



Flame-Retardant Standards and Standard Mixtures

Solutions for a Greener World

Isotope-Labeled and Unlabeled Brominated Diphenyl Ether (BDE) Standards

Generally used as flame retardants, brominated diphenyl ethers (BDEs) have become chemicals of significant environmental concern. BDEs may be generally considered as persistent and highly lipophilic substances, similar to well known environmental contaminants such as polychlorinated biphenyls (PCBs).

In 1996, CIL first introduced chlorinated and brominated diphenyl ether analytical standards. Since then, additional studies in Europe, Canada, Japan, and the United States have significantly increased interest in these products and enabled CIL to extend its flame-retardant offerings.

US EPA Method 1614 Standard Mixtures

The US EPA has developed a standardized test method for analysis of BDEs in multiple matrices by high-resolution GC/MS. CIL worked closely with the EPA and their contracting laboratories to develop standard mixtures specifically for use in Method 1614.

RoHS BDE Standard Mixtures

The Directive on the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment (2002/95/EC), commonly referred to as the Restriction of Hazardous Substances Directive (RoHS) was adopted in February 2003 in Europe and took effect in July 2006. This directive restricts the use of several types of hazardous materials in the manufacture of various types of electronic and electrical equipment. CIL worked with laboratories in the European Union to develop standards for analysis of brominated diphenyl ethers under the RoHS guidelines.

Isotope-Labeled and Unlabeled BDE Metabolites

Researchers have suggested that BDE body burdens are not completely represented by measurements of BDEs in tissue or milk. Analytical data indicates that the liver hydrolyzes BDEs in its attempts to expel them. BDE toxicity is still being established, but there is a likelihood that BDE metabolites have similar or greater toxicity than the parent BDEs. CIL has been producing both unlabeled and $^{13}\text{C}_{12}$ methoxy- and hydroxy-BDEs. These items represent some of the BDE metabolites available from CIL; please contact CIL or your CIL representative for more information on these compounds.

Brominated Flame-Retardant Standards and Standard Mixtures

Following regulatory restrictions and voluntary removal of BDE products from many flame-retardant applications, new brominated compounds have been developed as replacements for BDEs. As monitoring of these possible environmental pollutants increased, CIL developed several labeled and unlabeled standards to allow accurate analysis of these new-use brominated flame retardant (BFR) compounds. CIL further developed a series of standard mixtures, which include a combination of BDEs and other BFRs in comprehensive mixtures.

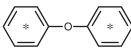
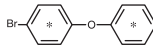
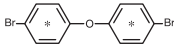
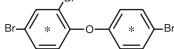
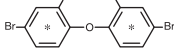
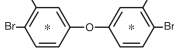
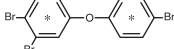
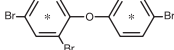
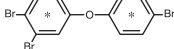
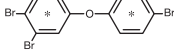
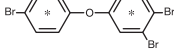
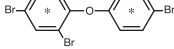
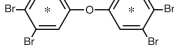
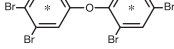
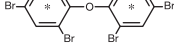
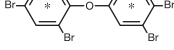
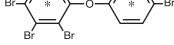
Dechloranes

Dechloranes are highly chlorinated norbornene compounds, synthesized by the Diels-Alder reaction of hexachloro-cyclopenta-diene with various substrates. Dechloranes first found commercial application as flame-retardant compounds in the 1960s. While Dechlorane Plus has been the subject of significant environmental research in recent years, related compounds – Dechlorane 602 (Dec 602), Dec 603 and Dec 604 – have been identified in air, fish and sediment samples. Although the research thus far is limited, indications suggest that Dec 602 may be found in fish and sediment samples at levels similar to or even higher than Dechlorane Plus.

Phosphorus Flame Retardants

Since the 1940s, trialkyl, triaryl and halogenated trialkyl/triaryl phosphate ester compounds have been used as commercial additives in flame retardants, plasticizers, hydraulic fluids, solvents, extraction agents, antifoam agents, adhesives and coatings for electronic devices. In recent years, the demand for phosphate ester compounds for flame-retardant applications has increased as many brominated flame retardants have been removed from the market. New research initiatives continue to broaden the understanding of the effects of these compounds in the environment, though analytical challenges remain. The use of isotopically labeled internal standards has been shown to help compensate for matrix effects, and to generally strengthen data by use of isotope dilution mass spectrometry.

