

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 | new! Formaldehyde and Other Carbonyl Compounds in Air |
| D5836-03 | Air: Isocyanates & Oxazoladines |
| D6042-96 | Plastic Container Testing |
| D6352-98 | Polywax® Standards |
| D6584-00 | Biodiesel |

ASTM E1387 and E1618 (Fire Debris Analysis)

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

E1387 Column Resolution Check Mix

(13 components)

| | |
|-----------------------------|--------------------------|
| <i>n</i> -hexane (C6) | <i>n</i> -eicosane (C20) |
| <i>n</i> -octane (C8) | 2-ethyltoluene |
| <i>n</i> -decane (C10) | 3-ethyltoluene |
| <i>n</i> -dodecane (C12) | toluene |
| <i>n</i> -tetradecane (C14) | 1,2,4-trimethylbenzene |
| <i>n</i> -hexadecane (C16) | <i>p</i> -xylene |
| <i>n</i> -octadecane (C18) | |

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

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.

| | |
|-----------------------------|--------------------------|
| <i>n</i> -hexane (C6) | <i>n</i> -eicosane (C20) |
| <i>n</i> -octane (C8) | 2-ethyltoluene |
| <i>n</i> -decane (C10) | 3-ethyltoluene |
| <i>n</i> -dodecane (C12) | toluene |
| <i>n</i> -tetradecane (C14) | 1,2,4-trimethylbenzene |
| <i>n</i> -hexadecane (C16) | <i>p</i> -xylene |
| <i>n</i> -octadecane (C18) | |

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

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 (1000°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)

| | |
|-----------------------------|-----------------------------------|
| <i>n</i> -pentane (C5) | <i>n</i> -hexadecane (C16) |
| <i>n</i> -hexane (C6) | <i>n</i> -heptadecane (C17) |
| <i>n</i> -heptane (C7) | <i>n</i> -octadecane (C18) |
| <i>n</i> -octane (C8) | <i>n</i> -eicosane (C20) |
| <i>n</i> -nonane (C9) | <i>n</i> -tetracosane (C24) |
| <i>n</i> -decane (C10) | <i>n</i> -octacosane (C28) |
| <i>n</i> -undecane (C11) | <i>n</i> -dotriacontane (C32) |
| <i>n</i> -dodecane (C12) | <i>n</i> -hexatriacontane (C36) |
| <i>n</i> -tetradecane (C14) | <i>n</i> -tetracontane (C40) |
| <i>n</i> -pentadecane (C15) | <i>n</i> -tetratetracontane (C44) |

1% weight each in carbon disulfide, 1g solution/ampul*
cat. # 31674 (ea.)

5% w/w, 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 (% w/w) | Conc. | Compound | Conc. (% w/w) |
|-----------------------------|-------|-----------------------------------|---------------|
| <i>n</i> -hexane (C6) | 6 | <i>n</i> -octadecane (C18) | 5 |
| <i>n</i> -heptane (C7) | 6 | <i>n</i> -eicosane (C20) | 2 |
| <i>n</i> -octane (C8) | 8 | <i>n</i> -tetracosane (C24) | 2 |
| <i>n</i> -nonane (C9) | 8 | <i>n</i> -octacosane (C28) | 1 |
| <i>n</i> -decane (C10) | 12 | <i>n</i> -dotriacontane (C32) | 1 |
| <i>n</i> -undecane (C11) | 12 | <i>n</i> -hexatriacontane (C36) | 1 |
| <i>n</i> -dodecane (C12) | 12 | <i>n</i> -tetracontane (C40) | 1 |
| <i>n</i> -tetradecane (C14) | 12 | <i>n</i> -tetratetracontane (C44) | 1 |
| <i>n</i> -hexadecane (C16) | 10 | | |

Packaged 1mL/ampul
cat. # 31222 (ea.)

No data pack available.

D3710-95 Calibration Mix (16 components)

| Compound | Conc. (% w/w) | Compound | Conc. (% w/w) |
|-----------------------------|---------------|-----------------------------|---------------|
| <i>n</i> -pentane (C5) | 8 | <i>n</i> -pentadecane (C15) | 2 |
| <i>n</i> -hexane (C6) | 6 | 2-methylbutane | 10 |
| <i>n</i> -heptane (C7) | 10 | 2-methylpentane | 6 |
| <i>n</i> -octane (C8) | 5 | 2,4-dimethylpentane | 6 |
| <i>n</i> -decane (C10) | 4 | toluene | 12 |
| <i>n</i> -dodecane (C12) | 4 | <i>p</i> -xylene | 14 |
| <i>n</i> -tridecane (C13) | 2 | <i>n</i> -propylbenzene | 5 |
| <i>n</i> -tetradecane (C14) | 2 | <i>n</i> -butylbenzene | 4 |

Packaged 1mL/ampul
cat. # 31223 (ea.)

No data pack available.

