                                       |                       |
| cat. # 32453 (ea.)  |                       |

**Organochlorine Pesticide Resolution Check Mix**

(with surrogates) (22 components)

|                         |               |  |     |
|-------------------------|---------------|--|-----|
| aldrin                  | 10 $\mu$ g/mL | endosulfan I                               | 10  |
| $\alpha$ -BHC           | 10            | endosulfan II                              | 20  |
| $\beta$ -BHC            | 10            | endosulfan sulfate                         | 20  |
| $\delta$ -BHC           | 10            | endrin                                     | 20  |
| $\gamma$ -BHC (lindane) | 10            | endrin aldehyde                            | 20  |
| $\alpha$ -chlordane     | 10            | endrin ketone                              | 20  |
| $\gamma$ -chlordane     | 10            | heptachlor                                 | 10  |
| decachlorobiphenyl (SS) | 20            | heptachlor epoxide (isomer B)              | 10  |
| dieldrin                | 20            | methoxychlor                               | 100 |
| 4,4'-DDD                | 20            | 2,4,5,6-tetrachloro- <i>m</i> -xylene (SS) | 10  |
| 4,4'-DDE                | 20            |  |     |
| 4,4'-DDT                | 20            |  |     |

In hexane:toluene, 1mL/ampul

cat. # 32454 (ea.)

**04.2, 04.1, 03.2, 3/90, 4/89, and 2/88 SOW (Pesticides), QA Mixes**

**Pesticide Surrogate Mix**

|   |                                       |
|---|---------------------------------------|
| decachlorobiphenyl                        | 2,4,5,6-tetrachloro- <i>m</i> -xylene |
| 200 $\mu$ g/mL each in acetone, 1mL/ampul |                                       |
| cat. # 32000 (ea.)                        |                                       |

**2,4,5,6-Tetrachloro-*m*-xylene**

200 $\mu$ g/mL in acetone, 1mL/ampul

cat. # 32027 (ea.)

200 $\mu$ g/mL in acetone, 5mL/ampul

cat. # 32028 (ea.)

**Decachlorobiphenyl (BZ #209)**

200 $\mu$ g/mL in acetone, 1mL/ampul

cat. # 32029 (ea.)

200 $\mu$ g/mL in acetone, 5mL/ampul

cat. # 32030 (ea.)

100 $\mu$ g/mL in isoctane, 1mL/ampul

cat. # 32289 (ea.)

**Dibutylchlorendate**

200 $\mu$ g/mL in acetone, 1mL/ampul

cat. # 32025 (ea.)

**Florisil® Cartridge Check Standard**

2,4,5-trichlorophenol

1,000 $\mu$ g/mL in acetone, 1mL/ampul

cat. # 32017 (ea.)

**Organochlorine Pesticide System Evaluation Mix**

|          |                |
|----------|----------------|
| 4,4'-DDT | 200 $\mu$ g/mL |
| endrin   | 100 $\mu$ g/mL |

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

cat. # 32417 (ea.)

04.2, 04.1, 03.2, 3/90, 4/89, and 2/88 SOW (Pesticides), QA Mixes cont'd

**Pesticide Resolution Check Mix (7 components)**

|                     |              |                      |    |
|---------------------|--------------|----------------------|----|
| $\gamma$ -chlordane | 1 $\mu$ g/mL | endosulfan sulfate   | 2  |
| 4,4'-DDE            | 2            | endrin ketone        | 2  |
| dieldrin            | 2            | methoxychlor         | 10 |
| endosulfan I        | 1            |                      |    |
|                     |              | In hexane, 1mL/ampul |    |
|                     |              | cat. # 32001 (ea.)   |    |

**Pesticide Resolution Check Mix w/Surrogates (9 components)**

|                         |              |  |    |
|-------------------------|--------------|--|----|
| $\gamma$ -chlordane     | 1 $\mu$ g/mL | endosulfan sulfate                         | 2  |
| 4,4'-DDE                | 2            | endrin ketone                              | 2  |
| decachlorobiphenyl (SS) | 2            | methoxychlor                               | 10 |
| dieldrin                | 2            | 2,4,5,6-tetrachloro- <i>m</i> -xylene (SS) | 2  |
| endosulfan I            | 1            |  |    |
|                         |              | In hexane, 1mL/ampul                       |    |
|                         |              | cat. # 32073 (ea.)                         |    |

**Pesticide Performance Evaluation Mix**

|                         |              |  |    |
|-------------------------|--------------|--|----|
| $\alpha$ -BHC           | 1 $\mu$ g/mL | 4,4'-DDT                                   | 10 |
| $\beta$ -BHC            | 1            | endrin                                     | 5  |
| $\gamma$ -BHC (lindane) | 1            | methoxychlor                               | 25 |
| 4,4'-DDT                | 10           | 2,4,5,6-tetrachloro- <i>m</i> -xylene (SS) | 2  |
|                         |              | In hexane, 1mL/ampul                       |    |
|                         |              | cat. # 32002 (ea.)                         |    |

**Pesticide Performance Evaluation Mix w/Surrogates**

(8 components)

|                         |              |  |    |
|-------------------------|--------------|--|----|
| $\alpha$ -BHC           | 1 $\mu$ g/mL | decachlorobiphenyl (SS)                    | 2  |
| $\beta$ -BHC            | 1            | endrin                                     | 5  |
| $\gamma$ -BHC (lindane) | 1            | methoxychlor                               | 25 |
| 4,4'-DDT                | 10           | 2,4,5,6-tetrachloro- <i>m</i> -xylene (SS) | 2  |
|                         |              | In hexane, 1mL/ampul                       |    |
|                         |              | cat. # 32074 (ea.)                         |    |



**Working with solutions containing decachlorobiphenyl**

Decachlorobiphenyl has poor solubility in most organic solvents. The maximum concentration that can be prepared in acetone, hexane, or isoctane is 200 $\mu$ g/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**

|                         |               |            |    |
|-------------------------|---------------|------------|----|
| aldrin                  | 25 $\mu$ g/mL | dieldrin   | 50 |
| $\gamma$ -BHC (lindane) | 25            | endrin     | 50 |
| 4,4'-DDT                | 50            | heptachlor | 25 |
| In acetone, 1mL/ampul   |               |            |    |
| cat. # 32018 (ea.)      |               |            |    |

**Pesticide Matrix Spike Mix (2/88 SOW)**

|                         |                |            |     |
|-------------------------|----------------|------------|-----|
| aldrin                  | 200 $\mu$ g/mL | dieldrin   | 500 |
| $\gamma$ -BHC (lindane) | 200            | endrin     | 500 |
| 4,4'-DDT                | 500            | heptachlor | 200 |
| In methanol, 1mL/ampul  |                |            |     |
| cat. # 32031 (ea.)      |                |            |     |

**Pesticide Evaluation Mix (2/88 SOW)**

|  |          |        |
|--|----------|--------|
| aldrin                                   | 4,4'-DDT |        |
| dibutylchlorendate (SS)                  |          | endrin |
| 100 $\mu$ g/mL each in hexane, 1mL/ampul |          |        |
| cat. # 32032 (ea.)                       |          |        |

See complete listing of PCBs, page 452.

**Low Concentration Pesticides Mixtures, QA Mixes**

|   |                |
|---|----------------|
| <b>L/C Pesticide Lab Control Sample</b> | (7 components) |
| $\gamma$ -BHC (lindane)                 | 10 $\mu$ g/mL  |
| $\gamma$ -chlordane                     | 10             |
| 4,4'-DDE                                | 20             |
| dieldrin                                | 20             |
| In acetone, 1mL/ampul                   |                |
| cat. # 32040 (ea.)                      |                |

**CLP Pesticides Mixtures, Calibration Mixes**

**Pesticide Standard Mix A (2/88 SOW)** (10 components)

|                         |               |                               |     |
|-------------------------|---------------|-------------------------------|-----|
| aldrin                  | 10 $\mu$ g/mL | endosulfan II                 | 20  |
| $\gamma$ -BHC (lindane) | 5             | endrin aldehyde               | 25  |
| 4,4'-DDT                | 20            | heptachlor                    | 10  |
| dieldrin                | 10            | heptachlor epoxide (isomer B) | 10  |
| endosulfan I            | 10            | methoxychlor                  | 100 |
| In hexane, 1mL/ampul    |               |                               |     |
| cat. # 32033 (ea.)      |               |                               |     |

**Pesticide Standard Mix B (2/88 SOW)** (11 components)

|                      |               |                    |    |
|----------------------|---------------|--------------------|----|
| aldrin               | 10 $\mu$ g/mL | 4,4'-DDD           | 20 |
| $\alpha$ -BHC        | 5             | 4,4'-DDE           | 10 |
| $\beta$ -BHC         | 10            | endosulfan sulfate | 20 |
| $\delta$ -BHC        | 10            | endrin             | 10 |
| $\alpha$ -chlordane  | 10            | endrin ketone      | 20 |
| $\gamma$ -chlordane  | 10            |                    |    |
| In hexane, 1mL/ampul |               |                    |    |
| cat. # 32034 (ea.)   |               |                    |    |

**Pesticide Standard Mix A** (9 components)

|                         |              |              |    |
|-------------------------|--------------|--------------|----|
| $\alpha$ -BHC           | 5 $\mu$ g/mL | endosulfan I | 5  |
| $\gamma$ -BHC (lindane) | 5            | endrin       | 10 |
| 4,4'-DDD                | 10           | heptachlor   | 5  |
| 4,4'-DDT                | 10           | methoxychlor | 50 |
| dieldrin                | 10           |              |    |

In hexane:toluene (90:10), 1mL/ampul

cat. # 32297 (ea.)

**CLP Pesticides Mixtures, Calibration Mixes cont'd**

**Pesticide Standard Mix B** (11 components)

|                     |              |                               |    |
|---------------------|--------------|-------------------------------|----|
| aldrin              | 5 $\mu$ g/mL | endosulfan II                 | 10 |
| $\beta$ -BHC        | 5            | endosulfan sulfate            | 10 |
| $\delta$ -BHC       | 5            | endrin aldehyde               | 10 |
| $\alpha$ -chlordane | 5            | endrin ketone                 | 10 |
| $\gamma$ -chlordane | 5            | heptachlor epoxide (isomer B) | 5  |
| 4,4'-DDE            | 10           |                               |    |

In hexane:toluene (90:10), 1mL/ampul  
cat. # 32298 (ea.)

**Organochlorine Pesticide Mix AB #1** (20 components)

|  |                               |
|--|-------------------------------|
| aldrin   | dieldrin                      |
| $\alpha$ -BHC  | endosulfan I                  |
| $\beta$ -BHC   | endosulfan II                 |
| $\delta$ -BHC  | endosulfan sulfate            |
| $\gamma$ -BHC (lindane)                                | endrin                        |
| $\alpha$ -chlordane                                    | endrin aldehyde               |
| $\gamma$ -chlordane                                    | endrin ketone                 |
| 4,4'-DDD   | heptachlor                    |
| 4,4'-DDE   | heptachlor epoxide (isomer B) |
| 4,4'-DDT   | methoxychlor                  |
| 200 $\mu$ g/mL each in hexane:toluene (1:1), 1mL/ampul |                               |
| cat. # 32291 (ea.)                                     |                               |

**Organochlorine Pesticide Mix AB #2** (20 components)

|                         |              |                               |    |
|-------------------------|--------------|-------------------------------|----|
| aldrin                  | 8 $\mu$ g/mL | dieldrin                      | 16 |
| $\alpha$ -BHC           | 8            | endosulfan I                  | 8  |
| $\beta$ -BHC            | 8            | endosulfan II                 | 16 |
| $\delta$ -BHC           | 8            | endosulfan sulfate            | 16 |
| $\gamma$ -BHC (lindane) | 8            | endrin                        | 16 |
| $\alpha$ -chlordane     | 8            | endrin aldehyde               | 16 |
| $\gamma$ -chlordane     | 8            | endrin ketone                 | 16 |
| 4,4'-DDD                | 16           | heptachlor                    | 8  |
| 4,4'-DDE                | 16           | heptachlor epoxide (isomer B) | 8  |
| 4,4'-DDT                | 16           | methoxychlor                  | 80 |

In hexane:toluene (1:1), 1mL/ampul  
cat. # 32292 (ea.)

**Organochlorine Pesticide Mix AB #3** (20 components)

|  |                               |
|--|-------------------------------|
| aldrin   | dieldrin                      |
| $\alpha$ -BHC  | endosulfan I                  |
| $\beta$ -BHC   | endosulfan II                 |
| $\delta$ -BHC  | endosulfan sulfate            |
| $\gamma$ -BHC (lindane)                                  | endrin                        |
| $\alpha$ -chlordane                                      | endrin aldehyde               |
| $\gamma$ -chlordane                                      | endrin ketone                 |
| 4,4'-DDD   | heptachlor                    |
| 4,4'-DDE   | heptachlor epoxide (isomer B) |
| 4,4'-DDT   | methoxychlor                  |
| 2,000 $\mu$ g/mL each in hexane:toluene (1:1), 1mL/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)

|                         |              |  |    |
|-------------------------|--------------|--|----|
| $\alpha$ -BHC           | 8 $\mu$ g/mL | endosulfan I                               | 8  |
| $\gamma$ -BHC (lindane) | 8            | endrin                                     | 16 |
| 4,4'-DDD                | 16           | heptachlor                                 | 8  |
| 4,4'-DDT                | 16           | methoxychlor                               | 80 |
| decachlorobiphenyl (SS) | 16           | 2,4,5,6-tetrachloro- <i>m</i> -xylene (SS) | 8  |
| dieldrin                | 16           |  |    |
| In hexane, 1mL/ampul    |              |  |    |
|                         |              | cat. # 32003 (ea.)                         |    |

### Pesticide Standard Mix B w/Surrogates (13 components)

|                         |              |  |    |
|-------------------------|--------------|--|----|
| aldrin                  | 8 $\mu$ g/mL | endosulfan II                              | 16 |
| $\beta$ -BHC            | 8            | endosulfan sulfate                         | 16 |
| $\delta$ -BHC           | 8            | endrin aldehyde                            | 16 |
| $\alpha$ -chlordane     | 8            | endrin ketone                              | 16 |
| $\gamma$ -chlordane     | 8            | heptachlor epoxide (isomer B)              | 8  |
| 4,4'-DDE                | 16           | 2,4,5,6-tetrachloro- <i>m</i> -xylene (SS) | 8  |
| decachlorobiphenyl (SS) | 16           |  |    |
| In hexane, 1mL/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.

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

Contains 1mL each of these mixtures.

cat. # 32404 (kit)



### Technical Chlordane, Toxaphene Solutions

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

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

H = hexane

I = isoctane

M = methanol



### also available

See pages 80-81 for Rtx®-CLPesticides and Rtx®-CLPesticide2 capillary columns for pesticides analysis.

See page 452 for our complete listing of PCBs and congeners.

## Aroclor Solutions

Volume is 1mL/ampul. Concentration is  $\mu$ g/mL unless otherwise noted.

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

A = acetone

H = hexane

I = isoctane

TO = transformer oil (PCB-free)

### please note

We test our transformer oil solvent to ensure that it is PCB-free.



### 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, warm it to room temperature and invert 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.
- 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 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.

## PCBs, Organotin

## PCB Kits

## PCB Kit #1

32006: Aroclor 1016  
 32007: Aroclor 1221  
 32008: Aroclor 1232  
 32009: Aroclor 1242  
 32010: Aroclor 1248  
 32011: Aroclor 1254  
 32012: Aroclor 1260

1,000 $\mu$ g/mL each in hexane, 1mL/ampul  
 cat. # 32089 (kit)



## PCB Kit #2

32064: Aroclor 1016  
 32065: Aroclor 1221  
 32066: Aroclor 1232  
 32067: Aroclor 1242  
 32068: Aroclor 1248  
 32069: Aroclor 1254  
 32070: Aroclor 1260

200 $\mu$ g/mL each in isoctane, 1mL/ampul  
 cat. # 32090 (kit)



## PCB Kit #3

32007: Aroclor 1221  
 32008: Aroclor 1232  
 32009: Aroclor 1242  
 32010: Aroclor 1248  
 32011: Aroclor 1254  
 32039: Aroclor 1016/1260

1,000 $\mu$ g/mL each in hexane, 1mL/ampul  
 cat. # 32400 (kit)



## PCB Kit #4

32065: Aroclor 1221  
 32066: Aroclor 1232  
 32067: Aroclor 1242  
 32068: Aroclor 1248  
 32069: Aroclor 1254  
 32299: Aroclor 1016/1260

200 $\mu$ g/mL each in isoctane, 1mL/ampul  
 cat. # 32401 (kit)



## PCB Congeners

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

| Compound                                       | Solvent | Conc. | cat.# (ea.) | price |
|--|---------|-------|-------------|-------|
| 2,4,4'-trichlorobiphenyl (BZ #28)              | I       | 10    | 32283       |       |
| 2,2',5,5'-tetrachlorobiphenyl (BZ #52)         | I       | 10    | 32284       |       |
| 2,2',4,5,5'-pentachlorobiphenyl (BZ #101)      | I       | 10    | 32285       |       |
| 2,3,4,4',5-pentachlorobiphenyl (BZ #118)       | I       | 10    | 32293       |       |
| 2,2',3,4,4',5-hexachlorobiphenyl (BZ #138)     | I       | 10    | 32286       |       |
| 2,2',4,4',5,5'-hexachlorobiphenyl (BZ #153)    | I       | 10    | 32287       |       |
| 2,2',3,4,4',5,5'-heptachlorobiphenyl (BZ #180) | I       | 10    | 32288       |       |
| decachlorobiphenyl (BZ #209)                   | I       | 10    | 32289       |       |

I = isoctane

## PCB Congeners cont'd

## PCB Congener Standard #1

2,4,4'-trichlorobiphenyl (BZ #28)  
 2,2',5,5'-tetrachlorobiphenyl (BZ #52)  
 2,2',4,5,5'-pentachlorobiphenyl (BZ #101)  
 2,2',3,4,4',5-hexachlorobiphenyl (BZ #138)  
 2,2',4,4',5,5'-hexachlorobiphenyl (BZ #153)  
 2,2',3,4,4',5,5'-heptachlorobiphenyl (BZ #180)  
 10 $\mu$ g/mL each in isoctane, 1mL/ampul

cat. # 32290 (ea.)

## PCB Congener Standard #2

2,4,4'-trichlorobiphenyl (BZ #28)  
 2,2',5,5'-tetrachlorobiphenyl (BZ #52)  
 2,2',4,5,5'-pentachlorobiphenyl (BZ #101)  
 2,3,4,4',5-pentachlorobiphenyl (BZ #118)  
 2,2',3,4,4',5-hexachlorobiphenyl (BZ #138)  
 2,2',4,4',5,5'-hexachlorobiphenyl (BZ #153)  
 2,2',3,4,4',5,5'-heptachlorobiphenyl (BZ #180)  
 10 $\mu$ g/mL each in isoctane, 1mL/ampul

cat. # 32294 (ea.)

## also available

Additional PCB congener mixes:

See EPA Method 8082: cat.# 32416 page 429.

See EPA Method 525: cat.# 32420 page 414.

## Organotin Mixes

## Butyltin Chloride Calibration Mixture

|  |                      |
|--|----------------------|
| butyltin trichloride                                   | tetrabutyltin        |
| dibutyltin dichloride                                  | tributyltin chloride |
| 2,000 $\mu$ g/mL each in methylene chloride, 1mL/ampul |                      |
|  | cat. # 31472 (ea.)   |

## Tributyltin Chloride Calibration Mixture

|   |                    |
|---|--------------------|
| 2,000 $\mu$ g/mL in methylene chloride, 1mL/ampul |                    |
|   | cat. # 31478 (ea.) |

## Phenyltin Chloride Calibration Mixture

|  |                       |
|--|-----------------------|
| diphenyltin dichloride                                 | tetraphenyltin        |
| phenyltin trichloride                                  | triphenyltin chloride |
| 2,000 $\mu$ g/mL each in methylene chloride, 1mL/ampul |                       |
|  | cat. # 31473 (ea.)    |

## Tri-n-propyltin Chloride Surrogate

|   |                    |
|---|--------------------|
| 2,000 $\mu$ g/mL in methylene chloride, 1mL/ampul |                    |
|   | cat. # 31476 (ea.) |

## Tripentyltin Chloride Surrogate

|   |                    |
|---|--------------------|
| 2,000 $\mu$ g/mL in methylene chloride, 1mL/ampul |                    |
|   | cat. # 31477 (ea.) |

## Tetra-n-propyltin Internal Standard

|   |                    |
|---|--------------------|
| 2,000 $\mu$ g/mL in methylene chloride, 1mL/ampul |                    |
|   | cat. # 31474 (ea.) |

## Tetrapentyltin Internal Standard

|   |                    |
|---|--------------------|
| 2,000 $\mu$ g/mL in methylene chloride, 1mL/ampul |                    |
|   | cat. # 31475 (ea.) |

**Minnesota Department of Agriculture List 1 Pesticides**

**Minnesota Ag List 1 Pesticides Mix A** (16 components)

|                                   |               |
|-----------------------------------|---------------|
| acetochlor                        | metolachlor   |
| alachlor                          | metribuzin    |
| atrazine                          | pendimethalin |
| cyanazine                         | prometon      |
| desethylatrazine                  | propachlor    |
| desisopropylatrazine              | propazine     |
| dimethenamid*                     | simazine      |
| ethalfluralin                     | trifluralin   |
| 200ppm each in acetone, 1mL/ampul |               |
| cat. # 32406 (ea.)                |               |

\*Added to Minnesota Department of Agriculture List 1 pesticide (neutrals) incident investigation requirements, effective January 1, 2000.<sup>1</sup> CAS # 87674-68-8 manufactured by several companies under various trade names.

<sup>1</sup>Analytical Lists for Pesticide Incident Investigations, Minnesota Department of Agriculture, Guidance Document 26 (3/99), St. Paul, MN. For a copy, visit their web site at: [www.mda.state.mn.us](http://www.mda.state.mn.us)

**Minnesota Ag List 1 Pesticides Mix B**

|                                   |           |
|-----------------------------------|-----------|
| chloryrifos                       | phorate   |
| EPTC                              | terbufos  |
| fonofos                           | triallate |
| 200ppm each in acetone, 1mL/ampul |           |

cat. # 32407 (ea.)



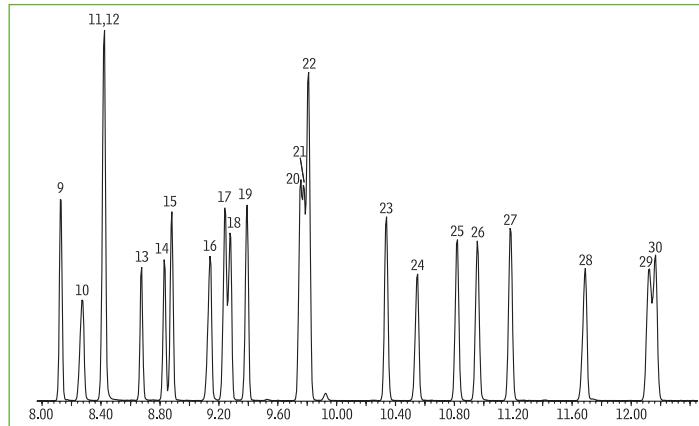
**Minnesota Ag List 1 Pesticide Kit**

32406: Minnesota Ag List Pesticides Mix A  
 32407: Minnesota Ag List Pesticides Mix B  
 Contains 1mL each of these mixtures.

cat. # 32408 (kit)

**Minnesota Dept. of Agriculture List 1 Pesticides on an Rxi®-1ms column.**

- |                                |                           |
|--------------------------------|---------------------------|
| 1. 2-fluorophenol (SS)         | 19. propazine             |
| 2. phenol-d6 (SS)              | 20. terbufos              |
| 3. 1,4-dichlorobenzene-d4 (IS) | 21. fonofos               |
| 4. nitrobenzene-d5 (SS)        | 22. phenanthrene-d10 (IS) |
| 5. naphthalene-d8 (IS)         | 23. triallate             |
| 6. EPTC                        | 24. metribuzin            |
| 7. 2-fluorobiphenyl (SS)       | 25. dimethenamid          |
| 8. acenaphthene-d10 (IS)       | 26. acetochlor            |
| 9. propachlor                  | 27. alachlor              |
| 10. desisopropyl atrazine      | 28. cyanazine             |
| 11. desethyl atrazine          | 29. metolachlor           |
| 12. 2,4,6-tribromophenol (SS)  | 30. chloryrifos           |
| 13. ethalfluralin              | 31. pendimethalin         |
| 14. trifluralin                | 32. p-terphenyl-d14 (SS)  |
| 15. phorate                    | 33. chrysene-d12 (IS)     |
| 16. simazine                   | 34. perylene-d12 (IS)     |
| 17. prometon                   |                           |
| 18. atrazine                   |                           |



Column: Rxi®-1ms, 30m, 0.25mm ID, 0.25μm (cat.# 13323)

Sample: Minnesota Ag List 1 Pesticides Mix A (cat.# 32406), Minnesota Ag List 1 Pesticides Mix B (cat.# 32407), SV Internal Standard Mix (cat.# 31206), B/N Surrogate Mix (4/89 SOW) (cat.# 31024), Acid Surrogate Mix (4/89 SOW) (cat.# 31025)

Inj.: 1.0μL, 10μg/mL each analyte (internal standards 25μg/mL), split (10:1) 4mm Drilled Uniliner® inlet liner (hole near bottom) (cat.# 20771)

Instrument: Agilent 6890  
 Inj. temp.: 250°C  
 Carrier gas: helium, constant flow  
 Flow rate: 1.2mL/min.  
 Oven temp.: 70°C (hold 1 min.) to 180°C @ 20°C/min., to 230°C @ 5°C/min., to 325°C @ 40°C/min. (hold 3.5 min.)

Det.: Agilent 5973 MSD

Transfer line

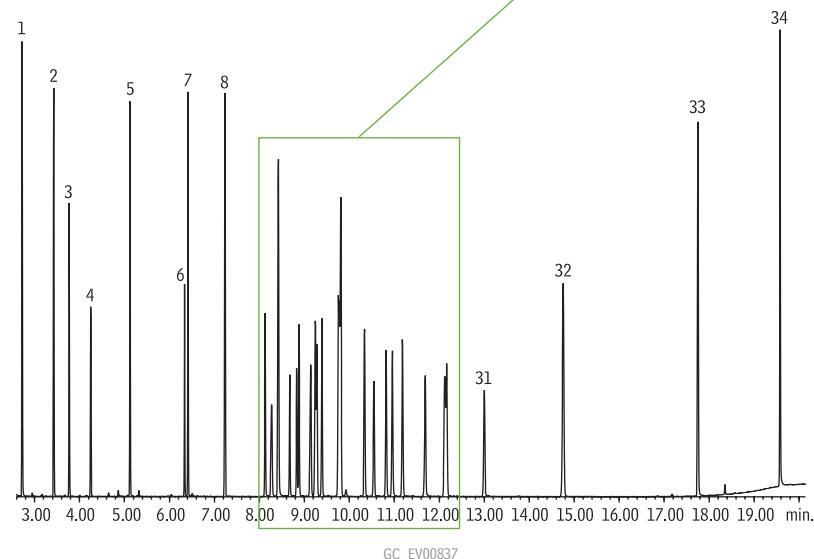
temp.: 280°C

Scan range: 35-550amu

Solvent delay: 2.50 min.

Tune: DFTPP

Ionization: EI



GC\_EV00837

## International Mixes

## International Environmental Mixes

| Country/Miscellaneous              | Compound Class              |
|------------------------------------|-----------------------------|
| Canada: CCME                       | Alkanes; PAHs               |
| Canada: Drinking Water             | Volatiles; Pesticides       |
| Canada: RBCA - Atlantic Provinces  | Aromatics; Aliphatics; PAHs |
| European Union                     | Pesticides                  |
| Japan                              | Odor Compounds              |
| Korea                              | Volatiles; Pesticides       |
| ISO/DIS-9377 Water Quality Testing | Hydrocarbons                |

## Canada cont'd

**Canadian Drinking Water Volatiles Mix** (19 components)

|                      |                    |
|----------------------|--------------------|
| benzene              | 1,1-dichloroethene |
| bromodichloromethane | ethylbenzene       |
| bromoform            | methylene chloride |
| carbon tetrachloride | tetrachloroethene  |
| chlorobenzene        | toluene            |
| chloroform           | trichloroethene    |
| dibromochloromethane | m-xylene           |
| 1,2-dichlorobenzene  | o-xylene           |
| 1,4-dichlorobenzene  | p-xylene           |
| 1,2-dichloroethane   |                    |

2,000µg/mL each in P&T methanol, 1mL/ampul  
cat. # 30610 (ea.)

## Canada

**C50 in Toluene**

n-pentacontane (C50)  
10µg/mL in toluene, 1mL/ampul  
cat. # 31685 (ea.)

**CCME F1 Surrogate Standard**

n-undecane (C11)  
1,000µg/mL in methylene chloride, 1mL/ampul  
cat. # 30612 (ea.)

**CCME F2 Surrogate Standard**

2-methylnonane  
1,000µg/mL in methylene chloride, 1mL/ampul  
cat. # 31870 (ea.)

**CCME F1 Retention Time Marker**

n-decane (C10) toluene  
n-hexane (C6)  
2,000µg/mL each in methanol, 1mL/ampul  
cat. # 30611 (ea.)

**CCME PAH Calibration Mix** (10 components)

|                        |                        |
|------------------------|------------------------|
| benzo(a)anthracene     | fluoranthene           |
| benzo(a)pyrene         | indeno(1,2,3-cd)pyrene |
| benzo(b)fluoranthene   | naphthalene            |
| benzo(k)fluoranthene   | phenanthrene           |
| dibenzo(a,h)anthracene | pyrene                 |

2,000µg/mL each in methylene chloride, 1mL/ampul  
cat. # 31869 (ea.)

**CCME PHC Calibration Mix**

|                    |                          |
|--------------------|--------------------------|
| n-decane (C10)     | n-tetratriacontane (C34) |
| n-hexadecane (C16) |                          |

5,000µg/mL each in toluene, 1mL/ampul  
cat. # 31684 (ea.)