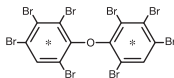
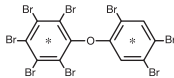
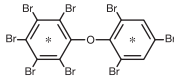
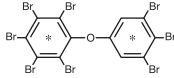
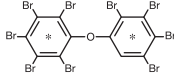
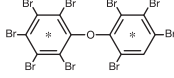
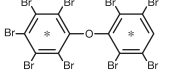
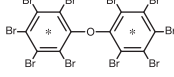
Isotope-Labeled Individual Brominated Diphenyl Ether (BDE) Standards

Catalog No.	Compound	BDE	Structure	Concentration	Amount
CLM-1587-1.2	Diphenyl ether ($^{13}\text{C}_{12}$, 99%)	0		50 ± 5 µg/mL in nonane	1.2 mL
EO-4999	4-Monobromodiphenyl ether ($^{13}\text{C}_{12}$, 99%)	3		50 ± 5 µg/mL in nonane	1.2 mL
EO-5001	4,4'-Dibromodiphenyl ether ($^{13}\text{C}_{12}$, 99%)	15		50 ± 5 µg/mL in nonane	1.2 mL
EO-5002	2,4,4'-Tribromodiphenyl ether ($^{13}\text{C}_{12}$, 99%)	28		50 ± 5 µg/mL in nonane	1.2 mL
EO-4982	2,2',4,4'-Tetrabromodiphenyl ether ($^{13}\text{C}_{12}$, 99%)	47		50 ± 5 µg/mL in nonane	1.2 mL
EO-1439	3,3',4,4'-Tetrabromodiphenyl ether ($^{13}\text{C}_{12}$, 99%)	77		50 ± 5 µg/mL in nonane	1.2 mL
EO-4983	2,2',4,4',5-Pentabromodiphenyl ether ($^{13}\text{C}_{12}$, 99%)	99		50 ± 5 µg/mL in nonane	1.2 mL
EO-4993	2,2',4,4',6-Pentabromodiphenyl ether ($^{13}\text{C}_{12}$, 99%)	100		50 ± 5 µg/mL in nonane	1.2 mL
EO-5034	2,3',4,4',5-Pentabromodiphenyl ether ($^{13}\text{C}_{12}$, 99%)	118		50 ± 5 µg/mL in nonane	1.2 mL
EO-4930	3,3',4,4',5-Pentabromodiphenyl ether ($^{13}\text{C}_{12}$, 99%)	126		50 ± 5 µg/mL in nonane	1.2 mL
EO-5035	2,2',3,4,4',5'-Hexabromodiphenyl ether ($^{13}\text{C}_{12}$, 99%)	138		50 ± 5 µg/mL in nonane	1.2 mL
EO-5165	2,2',3,4,4',6-Hexabromodiphenyl ether ($^{13}\text{C}_{12}$, 99%)	139		50 ± 5 µg/mL in nonane	1.2 mL
EO-4984	2,2',4,4',5,5'-Hexabromodiphenyl ether ($^{13}\text{C}_{12}$, 99%)	153		50 ± 5 µg/mL in nonane	1.2 mL
EO-5161	2,2',4,4',5,6'-Hexabromodiphenyl ether ($^{13}\text{C}_{12}$, 99%)	154		50 ± 5 µg/mL in nonane	1.2 mL
EO-5413	2,2',4,4',6,6'-Hexabromodiphenyl ether ($^{13}\text{C}_{12}$, 99%)	155		50 ± 5 µg/mL in nonane	1.2 mL
EO-4985	2,2',3,4,4',5',6-Heptabromodiphenyl ether ($^{13}\text{C}_{12}$, 99%)	183		50 ± 5 µg/mL in nonane	1.2 mL
EO-5376	2,3,3',4,4',5,6-Heptabromodiphenyl ether ($^{13}\text{C}_{12}$, 99%)	190		50 ± 5 µg/mL in nonane	1.2 mL

Multiple-unit pricing is available for individual ^{13}C -BDE standards as follows: 2-3 units = 20% discount; 4 or more units = 33% discount

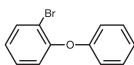
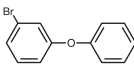
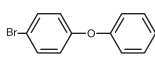
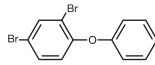
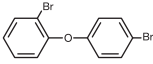
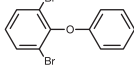
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Isotope-Labeled Individual Brominated Diphenyl Ether (BDE) Standards

Catalog No.	Compound	BDE	Structure	Concentration	Amount
EO-5337	2,2',3,3',4,4',5,5',6,6'-Octabromodiphenyl ether (¹³ C ₁₂ , 99%)	197		50 ± 5 µg/mL in nonane	1.2 mL
EO-5377	2,2',3,4,4',5,5',6-Octabromodiphenyl ether (¹³ C ₁₂ , 99%)	203		50 ± 5 µg/mL in nonane	1.2 mL
EO-5355	2,2',3,4,4',5,6,6'-Octabromodiphenyl ether (¹³ C ₁₂ , 99%)	204		50 ± 5 µg/mL in nonane	1.2 mL
EO-5362	2,3,3',4,4',5,5',6-Octabromodiphenyl ether (¹³ C ₁₂ , 99%)	205		50 ± 5 µg/mL in nonane	1.2 mL
EO-5240	2,2',3,3',4,4',5,5',6-Nonabromodiphenyl ether (¹³ C ₁₂ , 99%)	206		50 ± 5 µg/mL in nonane	1.2 mL
EO-5241	2,2',3,3',4,4',5,6,6'-Nonabromodiphenyl ether (¹³ C ₁₂ , 99%)	207		50 ± 5 µg/mL in nonane	1.2 mL
EO-5242	2,2',3,3',4,5,5',6,6'-Nonabromodiphenyl ether (¹³ C ₁₂ , 99%)	208		50 ± 5 µg/mL in nonane	1.2 mL
EO-5003	Decabromodiphenyl ether (¹³ C ₁₂ , 99%)	209		50 ± 5 µg/mL in nonane	1.2 mL