ANALYTICAL REFERENCE MATERIALS | OTHER MATERIALS





Lisa Pantzar
R&D Chemist
1+ year of service!

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.)

50mL cat. # 32425 (ea.)

No data pack available.

Aroclor Standards

| Compound | cat.# (ea.) |
|--|-------------|
| 50mg/kg in transformer oil (PCB-free) | |
| Aroclor 1016 | 32075 |
| Aroclor 1221 | 32077 |
| Aroclor 1232 | 32079 |
| Aroclor 1242 | 32081 |
| Aroclor 1248 | 32083 |
| Aroclor 1254 | 32085 |
| Aroclor 1260 | 32087 |
| 500mg/kg in transformer oil (PCB-free) | |
| Aroclor 1016 | 32076 |
| Aroclor 1221 | 32078 |
| Aroclor 1232 | 32080 |
| Aroclor 1242 | 32082 |
| Aroclor 1248 | 32084 |
| Aroclor 1254 | 32086 |
| Aroclor 1260 | 32088 |

ASTM Method D5197 (Formaldehyde and Other Carbonyl Compounds in Air)

CARB 1004 Aldehyde/Ketone-DNPH **new!** 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.)

ASTM Method D5197 (Formaldehyde and Other Carbonyl Compounds in Air) *cont'd*

DNPH Reference Materials

| Compound | cat.# (ea.) |
|-------------------------------------|-------------|
| 100µg/mL in acetonitrile, 1mL/ampul | |
| acetaldehyde-2,4-DNPH | 33074 |
| acetone-2,4-DNPH | 33075 |
| acrolein-2,4-DNPH | 33076 |
| benzaldehyde-2,4-DNPH | 33077 |
| 2-butanone-2,4-DNPH | 33078 |
| <i>n</i> -butyraldehyde-2,4-DNPH | 33079 |
| crotonaldehyde-2,4-DNPH | 33080 |
| 2,5-dimethylbenzaldehyde-2,4-DNPH | 33081 |
| formaldehyde-2,4-DNPH | 33082 |
| glycolaldehyde-2,4-DNPH | 33091 |
| hexaldehyde-2,4-DNPH | 33083 |
| isobutyraldehyde-2,4-DNPH | 33084 |
| isovaleraldehyde-2,4-DNPH | 33085 |
| methacrolein-2,4-DNPH | 33095 |
| propionaldehyde-2,4-DNPH | 33086 |
| <i>m</i> -tolualdehyde-2,4-DNPH | 33088 |
| <i>o</i> -tolualdehyde-2,4-DNPH | 33087 |
| <i>p</i> -tolualdehyde-2,4-DNPH | 33089 |
| valeraldehyde-2,4-DNPH | 33090 |

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

| Compound | cat.# (ea.) |
|---|-------------|
| 1,000µg/mL in dimethyl sulfoxide, 1mL/ampul | |
| 2,6-TDIP | 33000 |
| 2,4-TDIP | 33001 |
| 1,6-HDIP | 33002 |
| 4,4'-MDIP | 33003 |

Formaldehyde Oxazoladine

2,000µg/mL in toluene, 1mL/ampul
cat. # 33004 (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. To view lot 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 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.

Other Additives—Available From Restek as Custom Formulations

Similar methods for extractables in plastic pharmaceutical containers are cited in the United States Pharmacopoeia (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
- Ethanox® 330
- Ethanox® 702
- Ethanox® 703
- Irganox® L06
- Irganox® L57
- Irganox® L64
- Irganox® L109
- Irganox® L134
- Irganox® L135
- Irganox® 1035
- Santanox R
- Ultrinox® 626
- Vanlube® 81
- Vanlube® 848
- Vanlube® 7723
- Vanlube® AZ
- Vanlube® NA
- Vanlube® PCX
- Vanlube® SL
- Vanlube® SS

**ASTM Method D6352-98
(Polywax® Standards)**

These high molecular weight hydrocarbon waxes are useful for simulated distillation and other high-temperature GC work.

| Compound | qty. | cat.# (ea.) |
|---------------|------|-------------|
| 1mL/ampul | | |
| 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.) |

Diiolein

| |
|--|
| diiolein (1,3-di[<i>cis</i> -octadecenoyl]glycerol) |
| 5,000µg/mL in pyridine, 1mL/ampul |
| cat. # 33022 (ea.) |

Glycerin

| |
|---------------------------------|
| glycerin |
| 500µg/mL in pyridine, 1mL/ampul |
| cat. # 33020 (ea.) |

Monolein

| |
|---|
| monolein (1-mono[<i>cis</i> -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[<i>cis</i> -octadecenoyl]glycerol) |
| 5,000µg/mL in pyridine, 1mL/ampul |
| cat. # 33023 (ea.) |

also available

Restek offers a full range of derivatization reagents in 10 x 1g and 25g package sizes. See page 514.

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.)