**Canadian Drinking Water Triazine Herbicides Mix**

(7 components)  
alachlor metribuzin  
atrazine prometryne  
cyanazine (Bladex) simazine  
metolachlor  
500µg/mL each in acetone, 1mL/ampul  
cat. # 31864 (ea.)

**Canadian Drinking Water Phenoxyacid Herbicides Mix**

(11 components)  
bromoxynil pentachlorophenol  
2,4-D picloram  
dicamba 2,4,5-T  
2,4-dichlorophenol 2,3,4,6-tetrachlorophenol  
diclofop methyl 2,4,6-trichlorophenol  
dinoseb  
1,000µg/mL each in acetone, 1mL/ampul  
cat. # 31868 (ea.)

**Canadian Drinking Water Carbamates Mix**

|                      |
|----------------------|
| aldicarb carbofuran  |
| bendiocarb triallate |
| carbaryl (Sevin)     |

100µg/mL each in acetonitrile, 1mL/ampul  
cat. # 31865 (ea.)

**Canadian Drinking Water Chlorinated Pesticides Mix**

(14 components)  
aldrin 4,4'-DDT  
γ-BHC (lindane) dieldrin  
α-chlordane heptachlor  
γ-chlordane heptachlor epoxide (isomer B)  
2,4'-DDE methoxychlor  
4,4'-DDE oxychlordane  
2,4'-DDT trifluralin  
200µg/mL each in hexane:toluene, 1mL/ampul  
cat. # 31866 (ea.)

**Canadian Drinking Water OP Pesticides Mix** (9 components)

|                           |                   |
|---------------------------|-------------------|
| azinphos methyl (Guthion) | parathion (ethyl) |
| chlorpyrifos (Dursban)    | phorate           |
| Diazinon                  | temephos (Abate)  |
| dimethoate                | terbufos          |
| malathion                 |                   |

1,000µg/mL each in acetonitrile, 1mL/ampul  
cat. # 31867 (ea.)

## free data

## Available on Our Website: Lot Certificates, Data Packs, and MSDSs

For complete information detailing manufacturing and testing for Restek inventoried reference standards, visit our website at [www.restek.com/datapacks](http://www.restek.com/datapacks). To view certificates and/or an MSDS, enter the catalog number of the product in the Search feature. For a free data pack (Adobe® PDF file), enter the catalog number and lot number of the product.

## also available

Petroleum Standards & Sulfur Standards!  
See pages 472-475 for more information.

## Canada - Atlantic Provinces

|   |                       |
|---|-----------------------|
| <b>Atlantic RBCA EPH Mix</b> (11 components)                  |                       |
| acenaphthene  | n-dotriacontane (C32) |
| anthracene  | n-heneicosane (C21)   |
| benzo(a)pyrene  | n-hexadecane (C16)    |
| chrysene  | n-octacosane (C28)    |
| n-decane (C10)  | naphthalene           |
| n-dodecane (C12)  |                       |
| 1,000 $\mu$ g/mL each in hexane:methylene chloride, 1mL/ampul |                       |
| cat. # 31872 (ea.)  |                       |

## Atlantic RBCA EPH Surrogate Standard

|  |                 |
|--|-----------------|
| n-dotriacontane (C32)                                  | isobutylbenzene |
| 1,000 $\mu$ g/mL each in methylene chloride, 1mL/ampul |                 |
| cat. # 31873 (ea.)                                     |                 |

## Atlantic RBCA VPH Mix (12 components)

|  |                        |
|--|------------------------|
| benzene  | n-octane (C8)          |
| n-decane (C10)                                   | toluene                |
| ethylbenzene                                     | 1,2,4-trimethylbenzene |
| n-heptane (C7)                                   | 1,3,5-trimethylbenzene |
| n-hexane (C6)                                    | o-xylene               |
| 1-methyl-3-ethylbenzene                          | p-xylene               |
| 1,000 $\mu$ g/mL each in P&T methanol, 1mL/ampul |                        |
| cat. # 31871 (ea.)                               |                        |

## Atlantic RBCA VPH Surrogate Standard

|   |
|---|
| isobutylbenzene                             |
| 1,000 $\mu$ g/mL in P&T methanol, 1mL/ampul |
| cat. # 30613 (ea.)                          |

## Europe

### Organophosphorus Pesticide Mix, European Formulation

|                           |                |                       |       |
|---------------------------|----------------|-----------------------|-------|
| (16 components)           |                |                       |       |
| acephate                  | 200 $\mu$ g/mL | methamidophos         | 500   |
| azinphos methyl (Guthion) | 400            | methidathion          | 200   |
| chlorpyrifos              | 100            | omethoate             | 1,000 |
| demeton-s-methyl          | 200            | pirimiphos methyl     | 100   |
| dichlorvos (DDVP)         | 500            | profenos              | 200   |
| dimethoate                | 200            | pyrazophos            | 500   |
| ethion                    | 200            | tokuthion (prothifos) | 200   |
| malathion                 | 200            | tolclofos-methyl      | 100   |
| In acetone, 1mL/ampul     |                |                       |       |
| cat. # 32418 (ea.)        |                |                       |       |

### PCB Congener Standard #1

|  |
|--|
| 2,4,4'-trichlorobiphenyl (BZ #28)              |
| 2,2',5,5'-tetrachlorobiphenyl (BZ #52)         |
| 2,2',4,5,5'-pentachlorobiphenyl (BZ #101)      |
| 2,2',3,4,4',5'-hexachlorobiphenyl (BZ #138)    |
| 2,2',4,4',5,5'-hexachlorobiphenyl (BZ #153)    |
| 2,2',3,4,4',5,5'-heptachlorobiphenyl (BZ #180) |
| 10 $\mu$ g/mL each in isooctane, 1mL/ampul     |
| cat. # 32290 (ea.)                             |

### PCB Congener Standard #2

|  |
|--|
| 2,4,4'-trichlorobiphenyl (BZ #28)              |
| 2,2',5,5'-tetrachlorobiphenyl (BZ #52)         |
| 2,2',4,5,5'-pentachlorobiphenyl (BZ #101)      |
| 2,3',4,4',5-pentachlorobiphenyl (BZ #118)      |
| 2,2',3,4,4',5-hexachlorobiphenyl (BZ #138)     |
| 2,2',4,4',5,5'-hexachlorobiphenyl (BZ #153)    |
| 2,2',3,4,4',5,5'-heptachlorobiphenyl (BZ #180) |
| 10 $\mu$ g/mL each in isooctane, 1mL/ampul     |
| cat. # 32294 (ea.)                             |

## Europe cont'd

### Desethyl-atrazine

|  |
|--|
| 1,000 $\mu$ g/mL in acetone, 1mL/ampul |
| cat. # 32445 (ea.)                     |

### Desisopropylatrazine

|  |
|--|
| 1,000 $\mu$ g/mL in acetone, 1mL/ampul |
| cat. # 32446 (ea.)                     |

### Terbutylazine

|  |
|--|
| 1,000 $\mu$ g/mL in acetone, 1mL/ampul |
| cat. # 32447 (ea.)                     |

### Propazine

|  |
|--|
| 1,000 $\mu$ g/mL in acetone, 1mL/ampul |
| cat. # 32448 (ea.)                     |

### Prometryne

|  |
|--|
| 1,000 $\mu$ g/mL in acetone, 1mL/ampul |
| cat. # 32449 (ea.)                     |

## Japan

### Japan Calibration Mix (9 components)

|                               |                   |
|-------------------------------|-------------------|
| acrylonitrile                 | dichloromethane   |
| benzene                       | tetrachloroethene |
| 1,3-butadiene                 | trichloroethene   |
| chloroform                    | vinyl chloride    |
| 1,2-dichloroethane            |                   |
| <b>Cylinder Construction:</b> |                   |
| <b>Cylinder Fitting:</b>      |                   |
| aluminum                      |                   |
| CGA-180 outlet                |                   |

### Spectra 104L Cylinders:

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

### Scotty 110L Cylinders (Pi-marked Cylinders for EU Regulations):

|                       |
|-----------------------|
| Size: 8.3 x 29.5 cm.  |
| Volume/Pressure:      |
| 110 liters of gas     |
| @ 1,800psi            |
| Weight: 2.2 lbs./1 kg |
| US DOT Specs: 3AL2216 |

1ppm in nitrogen, 104 liters @ 1,800psi

cat. # 34418 (ea.)

1ppm in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)

cat. # 34418-PI (ea.)

Requires a high-purity VOC single-stage regulator. See page 386.

No data pack available.

### Drinking Water Odor Standard

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

|   |                    |
|---|--------------------|
| (+/-)-geosmin                             | 2-methylisoborneol |
| 100 $\mu$ g/mL in P&T methanol, 1mL/ampul |                    |
| cat. # 30608 (ea.)                        |                    |



## Underground Storage Tank Monitoring (UST): General

| Category  | Compound Class |
|---|----------------|
| Retention Time Standards .....                  | .Hydrocarbons  |
| Fuel Composite Standards .....                  | .Hydrocarbons  |
| Motor Oil Composite Standards .....             | .Hydrocarbons  |
| Single Source Fuel Standards .....              | .Hydrocarbons  |
| Military Fuels (Jet Propellant) .....           | .Hydrocarbons  |
| Fuel Oil Degradation Test .....                 | .Hydrocarbons  |
| Mineral Spirits .....                           | .Hydrocarbons  |
| PVOC, GRO and BTEX .....                        | .Hydrocarbons  |
| Gasoline Surrogate and Internal Standards ..... | .Volatiles     |
| Diesel Surrogate and Internal Standards .....   | .Hydrocarbons  |
| Diesel/Biodiesel Blend .....                    | .Hydrocarbons  |

### 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)

|   |                              |
|---|------------------------------|
| <i>n</i> -hexane (C6)                                   | <i>n</i> -octacosane (C28)   |
| <i>n</i> -decane (C10)                                  | <i>n</i> -triicontane (C30)  |
| <i>n</i> -dodecane (C12)                                | <i>n</i> -tetracontane (C40) |
| <i>n</i> -tetrasacosane (C24)                           |                              |
| 25 $\mu$ g/mL each in 1mL methylene chloride, 1mL/ampul |                              |
| cat. # 31200 (ea.)                                      |                              |

#### Retention Time Marker Standard

|  |                                 |
|--|---------------------------------|
| <i>n</i> -decane (C10)                     | <i>n</i> -hexatriacontane (C36) |
| <i>n</i> -pentacosane (C25)                |                                 |
| 1,000 $\mu$ g/mL each in hexane, 1mL/ampul |                                 |
| cat. # 31637 (ea.)                         |                                 |

#### Retention Time Marker

|  |                          |
|--|--------------------------|
| <i>n</i> -hexane (C6)                            | <i>n</i> -dodecane (C12) |
| <i>n</i> -decane (C10)                           |                          |
| 1,000 $\mu$ g/mL each in P&T methanol, 1mL/ampul |                          |
| cat. # 30483 (ea.)                               |                          |

#### TNRCC 1005 Retention Time Markers Mix

|   |                                  |
|---|----------------------------------|
| <i>n</i> -hexane (C6)                     | <i>n</i> -octacosane (C28)       |
| <i>n</i> -dodecane (C12)                  | <i>n</i> -pentatriacontane (C35) |
| 200 $\mu$ g/mL each in pentane, 1mL/ampul |                                  |
| cat. # 31698 (ea.)                        |                                  |

#### Retention Time Marker - Alaska

|   |                                 |
|---|---------------------------------|
| <i>n</i> -hexane (C6)                             | <i>n</i> -pentacosane (C25)     |
| <i>n</i> -decane (C10)                            | <i>n</i> -hexatriacontane (C36) |
| 1,000 $\mu$ g/mL in methylene chloride, 1mL/ampul |                                 |
| cat. # 31819 (ea.)                                |                                 |

### Fuel Composite Standards

#### Unleaded Gasoline Composite Standard

|  |
|--|
| 2,500 $\mu$ g/mL in P&T methanol, 1mL/ampul  |
| cat. # 30081 (ea.)                           |
| 50,000 $\mu$ g/mL in P&T methanol, 1mL/ampul |
| cat. # 30205 (ea.)                           |

|  |
|--|
| 50,000 $\mu$ g/mL in P&T methanol, 5mL/ampul |
| cat. # 30206 (ea.)                           |

#### Diesel Fuel #2 Composite Standard

|  |
|--|
| 5,000 $\mu$ g/mL in methylene chloride, 1mL/ampul  |
| cat. # 31093 (ea.)                                 |
| 50,000 $\mu$ g/mL in methylene chloride, 1mL/ampul |
| cat. # 31258 (ea.)                                 |

|  |
|--|
| 50,000 $\mu$ g/mL in methylene chloride, 5mL/ampul |
| cat. # 31259 (ea.)                                 |

#### Kerosene Composite Standard

|  |
|--|
| 5,000 $\mu$ g/mL in methylene chloride, 1mL/ampul  |
| cat. # 31094 (ea.)                                 |
| 50,000 $\mu$ g/mL in methylene chloride, 1mL/ampul |
| cat. # 31256 (ea.)                                 |

|  |
|--|
| 50,000 $\mu$ g/mL in methylene chloride, 5mL/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.

|  |
|--|
| 50,000 $\mu$ g/mL in methylene chloride, 1mL/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.

|  |
|--|
| 50,000 $\mu$ g/mL in methylene chloride, 1mL/ampul |
| cat. # 31465 (ea.)                                 |

### free literature

#### EPA Office of Underground Storage Tanks (OUST) Recommended Methods

Download your free copy from [www.restek.com](http://www.restek.com)

Fast Facts  
lit. cat.# 59397

See pages 461-467 for information on UST technical literature for individual states.

### also available

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

## UST Monitoring

## Single Source Fuels

**Unleaded Gasoline Standard**

Prepared from a single source (one refinery) product.

5,000 $\mu$ g/mL in P&T methanol, 1mL/ampul  
cat. # 30096 (ea.)**Kerosene Standard**

Prepared from a single source (one refinery) product.

5,000 $\mu$ g/mL in methylene chloride, 1mL/ampul  
cat. # 31229 (ea.)**Diesel Fuel #2 Standard**

Prepared from a single source (one refinery) product.

5,000 $\mu$ g/mL in methylene chloride, 1mL/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. 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.

5,000 $\mu$ g/mL in methylene chloride, 1mL/ampul  
cat. # 31216 (ea.)50,000 $\mu$ g/mL in methylene chloride, 1mL/ampul  
cat. # 31244 (ea.)**Fuel Oil #5 Standard**

Fuel oil #5 is typically used in applications in which there is little or no preheating of the fuel prior to burning. A blend of distillate (fuel oil #2) and residual (fuel oil #6), the fuel oil #5 used to prepare this mixture has a kinematic viscosity of 106.5 at 38°C (100°F), measured using ASTM D-445.

5,000 $\mu$ g/mL in methylene chloride, 1mL/ampul  
cat. # 31217 (ea.)50,000 $\mu$ g/mL in methylene chloride, 1mL/ampul  
cat. # 31246 (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.

5,000 $\mu$ g/mL in methylene chloride, 1mL/ampul  
cat. # 31218 (ea.)50,000 $\mu$ g/mL in methylene chloride, 1mL/ampul  
cat. # 31248 (ea.)50,000 $\mu$ g/mL in methylene chloride, 5mL/ampul  
cat. # 31249 (ea.)**Diesel/Biodiesel 80:20 Blend Standard**

The biodiesel component is methyl soyate.  
diesel/biodiesel 80:20

5,000 $\mu$ g/mL in methylene chloride, 1mL/ampul  
cat. # 31880 (ea.)

## Single Source Fuels cont'd

**Aviation Gas Standard**

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

2,500 $\mu$ g/mL in P&T methanol, 1mL/ampul  
cat. # 30094 (ea.)50,000 $\mu$ g/mL in P&T methanol, 1mL/ampul  
cat. # 30207 (ea.)50,000 $\mu$ g/mL in P&T methanol, 5mL/ampul  
cat. # 30208 (ea.)**Jet Fuel A Standard**

Commercial jet fuel A.

5,000 $\mu$ g/mL in methylene chloride, 1mL/ampul  
cat. # 31215 (ea.)50,000 $\mu$ g/mL in methylene chloride, 1mL/ampul  
cat. # 31242 (ea.)50,000 $\mu$ g/mL in methylene chloride, 5mL/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). We offer this high concentration standard.

50,000 $\mu$ g/mL in methylene chloride, 1mL/ampul  
cat. # 31838 (ea.)**Hydraulic Oil Standard**50,000 $\mu$ g/mL in methylene chloride, 1mL/ampul  
cat. # 31839 (ea.)

## Military Fuels (Jet Propellant)

**JP-4 Military Fuel Standard**5,000 $\mu$ g/mL in methylene chloride, 1mL/ampul  
cat. # 31219 (ea.)50,000 $\mu$ g/mL in methylene chloride, 1mL/ampul  
cat. # 31250 (ea.)50,000 $\mu$ g/mL in P&T methanol, 1mL/ampul  
cat. # 30472 (ea.)**JP-5 Military Fuel Standard**5,000 $\mu$ g/mL in methylene chloride, 1mL/ampul  
cat. # 31220 (ea.)50,000 $\mu$ g/mL in methylene chloride, 1mL/ampul  
cat. # 31252 (ea.)50,000 $\mu$ g/mL in methylene chloride, 5mL/ampul  
cat. # 31253 (ea.)**JP-8 Military Fuel Standard**5,000 $\mu$ g/mL in methylene chloride, 1mL/ampul  
cat. # 31262 (ea.)50,000 $\mu$ g/mL in methylene chloride, 1mL/ampul  
cat. # 31254 (ea.)

## did you know?

We have more than 2,000 pure, characterized, neat compounds in our inventory! If you do not see the EXACT mixture you need listed on any of these pages, contact us for a custom standard.

## Fuel Oil Degradation Test

Subsurface degradation of fuel oil spills can be estimated by examining the ratios of C17/pristane and C18/phytane.<sup>1</sup> 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

heptadecane (C17)  
octadecane (C18)  
pristane (2,6,10,14-tetramethylpentadecane)  
phytane (2,6,10,14-tetramethylhexadecane)

2,000 $\mu$ g/mL each in methylene chloride, 1mL/ampul  
cat. # 31240 (ea.)

<sup>1</sup>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

5,000 $\mu$ g/mL in methylene chloride, 1mL/ampul  
cat. # 31225 (ea.)

50,000 $\mu$ g/mL in methylene chloride, 1mL/ampul  
cat. # 31260 (ea.)

50,000 $\mu$ g/mL in methylene chloride, 5mL/ampul  
cat. # 31261 (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.

10,000 $\mu$ g/mL in P&T methanol, 1mL/ampul  
cat. # 30487 (ea.)

## free literature

### EPA Office of Underground Storage Tanks (OUST) Recommended Methods

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#### Fast Facts

lit. cat.# 59397

See pages 461-467 for information on UST technical literature for individual states.



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

### PVOC Mix (California) (7 components)

|                                |          |
|--------------------------------|----------|
| benzene                        | m-xylene |
| ethylbenzene                   | o-xylene |
| methyl tert-butyl ether (MTBE) | p-xylene |
| toluene                        |          |

1,000 $\mu$ g/mL each in P&T methanol, 1mL/ampul  
cat. # 30231 (ea.)

### PVOC/GRO Mix (Wisconsin) (10 components)

|                                |                        |
|--------------------------------|------------------------|
| benzene                        | 1,2,4-trimethylbenzene |
| ethylbenzene                   | 1,3,5-trimethylbenzene |
| methyl tert-butyl ether (MTBE) | m-xylene               |
| naphthalene                    | o-xylene               |
| toluene                        | p-xylene               |

1,000 $\mu$ g/mL each in P&T methanol, 1mL/ampul  
cat. # 30095 (ea.)

### GRO Mix (9 components)

|                 |                                    |
|-----------------|------------------------------------|
| benzene         | 1,2,4-trimethylbenzene             |
| ethylbenzene    | 2,2,4-trimethylpentane (isooctane) |
| 3-methylpentane | m-xylene                           |
| naphthalene     | o-xylene                           |
| toluene         |                                    |

1,000 $\mu$ g/mL each in P&T methanol, 1mL/ampul  
cat. # 30069 (ea.)

### GRO Mix (EPA) (9 components)

|                 |                |                        |       |
|-----------------|----------------|------------------------|-------|
| benzene         | 500 $\mu$ g/mL | 1,2,4-trimethylbenzene | 1,000 |
| ethylbenzene    | 500            | 2,2,4-trimethylpentane | 1,500 |
| heptane         | 500            | m-xylene               | 1,000 |
| 2-methylpentane | 1,500          | o-xylene               | 1,000 |
| toluene         | 1,500          |                        |       |

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

### BTEX Standard

|              |          |
|--------------|----------|
| benzene      | m-xylene |
| ethylbenzene | o-xylene |
| toluene      | p-xylene |

200 $\mu$ g/mL each in P&T methanol, 1mL/ampul  
cat. # 30051 (ea.)

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

2,000 $\mu$ g/mL each in P&T methanol (m-xylene and p-xylene at 1,000 $\mu$ g/mL), 1mL/ampul  
cat. # 30488 (ea.)

### BTEX Gas Mix

|              |          |
|--------------|----------|
| benzene      | m-xylene |
| ethylbenzene | o-xylene |
| toluene      | p-xylene |

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

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

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

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

Requires a high-purity VOC single-stage regulator. See page 386.  
No data pack available.

## cylinder design

### Spectra 104L Cylinders:

Aluminum construction.  
Size: 8 x 24 cm.  
Volume/Pressure:  
104 liters of gas @ 1,800psi  
CGA-180 outlet fitting.  
Weight: 1.5 lbs./0.7 kg

### Scotty 110L Cylinders:

Aluminum construction.  
Size: 8.3 x 29.5 cm.  
Volume/Pressure:  
110 liters of gas @ 1,800psi  
CGA-180 outlet fitting.  
Weight: 2.2 lbs./1 kg  
US DOT Specs: 3AL2216

## UST Monitoring

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

**Gasoline Component Standard** (10 components)

|  |                |                        |       |
|--|----------------|------------------------|-------|
| benzene  | 500 $\mu$ g/mL | 1,2,4-trimethylbenzene | 1,000 |
| ethylbenzene                                       | 500            | 2,2,4-trimethylpentane | 1,500 |
| heptane  | 500            | <i>m</i> -xylene       | 1,000 |
| 2-methylpentane                                    | 1,500          | <i>o</i> -xylene       | 1,000 |
| toluene  | 1,500          | <i>p</i> -xylene       | 1,000 |
| 10,000 $\mu$ g/mL total in P&T methanol, 1mL/ampul |                |                        |       |
| cat. # 30486 (ea.)                                 |                |                        |       |

**Certified BTEX in Unleaded Gas Composite Standard**

(9 components)

**Certified for:**

|   |                   |
|---|-------------------|
| benzene*                                | toluene*          |
| ethylbenzene*                           | <i>m</i> -xylene* |
| isopropyl benzene*                      | <i>o</i> -xylene* |
| methyl <i>tert</i> -butyl ether (MTBE)* | <i>p</i> -xylene* |
| naphthalene*                            |                   |

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

\*Concentration differs lot-to-lot. See on-line Certificate of Analysis for certified concentrations.

**Certified Aromatics in Gasoline** (16 components)**Certified for:**

|   |                          |
|---|--------------------------|
| benzene*                                | <i>n</i> -propylbenzene* |
| ethylbenzene*                           | toluene*                 |
| <i>m</i> -ethyltoluene*                 | 1,2,3-trimethylbenzene*  |
| <i>o</i> -ethyltoluene*                 | 1,2,4-trimethylbenzene*  |
| <i>p</i> -ethyltoluene*                 | 1,3,5-trimethylbenzene*  |
| isopropylbenzene*                       | <i>m</i> -xylene*        |
| methyl <i>tert</i> -butyl ether (MTBE)* | <i>o</i> -xylene*        |
| naphthalene*                            | <i>p</i> -xylene*        |

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

\*Concentration differs lot-to-lot. See on-line Certificate of Analysis for certified concentrations.

**Certified PAHs in Diesel** (7 components)**Certified PAHs**

|                 |                      |
|-----------------|----------------------|
| acenaphthene*   | 2-methylnaphthalene* |
| acenaphthylene* | naphthalene*         |
| fluorene*       | phenanthrene*        |

1-methylnaphthalene\*

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

\*Concentration differs lot-to-lot. See on-line Certificate of Analysis for certified concentrations.

**Gasoline Surrogate and Internal Standards**Volume is 1mL/ampul. Concentration is  $\mu$ g/mL.

| Compound                                 | Solvent | Conc.  | cat.# (ea.) | price |
|--|---------|--------|-------------|-------|
| 4-bromofluorobenzene                     | PTM     | 2,500  | 30067       |       |
| 4-bromofluorobenzene                     | PTM     | 10,000 | 30082       |       |
| 1-chlorooctane                           | PTM     | 10,000 | 30084       |       |
| $\alpha,\alpha,\alpha$ -trifluorotoluene | PTM     | 2,500  | 30068       |       |
| $\alpha,\alpha,\alpha$ -trifluorotoluene | PTM     | 10,000 | 30083       |       |

**Recommended Internal Standard (PID) for EPA GRO Method**

| Compound                 | Solvent | Conc. | cat.# (ea.) | price |
|--------------------------|---------|-------|-------------|-------|
| 1-chloro-4-fluorobenzene | PTM     | 2,500 | 30066       |       |

PTM = Purge &amp; trap grade methanol

**Diesel Surrogate and Internal Standards**Volume is 1mL/ampul. Concentration is  $\mu$ g/mL.

| Compound            | Solvent | Conc.  | cat.# (ea.) | price |
|---------------------|---------|--------|-------------|-------|
| 1-chlorooctadecane  | D       | 10,000 | 31098       |       |
| 2-fluorobiphenyl    | D       | 10,000 | 31096       |       |
| <i>o</i> -terphenyl | D       | 10,000 | 31097       |       |
| <i>p</i> -terphenyl | D       | 10,000 | 31095       |       |

**Recommended Internal Standards**

| Compound                | Solvent | Conc. | cat.# (ea.) | price |
|-------------------------|---------|-------|-------------|-------|
| 5- $\alpha$ -androstane | D       | 2,000 | 31065       |       |
| <i>o</i> -terphenyl     | A       | 2,000 | 31066       |       |

A = acetone

D = methylene chloride

**Diesel/Biodiesel Standard****Diesel/Biodiesel 80:20 Blend Standard**

The biodiesel component is methyl soyate.

5,000 $\mu$ g/mL in methylene chloride, 1mL/ampul  
cat. # 31880 (ea.)**also available**

ASTM Method D6584-00 and EN14105 Biodiesel Standards. See page 471.



## Underground Storage Tank Monitoring (UST): State Specific Methods

| State                           | Compound Class |
|---------------------------------|----------------|
| Alaska                          | .Hydrocarbons  |
| Arizona                         | .Hydrocarbons  |
| California/Los Angeles          | .Hydrocarbons  |
| Connecticut                     | .Hydrocarbons  |
| Florida                         | .Hydrocarbons  |
| Massachusetts                   | .Hydrocarbons  |
| Michigan                        | .Hydrocarbons  |
| Mississippi                     | .Hydrocarbons  |
| Northwest (Oregon & Washington) | .Hydrocarbons  |
| Pennsylvania                    | .Hydrocarbons  |
| Tennessee/Mississippi           | .Hydrocarbons  |
| Texas                           | .Hydrocarbons  |
| Washington                      | .Hydrocarbons  |
| Wisconsin                       | .Hydrocarbons  |

## Alaska *cont'd*

| <b>Alaska UST Method AK101AA</b> (14 components) |                        |
|--|------------------------|
| benzene  | toluene                |
| ethylbenzene                                     | 1,2,3-trimethylbenzene |
| 1-ethyl-2-methylbenzene                          | 1,2,4-trimethylbenzene |
| 1-ethyl-3-methylbenzene                          | 1,3,5-trimethylbenzene |
| 1-ethyl-4-methylbenzene                          | <i>m</i> -xylene       |
| isopropylbenzene                                 | <i>o</i> -xylene       |
| <i>n</i> -propylbenzene                          | <i>p</i> -xylene       |
| 2,000 $\mu$ g/mL each in P&T methanol, 1mL/ampul |                        |
|  | cat. # 30461 (ea.)     |

## Unleaded Gasoline Composite Standard

|  |
|--|
| 2,500 $\mu$ g/mL in P&T methanol, 1mL/ampul  |
| cat. # 30081 (ea.)                           |
| 50,000 $\mu$ g/mL in P&T methanol, 1mL/ampul |
| cat. # 30205 (ea.)                           |
| 50,000 $\mu$ g/mL in P&T methanol, 5mL/ampul |
| cat. # 30206 (ea.)                           |

## 1-Chloro-4-fluorobenzene Mix

|   |
|---|
| 2,500 $\mu$ g/mL in P&T methanol, 1mL/ampul |
| cat. # 30066 (ea.)                          |

## 4-Bromofluorobenzene Mix

|   |
|---|
| 2,000 $\mu$ g/mL in P&T methanol, 1mL/ampul |
| cat. # 30026 (ea.)                          |

## $\alpha,\alpha,\alpha$ -Trifluorotoluene

|  |
|--|
| 2,000 $\mu$ g/mL in P&T methanol, 1mL/ampul  |
| cat. # 30048 (ea.)                           |
| 2,500 $\mu$ g/mL in P&T methanol, 1mL/ampul  |
| cat. # 30068 (ea.)                           |
| 10,000 $\mu$ g/mL in P&T methanol, 1mL/ampul |
| cat. # 30083 (ea.)                           |

## 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 procedural 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

|   |                                 |
|---|---------------------------------|
| <i>n</i> -hexane (C6)                             | <i>n</i> -pentacosane (C25)     |
| <i>n</i> -decane (C10)                            | <i>n</i> -hexatriacontane (C36) |
| 1,000 $\mu$ g/mL in methylene chloride, 1mL/ampul |                                 |
| cat. # 31819 (ea.)                                |                                 |

## for more info

### State of Alaska

Method and regulatory information is available from:

Alaska Department of Environmental Conservation  
 410 Willoughby Avenue  
 Juneau, AK 99801-1795  
 Phone: (907)465-5203  
 Fax: (907)465-5218  
[www.dec.state.ak.us/regulations/index.htm](http://www.dec.state.ak.us/regulations/index.htm)



## free literature

### Alaska UST Monitoring

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Fast Facts  
 lit. cat.# 59503

## did you know?

We have more than 2,000 pure, characterized, neat compounds in our inventory! If you do not see the EXACT mixture you need listed on any of these pages, contact us for a custom standard.