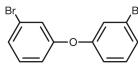
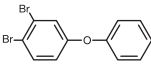
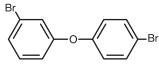
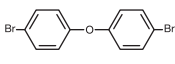
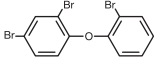
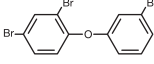
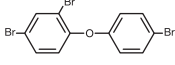
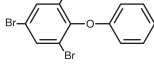
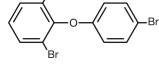
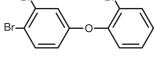
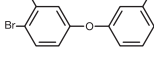
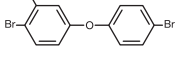
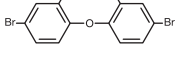
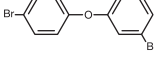
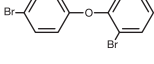
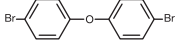
Multiple-unit pricing is available for individual ¹³C-BDE standards as follows: 2-3 units = 20% discount; 4 or more units = 33% discount

Unlabeled Individual Brominated Diphenyl Ether (BDE) Standards

Catalog No.	Compound	BDE	Structure	Concentration	Amount
BDE-1-CS	2-Monobromodiphenyl ether	1		50 ± 5 µg/mL in nonane	1.2 mL
BDE-2-CS	3-Monobromodiphenyl ether	2		50 ± 5 µg/mL in nonane	1.2 mL
BDE-3-CS	4-Monobromodiphenyl ether	3		50 ± 5 µg/mL in nonane	1.2 mL
BDE-7-CS	2,4-Dibromodiphenyl ether	7		50 ± 5 µg/mL in nonane	1.2 mL
BDE-8-CS	2,4'-Dibromodiphenyl ether	8		50 ± 5 µg/mL in nonane	1.2 mL
BDE-10-CS	2,6-Dibromodiphenyl ether	10		50 ± 5 µg/mL in nonane	1.2 mL

Multiple-unit pricing is available for individual unlabeled BDE standards as follows: 5-7 units = 20% discount; 8-11 units = 33% discount; 12 or more units = 50% discount

Unlabeled Individual Brominated Diphenyl Ether (BDE) Standards

Catalog No.	Compound	BDE	Structure	Concentration	Amount
BDE-11-CS	3,3'-Dibromodiphenyl ether	11		50 ± 5 µg/mL in nonane	1.2 mL
BDE-12-CS	3,4-Dibromodiphenyl ether	12		50 ± 5 µg/mL in nonane	1.2 mL
BDE-13-CS	3,4'-Dibromodiphenyl ether	13		50 ± 5 µg/mL in nonane	1.2 mL
BDE-15-CS	4,4'-Dibromodiphenyl ether	15		50 ± 5 µg/mL in nonane	1.2 mL
BDE-17-CS	2,2',4-Tribromodiphenyl ether	17		50 ± 5 µg/mL in nonane	1.2 mL
BDE-25-CS	2,3',4-Tribromodiphenyl ether	25		50 ± 5 µg/mL in nonane	1.2 mL
BDE-28-CS	2,4,4'-Tribromodiphenyl ether	28		50 ± 5 µg/mL in nonane	1.2 mL
BDE-30-CS	2,4,6-Tribromodiphenyl ether	30		50 ± 5 µg/mL in nonane	1.2 mL
BDE-32-CS	2,4',6-Tribromodiphenyl ether	32		50 ± 5 µg/mL in nonane	1.2 mL
BDE-33-CS	2',3,4-Tribromodiphenyl ether	33		50 ± 5 µg/mL in nonane	1.2 mL
BDE-35-CS	3,3',4-Tribromodiphenyl ether	35		50 ± 5 µg/mL in nonane	1.2 mL
BDE-37-CS	3,4,4'-Tribromodiphenyl ether	37		50 ± 5 µg/mL in nonane	1.2 mL
BDE-47-CS	2,2',4,4'-Tetrabromodiphenyl ether	47		50 ± 5 µg/mL in nonane	1.2 mL
BDE-49-CS	2,2',4,5'-Tetrabromodiphenyl ether	49		50 ± 5 µg/mL in nonane	1.2 mL
BDE-51-CS	2,2',4,6'-Tetrabromodiphenyl ether	51		50 ± 5 µg/mL in nonane	1.2 mL
BDE-66-CS	2,3',4,4'-Tetrabromodiphenyl ether	66		50 ± 5 µg/mL in nonane	1.2 mL

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(continued)

Unlabeled Individual Brominated Diphenyl Ether (BDE) Standards

Catalog No.	Compound	BDE	Structure	Concentration	Amount
BDE-71-CS	2,3',4',6-Tetrabromodiphenyl ether	71		50 ± 5 µg/mL in nonane	1.2 mL
BDE-75-CS	2,4,4',6-Tetrabromodiphenyl ether	75		50 ± 5 µg/mL in nonane	1.2 mL
BDE-77-CS	3,3',4,4'-Tetrabromodiphenyl ether	77		50 ± 5 µg/mL in nonane	1.2 mL
BDE-79-CS	3,3',4,5'-Tetrabromodiphenyl ether	79		50 ± 5 µg/mL in nonane	1.2 mL
BDE-85-CS	2,2',3,4,4'-Pentabromodiphenyl ether	85		50 ± 5 µg/mL in nonane	1.2 mL
BDE-99-CS	2,2',4,4',5-Pentabromodiphenyl ether	99		50 ± 5 µg/mL in nonane	1.2 mL
BDE-100-CS	2,2',4,4',6-Pentabromodiphenyl ether	100		50 ± 5 µg/mL in nonane	1.2 mL
BDE-105-CS	2,3,3',4,4'-Pentabromodiphenyl ether	105		50 ± 5 µg/mL in nonane	1.2 mL
BDE-116-CS	2,3,4,5,6-Pentabromodiphenyl ether	116		50 ± 5 µg/mL in nonane	1.2 mL
BDE-118-CS	2,3',4,4',5-Pentabromodiphenyl ether	118		50 ± 5 µg/mL in nonane	1.2 mL
BDE-119-CS	2,3',4,4',6-Pentabromodiphenyl ether	119		50 ± 5 µg/mL in nonane	1.2 mL
BDE-120-CS	2,3',4,5,5'-Pentabromodiphenyl ether	120		50 ± 5 µg/mL in nonane	1.2 mL
BDE-126-CS	3,3',4,4',5-Pentabromodiphenyl ether	126		50 ± 5 µg/mL in nonane	1.2 mL
BDE-128-CS	2,2',3,3',4,4'-Hexabromodiphenyl ether	128		50 ± 5 µg/mL in nonane	1.2 mL
BDE-138-CS	2,2',3,4,4',5'-Hexabromodiphenyl ether	138		50 ± 5 µg/mL in nonane	1.2 mL
BDE-139-CS	2,2',3,4,4',6-Hexabromodiphenyl ether	139		50 ± 5 µg/mL in nonane	1.2 mL
BDE-140-CS	2,2',3,4,4',6'-Hexabromodiphenyl ether	140		50 ± 5 µg/mL in nonane	1.2 mL

Multiple-unit pricing is available for individual unlabeled BDE standards as follows: 5-7 units = 20% discount; 8-11 units = 33% discount; 12 or more units = 50% discount

Unlabeled Individual Brominated Diphenyl Ether (BDE) Standards

Catalog No.	Compound	BDE	Structure	Concentration	Amount
BDE-148-CS	2,2',3,4',5,6'-Hexabromodiphenyl ether	148		50 ± 5 µg/mL in nonane	1.2 mL
BDE-153-CS	2,2',4,4',5,5'-Hexabromodiphenyl ether	153		50 ± 5 µg/mL in nonane	1.2 mL
BDE-154-CS	2,2',4,4',5,6'-Hexabromodiphenyl ether	154		50 ± 5 µg/mL in nonane	1.2 mL
BDE-155-CS	2,2',4,4',6,6'-Hexabromodiphenyl ether	155		50 ± 5 µg/mL in nonane	1.2 mL
BDE-166-CS	2,3,4,4',5,6-Hexabromodiphenyl ether	166		50 ± 5 µg/mL in nonane	1.2 mL
BDE-175-CS	2,2',3,3',4,5',6-Heptabromodiphenyl ether	175		50 ± 5 µg/mL in nonane	1.2 mL
BDE-181-CS	2,2',3,4,4',5,6-Heptabromodiphenyl ether	181		50 ± 5 µg/mL in nonane	1.2 mL
BDE-183-CS	2,2',3,4,4',5',6-Heptabromodiphenyl ether	183		50 ± 5 µg/mL in nonane	1.2 mL
BDE-190-CS	2,3,3',4,4',5,6-Heptabromodiphenyl ether	190		50 ± 5 µg/mL in nonane	1.2 mL
BDE-197-CS	2,2',3,3',4,4',6,6'-Octabromodiphenyl ether	197		50 ± 5 µg/mL in nonane	1.2 mL
BDE-203-CS	2,2',3,4,4',5,5',6-Octabromodiphenyl ether	203		50 ± 5 µg/mL in nonane	1.2 mL
BDE-204-CS	2,2',3,4,4',5,6',6-Octabromodiphenyl ether	204		50 ± 5 µg/mL in nonane	1.2 mL
BDE-205-CS	2,3,3',4,4',5,5',6-Octabromodiphenyl ether	205		50 ± 5 µg/mL in nonane	1.2 mL
BDE-206-CS	2,2',3,3',4,4',5,5',6-Nonabromodiphenyl ether	206		50 ± 5 µg/mL in nonane	1.2 mL
BDE-207-CS	2,2',3,3',4,4',5,6',6-Nonabromodiphenyl ether	207		50 ± 5 µg/mL in nonane	1.2 mL
BDE-208-CS	2,2',3,3',4,5,5',6,6'-Nonabromodiphenyl ether	208		50 ± 5 µg/mL in nonane	1.2 mL
BDE-209-CS	Decabromodiphenyl ether	209		50 ± 5 µg/mL in nonane	1.2 mL