## Alaska cont'd

**AK102**

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

**DRO Mix (Tennessee/Mississippi) (16 components)**

|                             |                             |
|-----------------------------|-----------------------------|
| <i>n</i> -decane (C10)      | <i>n</i> -octadecane (C18)  |
| <i>n</i> -undecane (C11)    | <i>n</i> -nonadecane (C19)  |
| <i>n</i> -dodecane (C12)    | <i>n</i> -eicosane (C20)    |
| <i>n</i> -tridecane (C13)   | <i>n</i> -heneicosane (C21) |
| <i>n</i> -tetradecane (C14) | <i>n</i> -docosane (C22)    |
| <i>n</i> -pentadecane (C15) | <i>n</i> -tricosane (C23)   |
| <i>n</i> -hexadecane (C16)  | <i>n</i> -tetracosane (C24) |
| <i>n</i> -heptadecane (C17) | <i>n</i> -pentacosane (C25) |

1,000 $\mu$ g/mL each in methylene chloride, 1mL/ampul  
cat. # 31214 (ea.)

**AK103**

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

**Residual Range Calibration Standard (RCS)**

SAE30 motor oil:SAE40 motor oil (1:1)  
50,000 $\mu$ g/mL in methylene chloride, 1mL/ampul  
cat. # 31817 (ea.)

**Residual Range Calibration Verification Standard (CVS)**

SAE30 motor oil:SAE40 motor oil (1:1)  
25,000 $\mu$ g/mL in methylene chloride, 1mL/ampul  
cat. # 31818 (ea.)

**Kerosene Composite Standard**

5,000 $\mu$ g/mL in methylene chloride, 1mL/ampul  
cat. # 31094 (ea.)  
50,000 $\mu$ g/mL in methylene chloride, 1mL/ampul  
cat. # 31256 (ea.)  
50,000 $\mu$ g/mL in methylene chloride, 5mL/ampul  
cat. # 31257 (ea.)

**Motor Oil Composite Standard**

50,000 $\mu$ g/mL in methylene chloride, 1mL/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.

5,000 $\mu$ g/mL in methylene chloride, 1mL/ampul  
cat. # 31218 (ea.)  
50,000 $\mu$ g/mL in methylene chloride, 1mL/ampul  
cat. # 31248 (ea.)  
50,000 $\mu$ g/mL in methylene chloride, 5mL/ampul  
cat. # 31249 (ea.)

**Diesel Fuel #2 Composite Standard**

5,000 $\mu$ g/mL in methylene chloride, 1mL/ampul  
cat. # 31093 (ea.)  
50,000 $\mu$ g/mL in methylene chloride, 1mL/ampul  
cat. # 31258 (ea.)  
50,000 $\mu$ g/mL in methylene chloride, 5mL/ampul  
cat. # 31259 (ea.)

***o*-Terphenyl**

2,000 $\mu$ g/mL in acetone, 1mL/ampul  
cat. # 31066 (ea.)  
10,000 $\mu$ g/mL in methylene chloride, 1mL/ampul  
cat. # 31097 (ea.)

***n*-Triaccontane-d62**

500 $\mu$ g/mL in methylene chloride, 1mL/ampul  
cat. # 31816 (ea.)

**5- $\alpha$ -androstane**

2,000 $\mu$ g/mL in methylene chloride, 1mL/ampul  
cat. # 31065 (ea.)

**Surrogate Standard Mixture**

|  |                    |
|--|--------------------|
| squalane   | tetrahydronaphthol |
| <i>o</i> -terphenyl                                    |                    |
| 1,000 $\mu$ g/mL each in methylene chloride, 1mL/ampul |                    |
|  | cat. # 31638 (ea.) |

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Fast Facts  
lit. cat.# 59503

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## Arizona

### Extraction Retention Time Standard

|  |                               |
|--|-------------------------------|
| <i>n</i> -hexane (C6)                                  | <i>n</i> -docosane (C22)      |
| <i>n</i> -decane (C10)                                 | <i>n</i> -dotriacontane (C32) |
| 2,000 $\mu$ g/mL each in methylene chloride, 1mL/ampul |                               |
| cat. # 31830 (ea.)                                     |                               |

### DRO/GRO Calibration Standard

|   |
|---|
| 10W30 motor oil:diesel fuel #2 (1:1 blend)              |
| 25,000 $\mu$ g/mL each in methylene chloride, 1mL/ampul |
| cat. # 31831 (ea.)                                      |

### DRO/GRO Range Calibration Standard (12 components)

|  |                               |
|--|-------------------------------|
| <i>n</i> -decane (C10)                                 | <i>n</i> -docosane (C22)      |
| <i>n</i> -dodecane (C12)                               | <i>n</i> -tetraacosane (C24)  |
| <i>n</i> -tetradecane (C14)                            | <i>n</i> -hexacosane (C26)    |
| <i>n</i> -hexadecane (C16)                             | <i>n</i> -octacosane (C28)    |
| <i>n</i> -octadecane (C18)                             | <i>n</i> -triacontane (C30)   |
| <i>n</i> -eicosane (C20)                               | <i>n</i> -dotriacontane (C32) |
| 2,000 $\mu$ g/mL each in methylene chloride, 1mL/ampul |                               |
| cat. # 31832 (ea.)                                     |                               |

### GRO P&T Retention Time Standard

|  |             |
|--|-------------|
| benzene  | naphthalene |
| 1,000 $\mu$ g/mL each in P&T methanol, 1mL/ampul |             |
| cat. # 30496 (ea.)                               |             |

### *o*-Terphenyl

|  |
|--|
| 2,000 $\mu$ g/mL in acetone, 1mL/ampul |
| cat. # 31066 (ea.)                     |

|  |
|--|
| 10,000 $\mu$ g/mL in methylene chloride, 1mL/ampul |
| cat. # 31097 (ea.)                                 |

## California

### PVOC Mix (California) (7 components)

|  |                  |
|--|------------------|
| benzene  | <i>m</i> -xylene |
| ethylbenzene                                     | <i>o</i> -xylene |
| methyl <i>tert</i> -butyl ether (MTBE)           | <i>p</i> -xylene |
| toluene  |                  |
| 1,000 $\mu$ g/mL each in P&T methanol, 1mL/ampul |                  |
| cat. # 30231 (ea.)                               |                  |

### California Oxygenates Mix

|  |                  |
|--|------------------|
| diisopropyl ether (DIPE)               | 2,000 $\mu$ g/mL |
| ethyl- <i>tert</i> -butyl ether (ETBE) | 2,000            |
| <i>tert</i> -amyl methyl ether (TAME)  | 2,000            |
| <i>tert</i> -butyl alcohol             | 10,000           |
| methyl <i>tert</i> -butyl ether (MTBE) | 2,000            |
| In P&T methanol, 1mL/ampul             |                  |
| cat. # 30465 (ea.)                     |                  |

### Methanol

|  |
|--|
| 10,000 $\mu$ g/mL in DI Water, 1mL/ampul |
| cat. # 30467 (ea.)                       |

### Ethanol

|  |
|--|
| 10,000 $\mu$ g/mL in DI Water, 1mL/ampul |
| cat. # 30466 (ea.)                       |

### Glycols Standard

|   |                  |
|---|------------------|
| ethylene glycol                               | propylene glycol |
| 50,000 $\mu$ g/mL each in DI water, 1mL/ampul |                  |
| cat. # 30471 (ea.)                            |                  |

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

### CA WIP VOA Standard (11 components)

|  |  |
|--|--|
| benzene  | methyl <i>tert</i> -butyl ether (MTBE) |
| chlorobenzene                                    | toluene                                |
| 1,2-dichlorobenzene                              | <i>m</i> -xylene                       |
| 1,3-dichlorobenzene                              | <i>o</i> -xylene                       |
| 1,4-dichlorobenzene                              | <i>p</i> -xylene                       |
| ethylbenzene                                     |  |
| 2,000 $\mu$ g/mL each in P&T methanol, 1mL/ampul |  |
| cat. # 30236 (ea.)                               |  |

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



### free literature

#### California UST Monitoring

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Fast Facts

lit. cat.# 59433

## Connecticut

### Connecticut ETPH Calibration Mixture (15 components)

|  |                                 |
|--|---------------------------------|
| <i>n</i> -nonane (C9)                                  | <i>n</i> -tetracosane (C24)     |
| <i>n</i> -decane (C10)                                 | <i>n</i> -hexacosane (C26)      |
| <i>n</i> -dodecane (C12)                               | <i>n</i> -octacosane (C28)      |
| <i>n</i> -tetradecane (C14)                            | <i>n</i> -triacontane (C30)     |
| <i>n</i> -hexadecane (C16)                             | <i>n</i> -dotriacontane (C32)   |
| <i>n</i> -octadecane (C18)                             | <i>n</i> -tetracontane (C34)    |
| <i>n</i> -eicosane (C20)                               | <i>n</i> -hexatriacontane (C36) |
| <i>n</i> -docosane (C22)                               |                                 |
| 1,000 $\mu$ g/mL each in methylene chloride, 1mL/ampul |                                 |
| cat. # 31614 (ea.)                                     |                                 |

## Florida

### Florida TRPH Standard (17 components)

|   |                                 |
|---|---------------------------------|
| <i>n</i> -octane (C8)                                 | <i>n</i> -hexacosane (C26)      |
| <i>n</i> -decane (C10)                                | <i>n</i> -octacosane (C28)      |
| <i>n</i> -dodecane (C12)                              | <i>n</i> -triacontane (C30)     |
| <i>n</i> -tetradecane (C14)                           | <i>n</i> -dotriacontane (C32)   |
| <i>n</i> -hexadecane (C16)                            | <i>n</i> -tetracontane (C34)    |
| <i>n</i> -octadecane (C18)                            | <i>n</i> -hexatriacontane (C36) |
| <i>n</i> -eicosane (C20)                              | <i>n</i> -octatriacontane (C38) |
| <i>n</i> -docosane (C22)                              | <i>n</i> -tetracontane (C40)    |
| <i>n</i> -tetracosane (C24)                           |                                 |
| 500 $\mu$ g/mL each in hexane, 1mL/ampul              |                                 |
| cat. # 31266 (ea.)                                    |                                 |
| 2,000 $\mu$ g/mL each in carbon disulfide, 1mL/ampul* |                                 |
| cat. # 31878 (ea.)                                    |                                 |

\*Ground transportation shipments only.

### Florida TRPH Surrogate Mix

|  |
|--|
| <i>n</i> -nonatriacontane (C39)                  |
| 3,000 $\mu$ g/mL in carbon disulfide, 1mL/ampul* |
| cat. # 31456 (ea.)                               |

|   |
|---|
| 3,000 $\mu$ g/mL in carbon disulfide, 10mL/ampul* |
| cat. # 31877 (ea.)                                |

\*Ground transportation shipments only.



### free literature

#### Florida UST Monitoring

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Fast Facts

lit. cat.# 59395

## UST Monitoring

## Massachusetts

**MA VPH Standard with Surrogate Rev. 1.1 (July 2004)**

(16 components)

|  |                                    |
|--|------------------------------------|
| benzene                                      | <i>n</i> -nonane (C9)              |
| <i>n</i> -butylcyclohexane                   | <i>n</i> -pentane (C5)             |
| <i>n</i> -decane (C10)                       | toluene                            |
| 2,5-dibromotoluene (SS)                      | 1,2,4-trimethylbenzene             |
| ethylbenzene                                 | 2,2,4-trimethylpentane (isooctane) |
| 2-methylpentane                              | <i>m</i> -xylene                   |
| methyl <i>tert</i> -butyl ether (MTBE)       | <i>o</i> -xylene                   |
| naphthalene                                  | <i>p</i> -xylene                   |
| 10,000 $\mu$ g/mL in P&T methanol, 1mL/ampul |                                    |
| cat. # 30604 (ea.)                           |                                    |

**MA VPH Matrix Spike Mix with Surrogate Rev. 1.1 (July 2004)**

(16 components)

|  |                                    |
|--|------------------------------------|
| benzene                                  | <i>n</i> -nonane (C9)              |
| <i>n</i> -butylcyclohexane               | <i>n</i> -pentane (C5)             |
| <i>n</i> -decane (C10)                   | toluene                            |
| 2,5-dibromotoluene (SS)                  | 1,2,4-trimethylbenzene             |
| ethylbenzene                             | 2,2,4-trimethylpentane (isooctane) |
| 2-methylpentane                          | <i>m</i> -xylene                   |
| methyl <i>tert</i> -butyl ether (MTBE)   | <i>o</i> -xylene                   |
| naphthalene                              | <i>p</i> -xylene                   |
| 50 $\mu$ g/mL in P&T methanol, 1mL/ampul |                                    |
| cat. # 30605 (ea.)                       |                                    |

**MA Volatile Petroleum Hydrocarbon (VPH) Standard**

(13 components)

|  |                  |                        |       |
|--|------------------|------------------------|-------|
| <i>n</i> -pentane (C5)                 | 1,000 $\mu$ g/mL | naphthalene            | 1,000 |
| <i>n</i> -nonane (C9)                  | 1,000            | toluene                | 1,500 |
| benzene                                | 500              | 1,2,4-trimethylbenzene | 1,000 |
| ethylbenzene                           | 500              | <i>m</i> -xylene       | 1,000 |
| isooctane                              | 1,500            | <i>o</i> -xylene       | 1,000 |
| 2-methylpentane                        | 1,500            | <i>p</i> -xylene       | 1,000 |
| methyl <i>tert</i> -butyl ether (MTBE) | 1,500            |                        |       |

In P&amp;T methanol, 1mL/ampul

cat. # 30434 (ea.)

**MA VPH Standard with Surrogate (14 components)**

|                         |                  |  |       |
|-------------------------|------------------|--|-------|
| <i>n</i> -pentane (C5)  | 1,000 $\mu$ g/mL | methyl <i>tert</i> -butyl ether (MTBE) | 1,500 |
| <i>n</i> -nonane (C9)   | 1,000            | naphthalene                            | 1,000 |
| benzene                 | 500              | toluene                                | 1,500 |
| 2,5-dibromotoluene (SS) | 1,000            | 1,2,4-trimethylbenzene                 | 1,000 |
| ethylbenzene            | 500              | <i>m</i> -xylene                       | 1,000 |
| isooctane               | 1,500            | <i>o</i> -xylene                       | 1,000 |
| 2-methylpentane         | 1,500            | <i>p</i> -xylene                       | 1,000 |

In P&amp;T methanol, 1mL/ampul

cat. # 30452 (ea.)

**MA VPH Matrix Spike Mix with Surrogate (14 components)**

|                         |  |  |  |
|-------------------------|--|--|--|
| <i>n</i> -pentane (C5)  |  | methyl <i>tert</i> -butyl ether (MTBE) |  |
| <i>n</i> -nonane (C9)   |  | naphthalene                            |  |
| benzene                 |  | toluene                                |  |
| 2,5-dibromotoluene (SS) |  | 1,2,4-trimethylbenzene                 |  |
| ethylbenzene            |  | <i>m</i> -xylene                       |  |
| isooctane               |  | <i>o</i> -xylene                       |  |
| 2-methylpentane         |  | <i>p</i> -xylene                       |  |

2,500 $\mu$ g/mL each in P&T methanol, 1mL/ampul

cat. # 30454 (ea.)

## free literature

## Massachusetts UST Monitoring

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## Fast Facts

lit. cat. # 59391

**MA VPH Surrogate Standard**

## 2,5-dibromotoluene

1,000 $\mu$ g/mL in P&T methanol, 1mL/ampul  
cat. # 30435 (ea.)10,000 $\mu$ g/mL in P&T methanol, 1mL/ampul  
cat. # 30453 (ea.)**Massachusetts APH Mix** (26 components)

|                          |  |
|--------------------------|--|
| benzene                  | 4-isopropyltoluene                     |
| 1,3-butadiene            | methyl <i>tert</i> -butyl ether (MTBE) |
| butylcyclohexane         | 1-methyl-3-ethylbenzene                |
| cyclohexane              | <i>n</i> -nonane (C9)                  |
| <i>n</i> -decane (C10)   | <i>n</i> -octane (C8)                  |
| 2,3-dimethylheptane      | toluene                                |
| 2,3-dimethylpentane      | toluene-d8 (IS)                        |
| <i>n</i> -dodecane (C12) | 1,2,3-trimethylbenzene                 |
| ethylbenzene             | 1,3,5-trimethylbenzene                 |
| <i>n</i> -heptane (C7)   | <i>n</i> -undecane (C11)               |
| <i>n</i> -hexane (C6)    | <i>m</i> -xylene                       |
| isopentane               | <i>o</i> -xylene                       |
| isopropylbenzene         | <i>p</i> -xylene                       |

**Cylinder Construction:** aluminum**Cylinder Fitting:** CGA-180 outlet1ppm in nitrogen, 104 liters @ 1,800psi  
cat. # 34540 (ea.)1ppm in nitrogen, 21 liters @ 350psig (Pi-marked Cylinder)  
cat. # 34540-PI (ea.)

Requires a high-purity VOC single-stage regulator. See page 386.

No data pack available.

**MA EPH Aromatic Hydrocarbon Standard** (17 components)

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

1,000 $\mu$ g/mL each in methylene chloride, 1mL/ampul  
cat. # 31458 (ea.)**MA EPH Aliphatic Hydrocarbon Standard** (14 components)

|                             |                                 |
|-----------------------------|---------------------------------|
| <i>n</i> -nonane (C9)       | <i>n</i> -eicosane (C20)        |
| <i>n</i> -decane (C10)      | <i>n</i> -docosane (C22)        |
| <i>n</i> -dodecane (C12)    | <i>n</i> -tetracosane (C24)     |
| <i>n</i> -tetradecane (C14) | <i>n</i> -hexacosane (C26)      |
| <i>n</i> -hexadecane (C16)  | <i>n</i> -octacosane (C28)      |
| <i>n</i> -octadecane (C18)  | <i>n</i> -triacontane (C30)     |
| <i>n</i> -nonadecane (C19)  | <i>n</i> -hexatriacontane (C36) |

1,000 $\mu$ g/mL each in hexane, 1mL/ampul  
cat. # 31459 (ea.)**MA EPH Matrix Spike Mix** (10 components)

|                             |              |
|-----------------------------|--------------|
| <i>n</i> -nonane (C9)       | acenaphthene |
| <i>n</i> -tetradecane (C14) | anthracene   |
| <i>n</i> -nonadecane (C19)  | chrysene     |
| <i>n</i> -eicosane (C20)    | naphthalene  |
| <i>n</i> -octacosane (C28)  | pyrene       |

250 $\mu$ g/mL each in acetone, 1mL/ampul  
cat. # 31460 (ea.)

## Massachusetts cont'd

### MA EPH Internal Standard

5- $\alpha$ -androstane  
 2,000 $\mu$ g/mL in methylene chloride, 1mL/ampul  
 cat. # 31065 (ea.)

### MA EPH Surrogate Spike Mix

1-chlorooctadecane                    o-terphenyl  
 4,000 $\mu$ g/mL each in acetone, 1mL/ampul  
 cat. # 31479 (ea.)

### 1-Chlorooctadecane Mix

1-chlorooctadecane  
 10,000 $\mu$ g/mL in methylene chloride, 1mL/ampul  
 cat. # 31098 (ea.)

### Naphthalene-d8

2,000 $\mu$ g/mL in methylene chloride, 1mL/ampul  
 cat. # 31043 (ea.)

### MA Fractionation Surrogate Spike Mix

2-bromonaphthalene                    2-fluorobiphenyl  
 4,000 $\mu$ g/mL each in hexane, 1mL/ampul  
 cat. # 31480 (ea.)

### MA Fractionation Check Mix (31 components)

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

25 $\mu$ g/mL each in hexane, 1mL/ampul  
 cat. # 31481 (ea.)

**Hydrocarbons:**  
 n-nonane (C9)  
 n-decane (C10)  
 n-dodecane (C12)  
 n-tetradecane (C14)  
 n-hexadecane (C16)  
 n-octadecane (C18)  
 n-nonadecane (C19)  
 n-eicosane (C20)  
 n-docosane (C22)  
 n-tetracosane (C24)  
 n-hexacosane (C26)  
 n-octacosane (C28)  
 n-triacontane (C30)  
 n-hexatriacontane (C36)

## Michigan

### Michigan GRO Mix (14 components)

benzene                                 naphthalene  
 1,2-dibromoethane                    toluene  
 1,2-dichloroethane                  1,2,4-trimethylbenzene  
 ethylbenzene                         1,3,5-trimethylbenzene  
 isopropylbenzene                    m-xylene  
 2-methylnaphthalene                o-xylene  
 methyl tert-butyl-ether (MTBE)    p-xylene  
 2,000 $\mu$ g/mL each in P&T methanol, 1mL/ampul  
 cat. # 30468 (ea.)

## Mississippi

### DRO Mix (Tennessee/Mississippi) (16 components)

|                     |                     |
|---------------------|---------------------|
| n-decane (C10)      | n-octadecane (C18)  |
| n-undecane (C11)    | n-nonadecane (C19)  |
| n-dodecane (C12)    | n-eicosane (C20)    |
| n-tridecane (C13)   | n-heneicosane (C21) |
| n-tetradecane (C14) | n-docosane (C22)    |
| n-pentadecane (C15) | n-tricosane (C23)   |
| n-hexadecane (C16)  | n-tetracosane (C24) |
| n-heptadecane (C17) | n-pentacosane (C25) |

1,000 $\mu$ g/mL each in methylene chloride, 1mL/ampul  
 cat. # 31214 (ea.)

### Gasoline Component Standard (10 components)

|                 |                |                        |       |
|-----------------|----------------|------------------------|-------|
| benzene         | 500 $\mu$ g/mL | 1,2,4-trimethylbenzene | 1,000 |
| ethylbenzene    | 500            | 2,2,4-trimethylpentane | 1,500 |
| heptane         | 500            | m-xylene               | 1,000 |
| 2-methylpentane | 1,500          | o-xylene               | 1,000 |
| toluene         | 1,500          | p-xylene               | 1,000 |

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

## Northwest USA Regional Method (Oregon & Washington)

also see Washington, page 467

### NW TPH-HCID Retention Time Mix

|                     |         |
|---------------------|---------|
| n-dodecane (C12)    | toluene |
| n-tetracosane (C24) |         |

2,500 $\mu$ g/mL each in methylene chloride, 1mL/ampul  
 cat. # 31485 (ea.)

### NW TPH-HCID Surrogate Mix

|  |                      |
|--|----------------------|
| n-pentacosane (C25)                                    | 4-bromofluorobenzene |
| 5,000 $\mu$ g/mL each in methylene chloride, 1mL/ampul |                      |
|  | cat. # 31486 (ea.)   |

### Glycols Standard

|   |                    |
|---|--------------------|
| ethylene glycol                               | propylene glycol   |
| 50,000 $\mu$ g/mL each in DI water, 1mL/ampul |                    |
|   | cat. # 30471 (ea.) |

### NW TPH-Dx Surrogate Mix Standards

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

| Compound          | Solvent | Conc.  | cat.# (ea.) | price |
|-------------------|---------|--------|-------------|-------|
| 2-fluorobiphenyl  | D       | 10,000 | 31096       |       |
| o-terphenyl       | D       | 10,000 | 31097       |       |
| p-terphenyl       | D       | 10,000 | 31095       |       |
| pentacosane (C25) | D       | 10,000 | 31487       |       |

D = methylene chloride

## also available

See the GC Applications section for glycols application chromatograms - pages 602-603.



## UST Monitoring

## Pennsylvania

**PA DEP UST Standard** (11 components)

|  |             |
|--|-------------|
| benzene  | naphthalene |
| 1,2-dibromoethane                                | toluene     |
| 1,2-dichloroethane                               | m-xylene    |
| ethylbenzene                                     | o-xylene    |
| isopropyl benzene                                | p-xylene    |
| methyl <i>tert</i> -butyl ether (MTBE)           |             |
| 2,000 $\mu$ g/mL each in P&T methanol, 1mL/ampul |             |
| cat. # 30433 (ea.)                               |             |

## Tennessee/Mississippi

**DRO Mix (Tennessee/Mississippi)** (16 components)

|  |                             |
|--|-----------------------------|
| <i>n</i> -decane (C10)                                 | <i>n</i> -octadecane (C18)  |
| <i>n</i> -undecane (C11)                               | <i>n</i> -nonadecane (C19)  |
| <i>n</i> -dodecane (C12)                               | <i>n</i> -eicosane (C20)    |
| <i>n</i> -tridecane (C13)                              | <i>n</i> -heneicosane (C21) |
| <i>n</i> -tetradecane (C14)                            | <i>n</i> -docosane (C22)    |
| <i>n</i> -pentadecane (C15)                            | <i>n</i> -tricosane (C23)   |
| <i>n</i> -hexadecane (C16)                             | <i>n</i> -tetracosane (C24) |
| <i>n</i> -heptadecane (C17)                            | <i>n</i> -pentacosane (C25) |
| 1,000 $\mu$ g/mL each in methylene chloride, 1mL/ampul |                             |
| cat. # 31214 (ea.)                                     |                             |

**Gasoline Component Standard** (10 components)

|  |                |                        |       |
|--|----------------|------------------------|-------|
| benzene  | 500 $\mu$ g/mL | 1,2,4-trimethylbenzene | 1,000 |
| ethylbenzene                                       | 500            | 2,2,4-trimethylpentane | 1,500 |
| heptane  | 500            | m-xylene               | 1,000 |
| 2-methylpentane                                    | 1,500          | o-xylene               | 1,000 |
| toluene  | 1,500          | p-xylene               | 1,000 |
| 10,000 $\mu$ g/mL total in P&T methanol, 1mL/ampul |                |                        |       |
| cat. # 30486 (ea.)                                 |                |                        |       |

## Texas

**Texas TNRCC Method 1006****TNRCC 1006 Retention Time Marker Mix** (9 components)

|                                      |                                  |
|--------------------------------------|----------------------------------|
| <i>n</i> -hexane (C6)                | <i>n</i> -hexadecane (C16)       |
| <i>n</i> -heptane (C7)               | <i>n</i> -heneicosane (C21)      |
| <i>n</i> -octane (C8)                | <i>n</i> -octacosane (C28)       |
| <i>n</i> -decane (C10)               | <i>n</i> -pentatriacontane (C35) |
| <i>n</i> -dodecane (C12)             |                                  |
| 200 $\mu$ g/mL in pentane, 1mL/ampul |                                  |
| cat. # 31814 (ea.)                   |                                  |

**Texas TNRCC Method 1005****TNRCC 1005 Retention Time Markers Mix**

|   |                                  |
|---|----------------------------------|
| <i>n</i> -hexane (C6)                     | <i>n</i> -octacosane (C28)       |
| <i>n</i> -dodecane (C12)                  | <i>n</i> -pentatriacontane (C35) |
| 200 $\mu$ g/mL each in pentane, 1mL/ampul |                                  |

cat. # 31698 (ea.)

**TX TPH Locator Mix**

|   |                            |
|---|----------------------------|
| <i>n</i> -hexane (C6)                     | <i>n</i> -octacosane (C28) |
| <i>n</i> -decane (C10)                    |                            |
| 200 $\mu$ g/mL each in pentane, 1mL/ampul |                            |

cat. # 31482 (ea.)

**TX TPH Calibration Mix**

|  |                             |
|--|-----------------------------|
| diesel fuel #2 composite                     | unleaded gasoline composite |
| 10,000 $\mu$ g/mL each in pentane, 1mL/ampul |                             |

cat. # 31483 (ea.)

**TX TPH Matrix Spike Mix**

|   |                             |
|---|-----------------------------|
| diesel fuel #2 composite                          | unleaded gasoline composite |
| 10,000 $\mu$ g/mL each in P&T methanol, 1mL/ampul |                             |

cat. # 31484 (ea.)

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

|   |                                  |
|---|----------------------------------|
| <i>n</i> -hexane (C6)                     | <i>n</i> -heneicosane (C21)      |
| <i>n</i> -octane (C8)                     | <i>n</i> -octacosane (C28)       |
| <i>n</i> -decane (C10)                    | <i>n</i> -pentatriacontane (C35) |
| <i>n</i> -dodecane (C12)                  | <i>n</i> -hexatriacontane (C36)  |
| <i>n</i> -hexadecane (C16)                |                                  |
| 200 $\mu$ g/mL each in pentane, 1mL/ampul |                                  |

cat. # 31639 (ea.)

 **$\alpha,\alpha,\alpha$ -Trifluorotoluene**

|   |  |
|---|--|
| 2,000 $\mu$ g/mL in P&T methanol, 1mL/ampul |  |
|---|--|

cat. # 30048 (ea.)

|   |  |
|---|--|
| 2,500 $\mu$ g/mL in P&T methanol, 1mL/ampul |  |
|---|--|

cat. # 30068 (ea.)

|  |  |
|--|--|
| 10,000 $\mu$ g/mL in P&T methanol, 1mL/ampul |  |
|--|--|

cat. # 30083 (ea.)

**1-Chlorooctane**

|  |  |
|--|--|
| 10,000 $\mu$ g/mL in P&T methanol, 1mL/ampul |  |
|--|--|

cat. # 30084 (ea.)

**1-Chlorooctadecane Mix**

|  |  |
|--|--|
| 1-chlorooctadecane                                 |  |
| 10,000 $\mu$ g/mL in methylene chloride, 1mL/ampul |  |

cat. # 31098 (ea.)