Multiple-unit pricing is available for individual unlabeled BDE standards as follows: 5-7 units = 20% discount; 8-11 units = 33% discount; 12 or more units = 50% discount

US EPA Method 1614 Standard Mixtures

Catalog No.	Compound	Amount
EO-5279	EPA Method 1614 Calibration Solutions [CS1-CS5]	Set of 5 × 0.2 mL in nonane
EO-5279-CS1	EPA Method 1614 Calibration Solution [CS1]	0.2 mL in nonane
EO-5279-CS2	EPA Method 1614 Calibration Solution [CS2]	0.2 mL in nonane
EO-5279-CS3	EPA Method 1614 Calibration Solution [CS3]	0.2 mL in nonane
EO-5279-CS4	EPA Method 1614 Calibration Solution [CS4]	0.2 mL in nonane
EO-5279-CS5	EPA Method 1614 Calibration Solution [CS5]	0.2 mL in nonane

All concentrations are in ng/mL (ppb)

Unlabeled	Congener	CS1	CS2	CS3	CS4	CS5
2,4,4'-TriBDE	28	1	5	50	500	2500
2,2',4,4'-TetraBDE	47	1	5	50	500	2500
2,2',4,4',5-PentaBDE	99	1	5	50	500	2500
2,2',4,4',6-PentaBDE	100	1	5	50	500	2500
2,2',4,4',5,5'-HexaBDE	153	1	5	50	500	2500
2,2',4,4',5,6'-HexaBDE	154	1	5	50	500	2500
2,2',3,4,4',5',6-HeptaBDE	183	1	5	50	500	2500
DecaBDE	209	10	50	500	5000	25,000
Surrogate						
2,4,4'-TriBDE (¹³ C ₁₂ , 99%)	28	100	100	100	100	100
2,2',4,4'-TetraBDE (¹³ C ₁₂ , 99%)	47	100	100	100	100	100
2,2',4,4',5-PentaBDE (¹³ C ₁₂ , 99%)	99	100	100	100	100	100
2,2',4,4',6-PentaBDE (¹³ C ₁₂ , 99%)	100	100	100	100	100	100
2,2',4,4',5,5'-HexaBDE (¹³ C ₁₂ , 99%)	153	100	100	100	100	100
2,2',4,4',5,6'-HexaBDE (¹³ C ₁₂ , 99%)	154	100	100	100	100	100
2,2',3,4,4',5',6-HeptaBDE (¹³ C ₁₂ , 99%)	183	100	100	100	100	100
DecaBDE (¹³ C ₁₂ , 99%)	209	1000	1000	1000	1000	1000
Cleanup						
2,2',3,4,4',6-HexaBDE (¹³ C ₁₂ , 99%)	139	100	100	100	100	100
Injection Internal						
2,2',5,5'-TetraCB (¹³ C ₁₂ , 99%)	PCB-52	100	100	100	100	100
2,2',3,4,4',5'-HexaCB (¹³ C ₁₂ , 99%)	PCB-138	100	100	100	100	100

NEW EO-1614-KIT	EPA Method 1614 "Starter Kit"	1 Kit
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Contains one each of the following items:

EO-5279	Method 1614 Calibration Solutions CS1-CS5
EO-5277	Method 1614 Labeled Surrogate Stock Solution
EO-5276	Method 1614 Labeled Cleanup Stock Solution
EO-5275	Method 1614 Labeled Injection Internal Stock Solution
EO-5278	Method 1614 Native PAR Stock Solution

US EPA Method 1614 Standard Mixtures

Catalog No.	Compound	Amount
EO-5277	EPA Method 1614 Labeled Surrogate Stock Solution	1.2 mL in nonane

Labeled	Congener	(ng/mL)
2,4,4'-TriBDE (¹³ C ₁₂ , 99%)	28	1000
2,2',4,4'-TetraBDE (¹³ C ₁₂ , 99%)	47	1000
2,2',4,4',5-PentaBDE (¹³ C ₁₂ , 99%)	99	1000
2,2',4,4',6-PentaBDE (¹³ C ₁₂ , 99%)	100	1000
2,2',4,4',5,5'-HexaBDE (¹³ C ₁₂ , 99%)	153	1000
2,2',4,4',5,6'-HexaBDE (¹³ C ₁₂ , 99%)	154	1000
2,2',3,4,4',5',6-HeptaBDE (¹³ C ₁₂ , 99%)	183	1000
DecaBDE (¹³ C ₁₂ , 99%)	209	10,000

EO-5276	EPA Method 1614 Labeled Cleanup Stock Solution	1.2 mL in nonane
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Labeled	Congener	(ng/mL)
2,2',3,4,4',6-HexaBDE (¹³ C ₁₂ , 99%)	139	1000