Don't see the UST mix you need? We can custom blend a UST mix to meet the requirements of your method. Visit our web site at [www.restek.com/solutions](http://www.restek.com/solutions).

## Washington

### WA VPH Marker Standard (9 components)

|  |                        |
|--|------------------------|
| <i>n</i> -pentane (C5)                           | 1-methylnaphthalene    |
| <i>n</i> -hexane (C6)                            | naphthalene            |
| <i>n</i> -octane (C8)                            | toluene                |
| <i>n</i> -decane (C10)                           | 1,2,3-trimethylbenzene |
| <i>n</i> -dodecane (C12)                         |                        |
| 1,000 $\mu$ g/mL each in P&T methanol, 1mL/ampul |                        |
|  | cat. # 30450 (ea.)     |

### WA VPH Standard (15 components)

|  |  |
|--|--|
| <i>n</i> -pentane (C5)                           | methyl <i>tert</i> -butyl ether (MTBE) |
| <i>n</i> -hexane (C6)                            | naphthalene                            |
| <i>n</i> -octane (C8)                            | toluene                                |
| <i>n</i> -decane (C10)                           | 1,2,3-trimethylbenzene                 |
| <i>n</i> -dodecane (C12)                         | <i>m</i> -xylene                       |
| benzene  | <i>o</i> -xylene                       |
| ethylbenzene                                     | <i>p</i> -xylene                       |
| 1-methylnaphthalene                              |  |
| 1,000 $\mu$ g/mL each in P&T methanol, 1mL/ampul |  |
|  | cat. # 30451 (ea.)                     |

### WA EPH Aromatic Hydrocarbon Mix

|  |                        |
|--|------------------------|
| acenaphthene   | pyrene                 |
| benzo(ghi)perylene                                     | toluene                |
| naphthalene  | 1,2,3-trimethylbenzene |
| 1,000 $\mu$ g/mL each in methylene chloride, 1mL/ampul |                        |
| cat. # 31488 (ea.)                                     |                        |

### WA EPH Aliphatic Hydrocarbon Mix

|  |                              |
|--|------------------------------|
| <i>n</i> -octane (C8)                      | <i>n</i> -hexadecane (C16)   |
| <i>n</i> -decane (C10)                     | <i>n</i> -heicosane (C21)    |
| <i>n</i> -dodecane (C12)                   | <i>n</i> -tetracontane (C34) |
| 1,000 $\mu$ g/mL each in hexane, 1mL/ampul |                              |
| cat. # 31489 (ea.)                         |                              |

### WA EPH Aromatic Hydrocarbon Standard (18 components)

|  |                        |
|--|------------------------|
| acenaphthene   | dibenzo(a,h)anthracene |
| acenaphthylene   | fluoranthene           |
| anthracene   | fluorene               |
| benzo(a)anthracene                                     | indeno(1,2,3-cd)pyrene |
| benzo(a)pyrene   | 2-methylnaphthalene    |
| benzo(b)fluoranthene                                   | naphthalene            |
| benzo(k)fluoranthene                                   | phenanthrene           |
| benzo(ghi)perylene                                     | pyrene                 |
| chrysene   | 1,2,3-trimethylbenzene |
| 1,000 $\mu$ g/mL each in methylene chloride, 1mL/ampul |                        |
| cat. # 31469 (ea.)                                     |                        |

## did you know?

We have more than 2,000 pure, characterized, neat compounds in our inventory! If you do not see the EXACT mixture you need listed on any of these pages, contact us for a custom standard.

## Washington cont'd

### WA EPH Matrix Spike Mix (10 components)

|   |                    |
|---|--------------------|
| <i>n</i> -decane (C10)                    | anthracene         |
| <i>n</i> -dodecane (C12)                  | benzo(a)pyrene     |
| <i>n</i> -hexadecane (C16)                | benzo(ghi)perylene |
| <i>n</i> -heicosane (C21)                 | naphthalene        |
| acenaphthene                              | pyrene             |
| 250 $\mu$ g/mL each in acetone, 1mL/ampul |                    |
|   | cat. # 31490 (ea.) |

### WA EPH Fractionation Check Mix (22 components)

|  |                        |
|--|------------------------|
| <i>n</i> -octane (C8)                    | benzo(b)fluoranthene   |
| <i>n</i> -decane (C10)                   | benzo(k)fluoranthene   |
| <i>n</i> -dodecane (C12)                 | benzo(ghi)perylene     |
| <i>n</i> -hexadecane (C16)               | chrysene               |
| <i>n</i> -heicosane (C21)                | dibenzo(a,h)anthracene |
| <i>n</i> -tetracontane (C34)             | fluoranthene           |
| acenaphthene                             | fluorene               |
| acenaphthylene                           | indeno(1,2,3-cd)pyrene |
| anthracene                               | naphthalene            |
| benzo(a)anthracene                       | phenanthrene           |
| benzo(a)pyrene                           | pyrene                 |
| 250 $\mu$ g/mL each in hexane, 1mL/ampul |                        |
|  | cat. # 31491 (ea.)     |

## free literature

### Northwest Regional/Washington UST Monitoring

Download your free copy from [www.restek.com](http://www.restek.com).

Fast Facts  
 lit. cat.# 59396

## Wisconsin

### PVOC/GRO Mix (Wisconsin) (10 components)

|  |                        |
|--|------------------------|
| benzene  | 1,2,4-trimethylbenzene |
| ethylbenzene                                     | 1,3,5-trimethylbenzene |
| methyl <i>tert</i> -butyl ether                  | <i>m</i> -xylene       |
| naphthalene                                      | <i>o</i> -xylene       |
| toluene  | <i>p</i> -xylene       |
| 1,000 $\mu$ g/mL each in P&T methanol, 1mL/ampul |                        |
|  | cat. # 30095 (ea.)     |

### DRO Mix (EPA/Wisconsin) (10 components)

|  |                             |
|--|-----------------------------|
| <i>n</i> -decane (C10)                                 | <i>n</i> -eicosane (C20)    |
| <i>n</i> -dodecane (C12)                               | <i>n</i> -docosane (C22)    |
| <i>n</i> -tetradecane (C14)                            | <i>n</i> -tetracosane (C24) |
| <i>n</i> -hexadecane (C16)                             | <i>n</i> -hexacosane (C26)  |
| <i>n</i> -octadecane (C18)                             | <i>n</i> -octacosane (C28)  |
| 2,000 $\mu$ g/mL each in methylene chloride, 1mL/ampul |                             |
|  | cat. # 31064 (ea.)          |

## free literature

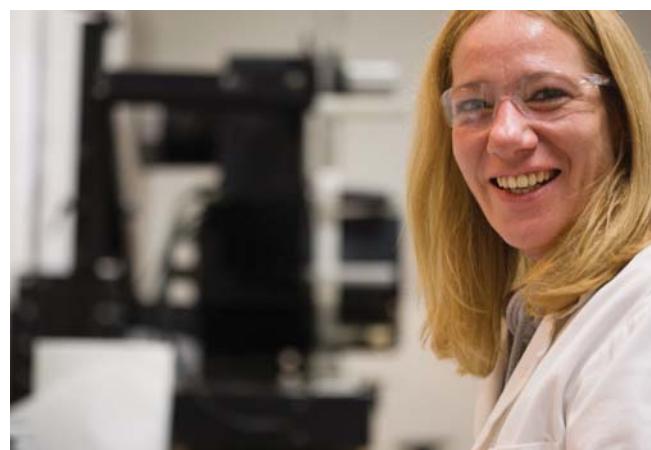
### Wisconsin UST Monitoring

Download your free copy from [www.restek.com](http://www.restek.com).

Fast Facts  
 lit. cat.# 59396

# ANALYTICAL REFERENCE MATERIALS OTHER MATERIALS

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Top: Dave Krantz, Vice President of Operations  
Bottom: Ann Glace, Manufacturing Technician



## ASTM Methods

| Method   | Type  |
|----------|---|
| E1387    | Fire Debris   |
| E1618    | Fire Debris   |
| D2887-01 | Simulated Distillation Petrochemical  |
| D2887    | Simulated Distillation Petrochemical  |
| D3710-95 | Simulated Distillation Petrochemical  |
| D4059-96 | PCB Standards in Oil  |
| D5197    | Formaldehyde and Other Carbonyl Compounds in Air  |
| D5836-03 | Air: Isocyanates & Oxazolidinones   |
| D6042-96 | Plastic Container Testing   |
| D6352-98 | Polywax® Standards  |
| D6584-00 | Biodiesel   |
| D6730-01 |  Determination of Individual Components in Spark Ignition Engine Fuels |

**NEW!**

### ASTM E1387 and E1618 (Fire Debris Analysis)

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

#### ASTM E1387 Column Resolution Check Mix (13 components)

|                     |                        |
|---------------------|------------------------|
| n-hexane (C6)       | n-eicosane (C20)       |
| n-octane (C8)       | 2-ethyltoluene         |
| n-decane (C10)      | 3-ethyltoluene         |
| n-dodecane (C12)    | toluene                |
| n-tetradecane (C14) | 1,2,4-trimethylbenzene |
| n-hexadecane (C16)  | p-xylene               |
| n-octadecane (C18)  |                        |

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

#### ASTM E1618 Test Mix (13 components)

Components in this mix (0.5µL/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)       | n-eicosane (C20)       |
| n-octane (C8)       | 2-ethyltoluene         |
| n-decane (C10)      | 3-ethyltoluene         |
| n-dodecane (C12)    | toluene                |
| n-tetradecane (C14) | 1,2,4-trimethylbenzene |
| n-hexadecane (C16)  | p-xylene               |
| n-octadecane (C18)  |                        |

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

## free data

#### Available on Our Website: Lot Certificates, Data Packs, and MSDSs

For complete information detailing manufacturing and testing for Restek inventoried reference standards, visit our website at [www.restek.com/datapacks](http://www.restek.com/datapacks).

To view certificates and/or an MSDS, enter the catalog number of the product in the Search feature. For a free data pack (Adobe® PDF file), enter the catalog number and lot number of the product.

### ASTM Simulated Distillation Petrochemical Mixtures

American Society for Testing and Materials (ASTM International) Method D2887-01 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.

#### ASTM D2887-01 Calibration Mix (20 components)

|                     |                           |
|---------------------|---------------------------|
| n-pentane (C5)      | n-hexadecane (C16)        |
| n-hexane (C6)       | n-heptadecane (C17)       |
| n-heptane (C7)      | n-octadecane (C18)        |
| n-octane (C8)       | n-eicosane (C20)          |
| n-nonane (C9)       | n-tetracosane (C24)       |
| n-decane (C10)      | n-octacosane (C28)        |
| n-undecane (C11)    | n-dotriacontane (C32)     |
| n-dodecane (C12)    | n-hexatriacontane (C36)   |
| n-tetradecane (C14) | n-tetracontane (C40)      |
| n-hexadecane (C16)  | n-tetratetracontane (C44) |

1% weight each in carbon disulfide, 1g solution/ampul\*  
 cat. # 31674 (ea.)

5% w/w in carbon disulfide, 1g /ampul\*\*  
 cat. # 31675 (ea.)

No data pack available.

\*This standard may only be shipped by FedEx ground, and only within the US.

\*\*The 5% w/w blend of neat hydrocarbons can be shipped in the US (overnight) and to our international customers.

#### ASTM Methods D2887 and D3710-95

These calibration mixtures are made using pure, highly characterized neat material, prepared using NIST-traceable balance 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.<br>(% w/w) | Compound                  | Conc.<br>(% w/w) |
|---------------------|------------------|---------------------------|------------------|
| n-hexane (C6)       | 6                | n-octadecane (C18)        | 5                |
| n-heptane (C7)      | 6                | n-eicosane (C20)          | 2                |
| n-octane (C8)       | 8                | n-tetracosane (C24)       | 2                |
| n-nonane (C9)       | 8                | n-octacosane (C28)        | 1                |
| n-decane (C10)      | 12               | n-dotriacontane (C32)     | 1                |
| n-undecane (C11)    | 12               | n-hexatriacontane (C36)   | 1                |
| n-dodecane (C12)    | 12               | n-tetracontane (C40)      | 1                |
| n-tetradecane (C14) | 12               | n-tetratetracontane (C44) | 1                |
| n-hexadecane (C16)  | 10               |                           |                  |
| Packaged 1mL/ampul  |                  |                           |                  |

cat. # 31222 (ea.)

No data pack available.

#### D3710-95 Calibration Mix (16 components)

| Compound            | Conc.<br>(% vol/vol) | Compound            | Conc.<br>(% vol/vol) |
|---------------------|----------------------|---------------------|----------------------|
| n-pentane (C5)      | 8                    | n-pentadecane (C15) | 2                    |
| n-hexane (C6)       | 6                    | 2-methylbutane      | 10                   |
| n-heptane (C7)      | 10                   | 2-methylpentane     | 6                    |
| n-octane (C8)       | 5                    | 2,4-dimethylpentane | 6                    |
| n-decane (C10)      | 4                    | toluene             | 12                   |
| n-dodecane (C12)    | 4                    | p-xylene            | 14                   |
| n-tridecane (C13)   | 2                    | n-propylbenzene     | 5                    |
| n-tetradecane (C14) | 2                    | n-butylbenzene      | 4                    |
| Packaged 1mL/ampul  |                      |                     |                      |

cat. # 31223 (ea.)

No data pack available.

## ASTM Methods

### ASTM Method D4059-96 (PCB Standards in Oil)

ASTM Method D4059-96 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, 5mL  | cat. # 32424 (ea.) |
| Neat, 50mL | cat. # 32425 (ea.) |

No data pack available.

#### Aroclor Standards

Volume is 1mL/ampul.

| Compound     | Solvent | Conc.    | cat.# (ea.) | price |
|--------------|---------|----------|-------------|-------|
| Aroclor 1016 | TO      | 50mg/kg  | 32075       |       |
| Aroclor 1016 | TO      | 500mg/kg | 32076       |       |
| Aroclor 1221 | TO      | 50mg/kg  | 32077       |       |
| Aroclor 1221 | TO      | 500mg/kg | 32078       |       |
| Aroclor 1232 | TO      | 50mg/kg  | 32079       |       |
| Aroclor 1232 | TO      | 500mg/kg | 32080       |       |
| Aroclor 1242 | TO      | 50mg/kg  | 32081       |       |
| Aroclor 1242 | TO      | 500mg/kg | 32082       |       |
| Aroclor 1248 | TO      | 50mg/kg  | 32083       |       |
| Aroclor 1248 | TO      | 500mg/kg | 32084       |       |
| Aroclor 1254 | TO      | 50mg/kg  | 32085       |       |
| Aroclor 1254 | TO      | 500mg/kg | 32086       |       |
| Aroclor 1260 | TO      | 50mg/kg  | 32087       |       |
| Aroclor 1260 | TO      | 500mg/kg | 32088       |       |

TO = transformer oil (PCB-free)

### ASTM Method D5197 (Formaldehyde and Other Carbonyl Compounds in Air)

#### CARB 1004 Aldehyde/Ketone-DNPH Calibration Standard

(13 components)

|  |                                 |
|--|---------------------------------|
| acetaldehyde-2,4-DNPH                  | hexaldehyde-2,4-DNPH            |
| acetone-2,4-DNPH                       | methacrolein-2,4-DNPH           |
| acrolein-2,4-DNPH                      | methyl ethyl ketone-2,4-DNPH    |
| benzaldehyde-2,4-DNPH                  | propionaldehyde-2,4-DNPH        |
| <i>n</i> -butyraldehyde-2,4-DNPH       | <i>m</i> -tolualdehyde-2,4-DNPH |
| crotonaldehyde-2,4-DNPH                | valeraldehyde-2,4-DNPH          |
| formaldehyde-2,4-DNPH                  |                                 |
| 3μg/mL each in acetonitrile, 1mL/ampul |                                 |
|  | cat. # 33093 (ea.)              |

#### DNPH Reference Materials

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

| Compound                          | Solvent | Conc. | cat.# (ea.) | price |
|-----------------------------------|---------|-------|-------------|-------|
| acetaldehyde-2,4-DNPH             | ACN     | 100   | 33074       |       |
| acetone-2,4-DNPH                  | ACN     | 100   | 33075       |       |
| acrolein-2,4-DNPH                 | ACN     | 100   | 33076       |       |
| benzaldehyde-2,4-DNPH             | ACN     | 100   | 33077       |       |
| 2-butanone-2,4-DNPH               | ACN     | 100   | 33078       |       |
| <i>n</i> -butyraldehyde-2,4-DNPH  | ACN     | 100   | 33079       |       |
| crotonaldehyde-2,4-DNPH           | ACN     | 100   | 33080       |       |
| 2,5-dimethylbenzaldehyde-2,4-DNPH | ACN     | 100   | 33081       |       |
| formaldehyde-2,4-DNPH             | ACN     | 100   | 33082       |       |
| glycolaldehyde-2,4-DNPH           | ACN     | 100   | 33091       |       |
| hexaldehyde-2,4-DNPH              | ACN     | 100   | 33083       |       |
| isobutyraldehyde-2,4-DNPH         | ACN     | 100   | 33084       |       |
| isovaleraldehyde-2,4-DNPH         | ACN     | 100   | 33085       |       |
| methacrolein-2,4-DNPH             | ACN     | 100   | 33095       |       |
| propionaldehyde-2,4-DNPH          | ACN     | 100   | 33086       |       |
| <i>m</i> -tolualdehyde-2,4-DNPH   | ACN     | 100   | 33088       |       |
| <i>o</i> -tolualdehyde-2,4-DNPH   | ACN     | 100   | 33087       |       |
| <i>p</i> -tolualdehyde-2,4-DNPH   | ACN     | 100   | 33089       |       |
| valeraldehyde-2,4-DNPH            | ACN     | 100   | 33090       |       |

ACN=acetonitrile

### ASTM Method D5836-03 / OSHA 42, OSHA 47, NIOSH 5522 (Analysis of Isocyanates in Indoor Air by HPLC)

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 an analysis 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)piperazine (1-2pp) derivative.

#### Isocyanates Singles

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

| Compound  | Solvent | Conc. | cat.# (ea.) | price |
|-----------|---------|-------|-------------|-------|
| 2,6-TDIP  | DMSO    | 1,000 | 33000       |       |
| 2,4-TDIP  | DMSO    | 1,000 | 33001       |       |
| 1,6-HDIP  | DMSO    | 1,000 | 33002       |       |
| 4,4'-MDIP | DMSO    | 1,000 | 33003       |       |

DMSO = dimethyl sulfoxide

#### Formaldehyde Oxazolidine

2,000μg/mL in toluene, 1mL/ampul

cat. # 33004 (ea.)

### 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 to 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, HPLC separation, and UV detection. Restek offers a variety of reversed phase HPLC columns suitable for these separations. Restek also designed an analytical reference material 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            | Irganox 3114 |
| erucamide slip | Irganox 1010 |
| vitamin E      | Irganox 1076 |
| Irgafos 168    |              |

50μg/mL each in isopropanol, 1mL/ampul  
cat. # 31628 (ea.)

No data pack available.

#### ASTM D6042-96 Internal Standard Mix

Tinuvin P

51.8μg/mL in isopropanol, 1mL/ampul  
cat. # 31629 (ea.)

No data pack available.

**ASTM Method D6042-96 (Plastic Container Testing)**  
*cont'd*

**Other Additives—Available from Restek as Custom Formulations**

Similar methods for extractables in plastic pharmaceutical containers are cited in the United States Pharmacopeia (USP), British Pharmacopoeia (BP), European Pharmacopoeia (EP), and Japanese Pharmacopoeia (JP). Customers may also have formulation-specific or product-specific test mixtures. Please contact us for a custom mixture. Our current inventory of raw materials includes these popular antioxidants. We have many more that are not listed and can obtain most compounds you may need.

- |               |                |                |               |
|---------------|----------------|----------------|---------------|
| • Ethanox 323 | • Irganox L64  | • Ultranox 626 | • Vanlube PCX |
| • Ethanox 330 | • Irganox L109 | • Vanlube 81   | • Vanlube SL  |
| • Ethanox 702 | • Irganox L134 | • Vanlube 848  | • Vanlube SS  |
| • Ethanox 703 | • Irganox L135 | • Vanlube 7723 |               |
| • Irganox L06 | • Irganox 1035 | • Vanlube AZ   |               |
| • Irganox L57 | • Santanox R   | • Vanlube NA   |               |

**ASTM Method D6352-98 (Polywax® Standards)**

These high molecular weight hydrocarbon waxes are useful for simulated distillation and other high-temperature GC work.

Volume is 1mL/ampul.

| Compound     | qty. | cat.# (ea.) | price |
|--------------|------|-------------|-------|
| Polywax 500  | 1g   | 36224       |       |
| Polywax 655  | 1g   | 36225       |       |
| Polywax 850  | 1g   | 36226       |       |
| Polywax 1000 | 1g   | 36227       |       |

No data pack available.

**ASTM Method D6584-00 and EN14105 (Biodiesel)**

**Determining Free and Total Glycerin in B-100 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. D6584-00 is a test method 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  
 1,000µg/mL in pyridine, 1mL/ampul  
 cat. # 33024 (ea.)
- 1,000µg/mL in pyridine, 5mL/ampul  
 cat. # 33032 (ea.)

**Diolein**

- diolein (1,3-di[*cis*-octadecenoyl]glycerol)  
 5,000µg/mL in pyridine, 1mL/ampul  
 cat. # 33022 (ea.)

**Glycerin**

- glycerin  
 500µg/mL in pyridine, 1mL/ampul  
 cat. # 33020 (ea.)

**ASTM Method D6584-00 and EN14105 (Biodiesel)**  
*cont'd*

**Monolein**

- monolein (1-mono[*cis*-9-octadecenoyl]-rac-glycerol)  
 5,000µg/mL in pyridine, 1mL/ampul  
 cat. # 33021 (ea.)

**Monopalmitin**

- monopalmitin  
 5,000µg/mL in pyridine, 1mL/ampul  
 cat. # 33026 (ea.)

**Tricaprin**

- tricaprin (1,2,3-tricaprinoylglycerol)  
 8,000µg/mL in pyridine, 1mL/ampul  
 cat. # 33025 (ea.)
- 8,000µg/mL in pyridine, 5mL/ampul  
 cat. # 33033 (ea.)

**Triolein**

- triolein (1,2,3-tri[*cis*-octadecenoyl]glycerol)  
 5,000µg/mL in pyridine, 1mL/ampul  
 cat. # 33023 (ea.)

**ASTM Method D6730-01 (Determination of Individual Components in Spark Ignition Engine Fuels)**

**Oxy Set-Up Blend**

ASTM method D6730-01 is specifically designed for the determination of the individual hydrocarbons present in spark ignition fuels, as well as fuel blends containing oxygenates such as methyl *tert*-butyl ether, ethyl *tert*-butyl ether, *tert*-butanol, ethanol, etc.

**NEW!**

Gravimetrically prepared and NIST-traceable.

|  |       |                            |       |
|--|-------|----------------------------|-------|
| benzene                                | 1.00% | 1-methylcyclopentane       | 0.50% |
| <i>tert</i> -butanol                   | 0.50% | 1-methyl-2-ethylbenzene    | 0.50% |
| cyclohexane                            | 28.9% | 1-methylnaphthalene        | 0.25% |
| <i>n</i> -decane                       | 1.00% | 5-methylnonane             | 0.20% |
| 2,3-dimethylbutane                     | 0.50% | naphthalene                | 0.50% |
| <i>trans</i> -1,2-dimethylcyclopentane | 0.50% | <i>n</i> -nonane           | 2.00% |
| 2,3-dimethylheptane                    | 0.20% | <i>n</i> -octane           | 2.00% |
| dodecane                               | 0.25% | <i>n</i> -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% |
| <i>n</i> -heptane                      | 2.00% | 2,2,3-trimethylpentane     | 0.50% |
| <i>n</i> -hexane                       | 2.00% | 2,3,3-trimethylpentane     | 0.50% |
| 2-methyl-2-butene                      | 2.50% | undecane                   | 0.50% |
| methyl <i>tert</i> -butyl ether        | 10.0% | <i>p</i> -xylene           | 1.00% |

2mL prescored ampul

cat. # 33034 (ea.) enquire

**Diesel/Biodiesel 80:20 Blend Standard**

The biodiesel component is methyl soyate.

diesel/biodiesel 80:20

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

**also available**

Restek offers a full range of derivatization reagents in 10 x 1g and 25g package sizes. See page 484.

# Petroleum Standards

## Petroleum Standards

These petroleum standards are gravimetrically prepared, NIST-traceable by weight, and 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-dimethylbenzenethiol  
 60 ppm total sulfur by weight from 1-octanethiol  
 30 ppm total sulfur by weight from 1-nonenethiol  
 60 ppm total sulfur by weight from 1-decanethiol  
 30 ppm total sulfur by weight from 1-pentadecanethiol  
 60 ppm total sulfur by weight from 1-hexadecanethiol  
 30 ppm total sulfur by weight from 1-octadecanethiol  
 Balance: toluene/isooctane 1/15

1mL pre-scored amber ampul.

[cat. # 33049 \(ea.\) enquire](#)

## 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

1mL pre-scored amber ampul.

[cat. # 33050 \(ea.\) enquire](#)

## also available

Custom ULSD and LSD calibration standards are also available in 100mL, 200mL, 500mL, and 1 liter bottles.

Call our Analytical Reference Department at 800-356-1688 or 814-353-1300, or your Restek representative for details.

## EPA Ultra Low & Low Sulfur Diesel Standards and Samples in Diesel Fuel to Meet EPA Requirements for Lab Qualification

### EPA Ultra Low Sulfur Diesel Precision Sample # 1

EPA Section 80.580-80.585 Title 40, Chapter 1, Part 80

Homogenous commercially available diesel fuel with sulfur content of 5-15 ppm.  
 1 x 200mL amber bottle.

[cat. # 33051 \(ea.\) enquire](#)

### EPA Low Sulfur Diesel Precision Sample # 2

EPA Section 80.580-80.585 Title 40, Chapter 1, Part 80

Homogenous commercially available diesel fuel with sulfur content of 200-500 ppm.  
 1 x 200mL amber bottle.

[cat. # 33052 \(ea.\) enquire](#)

### EPA Ultra Low Sulfur Diesel Accuracy Standard # 1

EPA Section 80.520(a)(1) and 80.510(b)

1-10 ppm total sulfur in a diesel fuel matrix for motor vehicle diesel and diesel additives subject to the 15 ppm sulfur standard.  
 1 x 200mL amber bottle.

[cat. # 33053 \(ea.\) enquire](#)

### EPA Ultra Low Sulfur Diesel Accuracy Standard # 2

EPA Section 80.520(a)(1) and 80.510(b)

10-20 ppm total sulfur in a diesel fuel matrix for motor vehicle diesel and diesel additives subject to the 15 ppm sulfur standard.  
 1 x 200mL amber bottle.

[cat. # 33054 \(ea.\) enquire](#)

### EPA Low Sulfur Diesel Accuracy Standard # 3

EPA Section 80.520(c) and 80.510(c)

100-200 ppm total sulfur in a diesel fuel matrix for motor vehicle diesel and diesel additives subject to the 500 ppm sulfur standard.  
 1 x 200mL amber bottle.

[cat. # 33055 \(ea.\) enquire](#)

### EPA Low Sulfur Diesel Accuracy Standard # 4

EPA Section 80.520(c) and 80.510(c)

400-500 ppm total sulfur in a diesel fuel matrix for motor vehicle diesel and diesel additives subject to the 500 ppm sulfur standard.  
 1 x 200mL amber bottle.

[cat. # 33056 \(ea.\) enquire](#)

## Ultra Low & Low Sulfur in Diesel Fuel Calibration Kits

EPA Section 80.580-80.585 Title 40, Chapter 1, Part 80

### Cal Kit ULSD 1 - 20

Blank

1.0 ppm total sulfur from di-n-butylsulfide in diesel fuel  
 2.5 ppm total sulfur from di-n-butylsulfide in diesel fuel  
 5.0 ppm total sulfur from di-n-butylsulfide in diesel fuel  
 10.0 ppm total sulfur from di-n-butylsulfide in diesel fuel  
 15.0 ppm total sulfur from di-n-butylsulfide in diesel fuel  
 20.0 ppm total sulfur from di-n-butylsulfide in diesel fuel

Set of seven 20mL bottles.

cat. # 33060 (kit) enquire



### Cal Kit ULSD 20 - 100

Blank

20.0 ppm total sulfur from di-n-butylsulfide in diesel fuel  
 35.0 ppm total sulfur from di-n-butylsulfide in diesel fuel  
 50.0 ppm total sulfur from di-n-butylsulfide in diesel fuel  
 75.0 ppm total sulfur from di-n-butylsulfide in diesel fuel  
 100 ppm total sulfur from di-n-butylsulfide in diesel fuel

Set of six 20mL bottles.

cat. # 33061 (kit) enquire



### Cal Kit LSD 100 - 500

Blank

100 ppm total sulfur from di-n-butylsulfide in diesel fuel  
 200 ppm total sulfur from di-n-butylsulfide in diesel fuel  
 300 ppm total sulfur from di-n-butylsulfide in diesel fuel  
 400 ppm total sulfur from di-n-butylsulfide in diesel fuel  
 500 ppm total sulfur from di-n-butylsulfide in diesel fuel

Set of six 20mL bottles.

cat. # 33062 (kit) enquire



## Low Sulfur in Gasoline Calibration Standards

EPA Section 80.190-80.415 Title 40, Chapter 1, Part 80

### Cal Kit SG 10 - 50

Blank

10 ppm sulfur from di-n-butylsulfide in gasoline by weight  
 20 ppm sulfur from di-n-butylsulfide in gasoline by weight  
 30 ppm sulfur from di-n-butylsulfide in gasoline by weight  
 40 ppm sulfur from di-n-butylsulfide in gasoline by weight  
 50 ppm sulfur from di-n-butylsulfide in gasoline by weight

Set of six 5mL amber bottles.

cat. # 33043 (kit) enquire



### Check Standard SG 25

25 ppm sulfur from di-n-butylsulfide in gasoline by weight.