EO-5275	EPA Method 1614 Labeled Injection Internal Stock Solution	1.2 mL in nonane
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Labeled	Congener	(ng/mL)
2,2',5,5'-TetraCB (¹³ C ₁₂ , 99%)	PCB-52	5000
2,2',3,4,4',5'-HexaCB (¹³ C ₁₂ , 99%)	PCB-138	5000

EO-5278	EPA Method 1614 Native PAR Stock Solution	1.2 mL in nonane
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Unlabeled	Congener	(ng/mL)
2,4,4'-TriBDE	28	1000
2,2',4,4'-TetraBDE	47	1000
2,2',4,4',5-PentaBDE	99	1000
2,2',4,4',6-PentaBDE	100	1000
2,2',4,4',5,5'-HexaBDE	153	1000
2,2',4,4',5,6'-HexaBDE	154	1000
2,2',3,4,4',5',6-HeptaBDE	183	1000
DecaBDE	209	10,000

RoHS Brominated Diphenyl Ether (BDE) Standard Mixtures

Catalog No.	Compound	Amount
EO-5402	RoHS PBDE Calibration Solutions [CS1-CS5]	Set of 5 × 0.2 mL in nonane
EO-5402-CS1	RoHS PBDE Calibration Solution [CS1]	0.2 mL in nonane
EO-5402-CS2	RoHS PBDE Calibration Solution [CS2]	0.2 mL in nonane
EO-5402-CS3	RoHS PBDE Calibration Solution [CS3]	0.2 mL in nonane
EO-5402-CS4	RoHS PBDE Calibration Solution [CS4]	0.2 mL in nonane
EO-5402-CS5	RoHS PBDE Calibration Solution [CS5]	0.2 mL in nonane

All concentrations are in ng/mL (ppb)

Unlabeled	BDE	CS1	CS2	CS3	CS4	CS5
4-MonoBDE	3	1	5	20	100	500
2,4-DiBDE	7	1	5	20	100	500
4,4'-DiBDE	15	1	5	20	100	500
2,2',4-TriBDE	17	1	5	20	100	500
2,4,4'-TriBDE	28	1	5	20	100	500
2,2',4,4'-TetraBDE	47	1	5	20	100	500
2,2',4,5'-TetraBDE	49	1	5	20	100	500
2,3',4,4'-TetraBDE	66	1	5	20	100	500
2,3',4',6-TetraBDE	71	1	5	20	100	500
3,3',4,4'-TetraBDE	77	1	5	20	100	500
2,2',3,4,4'-PentaBDE	85	1	5	20	100	500
2,2',4,4',5-PentaBDE	99	1	5	20	100	500
2,2',4,4',6-PentaBDE	100	1	5	20	100	500
2,3',4,4',6-PentaBDE	119	1	5	20	100	500
3,3',4,4',5-PentaBDE	126	1	5	20	100	500
2,2',3,4,4',5'-HexaBDE	138	2	10	40	200	1000
2,2',4,4',5,5'-HexaBDE	153	2	10	40	200	1000
2,2',4,4',5,6'-HexaBDE	154	2	10	40	200	1000
2,2',4,4',6,6'-HexaBDE	155	2	10	40	200	1000
2,3,4,4',5,6-HexaBDE	166	2	10	40	200	1000
2,2',3,4,4',5,6-HeptaBDE	181	2	10	40	200	1000
2,2',3,4,4',5',6-HeptaBDE	183	2	10	40	200	1000
2,3,3',4,4',5,6-HeptaBDE	190	2	10	40	200	1000
2,2',3,4,4',5,5',6-OctaBDE	203	2	10	40	200	1000
2,3,3',4,4',5,5',6-OctaBDE	205	2	10	40	200	1000
2,2',3,3',4,4',5,5',6-NonaBDE	206	5	25	100	500	2500
2,2',3,3',4,4',5,6,6'-NonaBDE	207	5	25	100	500	2500
DecaBDE	209	5	25	100	500	2500
Cleanup						
4-MonoBDE (¹³ C ₁₂ , 99%)	3	100	100	100	100	100
4,4'-DiBDE (¹³ C ₁₂ , 99%)	15	100	100	100	100	100
2,4,4'-TriBDE (¹³ C ₁₂ , 99%)	28	100	100	100	100	100
2,2',4,4'-TetraBDE (¹³ C ₁₂ , 99%)	47	100	100	100	100	100
2,2',4,4',5-PentaBDE (¹³ C ₁₂ , 99%)	99	100	100	100	100	100
2,2',4,4',5,5'-HexaBDE (¹³ C ₁₂ , 99%)	153	200	200	200	200	200
2,2',4,4',5,6'-HexaBDE (¹³ C ₁₂ , 99%)	154	200	200	200	200	200
2,2',3,4,4',5,6-HeptaBDE (¹³ C ₁₂ , 99%)	183	200	200	200	200	200
2,2',3,4,4',5,6'-OctaBDE (¹³ C ₁₂ , 99%)	204	200	200	200	200	200
2,2',3,3',4,4',5,6,6'-NonaBDE (¹³ C ₁₂ , 99%)	207	500	500	500	500	500
DecaBDE (¹³ C ₁₂ , 99%)	209	500	500	500	500	500
Syringe						
2,2',3,4,4',5'-HexaBDE (¹³ C ₁₂ , 99%)	138	200	200	200	200	200

RoHS Brominated Diphenyl Ether (BDE) Standard Mixtures

Catalog No.	Compound	Amount
EO-5403	RoHS PBDE Cleanup Spike	1.2 mL in nonane
NEW EO-5403-10X-1.2	RoHS PBDE Cleanup 10X Spike (¹³ C ₁₂ , 99%)	1.2 mL in nonane

Labeled	BDE	EO-5403 (ng/mL)	EO-5403-10X-1.2 (ng/mL)
4-MonoBDE (¹³ C ₁₂ , 99%)	3	100	1000
4,4'-DiBDE (¹³ C ₁₂ , 99%)	15	100	1000
2,4,4'-TriBDE (¹³ C ₁₂ , 99%)	28	100	1000
2,2',4,4'-TetraBDE (¹³ C ₁₂ , 99%)	47	100	1000
2,2',4,4',5-PentaBDE (¹³ C ₁₂ , 99%)	99	100	1000
2,2',4,4',5,5'-HexaBDE (¹³ C ₁₂ , 99%)	153	200	2000
2,2',4,4',5,6'-HexaBDE (¹³ C ₁₂ , 99%)	154	200	2000
2,2',3,4,4',5,6'-HeptaBDE (¹³ C ₁₂ , 99%)	183	200	2000
2,2',3,4,4',5,6,6'-OctaBDE (¹³ C ₁₂ , 99%)	204	200	2000
2,2',3,3',4,4',5,6,6'-NonaBDE (¹³ C ₁₂ , 99%)	207	500	5000
DecaBDE (¹³ C ₁₂ , 99%)	209	500	5000

EO-5404	RoHS PBDE Syringe Spike	1.2 mL in nonane
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Labeled	BDE	(ng/mL)
2,2',3,4,4',5'-HexaBDE (¹³ C ₁₂ , 99%)	138	200

EO-5405	RoHS PBDE Native PAR Spike	1.2 mL in nonane
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Unlabeled	BDE	(ng/mL)
4-MonoBDE	3	1000
2,4-DiBDE	7	1000
4,4'-DiBDE	15	1000
2,2',4-TriBDE	17	1000
2,4,4'-TriBDE	28	1000
2,2',4,4'-TetraBDE	47	1000
2,2',4,5'-TetraBDE	49	1000
2,3',4,4'-TetraBDE	66	1000
2,3',4',6-TetraBDE	71	1000
3,3',4,4'-TetraBDE	77	1000
2,2',3,4,4'-PentaBDE	85	1000
2,2',4,4',5-PentaBDE	99	1000
2,2',4,4',6-PentaBDE	100	1000
2,3',4,4',6-PentaBDE	119	1000
3,3',4,4',5-PentaBDE	126	1000
2,2',3,4,4',5'-HexaBDE	138	2000
2,2',4,4',5,5'-HexaBDE	153	2000
2,2',4,4',5,6'-HexaBDE	154	2000
2,2',4,4',6,6'-HexaBDE	155	2000
2,3,4,4',5,6-HexaBDE	166	2000
2,2',3,4,4',5,6-HeptaBDE	181	2000
2,2',3,4,4',5',6-HeptaBDE	183	2000
2,3,3',4,4',5,6-HeptaBDE	190	2000
2,2',3,4,4',5,5',6-OctaBDE	203	2000
2,3,3',4,4',5,5',6-OctaBDE	205	2000
2,2',3,3',4,4',5,5',6-NonaBDE	206	5000
2,2',3,3',4,4',5,6,6'-NonaBDE	207	5000
DecaBDE	209	5000

RoHS Brominated Diphenyl Ether (BDE) Standard Mixtures

Catalog No.	Compound	Amount
EO-5425	RoHS Screening PBDE Calibration Solutions [CS1-CS3]	Set of 3 × 0.2 mL in nonane
EO-5425-CS1	RoHS Screening PBDE Calibration Solution [CS1]	0.2 mL in nonane
EO-5425-CS2	RoHS Screening PBDE Calibration Solution [CS2]	0.2 mL in nonane
EO-5425-CS3	RoHS Screening PBDE Calibration Solution [CS3]	0.2 mL in nonane

All concentrations are in ng/mL (ppb)