Set of five 5mL amber bottles.

cat. # 33044 (ea.) enquire

## also available

Custom ULSD and LSD calibration standards are also available in 100mL, 200mL, 500mL, and 1 liter bottles.

Call our Analytical Reference Department at 800-356-1688 or 814-353-1300, or your Restek representative for details.

## Low Sulfur in Gasoline Calibration Standards cont'd

### Cal Kit SG 50 - 125

Blank

50 ppm sulfur from di-n-butylsulfide in gasoline by weight  
 65 ppm sulfur from di-n-butylsulfide in gasoline by weight  
 80 ppm sulfur from di-n-butylsulfide in gasoline by weight  
 95 ppm sulfur from di-n-butylsulfide in gasoline by weight  
 110 ppm sulfur from di-n-butylsulfide in gasoline by weight  
 125 ppm sulfur from di-n-butylsulfide in gasoline by weight

Set of seven 5mL amber bottles.

cat. # 33045 (kit) enquire



### Check Standard SG 75

75 ppm sulfur from di-n-butylsulfide in gasoline by weight.

Set of five 5mL amber bottles.

cat. # 33046 (ea.) enquire

### Cal Kit SG 110 - 500

Blank

110 ppm sulfur from di-n-butylsulfide  
 200 ppm sulfur from di-n-butylsulfide  
 300 ppm sulfur from di-n-butylsulfide  
 400 ppm sulfur from di-n-butylsulfide  
 500 ppm sulfur from di-n-butylsulfide

Set of six 5mL amber bottles.

cat. # 33047 (kit) enquire



### Check Standard SG 175

175 ppm sulfur from di-n-butylsulfide in gasoline by weight.

Set of five 5mL amber bottles.

cat. # 33048 (ea.) enquire

## Sulfur in Isooctane Calibration Kits and Check Standards

ASTM Methods D3120, D4045, D5453, D6920

### Cal Kit SISO 0.125 - 2.5ppm

Blank

0.125 w/w ppm total sulfur from di-n-butylsulfide in isooctane  
 0.25 w/w ppm total sulfur from di-n-butylsulfide in isooctane  
 0.50 w/w ppm total sulfur from di-n-butylsulfide in isooctane  
 1.00 w/w ppm total sulfur from di-n-butylsulfide in isooctane  
 2.50 w/w ppm total sulfur from di-n-butylsulfide in isooctane

Calibration kit for total sulfur by weight from di-n-butylsulfide in isooctane 0.125-2.5ppm range. Set of six 1mL pre-scored ampuls.

cat. # 33035 (kit) enquire



### Check Standard SISO 0.75

0.75ppm total sulfur by weight from di-n-butylsulfide in isooctane.

Set of five 1mL pre-scored ampuls.

cat. # 33036 (ea.) enquire



## please note

These petroleum standards are gravimetrically prepared, NIST-traceable by weight, and verified by one or more analytical methods.

# Petroleum Standards

## Sulfur in Isooctane Calibration Kits and Check Standards cont'd

### Cal Kit SISO 2.5 - 50 ppm

Blank

2.50 w/w ppm total sulfur from di-n-butylsulfide in isooctane  
 5.00 w/w ppm total sulfur from di-n-butylsulfide in isooctane  
 10.00 w/w ppm total sulfur from di-n-butylsulfide in isooctane  
 15.00 w/w ppm total sulfur from di-n-butylsulfide in isooctane  
 20.00 w/w ppm total sulfur from di-n-butylsulfide in isooctane  
 25.00 w/w ppm total sulfur from di-n-butylsulfide in isooctane  
 50.00 w/w ppm total sulfur from di-n-butylsulfide in isooctane  
 Calibration kit for total sulfur by weight from di-n-butylsulfide in isooctane  
 2.5-50 ppm range. Set of eight 1mL pre-scored ampuls.  
 cat. # 33037 (kit) enquire



### Check Standard SISO 30

30 ppm total sulfur by weight from di-n-butylsulfide in isooctane.

Set of five 1mL pre-scored ampuls.

cat. # 33038 (ea.) enquire

### Cal Kit SISO 50 - 1000 ppm

Blank

50 w/w ppm total sulfur from di-n-butylsulfide in isooctane  
 75 w/w ppm total sulfur from di-n-butylsulfide in isooctane  
 100 w/w ppm total sulfur from di-n-butylsulfide in isooctane  
 250 w/w ppm total sulfur from di-n-butylsulfide in isooctane  
 500 w/w ppm total sulfur from di-n-butylsulfide in isooctane  
 1000 w/w ppm total sulfur from di-n-butylsulfide in isooctane  
 Calibration kit for total sulfur by weight from di-n-butylsulfide in isooctane  
 50-100 ppm range. Set of seven 1mL pre-scored ampuls.  
 cat. # 33039 (kit) enquire



### Check Standard SISO 300

300 ppm total sulfur by weight from di-n-butylsulfide in isooctane.

Set of five 1mL pre-scored ampuls.

cat. # 33040 (ea.) enquire

### Cal Kit SISO 1000 - 6000

Blank

1000 w/w ppm total sulfur from di-n-butylsulfide in isooctane  
 1500 w/w ppm total sulfur from di-n-butylsulfide in isooctane  
 2000 w/w ppm total sulfur from di-n-butylsulfide in isooctane  
 4000 w/w ppm total sulfur from di-n-butylsulfide in isooctane  
 6000 w/w ppm total sulfur from di-n-butylsulfide in isooctane  
 Calibration kit for total sulfur by weight from di-n-butylsulfide in isooctane  
 1000 - 6000 ppm range. Set of six 1mL pre-scored ampuls.  
 cat. # 33041 (kit) enquire



### Check Standard SISO 3000

3000 ppm total sulfur by weight from di-n-butylsulfide in isooctane.

Set of five 1mL pre-scored ampuls.

cat. # 33042 (ea.) enquire

## also available

Custom total sulfur &amp; total nitrogen in isooctane check standards also available.

Call our Analytical Reference Department at 800-356-1688 or 814-353-1300, or your Restek representative for details.

## Total Sulfur & Total Nitrogen in Isooctane Calibration Kits

ASTM Methods D3120, D4045, D4629, D5453, D5762, D6069, D6920



### Cal Kit SNISO 0.125 - 5.0

Blank

0.125 w/w ppm total sulfur from thiophene & total nitrogen from pyridine in isooctane  
 0.25 w/w ppm total sulfur from thiophene & total nitrogen from pyridine in isooctane  
 0.50 w/w ppm total sulfur from thiophene & total nitrogen from pyridine in isooctane  
 1.00 w/w ppm total sulfur from thiophene & total nitrogen from pyridine in isooctane  
 2.50 w/w ppm total sulfur from thiophene & total nitrogen from pyridine in isooctane  
 5.00 w/w ppm total sulfur from thiophene & total nitrogen from pyridine in isooctane

Set of seven 1mL pre-scored amber ampuls.

cat. # 33057 (kit) enquire

### Cal Kit SNISO 5.0 - 50.0

Blank

5.00 w/w ppm total sulfur from thiophene & total nitrogen from pyridine in isooctane  
 10.0 w/w ppm total sulfur from thiophene & total nitrogen from pyridine in isooctane  
 25.0 w/w ppm total sulfur from thiophene & total nitrogen from pyridine in isooctane  
 50.0 w/w ppm total sulfur from thiophene & total nitrogen from pyridine in isooctane

Set of five 1mL pre-scored amber ampuls.

cat. # 33058 (kit) enquire



### Cal Kit SNISO 50.0 - 1000

Blank

50.0 w/w ppm total sulfur from thiophene & total nitrogen from pyridine in isooctane  
 75.0 w/w ppm total sulfur from thiophene & total nitrogen from pyridine in isooctane  
 100 w/w ppm total sulfur from thiophene & total nitrogen from pyridine in isooctane  
 250 w/w ppm total sulfur from thiophene & total nitrogen from pyridine in isooctane  
 500 w/w ppm total sulfur from thiophene & total nitrogen from pyridine in isooctane  
 1000 w/w ppm total sulfur from thiophene & total nitrogen from pyridine in isooctane

Set of seven 1mL pre-scored amber ampuls.

cat. # 33059 (kit) enquire



## free data

### Available on Our Website: Lot Certificates, Data Packs, and MSDSs

For complete information detailing manufacturing and testing for Restek inventoried reference standards, visit our website at [www.restek.com/datapacks](http://www.restek.com/datapacks). To view certificates and/or an MSDS, enter the catalog number of the product in the Search feature. For a free data pack (Adobe® PDF file), enter the catalog number and lot number of the product.

**Sulfur in Mineral Oil Calibration Kits and Check Standards**

ASTM Methods D2622, D3120, D4045, D4294, D5453, D6212, D6313, D6428, D6445, D7039

**Cal Kit SMO 2 - 20**

Blank

2.00 w/w ppm total sulfur from di-n-butylsulfide in mineral oil  
 5.00 w/w ppm total sulfur from di-n-butylsulfide in mineral oil  
 7.00 w/w ppm total sulfur from di-n-butylsulfide in mineral oil  
 10.00 w/w ppm total sulfur from di-n-butylsulfide in mineral oil  
 15.00 w/w ppm total sulfur from di-n-butylsulfide in mineral oil  
 20.00 w/w ppm total sulfur from di-n-butylsulfide in mineral oil

Set of seven 100mL bottles.

cat. # 33063 (kit) enquire

**Check Standard SMO 11**

11.0 w/w ppm total sulfur from di-n-butylsulfide in mineral oil.  
 1 liter bottle.

cat. # 33064 (ea.) enquire

**Cal Kit SMO 10 - 100**

Blank

10.0 w/w ppm total sulfur from di-n-butylsulfide in mineral oil  
 25.0 w/w ppm total sulfur from di-n-butylsulfide in mineral oil  
 50.0 w/w ppm total sulfur from di-n-butylsulfide in mineral oil  
 100 w/w ppm total sulfur from di-n-butylsulfide in mineral oil

Set of five 100mL bottles.

cat. # 33065 (kit) enquire

**Check Standard SMO 30**

30.0 w/w ppm total sulfur from di-n-butylsulfide in mineral oil.  
 1 liter bottle.

cat. # 33066 (ea.) enquire

**Cal Kit SMO 100 - 1000**

Blank

100 w/w ppm total sulfur from di-n-butylsulfide in mineral oil  
 200 w/w ppm total sulfur from di-n-butylsulfide in mineral oil  
 300 w/w ppm total sulfur from di-n-butylsulfide in mineral oil  
 400 w/w ppm total sulfur from di-n-butylsulfide in mineral oil  
 500 w/w ppm total sulfur from di-n-butylsulfide in mineral oil  
 600 w/w ppm total sulfur from di-n-butylsulfide in mineral oil  
 750 w/w ppm total sulfur from di-n-butylsulfide in mineral oil  
 1000 w/w ppm total sulfur from di-n-butylsulfide in mineral oil

Set of nine 100mL bottles.

cat. # 33067 (kit) enquire

**Check Standard SMO 350**

350 w/w ppm total sulfur from di-n-butylsulfide in mineral oil.  
 1 liter bottle.

cat. # 33068 (ea.) enquire

**Cal Kit SMO 1000 - 25000**

Blank

1000 w/w ppm total sulfur from di-n-butylsulfide in mineral oil  
 2500 w/w ppm total sulfur from di-n-butylsulfide in mineral oil  
 5000 w/w ppm total sulfur from di-n-butylsulfide in mineral oil  
 1.00% total sulfur by weight from di-n-butylsulfide in mineral oil  
 1.50% total sulfur by weight from di-n-butylsulfide in mineral oil  
 2.00% total sulfur by weight from di-n-butylsulfide in mineral oil  
 2.50% total sulfur by weight from di-n-butylsulfide in mineral oil

Set of eight 100mL bottles.

cat. # 33069 (kit) enquire

**Check Standard SMO 3000**

3000 w/w ppm total sulfur from di-n-butylsulfide. 1 liter bottle.

cat. # 33070 (ea.) enquire

**Cal Kit SMO 25000 - 50000**

Blank

2.50% total sulfur by weight from di-n-butylsulfide in mineral oil  
 3.00% total sulfur by weight from di-n-butylsulfide in mineral oil  
 3.50% total sulfur by weight from di-n-butylsulfide in mineral oil  
 4.00% total sulfur by weight from di-n-butylsulfide in mineral oil  
 4.50% total sulfur by weight from di-n-butylsulfide in mineral oil  
 5.00% total sulfur by weight from di-n-butylsulfide in mineral oil

Set of seven 100mL bottles.

cat. # 33071 (kit) enquire

**Check Standard SMO 37000**

3.70% total sulfur by weight from di-n-butylsulfide in mineral oil.  
 1 liter bottle.

cat. # 33072 (ea.) enquire

**please note**

These petroleum standards are gravimetrically prepared, NIST-traceable by weight, and verified by one or more analytical methods.

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## Forensic: Fire Debris, Blood Alcohol

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| European Pharmacopoeia Standards .....  | .Residual Solvents |

## 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 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

10,000 $\mu$ g/mL in P&T methanol, 1mL/ampul  
cat. # 30487 (ea.)

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

Volume is 1mL/ampul unless otherwise noted. Concentration is  $\mu$ g/mL.

| Compound                           | Solvent | Conc.  | cat.# (ea.) | price |
|------------------------------------|---------|--------|-------------|-------|
| unleaded gasoline: unweathered     | PTM     | 5,000  | 30096       |       |
| unleaded gasoline: 25% weathered   | PTM     | 5,000  | 30097       |       |
| unleaded gasoline: 50% weathered   | PTM     | 5,000  | 30098       |       |
| unleaded gasoline: 75% weathered   | PTM     | 5,000  | 30099       |       |
| unleaded gasoline: 99% weathered   | PTM     | 5,000  | 30436       |       |
| Compound                           | Solvent | Conc.  | cat.# (ea.) | price |
| kerosene: unweathered              | D       | 5,000  | 31229       |       |
| kerosene: 25% weathered            | D       | 5,000  | 31230       |       |
| kerosene: 50% weathered            | D       | 5,000  | 31231       |       |
| kerosene: 75% weathered            | D       | 5,000  | 31232       |       |
| Compound                           | Solvent | Conc.  | cat.# (ea.) | price |
| diesel fuel #2: unweathered        | D       | 5,000  | 31233       |       |
| diesel fuel #2: 25% weathered      | D       | 5,000  | 31234       |       |
| diesel fuel #2: 50% weathered      | D       | 5,000  | 31235       |       |
| diesel fuel #2: 75% weathered      | D       | 5,000  | 31236       |       |
| Compound                           | Solvent | Conc.  | cat.# (ea.) | price |
| mineral spirits: unweathered       | D       | 5,000  | 31225       |       |
| mineral spirits: unweathered       | D       | 50,000 | 31260       |       |
| mineral spirits: unweathered (5mL) | D       | 50,000 | 31261       |       |
| mineral spirits: 25% weathered     | D       | 5,000  | 31226       |       |
| mineral spirits: 50% weathered     | D       | 5,000  | 31227       |       |
| mineral spirits: 75% weathered     | D       | 5,000  | 31228       |       |

D = methylene chloride  
PTM = P&T methanol

## 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](http://www.restek.com/solutions).

We'll be glad to work with you!

## Weathered Petrochemical Standards cont'd

## Weathered Gasoline Kit

30096: Unleaded Gasoline Standard  
30097: Unleaded Gas Standard: 25% Weathered  
30098: Unleaded Gas Standard: 50% Weathered  
30099: Unleaded Gas Standard: 75% Weathered  
Contains 1mL each of these mixtures.  
cat. # 30100 (kit)



## Weathered Gasoline Kit #2

30096: Unleaded Gasoline Standard  
30097: Unleaded Gas Standard: 25% Weathered  
30098: Unleaded Gas Standard: 50% Weathered  
30099: Unleaded Gas Standard: 75% Weathered  
30436: Unleaded Gas Standard: 99% Weathered  
Contains 1mL each of these mixtures.  
cat. # 30437 (kit)



## Weathered Kerosene Kit

31229: Kerosene Standard  
31230: Kerosene Standard: 25% Weathered  
31231: Kerosene Standard: 50% Weathered  
31232: Kerosene Standard: 75% Weathered  
Contains 1mL each of these mixtures.  
cat. # 31238 (kit)



## Weathered Diesel Fuel #2 Kit

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  
Contains 1mL each of these mixtures.  
cat. # 31239 (kit)



## Weathered Mineral Spirits Kit

31225: Mineral Spirits Standard  
31226: Mineral Spirits Standard: 25% Weathered  
31227: Mineral Spirits Standard: 50% Weathered  
31228: Mineral Spirits Standard: 75% Weathered  
Contains 1mL each of these mixtures.  
cat. # 31237 (kit)



## Blood Alcohol Standards

## Blood Alcohol Mix Resolution Control Standard (8 components)

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. Concentration of ethanol is NIST-traceable.

|                                |                     |
|--------------------------------|---------------------|
| acetaldehyde                   | ethyl acetate       |
| acetone                        | isopropanol         |
| acetonitrile                   | methanol            |
| ethanol (NIST certified value) | methyl ethyl ketone |

0.100g/dL each in water, 1mL/ampul  
cat. # 36256 (ea.)

## Forensic: Blood Alcohol, Bank Dyes, Explosives

## Blood Alcohol Standards cont'd

We have developed calibration mixtures for performing multi-point instrument calibrations so that laboratories can construct calibration curves. The data pack (which can be downloaded from our website at [www.restek.com/datapacks](http://www.restek.com/datapacks)) includes a Certificate of Analysis, raw material testing results, statistical QA results, analytical balance printout, and gravimetric weight of each analyte. Ethanol in these mixes is National Institute of Standards and Technology (NIST)-traceable.

| Compound                                   | qty.   | cat.# | price   |
|--|--------|-------|---------|
| <b>0.010g/dL forensic ethanol solution</b> |        |       |         |
| 1mL/ampul                                  | 5-pk.  | 36276 |         |
| 1mL/ampul                                  | 10-pk. | 36278 |         |
| 5mL/ampul                                  | ea.    | 36277 |         |
| <b>0.015g/dL forensic ethanol solution</b> |        |       |         |
| 1mL/ampul                                  | 5-pk.  | 36232 |         |
| 1mL/ampul                                  | 10-pk. | 36332 |         |
| 5mL/ampul                                  | ea.    | 36240 | enquire |
| 20mL/ampul                                 | ea.    | 36248 |         |
| <b>0.02g/dL forensic ethanol solution</b>  |        |       |         |
| 1mL/ampul                                  | 5-pk.  | 36233 |         |
| 1mL/ampul                                  | 10-pk. | 36333 |         |
| 5mL/ampul                                  | ea.    | 36241 | enquire |
| 20mL/ampul                                 | ea.    | 36249 |         |
| <b>0.025g/dL forensic ethanol solution</b> |        |       |         |
| 1mL/ampul                                  | 5-pk.  | 36234 |         |
| 1mL/ampul                                  | 10-pk. | 36334 |         |
| 5mL/ampul                                  | ea.    | 36242 |         |
| 20mL/ampul                                 | ea.    | 36250 | enquire |
| <b>0.04g/dL forensic ethanol solution</b>  |        |       |         |
| 1mL/ampul                                  | 5-pk.  | 36235 |         |
| 1mL/ampul                                  | 10-pk. | 36335 |         |
| 5mL/ampul                                  | ea.    | 36243 |         |
| 20mL/ampul                                 | ea.    | 36251 |         |
| <b>0.05g/dL forensic ethanol solution</b>  |        |       |         |
| 1mL/ampul                                  | 5-pk.  | 36257 |         |
| 1mL/ampul                                  | 10-pk. | 36259 |         |
| 5mL/ampul                                  | ea.    | 36258 |         |
| 20mL/ampul                                 | ea.    | 36260 |         |
| <b>0.08g/dL forensic ethanol solution</b>  |        |       |         |
| 1mL/ampul                                  | 5-pk.  | 36262 |         |
| 1mL/ampul                                  | 10-pk. | 36264 |         |
| 5mL/ampul                                  | ea.    | 36263 |         |
| 20mL/ampul                                 | ea.    | 36265 |         |
| <b>0.1g/dL forensic ethanol solution</b>   |        |       |         |
| 1mL/ampul                                  | 5-pk.  | 36236 |         |
| 1mL/ampul                                  | 10-pk. | 36336 |         |
| 5mL/ampul                                  | ea.    | 36244 |         |
| 20mL/ampul                                 | ea.    | 36252 |         |
| <b>0.15g/dL forensic ethanol solution</b>  |        |       |         |
| 1mL/ampul                                  | 5-pk.  | 36237 |         |
| 1mL/ampul                                  | 10-pk. | 36337 |         |
| 5mL/ampul                                  | ea.    | 36245 |         |
| 20mL/ampul                                 | ea.    | 36253 |         |
| <b>0.16g/dL forensic ethanol solution</b>  |        |       |         |
| 1mL/ampul                                  | 5-pk.  | 36417 |         |
| 1mL/ampul                                  | 10-pk. | 36418 |         |
| 5mL/ampul                                  | ea.    | 36419 |         |
| 20mL/ampul                                 | ea.    | 36420 |         |
| <b>0.2g/dL forensic ethanol solution</b>   |        |       |         |
| 1mL/ampul                                  | 5-pk.  | 36238 |         |
| 1mL/ampul                                  | 10-pk. | 36338 |         |
| 5mL/ampul                                  | ea.    | 36246 |         |
| 20mL/ampul                                 | ea.    | 36254 |         |

NEW!

## did you know?

Resolve blood alcohol samples in less than 3 minutes with our Rtx®-BAC1 and Rtx®-BAC2 columns. For more information on these columns or to find out what's new for clinical/forensic analyses, visit [www.restek.com/CFT](http://www.restek.com/CFT).

## Blood Alcohol Standards cont'd

| Compound                          | qty.   | cat.# | price |
|-----------------------------------|--------|-------|-------|
| 0.3g/dL forensic ethanol solution |        |       |       |
| 1mL/ampul                         | 5-pk.  | 36239 |       |
| 1mL/ampul                         | 10-pk. | 36339 |       |
| 5mL/ampul                         | ea.    | 36247 |       |
| 20mL/ampul                        | ea.    | 36255 |       |
| 0.4g/dL forensic ethanol solution |        |       |       |
| 1mL/ampul                         | 5-pk.  | 36266 |       |
| 1mL/ampul                         | 10-pk. | 36268 |       |
| 5mL/ampul                         | ea.    | 36267 |       |
| 20mL/ampul                        | ea.    | 36269 |       |

## Bank Dye Standard (MAAQ)

Restek offers this qualitative standard to help investigators in municipal police stations and criminal laboratories fight crime.

1-N-(methylamino)anthraquinone (MAAQ)

100µg/mL in methylene chloride, 1mL/ampul  
cat. # 31823 (ea.)

No data pack available.

## Explosives Solutions

## Single-Component Explosives Solutions

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

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

| Compound                            | Solvent | Conc. | cat.# (ea.) | price   |
|-------------------------------------|---------|-------|-------------|---------|
| 2-amino-4,6-dinitrotoluene          | ACN     | 1,000 | 31670       | enquire |
| 4-amino-2,6-dinitrotoluene          | ACN     | 1,000 | 31671       | enquire |
| ammonium picrate                    | ACN     | 2,000 | 31890       | enquire |
| 3,5-dinitroaniline                  | ACN     | 1,000 | 31661       | enquire |
| 1,3-dinitrobenzene                  | ACN     | 1,000 | 31662       | enquire |
| 1,4-dinitrobenzene                  | ACN     | 2,000 | 33205       | enquire |
| 2,4-dinitrotoluene                  | ACN     | 1,000 | 31663       | enquire |
| 2,6-dinitrotoluene                  | ACN     | 1,000 | 31664       | enquire |
| EGDN                                | M       | 1,000 | 31601       | enquire |
| HMX                                 | ACN     | 1,000 | 31665       | enquire |
| nitrobenzene                        | ACN     | 1,000 | 31657       | enquire |
| nitroglycerin                       | M       | 1,000 | 31498       | enquire |
| nitroguanidine                      | M       | 1,000 | 31602       | enquire |
| 2-nitrotoluene                      | ACN     | 1,000 | 31659       | enquire |
| 3-nitrotoluene                      | ACN     | 1,000 | 31660       | enquire |
| 4-nitrotoluene                      | ACN     | 1,000 | 31658       | enquire |
| PETN (pentaerythritol tetranitrate) | M       | 1,000 | 31600       | enquire |
| picric acid                         | M       | 1,000 | 31499       | enquire |
| propylene glycol dinitrate (PGDN)   | M       | 1,000 | 31821       | enquire |
| RDX                                 | ACN     | 1,000 | 31666       | enquire |
| tetryl                              | ACN     | 1,000 | 31667       | enquire |
| 1,3,5-trinitrobenzene               | ACN     | 1,000 | 31668       | enquire |
| 2,4,6-trinitrotoluene               | ACN     | 1,000 | 31669       | enquire |

ACN = acetonitrile

M = methanol

## References (Not available from Restek.)

<sup>1</sup>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.

<sup>2</sup>M. E. Walsh, T. Ranney, J. Chromatogr. Sci., Vol. 36, pp. 406-416, August 1998.

## Forensic: Drugs of Abuse

## Exempted Drug of Abuse Reference Materials

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

| Compound                                | CAS#        | Solvent | Conc. | cat.# (ea.) | price   |
|---|-------------|---------|-------|-------------|---------|
| <b>Benzodiazepines</b>                  |             |         |       |             |         |
| alprazolam                              | 28981-97-7  | PTM     | 1,000 | 34042       | enquire |
| bromazepam                              | 1812-30-2   | PTM     | 1,000 | 34043       | enquire |
| chlor diazepoxide                       | 438-41-5    | PTM     | 1,000 | 34044       | enquire |
| clobazam                                | 22316-47-8  | PTM     | 1,000 | 34045       | enquire |
| clonazepam                              | 1622-61-3   | PTM     | 1,000 | 34046       | enquire |
| diazepam                                | 439-14-5    | PTM     | 1,000 | 34047       | enquire |
| flunitrazepam                           | 1622-62-4   | PTM     | 1,000 | 34049       | enquire |
| flurazepam                              | 1172-18-5   | PTM     | 1,000 | 34050       | enquire |
| lorazepam                               | 846-49-1    | PTM     | 1,000 | 34051       | enquire |
| nitrazepam                              | 146-22-5    | PTM     | 1,000 | 34053       | enquire |
| oxazepam                                | 604-75-1    | PTM     | 1,000 | 34054       | enquire |
| prazepam                                | 2955-38-6   | PTM     | 1,000 | 34055       | enquire |
| temazepam                               | 896-50-4    | PTM     | 1,000 | 34056       | enquire |
| triazolam                               | 28911-01-5  | PTM     | 1,000 | 34057       | enquire |
| <b>Cocaine &amp; Metabolites</b>        |             |         |       |             |         |
| cocaethylene                            | 529-38-4    | ACN     | 1,000 | 34066       | enquire |
| cocaine                                 | 53-21-4     | PTM     | 1,000 | 34015       | enquire |
| benzoylecgonine                         | 519-09-5    | PTM     | 1,000 | 34016       | enquire |
| ecgonine                                | 5796-31-6   | PTM     | 1,000 | 34017       | enquire |
| ecgonine methyl ester                   | 38969-40-3  | PTM     | 1,000 | 34018       | enquire |
| <b>Methadone &amp; Metabolites</b>      |             |         |       |             |         |
| EDDP perchlorate                        | 66729-78-0  | M       | 1,000 | 34069       | enquire |
| methadone                               | 1095-90-5   | PTM     | 1,000 | 34005       | enquire |
| <b>Amphetamines &amp; Metabolites</b>   |             |         |       |             |         |
| d-amphetamine                           | 51-63-8     | PTM     | 1,000 | 34020       | enquire |
| (+)-methamphetamine                     | 51-57-0     | PTM     | 1,000 | 34021       | enquire |
| 3,4-MDA HCl                             | 4764-17-4   | M       | 1,000 | 34070       | enquire |
| 3,4-MDEA HCl                            | 82801-81-8  | M       | 1,000 | 34072       | enquire |
| 3,4-MDMA HCl                            | 42542-10-9  | M       | 1,000 | 34071       | enquire |
| phenylpropanoamine HCl                  | 154-41-6    | M       | 1,000 | 34073       | enquire |
| <b>Opiates &amp; Metabolites</b>        |             |         |       |             |         |
| codeine                                 | 76-57-3     | PTM     | 1,000 | 34000       | enquire |
| dextromethorphan HBr monohydrate        | 125-69-9    | M       | 1,000 | 34081       | enquire |
| hydrocodone                             | 34195-34-1  | PTM     | 1,000 | 34002       | enquire |
| hydromorphone                           | 71-68-1     | PTM     | 1,000 | 34063       | enquire |
| morphine                                | 6211-15-0   | PTM     | 1,000 | 34006       | enquire |
| oxycodone                               | 124-90-3    | PTM     | 1,000 | 34007       | enquire |
| oxymorphone                             | 76-41-5     | PTM     | 1,000 | 34065       | enquire |
| <b>Cannabinoid &amp; Metabolites</b>    |             |         |       |             |         |
| cannabidiol                             | 13956-24-1  | PTM     | 1,000 | 34011       | enquire |
| cannabinol                              | 521-35-7    | PTM     | 1,000 | 34010       | enquire |
| Δ <sup>9</sup> -THC                     | 1972-08-3   | M       | 1,000 | 34067       | enquire |
| (±)11-nor-9-carboxy-Δ <sup>9</sup> -THC | 104784-50-2 | M       | 100   | 34068       | enquire |
| <b>Barbiturates</b>                     |             |         |       |             |         |
| amobarbital                             | 64-43-7     | PTM     | 1,000 | 34028       | enquire |
| aprobarbital                            | 77-02-1     | PTM     | 1,000 | 34029       | enquire |
| barbital                                | 57-44-3     | PTM     | 1,000 | 34030       | enquire |
| butabarbital                            | 125-40-6    | PTM     | 1,000 | 34031       | enquire |
| butalbital                              | 77-26-9     | PTM     | 1,000 | 34032       | enquire |
| DL-glutethimide                         | 18389-24-7  | PTM     | 1,000 | 34058       | enquire |
| hexobarbital                            | 56-29-1     | PTM     | 1,000 | 34033       | enquire |
| mephobarbital                           | 115-38-8    | PTM     | 1,000 | 34034       | enquire |
| methohexital                            | 151-83-7    | PTM     | 1,000 | 34035       | enquire |
| pentobarbital                           | 76-74-4     | PTM     | 1,000 | 34036       | enquire |
| phenobarbital                           | 50-06-6     | PTM     | 1,000 | 34037       | enquire |
| secobarbital                            | 29071-21-4  | PTM     | 1,000 | 34038       | enquire |
| talbutal                                | 115-44-6    | PTM     | 1,000 | 34039       | enquire |
| thiamylal                               | 337-47-3    | PTM     | 1,000 | 34040       | enquire |
| thiopental                              | 7L-73-8     | PTM     | 1,000 | 34041       | enquire |

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in the Search feature. For a free data pack (Adobe® PDF file), enter the catalog  
number and lot number of the product.

| Compound   | CAS#       | Solvent | Conc. | cat.# (ea.) | price   |
|--|------------|---------|-------|-------------|---------|
| <b>GHB</b>   |            |         |       |             |         |
| 1,4-butanediol                                       | 110-63-4   | M       | 1,000 | 34078       | enquire |
| $\gamma$ -butyrolactone (GBL)                        | 96-48-0    | ACN     | 1,000 | 34077       | enquire |
| $\alpha$ -methylene- $\gamma$ -butyrolactone (AMGBL) | 547-65-9   | ACN     | 1,000 | 34079       | enquire |
| $\gamma$ -valerolactone                              | 108-29-2   | ACN     | 1,000 | 34080       | enquire |
| <b>LSD</b>   |            |         |       |             |         |
| LAMPA  | 40158-98-3 | ACN     | 1,000 | 34075       | enquire |
| LSD  | 50-37-3    | ACN     | 25    | 34089       | enquire |
| LSD  | 50-37-3    | ACN     | 100   | 34088       | enquire |
| <b>Other</b>   |            |         |       |             |         |
| benzphetamine  | 5411-22-3  | PTM     | 1,000 | 34022       | enquire |
| caffeine   | 58-08-2    | M       | 1,000 | 34084       | enquire |
| continine  | 486-56-6   | M       | 1,000 | 34086       | enquire |
| fenfluramine   | 16105-77-4 | PTM     | 1,000 | 34023       | enquire |
| fentanyl   | 437-38-7   | M       | 1,000 | 34082       | enquire |
| nor-fentanyl oxalate                                 | 1609-66-1  | M       | 1,000 | 34083       | enquire |
| levorphanol  | 5985-38-6  | PTM     | 1,000 | 34003       | enquire |
| meperidine   | 50-13-5    | PTM     | 1,000 | 34004       | enquire |
| meprobamate  | 57-53-4    | PTM     | 1,000 | 34059       | enquire |
| methaqualone   | 340-56-7   | PTM     | 1,000 | 34064       | enquire |
| methyprylon  | 125-64-4   | PTM     | 1,000 | 34060       | enquire |
| nicotine   | 54-11-5    | M       | 1,000 | 34085       | enquire |
| pentazocine  | 64024-15-3 | PTM     | 1,000 | 34062       | enquire |
| phenacylidine  | 956-90-1   | PTM     | 1,000 | 34027       | enquire |
| phenidimetrazine                                     | 50-58-8    | PTM     | 1,000 | 34025       | enquire |
| phemetazine  | 1707-14-8  | PTM     | 1,000 | 34026       | enquire |
| phentermine  | 1197-21-3  | PTM     | 1,000 | 34024       | enquire |
| dextro-propoxyphene                                  | 1639-60-7  | PTM     | 1,000 | 34008       | enquire |
| thebaine   | 115-37-7   | PTM     | 1,000 | 34009       | enquire |

ACN = acetonitrile

M = methanol

PTM = purge & trap grade methanol

## Forensic Drug Screen Test Mixture

| Forensic Drug Screen Test Result |               |             |    |
|----------------------------------|---------------|-------------|----|
| amiodarone                       | 10 $\mu$ g/mL | diazepam    | 10 |
| amphetamine                      | 10            | doxepine    | 10 |
| caffeine                         | 10            | haloperidol | 1  |
| codeine                          | 10            | morphine    | 10 |

In P&T methanol, 1mL/ampul

cat. # 36340 (ea.)

## **Forensic Drug Screen Internal Standard**



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## USP <467>

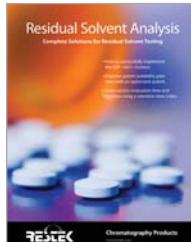
The United States Pharmacopeia (USP) general chapter <467> Residual Solvents is a widely used compendial method intended for identifying and quantifying residual solvents in drug substances, drug products, and excipients. In an attempt to better mirror the International Conference on Harmonization (ICH) 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 1mL/ampul.

| Compound                   | Solvent | Conc.     | cat.# (ea.) | price   |
|----------------------------|---------|-----------|-------------|---------|
| acetonitrile               | DMSO    | 2.05mg/mL | 36281       |         |
| benzene                    | DMSO    | 10mg/mL   | 36282       |         |
| carbon tetrachloride       | DMSO    | 20mg/mL   | 36283       |         |
| chlorobenzene              | DMSO    | 1.8mg/mL  | 36284       |         |
| chloroform                 | DMSO    | 0.3mg/mL  | 36285       |         |
| cyclohexane                | DMSO    | 19.4mg/mL | 36286       |         |
| 1,1-dichloroethene         | DMSO    | 40mg/mL   | 36287       |         |
| 1,2-dichloroethane         | DMSO    | 25mg/mL   | 36288       |         |
| cis-1,2-dichloroethylene   | DMSO    | 4.67mg/mL | 36289       |         |
| trans-1,2-dichloroethylene | DMSO    | 4.67mg/mL | 36290       |         |
| 1,2-dimethoxyethane        | DMSO    | 0.5mg/mL  | 36291       |         |
| N,N-dimethylacetamide      | DMSO    | 5.45mg/mL | 36292       |         |
| N,N-dimethylformamide      | DMSO    | 4.4mg/mL  | 36293       |         |
| 1,4-dioxane                | DMSO    | 1.9mg/mL  | 36294       |         |
| 2-ethoxyethanol            | DMSO    | 0.8mg/mL  | 36295       |         |
| ethylbenzene               | DMSO    | 1.84mg/mL | 36296       |         |
| ethylene glycol            | DMSO    | 3.1mg/mL  | 36297       |         |
| formamide                  | DMSO    | 1.1mg/mL  | 36298       |         |
| hexane                     | DMSO    | 1.45mg/mL | 36299       |         |
| methanol                   | DMSO    | 15mg/mL   | 36401       |         |
| 2-methoxyethanol           | DMSO    | 0.25mg/mL | 36402       |         |
| methylbutylketone          | DMSO    | 0.25mg/mL | 36400       |         |
| methylcyclohexane          | DMSO    | 5.9mg/mL  | 36403       | enquire |
| methylene chloride         | DMSO    | 3mg/mL    | 36404       |         |
| N-methylpyrrolidone        | DMSO    | 2.65mg/mL | 36405       |         |
| nitromethane               | DMSO    | 0.25mg/mL | 36406       |         |
| pyridine                   | DMSO    | 1mg/mL    | 36407       |         |
| sulfolane                  | DMSO    | 0.8mg/mL  | 36413       |         |
| tetrahydrofuran (THF)      | DMSO    | 3.6mg/mL  | 36408       |         |
| tetralin                   | DMSO    | 0.5mg/mL  | 36409       |         |
| toluene                    | DMSO    | 4.45mg/mL | 36410       |         |
| 1,1,1-trichloroethane      | DMSO    | 50mg/mL   | 36411       |         |
| trichloroethene            | DMSO    | 0.4mg/mL  | 36412       |         |
| m-xylene                   | DMSO    | 6.51mg/mL | 36414       |         |
| o-xylene                   | DMSO    | 0.97mg/mL | 36415       |         |
| p-xylene                   | DMSO    | 1.52mg/mL | 36416       |         |

DMSO = dimethyl sulfoxide



## free literature

### Residual Solvent Analysis

Download your free copy from [www.restek.com](http://www.restek.com)!

Flyer

lit. cat.# PHFL1018

These mixtures reflect the changes made in USP30/NF25 effective July 1, 2008.

### Residual Solvents - Class 1

|                                  |         |                       |    |
|----------------------------------|---------|-----------------------|----|
| benzene                          | 10mg/mL | 1,1-dichloroethene    | 40 |
| carbon tetrachloride             | 20      | 1,1,1-trichloroethane | 50 |
| 1,2-dichloroethane               | 25      |                       |    |
| In dimethyl sulfoxide, 1mL/ampul |         |                       |    |
|                                  |         | cat. # 36279 (ea.)    |    |

### Residual Solvents Class 2 - Mix A (15 components)

|                                  |           |                    |      |
|----------------------------------|-----------|--------------------|------|
| acetonitrile                     | 2.05mg/mL | methylcyclohexane  | 5.90 |
| chlorobenzene                    | 1.80      | methylene chloride | 3.00 |
| cyclohexane                      | 19.40     | tetrahydrofuran    | 3.45 |
| cis-1,2-dichloroethene           | 4.70      | toluene            | 4.45 |
| trans-1,2-dichloroethene         | 4.70      | m-xylene           | 6.51 |
| 1,4-dioxane                      | 1.90      | o-xylene           | 0.98 |
| ethylbenzene                     | 1.84      | p-xylene           | 1.52 |
| methanol                         | 15.00     |                    |      |
| In dimethyl sulfoxide, 1mL/ampul |           |                    |      |
|                                  |           | cat. # 36271 (ea.) |      |

### Residual Solvents Class 2 - Mix B (8 components)

|                                  |         |                    |     |
|----------------------------------|---------|--------------------|-----|
| chloroform                       | 60µg/mL | nitromethane       | 50  |
| 1,2-dimethoxyethane              | 100     | pyridine           | 200 |
| n-hexane (C6)                    | 290     | tetralin           | 100 |
| 2-hexanone                       | 50      | trichloroethene    | 80  |
| In dimethyl sulfoxide, 1mL/ampul |         |                    |     |
|                                  |         | cat. # 36280 (ea.) |     |

### Residual Solvents Class 2 - Mix C (8 components)

|                                  |          |                                      |       |
|----------------------------------|----------|--------------------------------------|-------|
| 2-ethoxyethanol                  | 800µg/mL | 2-methoxyethanol (methyl Cellosolve) | 250   |
| ethylene glycol                  | 3,100    | N-methylpyrrolidone                  | 2,650 |
| formamide                        | 1,100    | sulfolane                            | 800   |
| N,N-dimethylacetamide            | 5,450    |                                      |       |
| N,N-dimethylformamide            | 4,400    |                                      |       |
| In dimethyl sulfoxide, 1mL/ampul |          |                                      |       |
|                                  |          | cat. # 36273 (ea.)                   |       |

## also available

For other reference mixes for USP <467> and European Pharmacopoeia, see page 480. Class III solvents are available as custom mixes. Visit [www.restek.com/solutions](http://www.restek.com/solutions) for our custom reference material request form.



For a list of OVI retention times,  
see page 691.

**USP <467> cont'd**

These Class 1 mixtures reflect the changes made in USP24/NF19 effective January 1, 2000, and USP23/NF18 effective January 1, 1995 to December 31, 1999. While these mixtures do not meet the current USP guidelines, many labs still use these mixtures to obtain a detectable benzene peak for the direct injection methods, Method I and Method V.

**USP <467> Calibration Mix #7**

|                                  |               |                    |     |
|----------------------------------|---------------|--------------------|-----|
| chloroform                       | 60 $\mu$ g/mL | methylene chloride | 600 |
| 1,4-dioxane                      | 380           | trichloroethene    | 80  |
| In dimethyl sulfoxide, 1mL/ampul |               |                    |     |
| cat. # 36009                     | (ea.)         |                    |     |

**USP <467> Calibration Mix #6**

|                        |               |                    |     |
|------------------------|---------------|--------------------|-----|
| chloroform             | 60 $\mu$ g/mL | methylene chloride | 600 |
| 1,4-dioxane            | 380           | trichloroethene    | 80  |
| In methanol, 1mL/ampul |               |                    |     |
| cat. # 36008           | (ea.)         |                    |     |

**USP <467> Calibration Mixture #5**

|                                  |              |                    |     |
|----------------------------------|--------------|--------------------|-----|
| benzene                          | 2 $\mu$ g/mL | methylene chloride | 600 |
| chloroform                       | 60           | trichloroethene    | 80  |
| 1,4-dioxane                      | 380          |                    |     |
| In dimethyl sulfoxide, 1mL/ampul |              |                    |     |
| cat. # 36007                     | (ea.)        |                    |     |

**USP <467> Calibration Mixture #4**

|                        |              |                    |     |
|------------------------|--------------|--------------------|-----|
| benzene                | 2 $\mu$ g/mL | methylene chloride | 600 |
| chloroform             | 60           | trichloroethene    | 80  |
| 1,4-dioxane            | 380          |                    |     |
| In methanol, 1mL/ampul |              |                    |     |
| cat. # 36006           | (ea.)        |                    |     |

**USP <467> Calibration Mixture #2**

|                        |                |                    |     |
|------------------------|----------------|--------------------|-----|
| benzene                | 100 $\mu$ g/mL | methylene chloride | 500 |
| chloroform             | 50             | trichloroethene    | 100 |
| 1,4-dioxane            | 100            |                    |     |
| In methanol, 1mL/ampul |                |                    |     |
| cat. # 36002           | (ea.)          |                    |     |

**USP <467> Calibration Mixture #3**

|                                  |                |                    |     |
|----------------------------------|----------------|--------------------|-----|
| benzene                          | 100 $\mu$ g/mL | methylene chloride | 500 |
| chloroform                       | 50             | trichloroethene    | 100 |
| 1,4-dioxane                      | 100            |                    |     |
| In dimethyl sulfoxide, 1mL/ampul |                |                    |     |
| cat. # 36004                     | (ea.)          |                    |     |

**Ethylene Oxide**

500 $\mu$ g/mL in dimethyl sulfoxide, 1mL/ampul  
cat. # 36005 (ea.)

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**European Pharmacopoeia Method**

The analysis of residual solvents in pharmaceutical products has changed, particularly for products being sold into Europe. The International Conference on Harmonization (ICH) Guidelines for Residual Solvents is becoming the international standard and is being adopted by more pharmacopoeias, including the United States Pharmacopeia, every year. The ICH method and compound list is more extensive than any method previously used and poses new challenges. Compounds in Class 1 are solvents considered to be of highest risk and to be avoided in pharmaceutical manufacturing. Use of Class 2 compounds is to be limited, as they pose a lower, but present, threat to health. Compounds in Class 3 pose the lowest toxic potential and may be used routinely in manufacturing.

**European Pharmacopoeia/ICH Class 1 Mix**

|                      |              |                       |      |
|----------------------|--------------|-----------------------|------|
| benzene              | 2 $\mu$ g/mL | 1,1-dichloroethene    | 8    |
| carbon tetrachloride | 4            | 1,1,1-trichloroethane | 1500 |
| 1,2-dichloroethane   | 5            |                       |      |

Prepared in water:dimethyl sulfoxide (90:10), 1mL/ampul  
cat. # 36228 (ea.)

**European Pharmacopoeia/ICH Class 1 Mix (revised)**

|                      |              |                       |    |
|----------------------|--------------|-----------------------|----|
| benzene              | 2 $\mu$ g/mL | 1,1-dichloroethene    | 8  |
| carbon tetrachloride | 4            | 1,1,1-trichloroethane | 10 |
| 1,2-dichloroethane   | 5            |                       |    |

In water:dimethyl sulfoxide (90:10), 1mL/ampul  
cat. # 36261 (ea.)

**European Pharmacopoeia/ICH Q3C(M) Class 2 Mix C, Revised**

|                 |                |                     |     |
|-----------------|----------------|---------------------|-----|
| 2-ethoxyethanol | 160 $\mu$ g/mL | N-methylpyrrolidone | 530 |
| ethylene glycol | 620            | sulfolane           | 160 |
| formamide       | 220            |                     |     |

2-methoxyethanol  
(methyl Cellosolve)  
In dimethyl sulfoxide, 1mL/ampul  
cat. # 36275 (ea.)

**European Pharmacopoeia/ICH Class 2 Mix B (10 components)**

|   |                |                               |       |
|---|----------------|-------------------------------|-------|
| acetonitrile  | 410 $\mu$ g/mL | methanol                      | 3,000 |
| chloroform  | 60             | nitromethane                  | 50    |
| 1,2-dimethoxyethane                                     | 100            | pyridine                      | 200   |
| N,N-dimethylacetamide                                   | 1,090          | 1,2,3,4-tetrahydronaphthalene |       |
| 1,4-dioxane   | 380            | (tetraline)                   | 100   |
| 2-hexanone  | 50             |                               |       |
| Prepared in water:dimethyl sulfoxide (90:10), 1mL/ampul |                |                               |       |
| cat. # 36230  | (ea.)          |                               |       |

**European Pharmacopoeia/ICH Q3C(M) Class 2 Mix A, Revised**

(14 components)

|                                  |                |                    |       |
|----------------------------------|----------------|--------------------|-------|
| chlorobenzene                    | 360 $\mu$ g/mL | methylene chloride | 600   |
| cyclohexane                      | 3,880          | tetrahydrofuran    | 720   |
| cis-1,2-dichloroethene           | 1,870          | toluene            | 890   |
| N,N-dimethylformamide            | 880            | trichloroethene    | 80    |
| ethylbenzene                     | 369            | m-xylene           | 1,302 |
| n-hexane (C6)                    | 290            | o-xylene           | 195   |
| methylcyclohexane                | 1,180          | p-xylene           | 304   |
| In dimethyl sulfoxide, 1mL/ampul |                |                    |       |
| cat. # 36274                     | (ea.)          |                    |       |

**did you know?**

We prepare Rtx®-1301 (cat.# 16085) and Stabilwax® (cat.# 10640) capillary columns and the analytical reference materials to meet the requirements for European Pharmacopoeia. Download lit. cat.# 59107, *European Pharmacopoeia Analysis of Residual Solvents* from our website for more information.

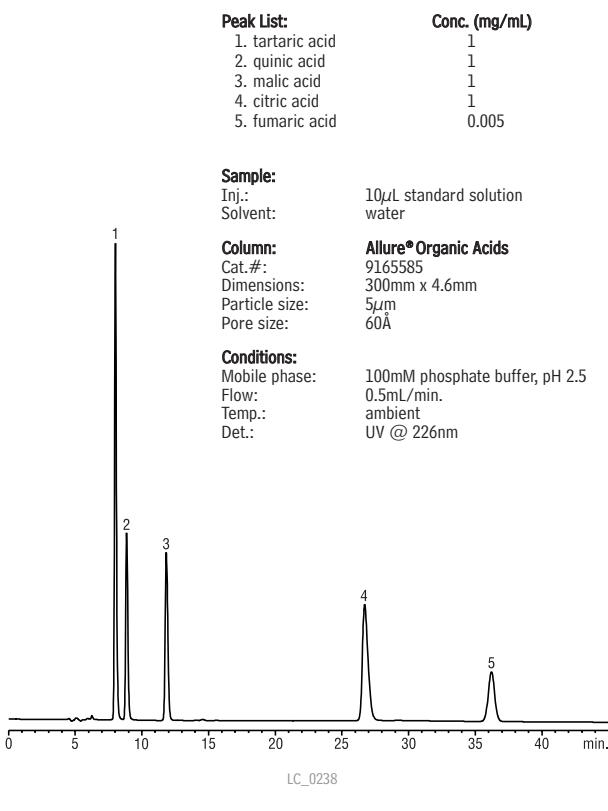
## Organic Acids

### Fruit Juice Organic Acid Standard

|                     |                  |               |       |
|---------------------|------------------|---------------|-------|
| citric acid         | 2,000 $\mu$ g/ml | quinic acid   | 2,000 |
| fumaric acid        | 10*              | tartaric acid |       |
| malic acid          | 2,000            |               |       |
| In water, 1mL/ampul |                  |               |       |
| cat. # 35080 (ea.)  |                  |               |       |
| In water, 5mL/ampul |                  |               |       |
| cat. # 35081 (ea.)  |                  |               |       |

\*Fumaric acid is a trace impurity in malic acid, as well as an added component of the mix. The amount of fumaric acid in malic acid will not affect the stated concentration of malic acid, but can represent a significant and variable deviation from the low concentration of fumaric acid stated to be in the mix. All other components of the mix are at the specified concentration.

### Organic acids on an Allure® Organic Acids HPLC column.



### Fatty Acid Methyl Esters

#### Marine Oil FAME Mix (20 components)

| Chain | Description                     | % by Weight |
|-------|---------------------------------|-------------|
| C14:0 | methyl myristate                | 6.0         |
| C14:1 | methyl myristoleate             | 1.0         |
| C16:0 | methyl palmitate                | 16.0        |
| C16:1 | methyl palmitoleate             | 5.0         |
| C18:0 | methyl stearate                 | 8.0         |
| C18:1 | methyl oleate                   | 13.0        |
| C18:1 | methyl vaccenate                | 4.0         |
| C18:2 | methyl linoleate                | 2.0         |
| C18:3 | methyl linolenate               | 2.0         |
| C20:0 | methyl arachidate               | 1.0         |
| C20:1 | methyl 11-eicosenoate           | 9.0         |
| C20:2 | methyl 11-14-eicosadienoate     | 1.0         |
| C20:4 | methyl arachidonate             | 3.0         |
| C20:3 | methyl 11-14-17-eicosatrienoate | 1.0         |
| C20:5 | methyl eicosapentaenoate        | 10.0        |
| C22:0 | methyl behenate                 | 1.0         |
| C22:1 | methyl erucate                  | 3.0         |
| C22:6 | methyl docosahexaenoate         | 12.0        |
| C24:0 | methyl linocerate               | 1.0         |
| C24:1 | methyl nervonate                | 1.0         |

cat. # 35066 (100mg)

No data pack available.

#### cis/trans FAME Mix (8 components)

| Description                                    | % by Weight |
|--|-------------|
| methyl elaidate (C18:1 <i>trans</i> -9)        | 10.0        |
| methyl linoleate (C18:2 <i>cis</i> -9,12)      | 20.0        |
| methyl oleate (C18:1 <i>cis</i> -9)            | 10.0        |
| methyl petroselinate (C18:1 <i>cis</i> -6)     | 8.0         |
| methyl petroselaidate (C18:1 <i>trans</i> -6)  | 8.0         |
| methyl stearate (C18:0)                        | 20.0        |
| methyl transvaccenate (C18:1 <i>trans</i> -11) | 12.0        |
| methyl vaccenate (C18:1 <i>cis</i> -11)        | 12.0        |

10mg/mL total in methylene chloride, 1mL/ampul  
 cat. # 35079 (ea.)

No data pack available.

## free literature



### Single-Column Method for HPLC Analysis of Organic Acids in Fruit Juices, Using an Allure® Organic Acids Column

A highly aqueous mobile phase is needed to force interaction between polar organic acids and the stationary phase in an HPLC column, but conventional C18 phases collapse in 100% aqueous mobile phases. A 300mm Allure® Organic Acids column resolves key organic acids, such as tartaric and quinic acids, using the conditions specified for a two-column analysis in AOAC Method 986.13. Example chromatograms are included in this 2-page note.

Download your free copy from [www.restek.com](http://www.restek.com).

Applications Note  
 lit. cat.# 59530

## free data

### Available on Our Website: Lot Certificates, Data Packs, and MSDSs

For complete information detailing manufacturing and testing for Restek inventoried reference standards, visit our website at [www.restek.com/datapacks](http://www.restek.com/datapacks). To view certificates and/or an MSDS, enter the catalog number of the product in the Search feature. For a free data pack (Adobe® PDF file), enter the catalog number and lot number of the product.

## Fatty Acid Methyl Esters

## Fatty Acid Methyl Esters cont'd

## NLEA FAME Mix (28 components)

| Chain                 | % by Weight | Chain                                   | % by Weight |
|-----------------------|-------------|---|-------------|
| C4:0                  | 1.5         | C18:1( <i>trans</i> -9)                 | 2.5         |
| C6:0                  | 1.5         | C18:1( <i>cis</i> -9)                   | 15.0        |
| C8:0                  | 2.0         | C18:2(all- <i>trans</i> -9,12)          | 2.5         |
| C10:0                 | 2.5         | C18:2(all- <i>cis</i> -9,12)            | 10.0        |
| C11:0                 | 2.5         | C18:3(all- <i>cis</i> -9,12,15)         | 5.0         |
| C12:0                 | 5.0         | C20:0                                   | 2.5         |
| C13:                  | 2.5         | C20:1( <i>cis</i> -11)                  | 1.5         |
| C14:0                 | 2.5         | C20:5(all- <i>cis</i> -5,8,11,14,17)    | 2.5         |
| C14:1( <i>cis</i> -9) | 1.5         | C22:0                                   | 2.5         |
| C15:0                 | 1.5         | C22:1( <i>cis</i> -13)                  | 1.5         |
| C16:0                 | 10.0        | C22:6(all- <i>cis</i> -4,7,10,13,16,19) | 2.5         |
| C16:1( <i>cis</i> -9) | 5.0         | C23:0                                   | 1.5         |
| C17:0                 | 2.5         | C24:0                                   | 2.5         |
| C18:0                 | 5.0         | C24:1( <i>cis</i> -15)                  | 2.5         |

30mg/mL total in methylene chloride, 1mL/ampul  
cat. # 35078 (ea.)

No data pack available.

## Food Industry FAME Mix (37 components)

| Chain                          | % by Weight | Chain                                    | % by Weight |
|--------------------------------|-------------|--|-------------|
| C4:0                           | 4.0         | C18:2(all- <i>cis</i> -9,12)             | 2.0         |
| C6:0                           | 4.0         | C18:3(all- <i>cis</i> -6,9,12)           | 2.0         |
| C8:0                           | 4.0         | C18:3(all- <i>cis</i> -9,12,15)          | 2.0         |
| C10:0                          | 4.0         | C20:0                                    | 4.0         |
| C11:0                          | 2.0         | C20:1( <i>cis</i> -11)                   | 2.0         |
| C12:0                          | 4.0         | C20:2(all- <i>cis</i> -11,14,)           | 2.0         |
| C13:                           | 2.0         | C20:3(all- <i>cis</i> -8,11,14)          | 2.0         |
| C14:0                          | 4.0         | C20:3(all- <i>cis</i> -11,14,17)         | 2.0         |
| C14:1( <i>cis</i> -9)          | 2.0         | C20:4(all- <i>cis</i> -5,8,11,14)        | 2.0         |
| C15:0                          | 2.0         | C20:5(all- <i>cis</i> -5,8,11,14,17)     | 2.0         |
| C16:0                          | 6.0         | C21:0                                    | 2.0         |
| C16:1( <i>cis</i> -9)          | 2.0         | C22:0                                    | 4.0         |
| C17:0                          | 2.0         | C22:1( <i>cis</i> -13)                   | 2.0         |
| C18:0                          | 2.0         | C22:2(all- <i>cis</i> -13,16)            | 2.0         |
| C18:1( <i>cis</i> -9)          | 2.0         | C22:6 (all- <i>cis</i> -4,7,10,13,16,19) | 2.0         |
| C18:2(all- <i>trans</i> -9,12) | 2.0         | C23:0                                    | 2.0         |
|                                |             | C24:0                                    | 4.0         |
|                                |             | C24:1( <i>cis</i> -15)                   | 2.0         |

30mg/mL total in methylene chloride, 1mL/ampul  
cat. # 35077 (ea.)

No data pack available.

## Neat Fatty Acid Methyl Esters

| Chain                 | Description            | CAS #      | qty.  | cat.# | price |
|-----------------------|------------------------|------------|-------|-------|-------|
| C6:0                  | methyl caproate        | 106-70-7   | 100mg | 35037 |       |
| C7:0                  | methyl heptanoate      | 106-73-0   | 100mg | 35038 |       |
| C8:0                  | methyl caprylate       | 111-11-5   | 100mg | 35039 |       |
| C9:0                  | methyl nonanoate       | 1731-84-6  | 100mg | 35040 |       |
| C10:0                 | methyl caprate         | 110-42-9   | 100mg | 35041 |       |
| C11:0                 | methyl undecanoate     | 1731-86-8  | 100mg | 35042 |       |
| C12:0                 | methyl laurate         | 111-82-0   | 100mg | 35043 |       |
| C13:0                 | methyl tridecanoate    | 1731-88-0  | 100mg | 35044 |       |
| C14:0                 | methyl myristate       | 124-10-7   | 100mg | 35045 |       |
| C14:1 Δ 9 cis         | methyl myristoleate    | 56219-06-8 | 100mg | 35046 |       |
| C15:0                 | methyl pentadecanoate  | 7162-64-1  | 100mg | 35047 |       |
| C16:0                 | methyl palmitate       | 112-39-0   | 100mg | 35048 |       |
| C16:1 Δ 9 cis         | methyl palmitoleate    | 1120-25-8  | 100mg | 35049 |       |
| C17:0                 | methyl heptadecanoate  | 1731-92-6  | 100mg | 35050 |       |
| C18:0                 | methyl stearate        | 112-61-8   | 100mg | 35051 |       |
| C18:1 Δ 9 cis         | methyl oleate          | 112-62-9   | 100mg | 35052 |       |
| C18:2 Δ 9,12 cis      | methyl linoleate       | 112-63-0   | 100mg | 35053 |       |
| C18:3 Δ 9,12,15 cis   | methyl linolenate      | 301-00-8   | 100mg | 35054 |       |
| C19:0                 | methyl nonadecanoate   | 1731-94-8  | 100mg | 35055 |       |
| C20:0                 | methyl arachidate      | 1120-28-1  | 100mg | 35056 |       |
| C20:1 Δ 11 cis        | methyl eicosenoate     | 2390-09-2  | 100mg | 35057 |       |
| C20:2 Δ 11,14 cis     | methyl eicosadienoate  | 2463-02-7  | 100mg | 35058 |       |
| C20:3 Δ 11,14,17 cis  | methyl eicosatrienoate | 55682-88-7 | 100mg | 35059 |       |
| C20:4 Δ 5,8,11,14 cis | methyl arachidonate    | 2566-89-4  | 100mg | 35060 |       |
| C21:0                 | methyl heneicosanoate  | 6064-90-0  | 100mg | 35061 |       |
| C22:0                 | methyl behenate        | 929-77-1   | 100mg | 35062 |       |
| C22:1 Δ 13 cis        | methyl erucate         | 1120-34-9  | 100mg | 35063 |       |
| C24:0                 | methyl lignocerate     | 2442-49-1  | 100mg | 35064 |       |
| C24:1 Δ 15 cis        | methyl nervonate       | 2733-88-2  | 100mg | 35065 |       |

No data pack available.

## free literature

## Foods, Flavors, and Fragrances

Includes important analysis tips, and chromatograms for analysis of fats and oils, carbohydrates, vitamins, amino acids, organic acids, preservatives, flavors and fragrances, essential oils, and chiral separations. Retention time indices and product listings for all relevant GC and HPLC products also are included.

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Minicatalog  
lit. cat.# 59260A



## 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 ouri-curi 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 #7: oils of short chain lengths (C6 - C10)  
 FAME #8: oils of short to mid-range chain lengths (C11 - C15)  
 FAME #9: oils of mid-range to long chain lengths (C16 - C20)  
 FAME #12: oils of mid-range to long chain lengths (C13 - C21)  
 FAME #13: mustard seed oil  
 FAME #14: cocoa butter  
 FAME #15: peanut oil

## ordering note

Custom fatty acid methyl ester mixtures also are available. Call **800-356-1688** or **814-353-1300**, or contact your Restek representative for details.

| Mix      | cat. # | price | Composition of each mixture listed as a weight/weight % basis (minimum 50mg/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  |
| 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 | 20.0 | 20.0 |      |      |
| FAME #2  | 35011  | 20.0  | 20.0   | 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 | 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 #7  | 35016  | 20.0  | 20.0   | 20.0 | 20.0 | 20.0 |      |      |      |      |      |      |      |      |
| FAME #8  | 35017  |       |  |      |      | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 | 20.0 |      |      |
| FAME #9  | 35018  |       |  |      |      |      | 20.0 | 20.0 | 20.0 |      | 20.0 | 20.0 |      |      |
| FAME #12 | 35021  |       |  |      |      | 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 |
| FAME #14 | 35035  |       |  |      |      | 0.1  | 26.3 | 0.4  | 0.3  | 33.7 | 34.3 | 3.1  | 0.2  | 1.3  |
| FAME #15 | 35036  |       |  |      |      |      | 10.0 | 3.0  | 50.0 | 30.0 | 1.5  | 1.5  |      | 3.0  |
|          |        |       |  |      |      |      |      |      |      |      |      |      |      | 1.0  |

### Important Information About FAME Mixtures:

We certify that all raw materials used in these mixes have a minimum purity of 99%. The exact composition of each mixture is determined by precise gravimetric techniques, based on a weight/weight % basis, and is confirmed using high resolution capillary gas chromatography. A Certificate of Analysis, supplied with each product, lists mixture composition and analysis conditions and includes a sample chromatogram. Products are packaged by volume and are guaranteed to contain a minimum amount of 50mg/ampul. The FAMEs in these are *trans* isomer.

Improper storage or handling after opening may result in accelerated degradation of the unsaturated compounds. All materials must be stored under nitrogen at -18°C to prevent degradation.

## Derivatization Reagents

### Silylation Derivatization Reagents

- Replaces active hydrogen, reducing polarity and making the compounds more volatile.
- Increases 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.# | price |
|---|------------|-------|-------|
| <b>MSTFA (N-methyl-N-trimethylsilyltrifluoroacetamide)</b>  |            |       |       |
| 10-pk. (10x1g)  | 24589-78-4 | 35600 |       |
| 25g vial  | 24589-78-4 | 35601 |       |
| <b>MSTFA w/1% TMCS (N-methyl-N-trimethylsilyltrifluoroacetamide w/1% trimethylchlorosilane)</b>                                       |            |       |       |
| 10-pk. (10x1g)  | 24589-78-4 | 35602 |       |
| 25g vial  | 24589-78-4 | 35603 |       |
| <b>BSTFA (N,O-bis[trimethylsilyl]trifluoroacetamide)</b>  |            |       |       |
| 10-pk. (10x1g)  | 25561-30-2 | 35604 |       |
| 25g vial  | 25561-30-2 | 35605 |       |
| <b>BSTFA w/1% TMCS (N,O-bis[trimethylsilyl]trifluoroacetamide] w/1% trimethylchlorosilane)</b>  |            |       |       |
| 10-pk. (10x1g)  | 25561-30-2 | 35606 |       |
| 25g vial  | 25561-30-2 | 35607 |       |
| <b>MTBSTFA w/1% TBDMCS (N-methyl-N[<i>tert</i>-butyldimethylsilyl]trifluoroacetamide) w/1% <i>tert</i>-butyldimethylchlorosilane)</b> |            |       |       |
| 10-pk. (10x1g)  | 77377-52-7 | 35608 |       |
| 25g vial  | 77377-52-7 | 35610 |       |
| <b>TMCS (trimethylchlorosilane)</b>   |            |       |       |
| 10-pk. (10x1g)  | 75-77-4    | 35611 |       |
| 25g vial  | 75-77-4    | 35612 |       |



### Derivatization Reagents

- Reagents available for acylation, alkylation, and silylation.
- Packaged in 10 x 1g vials or 25g vials.
- High purity for accurate results.

### 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 types of advantages available from silylation reagents: creating less polar, more volatile derivatives. In comparison to silylating reagents, the acylating reagents can more readily target highly polar multi-functional 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.# | price |
|---|----------|-------|-------|
| <b>MBTFA (N-methyl-bis-trifluoroacetamide)</b>    |          |       |       |
| 10-pk. (10x1g)                                    | 685-27-8 | 35616 |       |
| 25g vial  | 685-27-8 | 35617 |       |
| <b>TFAA (trifluoroacetic acid anhydride)</b>      |          |       |       |
| 10-pk. (10x1g)                                    | 407-25-0 | 35618 |       |
| 25g vial  | 407-25-0 | 35619 |       |
| <b>PFAA (pentafluoropropionic acid anhydride)</b> |          |       |       |
| 10-pk. (10x1g)                                    | 356-42-3 | 35620 |       |
| 25g vial  | 356-42-3 | 35621 |       |
| <b>HFAA (heptafluorobutyric acid anhydride)</b>   |          |       |       |
| 10-pk. (10x1g)                                    | 336-59-4 | 35622 |       |
| 25g vial  | 336-59-4 | 35623 |       |
| <b>PFPOH (pentafluoropropanol)</b>                |          |       |       |
| 10-pk. (10x1g)                                    | 422-05-9 | 35624 |       |
| 25g vial  | 422-05-9 | 35625 |       |

### Alkylation Derivatization Reagents

- Adds alkyl groups to functional hydrogens (H).
- Decreases polarity on compounds containing acidic hydrogens, i.e., phenols, carboxylic acids.
- Forms an ester.

Alkylation reagents reduce molecular polarity by replacing active hydrogens, such as carboxylic acids and phenols. Alkylation reagents can be used alone to form esters and amides or they can be used in conjunction with acylation or silylation reagents. A two-step approach is commonly used in the derivatization of amino acids, where multiple functional groups of these compounds may necessitate protection during derivatization.

Esterification is the reaction of an acid with an alcohol in the presence of a catalyst. It is the most popular method of alkylation due to the availability of reagents and ease of use. Alkyl esters are stable, and can be formed quickly and quantitatively. Retention of the derivative can be varied by altering the length of the substituted alkyl group. In addition to the formation of simple esters, alkylation reagents can be used in extraction procedures where biological matrices are present.

| Compound       | CAS#      | cat.# | price |
|----------------|-----------|-------|-------|
| <b>TMPAH</b>   |           |       |       |
| 10-pk. (10x1g) | 1899-02-1 | 35614 |       |
| 25g vial       | 1899-02-1 | 35615 |       |

### FAPAS® Food Testing Program\*

- External check of quality for laboratories performing food testing.
- Ensures accurate proficiency testing.

Laboratories testing food quality and safety are encouraged to routinely perform proficiency tests. Proficiency testing is an external check of quality. It provides an independent and unbiased assessment of the performance of all aspects of the laboratory, both human and hardware. Each participating laboratory is encouraged to use its normal analytical method, thereby simulating the testing of a routine laboratory sample as closely as possible. While the outcome of the analysis may depend on the choice of method, it also could be affected by the performance of the laboratory equipment or the competence of the analyst. Using proficiency testing, those laboratories performing well can ensure high standards are maintained and those performing unsatisfactorily can implement corrective action rapidly. In an environment in which analytical laboratories compete intensively for work, proficiency testing provides the means by which external customers can compare competence in carrying out specific tests. Together with laboratory accreditation and the use of validated methods, proficiency tests are an important requirement of the EU Additional Measures Directive 93/99/EEC applying to laboratories entrusted with the official control of food.

\*Use of Restek calibration mixtures by laboratories participating in the FAPAS program is voluntary and 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.

#### **FAPAS® Series 5 OC Pesticide Mix 1** (19 components)

Equal concentration of all compounds. Suitable for GC/MS analysis.

|                              |                               |
|------------------------------|-------------------------------|
| aldrin                       | dieldrin                      |
| α-BHC                        | α-endosulfan (I)              |
| β-BHC                        | β-endosulfan (II)             |
| γ-BHC (lindane)              | endosulfan sulfate            |
| α-chlordane ( <i>cis</i> )   | endrin                        |
| γ-chlordane ( <i>trans</i> ) | heptachlor                    |
| 4,4'-DDD                     | heptachlor epoxide (isomer B) |
| 4,4'-DDE                     | hexachlorobenzene             |
| 2,4'-DDT                     | oxychlordane                  |
| 4,4'-DDT                     |                               |

100µg/mL each in acetone, 1mL/ampul

cat. # 32412 (ea.)

#### **FAPAS® Series 9 OP Pesticide Mix 1** (10 components)

Equal concentration of all compounds. Suitable for GC/FPD, GC/NPD, & GC/MS analysis.

|                      |                   |
|----------------------|-------------------|
| chlorpyriphos        | fenitrothion      |
| chlorpyriphos-methyl | malathion         |
| diazinon             | methacryphon      |
| dichlorvos           | phosphamidon      |
| etrimphos            | pirimiphos-methyl |

100µg/mL each in acetone, 1mL/ampul

cat. # 32413 (ea.)

#### **FAPAS® Series 5 OC Pesticide Mix 2** (19 components)

Varied concentrations. Suitable for GC/ECD analysis.

|                              |         |                               |    |
|------------------------------|---------|-------------------------------|----|
| aldrin                       | 10µg/mL | dieldrin                      | 20 |
| α-BHC                        | 10      | α-endosulfan (I)              | 10 |
| β-BHC                        | 10      | β-endosulfan (II)             | 20 |
| γ-BHC (lindane)              | 10      | endosulfan sulfate            | 20 |
| α-chlordane ( <i>cis</i> )   | 10      | endrin                        | 20 |
| γ-chlordane ( <i>trans</i> ) | 10      | heptachlor                    | 10 |
| 4,4'-DDD                     | 20      | heptachlor epoxide (isomer B) | 10 |
| 4,4'-DDE                     | 20      | hexachlorobenzene             | 10 |
| 2,4'-DDT                     | 20      | oxychlordane                  | 10 |
| 4,4'-DDT                     | 20      |                               |    |

In acetone, 1mL/ampul

cat. # 32414 (ea.)

FAPAS-registered trademark of Central Science Laboratory, Sand Hutton, York, YO41, UK.

### also available

Plastic Container Testing Reference Materials.

See page 470.

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 Food, Flavor & Fragrance  
 Articles Online



[www.restek.com/FFF](http://www.restek.com/FFF)

## Column Test Mixes

### Dimethyldichlorosilane (DMDCS) Deactivating Agent

Restek offers dimethyldichlorosilane (DMDCS), for deactivating liners and other glassware. Simply dilute the neat material to a 5% solution in toluene, soak the glass item(s) in the solution for 15 minutes, and rinse with toluene and methanol. DMDCS reacts with active hydroxyl groups on the glass surface to produce a deactivated surface. A detailed procedure is included with the product.

dimethyldichlorosilane (DMDCS)

Neat, 20mL/ampul

cat. # 31840 (ea.)

### Fragrance Materials Test Mix

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 0.5mL of neat mixture to 10mL with acetone. The working solution will be stable for up to one week if transferred to a dark container and stored refrigerated.

|                          |       |                                   |       |
|--------------------------|-------|-----------------------------------|-------|
| benzoic acid             | 1.0%  | geraniol                          | 0.6%  |
| benzyl salicylate        | 36.2% | hydroxycitronellal (3,7-dimethyl- |       |
| 1,8-cineole (eucalyptol) | 0.5%  | 7-hydroxyoctanal)                 | 5.0%  |
| trans cinnamaldehyde     | 0.5%  | d-limonene                        | 20.0% |
| cinnamyl acetate         | 0.3%  | thymol                            | 0.3%  |
| cinnamyl alcohol         | 0.3%  | vanillin                          | 0.1%  |
| ethyl butyrate           | 36.2% |                                   |       |

Neat, 0.5mL in an amber ampul

cat. # 31807 (ea.)

No data pack available.



### also available

See **pages 627-637** for chromatograms of flavors and fragrances analysis.

### Grob Test Mix (Capillary GC)

For use with temperature programmed conditions.

|                     |           |                      |      |
|---------------------|-----------|----------------------|------|
| nC10-FAME           | 0.42mg/mL | 2,6-dimethylphenol   | 0.32 |
| nC11-FAME           | 0.42      | 2-ethylhexanoic acid | 0.38 |
| nC12-FAME           | 0.41      | nonanal              | 0.40 |
| 2,3-butanediol      | 0.53      | 1-octanol            | 0.36 |
| dicyclohexylamine   | 0.31      | undecane (C11)       | 0.29 |
| 2,6-dimethylaniline | 0.32      | decane (C10)         | 0.28 |

In methylene chloride, 1mL/ampul

cat. # 35000 (ea.)

No data pack available.

### Amine Column Test Mix (GC)

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

|                    |           |                     |      |
|--------------------|-----------|---------------------|------|
| 1,2-butanediol     | 0.60mg/mL | diethanolamine      | 1.20 |
| pyridine           | 0.60      | 2-nonanol           | 0.60 |
| decane (C10)       | 0.60      | 2,6-dimethylaniline | 0.60 |
| diethylenetriamine | 1.20      | dodecane (C12)      | 0.60 |

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

cat. # 35002 (ea.)

No data pack available.

### Isothermal Column Test Mix (GC)

|                |           |                     |      |
|----------------|-----------|---------------------|------|
| 1,2-hexanediol | 0.46mg/mL | 1-octanol           | 0.36 |
| decane (C10)   | 0.29      | nonanal             | 0.40 |
| undecane (C11) | 0.29      | 2,6-dimethylaniline | 0.32 |
| dodecane (C12) | 0.29      | 2,6-dichlorophenol  | 0.57 |
| tridecane      | 0.29      | naphthalene         | 0.32 |

In methylene chloride, 1mL/ampul

cat. # 35003 (ea.)

No data pack available.

### HPLC Normal Phase Test Mix #1

|              |           |                         |      |
|--------------|-----------|-------------------------|------|
| benzene      | 1.00mg/mL | benzyl alcohol          | 3.00 |
| benzaldehyde | 0.04      | 4-methoxybenzyl alcohol | 2.00 |

In hexane, 1mL/ampul

cat. # 35004 (ea.)

No data pack available.

### HPLC Reversed Phase Test Mix #1

|         |           |             |      |
|---------|-----------|-------------|------|
| benzene | 3.00mg/mL | naphthalene | 0.50 |
| uracil  | 0.02      | biphenyl    | 0.06 |

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

cat. # 35005 (ea.)

No data pack available.

### free data

#### Available on Our Website: Lot Certificates, Data Packs, and MSDSs

For complete information detailing manufacturing and testing for Restek inventoried reference standards, visit our website at [www.restek.com/datapacks](http://www.restek.com/datapacks).

To view certificates and/or an MSDS, enter the catalog number of the product in the Search feature. For a free data pack (Adobe® PDF file), enter the catalog number and lot number of the product.

**HPLC OQ Linearity Test Mix Kit**

Linear detector responses to concentration variations are an important part of operation qualification (OQ) for HPLC 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.

Caffeine at 5.0, 25.0, 125.0, 250.0, 500.0 $\mu$ g/mL in water in a five ampul kit.  
1mL each of these mixtures.

cat. # 31805 (kit)

No data pack available.

**also available**

Individual ampuls of caffeine are available on page 400.

**Carbohydrate HPLC Performance Check Mix**

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

|          |       |         |     |
|----------|-------|---------|-----|
| glucose  | 2.0mg | maltose | 4.5 |
| fructose | 2.1   | sucrose | 4.0 |
| lactose  | 4.4   |         |     |

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

cat. # 31809 (ea.)

No data pack available.

**HPLC Performance Test Mix**

The National Institute of Standards and Technology (NIST) has formulated a mixture that is highly effective for characterizing HPLC 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 | 2,800 $\mu$ g/mL | quinizarin toluene | 94 1,400 |
| ethylbenzene                | 1,700            | uracil             | 28       |

In methanol, 1mL/ampul

cat. # 31699 (ea.)

**did you know?**

We have more than 2,000 pure, characterized, neat compounds in our inventory! If you do not see the EXACT mixture you need listed on any of these pages, contact us for a custom standard.

**OQ Response Linearity Test Standard**

|                             |                |                             |        |
|-----------------------------|----------------|-----------------------------|--------|
| <i>n</i> -heptadecane (C17) | 1.5 $\mu$ g/mL | <i>n</i> -docosane (C22)    | 1,000  |
| <i>n</i> -octadecane (C18)  | 10             | <i>n</i> -tetracosane (C24) | 10,000 |
| <i>n</i> -nonadecane (C19)  | 2              |                             |        |
| <i>n</i> -eicosane (C20)    | 100            |                             |        |

In isoctane, 1mL/ampul

cat. # 33906 (ea.)

**NPD Performance Evaluation Standard**

|            |                |                      |     |
|------------|----------------|----------------------|-----|
| azobenzene | 6.5 $\mu$ g/mL | <i>n</i> -octadecane | 100 |
| malathion  | 10             |                      |     |

In isoctane, 1mL/ampul

cat. # 33907 (ea.)

**FID Performance Evaluation Standard**

|                                     |                            |
|-------------------------------------|----------------------------|
| <i>n</i> -tetradecane (C14)         | <i>n</i> -hexadecane (C16) |
| <i>n</i> -pentadecane (C15)         |                            |
| 0.03 w/w% each in hexane, 1mL/ampul |                            |

cat. # 33908 (ea.)

**OQ/PV Headspace Standard**

|   |                              |
|---|------------------------------|
| 1,2-dichlorobenzene                         | <i>tert</i> -butyl disulfide |
| nitrobenzene                                |                              |
| 2,000 $\mu$ g/mL each in ethanol, 1mL/ampul |                              |

cat. # 33909 (ea.)



For Restek's complete line of column test mixes, visit our website at:

**[www.restek.com/testmixes](http://www.restek.com/testmixes)**



# GAS STANDARDS

AIR MONITORING

Gas Standards

## Environmental Air Monitoring Gas Standards also from Spectra Gas - large Cylinders & Custom Mixes

Our high-quality air monitoring gas calibration standards are provided by Spectra Gases and Scott Specialty Gases—meeting lab requirements for two separate sources of calibration standards. Mixes are produced gravimetrically using NIST (National Institute of Science and Technology) traceable weights. Each comes with a Certificate of Analysis and unique serial number. All cylinders are disposable and do not require rental or demurrage fees. Recertification of cylinders is available directly with our suppliers. All cylinders are drop-shipped from our suppliers to provide fast delivery and the “freshest” standard possible. 12-month stability on all cylinders unless otherwise specified.

### TO-14A Calibration Mix (39 components)

|                           |                                |
|---------------------------|--------------------------------|
| benzene                   | ethyl chloride                 |
| bromomethane              | hexachloro-1,3-butadiene       |
| carbon tetrachloride      | methylene chloride             |
| chlorobenzene             | styrene                        |
| chloroform                | 1,1,2,2-tetrachloroethane      |
| chloromethane             | tetrachloroethylene            |
| 1,2-dibromoethane         | toluene                        |
| m-dichlorobenzene         | 1,2,4-trichlorobenzene         |
| o-dichlorobenzene         | 1,1,1-trichloroethane          |
| p-dichlorobenzene         | 1,1,2-trichloroethane          |
| dichlorodifluoromethane   | trichloroethene                |
| 1,1-dichloroethane        | trichlorofluoromethane         |
| 1,2-dichloroethane        | 1,1,2-trichlorotrifluoroethane |
| 1,1-dichloroethene        | 1,2,4-trimethylbenzene         |
| cis-1,2-dichloroethene    | 1,3,5-trimethylbenzene         |
| 1,2-dichloropropane       | vinyl chloride                 |
| cis-1,3-dichloropropene   | m-xylene                       |
| trans-1,3-dichloropropene | o-xylene                       |
| dichlorotetrafluoroethane | p-xylene                       |

1ppm in nitrogen, 104 liters @ 1,800psi

cat. # 34400 (ea.)

1ppm in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)

cat. # 34400-PI (ea.)

100ppb in nitrogen, 104 liters @ 1,800psi

cat. # 34421 (ea.)

100ppb in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)

cat. # 34421-PI (ea.)

### TO-14A 41 Component Mix (41 components)

|                           |                                |
|---------------------------|--------------------------------|
| acrylonitrile             | ethyl benzene                  |
| benzene                   | ethyl chloride                 |
| bromomethane              | hexachloro-1,3-butadiene       |
| 1,3-butadiene             | methylene chloride             |
| carbon tetrachloride      | styrene                        |
| chlorobenzene             | 1,1,2,2-tetrachloroethane      |
| chloroform                | tetrachloroethylene            |
| chloromethane             | toluene                        |
| 1,2-dibromoethane         | 1,2,4-trichlorobenzene         |
| m-dichlorobenzene         | 1,1,1-trichloroethane          |
| o-dichlorobenzene         | 1,1,2-trichloroethane          |
| p-dichlorobenzene         | trichloroethene                |
| dichlorodifluoromethane   | trichlorofluoromethane         |
| 1,1-dichloroethane        | 1,1,2-trichlorotrifluoroethane |
| 1,2-dichloroethane        | 1,2,4-trimethylbenzene         |
| 1,1-dichloroethene        | 1,3,5-trimethylbenzene         |
| cis-1,2-dichloroethene    | vinyl chloride                 |
| 1,2-dichloropropane       | m-xylene                       |
| cis-1,3-dichloropropene   | o-xylene                       |
| trans-1,3-dichloropropene | p-xylene                       |

1ppm in nitrogen, 104 liters @ 1,800psi

cat. # 34430 (ea.)

1ppm in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)

cat. # 34430-PI (ea.)

100ppb in nitrogen, 104 liters @ 1,800psi

cat. # 34431 (ea.)

100ppb in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)

cat. # 34431-PI (ea.)

## it's a fact

Higher concentration = **MORE STANDARD** for your money!



## please note

Gas standards are subject to hazardous materials shipping fees by most freight carriers.

### TO-14A 43 Component Mix (43 components)

|                           |                                |
|---------------------------|--------------------------------|
| acrylonitrile             | ethyl benzene                  |
| benzene                   | ethyl chloride                 |
| bromomethane              | 4-ethyltoluene                 |
| 1,3-butadiene             | hexachloro-1,3-butadiene       |
| carbon tetrachloride      | methylene chloride             |
| chlorobenzene             | styrene                        |
| chloroform                | 1,1,2,2-tetrachloroethane      |
| chloromethane             | tetrachloroethylene            |
| 1,2-dibromoethane         | toluene                        |
| m-dichlorobenzene         | 1,2,4-trichlorobenzene         |
| o-dichlorobenzene         | 1,1,1-trichloroethane          |
| p-dichlorobenzene         | 1,1,2-trichloroethane          |
| dichlorodifluoromethane   | trichloroethene                |
| 1,1-dichloroethane        | trichlorofluoromethane         |
| 1,2-dichloroethane        | 1,1,2-trichlorotrifluoroethane |
| 1,1-dichloroethene        | 1,2,4-trimethylbenzene         |
| cis-1,2-dichloroethene    | 1,3,5-trimethylbenzene         |
| 1,2-dichloropropane       | vinyl chloride                 |
| cis-1,3-dichloropropene   | m-xylene                       |
| trans-1,3-dichloropropene | o-xylene                       |
| dichlorotetrafluoroethane | p-xylene                       |

1ppm in nitrogen, 104 liters @ 1,800psi

cat. # 34432 (ea.)

1ppm in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)

cat. # 34432-PI (ea.)

100ppb in nitrogen, 104 liters @ 1,800psi

cat. # 34433 (ea.)

100ppb in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)

cat. # 34433-PI (ea.)

## cylinder design

### Spectra 104L Cylinders:

Aluminum construction  
Size: 8 x 24 cm  
Volume/Pressure:  
104 liters of gas  
@ 1,800psi  
CGA-180  
outlet fitting.  
Weight:  
1.5 lbs/0.7 kg



### Scotty 110L Cylinders (Pi-marked Cylinders for EU Regulations):

Aluminum construction  
Size: 8.3 x 29.5 cm  
Volume/Pressure:  
110 liters of gas  
@ 1,800psi  
CGA-180 outlet fitting.  
Weight: 2.2 lbs/1 kg  
US DOT Specs: 3AL2216



## did you know?

### Pi-marked Gas Cylinders for EU Countries

Our Pi-marked gas standards from Scott Specialty Gases meet the requirements of Transportable Pressure Equipment Directive (TPED) implemented in 2001 that regulates the safe transport of pressurized containers used throughout the European community.

We can provide the same mix from two suppliers—meeting your need for second source gas standards.

# AIR MONITORING

## Gas Standards

### TO-14A GC/MS Tuning Mix

|  |  |
|--|--|
| 4-bromofluorobenzene   |  |
| 1ppm in nitrogen, 104 liters @ 1,800psi                        |  |
| cat. # 34406 (ea.)   |  |
| 1ppm in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)   |  |
| cat. # 34406-PI (ea.)  |  |
| 100ppb in nitrogen, 104 liters @ 1,800psi                      |  |
| cat. # 34424 (ea.)   |  |
| 100ppb in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder) |  |
| cat. # 34424-PI (ea.)  |  |

### TO-14A Aromatics Mix (14 components)

|  |                        |
|--|------------------------|
| benzene  | toluene                |
| chlorobenzene  | 1,2,4-trichlorobenzene |
| m-dichlorobenzene  | 1,2,4-trimethylbenzene |
| o-dichlorobenzene  | 1,3,5-trimethylbenzene |
| p-dichlorobenzene  | m-xylene               |
| ethyl benzene  | o-xylene               |
| styrene  | p-xylene               |
| 1ppm in nitrogen, 104 liters @ 1,800psi                        |                        |
| cat. # 34404 (ea.)   |                        |
| 1ppm in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)   |                        |
| cat. # 34404-PI (ea.)  |                        |
| 100ppb in nitrogen, 104 liters @ 1,800psi                      |                        |
| cat. # 34423 (ea.)   |                        |
| 100ppb in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder) |                        |
| cat. # 34423-PI (ea.)  |                        |

### TO-14A Chlorinated Hydrocarbon Mix (19 components)

|  |                           |
|--|---------------------------|
| carbon tetrachloride   | hexachloro-1,3-butadiene  |
| chloroform   | methyl chloride           |
| 1,1-dichloroethane   | methylene chloride        |
| 1,2-dichloroethane   | 1,1,2,2-tetrachloroethane |
| 1,1-dichloroethene   | tetrachloroethylene       |
| cis-1,2-dichloroethylene                                       | 1,1,1-trichloroethane     |
| 1,2-dichloropropane  | 1,1,2-trichloroethane     |
| cis-1,3-dichloropropene  | trichloroethene           |
| trans-1,3-dichloropropene                                      | v vinyl chloride          |
| ethyl chloride   |                           |
| 1ppm in nitrogen, 104 liters @ 1,800psi                        |                           |
| cat. # 34402 (ea.)   |                           |
| 1ppm in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)   |                           |
| cat. # 34402-PI (ea.)  |                           |
| 100ppb in nitrogen, 104 liters @ 1,800psi                      |                           |
| cat. # 34422 (ea.)   |                           |
| 100ppb in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder) |                           |
| cat. # 34422-PI (ea.)  |                           |

### TO-14A Internal Standard Mix

|  |                     |
|--|---------------------|
| bromochloromethane   | 1,4-difluorobenzene |
| chlorobenzene-d5   |                     |
| 1ppm in nitrogen, 104 liters @ 1,800psi                        |                     |
| cat. # 34412 (ea.)   |                     |
| 1ppm in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)   |                     |
| cat. # 34412-PI (ea.)  |                     |
| 100ppb in nitrogen, 104 liters @ 1,800psi                      |                     |
| cat. # 34427 (ea.)   |                     |
| 100ppb in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder) |                     |
| cat. # 34427-PI (ea.)  |                     |

### TO-14A Internal Standard/Tuning Mix

|  |                     |
|--|---------------------|
| bromochloromethane   | chlorobenzene-d5    |
| 1-bromo-4-fluorobenzene<br>(4-bromofluorobenzene)              | 1,4-difluorobenzene |
| 1ppm in nitrogen, 104 liters @ 1,800psi                        |                     |
| cat. # 34408 (ea.)   |                     |
| 1ppm in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)   |                     |
| cat. # 34408-PI (ea.)  |                     |
| 100ppb in nitrogen, 104 liters @ 1,800psi                      |                     |
| cat. # 34425 (ea.)   |                     |
| 100ppb in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder) |                     |
| cat. # 34425-PI (ea.)  |                     |

### TO-15 Subset 25 Component Mix (25 components)

|  |                                |
|--|--------------------------------|
| acetone  | 4-ethyltoluene                 |
| allyl chloride   | heptane                        |
| benzyl chloride*   | hexane                         |
| bromodichloromethane   | 2-hexanone (MBK)               |
| bromoform  | 4-methyl-2-pentanone           |
| 1,3-butadiene  | methyl tert-butyl ether (MTBE) |
| 2-butane (MEK)   | 2-propanol                     |
| carbon disulfide*  | propylene                      |
| cyclohexane  | tetrahydrofuran                |
| dibromochloromethane   | 2,2,4-trimethylpentane         |
| trans-1,2-dichloroethene                                       | vinyl acetate                  |
| 1,4-dioxane  | vinyl bromide                  |
| ethyl acetate  |                                |
| 1ppm in nitrogen, 104 liters @ 1,800psi                        |                                |
| cat. # 34434 (ea.)   |                                |
| 1ppm in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)   |                                |
| cat. # 34434-PI (ea.)  |                                |
| 100ppb in nitrogen, 104 liters @ 1,800psi                      |                                |
| cat. # 34435 (ea.)   |                                |
| 100ppb in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder) |                                |
| cat. # 34435-PI (ea.)  |                                |

\*Stability of this compound cannot be guaranteed.

### TO-15 64 Component Mix (64 components)

|  |   |
|--|---|
| acetone  | 4-ethyltoluene                                    |
| acrolein   | trichlorofluoromethane (Freon 11)                 |
| benzene  | dichlorodifluoromethane (Freon 12)                |
| benzyl chloride*   | 1,1,2-trichloro-1,2,2-trifluoroethane (Freon 113) |
| bromodichloromethane   | 1,2-dichlorotetrafluoroethane (Freon 114)         |
| bromoform  | heptane   |
| 1,3-butadiene  | hexachloro-1,3-butadiene                          |
| 2-butane (MEK)   | hexane  |
| carbon disulfide*  | 2-hexanone (MBK)                                  |
| carbon tetrachloride   | 4-methyl-2-pentanone (MIBK)                       |
| chlorobenzene  | methylene chloride                                |
| chloroethane   | methyl tert-butyl ether (MTBE)                    |
| chloroform   | methyl methacrylate                               |
| chloromethane  | 2-propanol  |
| cyclohexane  | propylene   |
| dibromochloromethane   | styrene   |
| 1,2-dichlorobenzene  | 1,1,2,2-tetrachloroethane                         |
| 1,3-dichlorobenzene  | tetrachloroethylene                               |
| 1,4-dichlorobenzene  | tetrahydrofuran                                   |
| 1,1-dichloroethane   | toluene   |
| 1,2-dichloroethane   | 1,2,4-trichlorobenzene                            |
| 1,1-dichloroethene   | 1,1,1-trichloroethane                             |
| cis-1,2-dichloroethene   | 1,1,2-dichloroethane                              |
| trans-1,2-dichloroethene                                       | 1,1,2-trichloroethane                             |
| 1,2-dichloropropane  | trichloroethylene                                 |
| cis-1,3-dichloropropene  | 1,2,4-trimethylbenzene                            |
| trans-1,3-dichloropropene                                      | 1,3,5-trimethylbenzene                            |
| 1,4-dioxane  | vinyl acetate                                     |
| ethanol*   | vinyl chloride                                    |
| ethyl acetate  | m-xylene  |
| ethyl benzene  | o-xylene  |
| ethylene dibromide   | p-xylene  |
| (1,2-dibromoethane)  |   |
| 1ppm in nitrogen, 104 liters @ 1,800psi                        |   |
| cat. # 34436 (ea.)   |   |
| 1ppm in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)   |   |
| cat. # 34436-PI (ea.)  |   |
| 100ppb in nitrogen, 104 liters @ 1,800psi                      |   |
| cat. # 34437 (ea.)   |   |
| 100ppb in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder) |   |
| cat. # 34437-PI (ea.)  |   |

\*Stability of this compound cannot be guaranteed.

### also available

See page 386 for high-purity regulator.

### TO-14A/TO-15/TO-17 Performance Test Standard

Restek is pleased to offer the Performance Testing/VOC Audit Sample Program in cooperation with Spectra Gases. This is an on-going testing program in which laboratories, and/or other users of VOC standards, are able to evaluate their own capabilities, as well as compare their results and accuracy against other laboratories. As a participant in the program, you will receive a disposable cylinder, directly from Spectra Gases, containing multiple unknown TO-14A/TO-15 components at varying concentrations that are to be identified, quantified, and reported via the Spectra Gases P-T Audit Program forms. The results will be published and distributed for peer review. To ensure confidentiality, all participating laboratories will be anonymous, and only the individual laboratory will know their own results. To provide statistical analysis, the audit sample will be shipped to all laboratories at the same time, once a year during the fourth quarter.

150 liters @ 1,800psig  
cat. # 34560 (ea.)

### cylinder design

#### Performance Test Standard

Size: 5A disposable  
(3.2" x 12")  
Volume/Pressure:  
150L @ 1,800psig  
CGA 180 outlet fitting  
Weight: 2.2 lbs

### Sulfur 5-Component Mix

12-month stability. +/- 10% accuracy.  
carbonyl sulfide  
dimethyl sulfide  
ethyl mercaptan

hydrogen sulfide  
methyl mercaptan

1ppm in nitrogen, 110 liters @ 1,800psi  
cat. # 34561 (ea.)

1ppm in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)  
cat. # 34561-PI (ea.)

### Massachusetts APH Mix (26 components)

|                     |                                 |
|---------------------|---------------------------------|
| benzene             | p-isopropyltoluene              |
| 1,3-butadiene       | methyl <i>tert</i> -butyl ether |
| butylcyclohexane    | 1-methyl-3-ethylbenzene         |
| cyclohexane         | n-nonane                        |
| n-decane            | n-octane                        |
| 2,3-dimethylheptane | toluene                         |
| 2,3-dimethylpentane | toluene-d8 (IS)                 |
| n-dodecane          | 1,2,3-trimethylbenzene          |
| ethylbenzene        | 1,3,5-trimethylbenzene          |
| n-heptane           | n-undecane                      |
| n-hexane            | o-xylene                        |
| isopentane          | m/p-xylene (combined)           |
| isopropylbenzene    |                                 |

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

1ppm in nitrogen, 21 liters @ 350psig (Pi-marked Cylinder)  
cat. # 34540-PI (ea.)

### Japan Calibration Mix (9 components)

|               |                     |
|---------------|---------------------|
| acrylonitrile | dichloromethane     |
| benzene       | tetrachloroethylene |
| 1,3-butadiene | trichloroethylene   |
| chloroform    | vinyl chloride      |

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

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

### BTEX Gas Mix

|   |          |
|---|----------|
| benzene   | m-xylene |
| ethylbenzene  | o-xylene |
| toluene   | p-xylene |
| 1ppm in nitrogen, 104 liters @ 1,800psi<br>cat. # 34414 (ea.)                           |          |
| 1ppm in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)<br>cat. # 34414-PI (ea.)   |          |
| 100ppb in nitrogen, 104 liters @ 1,800psi<br>cat. # 34428 (ea.)                         |          |
| 100ppb in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)<br>cat. # 34428-PI (ea.) |          |

### BTEX and MTBE Gas Mix

|   |          |
|---|----------|
| benzene   | m-xylene |
| ethylbenzene  | o-xylene |
| methyl <i>tert</i> -butyl ether (MTBE)  | p-xylene |
| toluene   |          |
| 1ppm in nitrogen, 104 liters @ 1,800psi<br>cat. # 34541 (ea.)                           |          |
| 1ppm in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)<br>cat. # 34541-PI (ea.)   |          |
| 100ppb in nitrogen, 104 liters @ 1,800psi<br>cat. # 34542 (ea.)                         |          |
| 100ppb in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)<br>cat. # 34542-PI (ea.) |          |

### cylinder design

#### Spectra 104L Cylinders:

Aluminum construction  
Size: 8 x 24 cm  
Volume/Pressure:  
104 liters of gas  
@ 1,800psi  
CGA-180  
outlet fitting.  
Weight:  
1.5 lbs/0.7 kg



#### Scotty 110L Cylinders (Pi-marked Cylinders for EU Regulations):

Aluminum construction  
Size: 8.3 x 29.5 cm  
Volume/Pressure:  
110 liters of gas  
@ 1,800psi  
CGA-180 outlet fitting.  
Weight: 2.2 lbs/1 kg  
US DOT Specs: 3AL2216



### please note

Gas standards are subject to hazardous materials shipping fees by most freight carriers.

### for reference books

Visit [www.restek.com](http://www.restek.com)

### did you know?

#### Pi-marked Gas Cylinders for EU Countries

Our Pi-marked gas standards from Scott Specialty Gases meet the requirements of Transportable Pressure Equipment Directive (TPED) implemented in 2001 that regulates the safe transport of pressurized containers used throughout the European community.

### also available

#### Custom air standards!

Visit [www.restek.com](http://www.restek.com) for our custom air standards ordering form.

# AIR MONITORING

## Gas Standards

### Ozone Precursor Mixture/PAMS (57 components)

|                          |                               |
|--------------------------|-------------------------------|
| acetylene                | isopropylbenzene              |
| benzene                  | methylcyclohexane             |
| <i>n</i> -butane         | methylcyclopentane            |
| 1-butene                 | 2-methylheptane               |
| <i>cis</i> -2-butene     | 3-methylheptane               |
| <i>trans</i> -2-butene   | 2-methylhexane                |
| cyclohexane              | 3-methylhexane                |
| cyclopentane             | 2-methylpentane               |
| <i>n</i> -decane         | 3-methylpentane               |
| <i>m</i> -diethylbenzene | <i>n</i> -nonane              |
| <i>p</i> -diethylbenzene | <i>n</i> -octane              |
| 2,2-dimethylbutane       | <i>n</i> -pentane             |
| 2,3-dimethylbutane       | 1-pentene                     |
| 2,3-dimethylpentane      | <i>cis</i> -2-pentene         |
| 2,4-dimethylpentane      | <i>trans</i> -2-pentene       |
| <i>n</i> -dodecane       | propane                       |
| ethane                   | <i>n</i> -propylbenzene       |
| ethylbenzene             | propylene                     |
| ethylene                 | styrene                       |
| <i>m</i> -ethyltoluene   | toluene                       |
| <i>o</i> -ethyltoluene   | 1,2,3-trimethylbenzene        |
| <i>p</i> -ethyltoluene   | 1,2,4-trimethylbenzene        |
| <i>n</i> -heptane        | 1,3,5-trimethylbenzene        |
| <i>n</i> -hexane         | 2,2,4-trimethylpentane        |
| 1-hexene                 | 2,3,4-trimethylpentane        |
| isobutane                | <i>n</i> -undecane            |
| isopentane               | <i>o</i> -xylene              |
| isoprene                 | <i>m/p</i> -xylene (combined) |

1ppm in nitrogen, 104 liters @ 1,800psi

cat. # 34420 (ea.)

1ppm in nitrogen, 30 liters @ 500psi (Pi-marked Cylinder)

cat. # 34420-PI (ea.)

100ppb in nitrogen, 104 liters @ 1,800psi

cat. # 34429 (ea.)

100ppb in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)

cat. # 34429-PI (ea.)

### Ozone Precursor/PAMS Mix

(57 components at EPA concentrations: ppbC)

|                          |    |                               |    |
|--------------------------|----|-------------------------------|----|
| acetylene                | 40 | isopropylbenzene              | 40 |
| benzene                  | 30 | methylcyclohexane             | 30 |
| <i>n</i> -butane         | 40 | methylcyclopentane            | 25 |
| 1-butene                 | 30 | 2-methylheptane               | 25 |
| <i>cis</i> -2-butene     | 35 | 3-methylheptane               | 25 |
| <i>trans</i> -2-butene   | 25 | 2-methylhexane                | 25 |
| cyclohexane              | 40 | 3-methylhexane                | 25 |
| cyclopentane             | 20 | 2-methylpentane               | 20 |
| <i>n</i> -decane         | 30 | 3-methylpentane               | 40 |
| <i>m</i> -diethylbenzene | 40 | <i>n</i> -nonane              | 25 |
| <i>p</i> -diethylbenzene | 25 | <i>n</i> -octane              | 30 |
| 2,2-dimethylbutane       | 40 | <i>n</i> -pentane             | 25 |
| 2,3-dimethylbutane       | 50 | 1-pentene                     | 25 |
| 2,3-dimethylpentane      | 50 | <i>cis</i> -2-pentene         | 35 |
| 2,4-dimethylpentane      | 40 | <i>trans</i> -2-pentene       | 25 |
| <i>n</i> -dodecane       | 40 | propane                       | 40 |
| ethane                   | 25 | <i>n</i> -propylbenzene       | 30 |
| ethylbenzene             | 25 | propylene                     | 25 |
| ethylene                 | 20 | styrene                       | 40 |
| <i>m</i> -ethyltoluene   | 25 | toluene                       | 40 |
| <i>o</i> -ethyltoluene   | 30 | 1,2,3-trimethylbenzene        | 25 |
| <i>p</i> -ethyltoluene   | 40 | 1,2,4-trimethylbenzene        | 40 |
| <i>n</i> -heptane        | 25 | 1,3,5-trimethylbenzene        | 25 |
| <i>n</i> -hexane         | 30 | 2,2,4-trimethylpentane        | 30 |
| 1-hexene                 | 60 | 2,3,4-trimethylpentane        | 25 |
| isobutane                | 25 | <i>n</i> -undecane            | 30 |
| isopentane               | 40 | <i>o</i> -xylene              | 25 |
| isoprene                 | 40 | <i>m/p</i> -xylene (combined) | 40 |

20-60ppb C in nitrogen, 104 liters @ 1,800psi

cat. # 34445 (ea.)

20-60ppb C in nitrogen, 110 liters @ 1,800psi (Pi-marked Cylinder)

cat. # 34445-PI (ea.)



24129

### Small Cylinder Stand

- Supports and stabilizes disposable gas cylinders.
- Fits cylinders up to 3<sup>3/8</sup>" (8cm) in diameter.
- Adjustable screw secures cylinder in place.

This cylinder stand is designed to support small diameter cylinders, such as 104L and 110L disposable cylinders. It is a simple, safe, and economical way to stabilize the position of small cylinders, while keeping them within close proximity. The stand is constructed of heavyweight painted steel and includes an adjustable screw for safely securing cylinders.

| Description          | qty. | cat.# | price |
|----------------------|------|-------|-------|
| Small Cylinder Stand | ea.  | 24129 |       |



21572

### Spectra Gas 7621 High-Purity VOC Regulator

- Single-stage, stainless steel.
- Two pressure gauges and CGA-180 fitting.
- 3,000psig maximum inlet pressure.
- Stainless steel diaphragm and Kel-F® seat.
- 1/8-inch tube compression outlet.
- Low internal volume: 3.03cc.
- Accurate pressure control even at low flow rates.
- Individually tested for leaks and impurities.

| Description                     | qty. | cat.#      | price |
|---------------------------------|------|------------|-------|
| 0-30psig outlet pressure gauge  | ea.  | 21572      |       |
| 0-100psig outlet pressure gauge | ea.  | 21572-R100 |       |

### Natural Gas and Refinery Gas Standards

- Each available in three varying concentrations.
- Mini-regulator designed specially for these standards.

### Natural Gas Standards

Available in three mixes, from lean to rich. Each has an extended list of C6+ components.

|  | <b>Natural Gas Standard #1</b><br>cat.# 34438, ea. 663.70<br>% each compound** | <b>Natural Gas Standard #2</b><br>cat.# 34439, ea. 663.70<br>% each compound** | <b>Natural Gas Standard #3</b><br>cat.# 34440, ea. 663.70<br>% each compound** |
|--|--|--|--|
| nitrogen                                 | 1.000  | 2.500  | 5.000  |
| carbon dioxide                           | 0.500  | 1.000  | 1.500  |
| methane UHP                              | 94.750   | 85.250   | 70.000   |
| ethane UHP                               | 2.000  | 5.000  | 9.000  |
| propane                                  | 0.750  | 3.000  | 6.000  |
| isobutane                                | 0.300  | 1.000  | 3.000  |
| n-butane                                 | 0.300  | 1.000  | 3.000  |
| isopentane                               | 0.150  | 0.500  | 1.000  |
| n-pentane                                | 0.150  | 0.500  | 1.000  |
| hexanes plus*                            | 0.100  | 0.250  | 0.500  |
| <b>Concentration</b>                     | mole   | mole   | mole   |
| <b>Volume</b>                            | 13.16L @ 200psig   | 13.16L @ 200psig   | 5.5L @ 75psig  |
| <b>Ideal Heating Value (Dry BTU/SCF)</b> | 1048 gross   | 1142 gross   | 1317 gross   |

### Refinery Gas Standards

Available in three mixes with varying C5 unsaturates or extended C6+ components.

|                      | <b>Refinery Gas Standard #1</b><br>cat.# 34441, ea. 942.30<br>% each compound** | <b>Refinery Gas Standard #2</b><br>cat.# 34442, ea. 942.30<br>% each compound** | <b>Refinery Gas Standard #5</b><br>cat.# 34443, ea. 942.30<br>% each compound** |
|----------------------|---|---|---|
| hydrogen             | 40.750  | 12.500  | 12.500  |
| argon                | 0.500   | 1.000   | 1.000   |
| nitrogen             | 4.000   | 37.200  | 37.200  |
| carbon monoxide      | 1.000   | 1.000   | 1.000   |
| carbon dioxide       | 3.000   | 3.000   | 3.000   |
| methane              | 8.500   | 5.000   | 5.000   |
| ethane               | 6.000   | 4.000   | 4.000   |
| ethylene             | 2.000   | 2.000   | 2.000   |
| acetylene            | —   | 1.000   | 1.000   |
| propane              | 7.000   | 6.000   | 6.000   |
| propylene            | 3.000   | 3.000   | 3.000   |
| propadiene           | 0.850   | 1.000   | 1.000   |
| cyclopropane         | —   | 0.040   | —   |
| isobutane            | 6.000   | 5.000   | 5.000   |
| n-butane             | 4.000   | 4.000   | 4.000   |
| isobutylene          | 2.000   | 1.000   | 1.000   |
| 1,3 butadiene        | 3.000   | 3.000   | 3.000   |
| cis-2-butene         | 2.000   | 2.000   | 2.000   |
| trans-2-butene       | 2.000   | 3.000   | 3.000   |
| butene-1             | 2.000   | 2.000   | 2.000   |
| 2-methyl-2-butene    | —   | 0.200   | 0.200   |
| isopentane           | 1.000   | 1.000   | 1.000   |
| n-pentane            | 1.000   | 1.000   | 1.000   |
| cis-2-pentene        | —   | 0.400   | 0.400   |
| trans-2-pentene      | —   | 0.160   | 0.200   |
| pentene-1            | —   | 0.400   | 0.400   |
| n-hexane             | 0.500   | 0.100   | —   |
| hexanes plus         | —   | —   | 0.100   |
| <b>Concentration</b> | mole  | mole  | mole  |
| <b>Volume</b>        | 5.2L @ 70psig   | 4.9L @ 60psig   | 4.6L @ 60psig   |

\*Contact Restek or your Restek representative for a complete list of hexanes plus.

\*\*Precise concentrations are provided on the data sheet included with each cylinder and may vary slightly from those listed here.

### please note

Gas standards on this page are not available in Pi-marked cylinders for EU countries.



### cylinder design

#### DCG Partnership Cylinders:

**Size:** 7.6 x 24 cm

**CGA-170/110** connection.

**US DOT Specs:** DOT-4B-240ET

**Please note:** This cylinder is not approved for use in Canada.



| Description    | qty. | cat.# | price |
|----------------|------|-------|-------|
| Mini-Regulator | ea.  | 22032 |       |

22032

# AIR MONITORING

## Gas Standards

### Scott Transportable Pure Gases and Mixtures in 14-, 48-, and 110-Liter Sizes

We offer a wide range of Scott Transportable Gases, from pure gases for purging or calibrating to multi-component mixes which are ideal for peak identification work.

The 14-liter container has a CGA 160 connection for more precise integration with analytical systems. The 48-liter cylinder has a CGA 165 connection, and can deliver large volumes of sample. The 110-liter cylinder has a CGA 180 connection.

#### Scotty® 14

Contents: 14 liters  
Pressure: 240psig (17 bar)  
Outlet Fitting: CGA 160  
Weight: 1.5 lbs/0.7 kg  
Dimensions: 3" diameter x 11" height (7.6 x 28cm)  
DOT Specifications:  
4B240



*Please note: this cylinder is not approved for use in Canada.*

#### Scotty® 48

Contents: 48 liters  
Pressure: 300psig (21 bar)  
Outlet Fitting: CGA 165  
Weight: 1.75 lbs/0.8 kg  
Dimensions:  
4" diameter x 16 1/4" height (10.2 x 41cm)  
DOT Specifications:  
39 NRC



#### Scotty® 110

(Pi-marked Cylinders for EU Regulations)  
Contents: 110 liters  
Pressure:  
1800psig (124 bar)  
Outlet Fitting: CGA 180  
Weight: 2.2 lbs/1 kg  
Dimensions:  
3.25" diameter x 11.625" height (8.3 x 29.5cm)  
DOT Specifications:  
3AL2216



#### Description

##### Pure Gases

|                        | Shelf Life | cat.# | Scotty 14 (14 Liter) price | Scotty 48 (48 Liter) price | Scotty 110 (110 Liter) price |
|------------------------|------------|-------|----------------------------|----------------------------|------------------------------|
| Air, zero (THC < 1ppm) | 2 yrs.     | 34448 | 34449                      | 34449-PI                   |                              |
| Argon, 99.995%         | 2 yrs.     | 34457 | —                          | —                          | 34457-PI                     |
| Carbon dioxide, 99.80% | 2 yrs.     | 34451 | 34452                      | 34452-PI                   |                              |
| Hydrogen, 99.99%       | 2 yrs.     | 34453 | —                          | —                          | 34453-PI                     |
| Methane, 99.00%        | 2 yrs.     | 34454 | —                          | —                          | 34454-PI                     |
| Oxygen, 99.60%         | 2 yrs.     | 34455 | —                          | —                          | 34455-PI                     |

#### Two-Component Mixtures

|   |        |       |       |          |
|---|--------|-------|-------|----------|
| Benzene in air (1ppm)                     | 1 yr.  | —     | 34458 | 34458-PI |
| Benzene in air (100ppm)                   | 1 yr.  | —     | 34459 | 34459-PI |
| 1,3-Butadiene in nitrogen (10ppm)         | 2 yrs. | 34460 | 34461 | 34461-PI |
| Carbon dioxide in helium (100ppm)         | 2 yrs. | 34462 | —     | 34462-PI |
| Carbon dioxide in nitrogen (100ppm)       | 2 yrs. | 34463 | 34464 | 34464-PI |
| Carbon dioxide in nitrogen (1000ppm)      | 2 yrs. | 34465 | 34466 | 34466-PI |
| Ethylene in air (8-10ppm)                 | 2 yrs. | 34467 | 34468 | 34468-PI |
| Ethylene in helium (100ppm)               | 2 yrs. | 34489 | —     | 34489-PI |
| Hydrogen in helium (100ppm)               | 2 yrs. | 34469 | —     | 34469-PI |
| Hydrogen in nitrogen (1%)                 | 2 yrs. | 34471 | 34472 | 34472-PI |
| Hydrogen in nitrogen (100ppm)             | 2 yrs. | 34473 | 34474 | 34474-PI |
| Methane in helium (100ppm)                | 2 yrs. | 34476 | 34477 | 34477-PI |
| Methane in nitrogen (100ppm)              | 2 yrs. | 34478 | —     | 34478-PI |
| Methane in nitrogen (1%)                  | 2 yrs. | 34482 | 34483 | 34483-PI |
| Nitrogen in helium (100ppm)               | 2 yrs. | 34479 | —     | 34479-PI |
| Nitrous oxide in nitrogen (1ppm)          | 2 yrs. | 34484 | 34485 | 34485-PI |
| Oxygen in helium (100ppm)                 | 2 yrs. | 34480 | —     | 34480-PI |
| Oxygen in nitrogen (2%)                   | 2 yrs. | 34487 | 34488 | 34488-PI |
| Oxygen in nitrogen (6%)                   | 2 yrs. | 34491 | 34492 | 34492-PI |
| 1,1,1-Trichloroethane in nitrogen (10ppm) | 2 yrs. | —     | 34493 | 34493-PI |
| Trichloroethylene in nitrogen (10ppm)     | 2 yrs. | 34494 | 34495 | 34495-PI |
| Vinyl chloride in nitrogen (1ppm)         | 2 yrs. | 34496 | 34497 | 34497-PI |
| Vinyl chloride in nitrogen (10ppm)        | 2 yrs. | 34498 | 34499 | 34499-PI |
| Vinyl chloride in nitrogen (50ppm)        | 2 yrs. | 34500 | —     | 34500-PI |
| Vinyl chloride in nitrogen (100ppm)       | 2 yrs. | 34501 | —     | 34501-PI |
| Vinyl chloride in nitrogen (1000ppm)      | 2 yrs. | 34502 | —     | 34502-PI |

**AIR MONITORING**  
**Gas Standards, Regulators**

| Description   | Shelf Life | Scotty 14<br>(14 Liter) |       | Scotty 48<br>(48 Liter) |       | Scotty 110<br>(110 Liter) |       |
|---|------------|-------------------------|-------|-------------------------|-------|---------------------------|-------|
|   |            | cat.#                   | price | cat.#                   | price | cat.#                     | price |
| <b>Multi-Component Mixtures</b>   |            |                         |       |                         |       |                           |       |
| Carbon monoxide, carbon dioxide, hydrogen and oxygen in nitrogen (0.5% each)  | 2 yrs.     | 34504                   |       | 34505                   |       | 34505-PI                  |       |
| Carbon monoxide, carbon dioxide, hydrogen and oxygen in nitrogen (1% each)  | 2 yrs.     | 34507                   |       | 34508                   |       | 34508-PI                  |       |
| Carbon monoxide, carbon dioxide, methane, ethane, ethylene and acetylene in nitrogen (1% each)  | 1 yr.      | —                       | —     | 34511                   |       | 34511-PI                  |       |
| Carbon monoxide, carbon dioxide, nitrogen, and oxygen, (5% each) and methane and hydrogen (4% each) in helium                                     | 2 yrs.     | 34512                   |       | —                       | —     | 34512-PI                  |       |
| Carbon monoxide (7%), carbon dioxide (15%) and oxygen (5%) in nitrogen  | 2 yrs.     | 34514                   |       | —                       | —     | 34514-PI                  |       |
| Carbon monoxide (7%), oxygen (4%), carbon dioxide (15%) and methane (4.5%) in nitrogen  | 2 yrs.     | 34515                   |       | 34516                   |       | 34516-PI                  |       |
| C1-C6 n-Paraffins: methane, ethane, propane, butane, pentane, hexane in nitrogen (15ppm each)   | 2 yrs.     | 34518                   |       | 34519                   |       | 34519-PI                  |       |
| C1-C6 n-Paraffins: methane, ethane, propane, butane, pentane, hexane in helium (100ppm each)  | 2 yrs.     | 34521                   |       | 34522                   |       | 34522-PI                  |       |
| C1-C6 n-Paraffins: methane, ethane, propane, butane, pentane, hexane in nitrogen (1000ppm each)   | 2 yrs.     | 34524                   |       | 34525                   |       | 34525-PI                  |       |
| C1-C6 n-Paraffins: methane, ethane, propane, butane, pentane, hexane in nitrogen (100ppm each)  | 2 yrs.     | 34527                   |       | 34528                   |       | 34528-PI                  |       |
| C2-C6 Olefins: ethylene, propylene, 1-butene, 1-pentene, 1-hexene in helium (100ppm each)   | 2 yrs.     | 34529                   |       | 34530                   |       | 34530-PI                  |       |
| C2-C6 Olefins: ethylene, propylene, 1-butene, 1-pentene, 1-hexene in nitrogen (100ppm each)   | 2 yrs.     | 34531                   |       | 34532                   |       | 34532-PI                  |       |
| Branched Paraffins: 2,2-dimethylbutane, 2,2-dimethylpropane, isobutane, 2-methylbutane, 2-methylpentane, 3-methylpentane in nitrogen (15ppm each) | 2 yrs.     | 34534                   |       | —                       | —     | 34534-PI                  |       |
| Methane, ethane, ethylene, acetylene, propane, propylene, n-butane, propyne in nitrogen (15ppm each)  | 1 yr.      | —                       | —     | 34537                   |       | 34537-PI                  |       |
| n-butane, isobutane, cis-2-butene, trans-2-butene, 1-butene, iso-butylene, 1,3-butadiene, ethyl acetylene in nitrogen (15ppm each)                | 1 yr.      | —                       | —     | 34539                   |       | 34539-PI                  |       |



## did you know?

### Pi-marked Gas Cylinders for EU Countries

Our Pi-marked gas standards from Scott Specialty Gases meet the requirements of Transportable Pressure Equipment Directive (TPED) implemented in 2001 that regulates the safe transport of pressurized containers used throughout the European community.

## also available

### Custom air standards!

Visit [www.restek.com](http://www.restek.com) for our custom air standards ordering form.



## also available

Regulators with CGA-180 connections for the 110L cylinders are listed on page 386.



### Syringe Adapter Kit for Single-Stage VOC Regulator

Use to withdraw sample from a high-pressure cylinder after pressure reduction through the high-purity VOC single-stage regulator.

Kit contains one nickel-plated brass  $\frac{1}{4}$ " NPT to female luer fitting, which can be used with an A-2 Luer syringe (cat.# 20162 or 20163), and one stainless steel  $\frac{1}{4}$ " NPT x  $\frac{1}{8}$ " compression fitting with septum (can be used with any syringe needle).

| Description         | qty. | cat.# | price |
|---------------------|------|-------|-------|
| Syringe Adapter Kit | ea.  | 21118 |       |