Unlabeled	BDE	CS1	CS2	CS3
4,4'-DiBDE	15	20	100	1000
2,4,4'-TriBDE	28	20	100	1000
2,2',4,4'-TetraBDE	47	20	100	1000
2,2',4,4',5-PentaBDE	99	20	100	1000
2,2',4,4',5,5'-HexaBDE	153	20	100	1000
2,2',4,4',5,6'-HexaBDE	154	20	100	1000
2,2',3,4,4',5,6-HeptaBDE	183	20	100	1000
2,2',3,3',4,4',6,6'-OctaBDE	197	50	250	2500
2,2',3,3',4,4',5,5',6-NonaBDE	206	100	500	5000
2,2',3,3',4,4',5,6,6'-NonaBDE	207	50	250	2500
2,2',3,3',4,5,5',6,6'-NonaBDE	208	50	250	2500
DecaBDE	209	500	2500	25,000
Cleanup				
4,4'-DiBDE (¹³ C ₁₂ , 99%)	15	100	100	100
2,4,4'-TriBDE (¹³ C ₁₂ , 99%)	28	100	100	100
2,2',4,4'-TetraBDE (¹³ C ₁₂ , 99%)	47	100	100	100
2,2',4,4',5-PentaBDE (¹³ C ₁₂ , 99%)	99	100	100	100
2,2',4,4',5,5'-HexaBDE (¹³ C ₁₂ , 99%)	153	100	100	100
2,2',4,4',5,6'-HexaBDE (¹³ C ₁₂ , 99%)	154	100	100	100
2,2',3,4,4',5,6-HeptaBDE (¹³ C ₁₂ , 99%)	183	100	100	100
2,2',3,3',4,4',6,6'-OctaBDE (¹³ C ₁₂ , 99%)	197	250	250	250
2,2',3,3',4,4',5,5',6-NonaBDE (¹³ C ₁₂ , 99%)	206	500	500	500
2,2',3,3',4,5,5',6,6'-NonaBDE (¹³ C ₁₂ , 99%)	208	250	250	250
DecaBDE (¹³ C ₁₂ , 99%)	209	2500	2500	2500
Syringe				
2,2',3,3',4,4',5,6,6'-NonaBDE (¹³ C ₁₂ , 99%)	207	250	250	250

RoHS Brominated Diphenyl Ether (BDE) Standard Mixtures

Catalog No.	Compound	Amount
EO-5426	RoHS Screening PBDE Cleanup Spike	1.2 mL in nonane

Labeled	BDE	(ng/mL)
4,4'-DiBDE (¹³ C ₁₂ , 99%)	15	1000
2,4,4'-TriBDE (¹³ C ₁₂ , 99%)	28	1000
2,2',4,4'-TetraBDE (¹³ C ₁₂ , 99%)	47	1000
2,2',4,4',5-PentaBDE (¹³ C ₁₂ , 99%)	99	1000
2,2',4,4',5,5'-HexaBDE (¹³ C ₁₂ , 99%)	153	1000
2,2',4,4',5,6'-HexaBDE (¹³ C ₁₂ , 99%)	154	1000
2,2',3,4,4',5',6-HeptaBDE (¹³ C ₁₂ , 99%)	183	1000
2,2',3,3',4,4',6,6'-OctaBDE (¹³ C ₁₂ , 99%)	197	2500
2,2',3,3',4,4',5,5',6-NonaBDE (¹³ C ₁₂ , 99%)	206	5000
2,2',3,3',4,5,5',6,6'-NonaBDE (¹³ C ₁₂ , 99%)	208	2500
DecaBDE (¹³ C ₁₂ , 99%)	209	25,000

EO-5427	RoHS Screening PBDE Syringe Spike	1.2 mL in nonane
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Labeled	BDE	(ng/mL)
2,2',3,3',4,4',5,6,6'-NonaBDE (¹³ C ₁₂ , 99%)	207	2500

EO-5428	RoHS Screening PBDE Native PAR Spike	1.2 mL in nonane
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Unlabeled	BDE	(ng/mL)
4,4'-DiBDE	15	1000
2,4,4'-TriBDE	28	1000
2,2',4,4'-TetraBDE	47	1000
2,2',4,4',5-PentaBDE	99	1000
2,2',4,4',5,5'-HexaBDE	153	1000
2,2',4,4',5,6'-HexaBDE	154	1000
2,2',3,4,4',5',6-HeptaBDE	183	1000
2,2',3,3',4,4',6,6'-OctaBDE	197	2500
2,2',3,3',4,4',5,5',6-NonaBDE	206	5000
2,2',3,3',4,4',5,6,6'-NonaBDE	207	2500
2,2',3,3',4,5,5',6,6'-NonaBDE	208	2500
DecaBDE	209	25,000

Brominated Diphenyl Ether (BDE) Standard Mixtures

Catalog No.	Compound	Amount
EO-5104	Brominated Diphenyl Ether Calibration Solutions [CS1-CS6]	Set of 6 × 0.2 mL in nonane
EO-5104-CS1	Brominated Diphenyl Ether Calibration Solution [CS1]	0.2 mL in nonane
EO-5104-CS2	Brominated Diphenyl Ether Calibration Solution [CS2]	0.2 mL in nonane
EO-5104-CS3	Brominated Diphenyl Ether Calibration Solution [CS3]	0.2 mL in nonane
EO-5104-CS4	Brominated Diphenyl Ether Calibration Solution [CS4]	0.2 mL in nonane
EO-5104-CS5	Brominated Diphenyl Ether Calibration Solution [CS5]	0.2 mL in nonane
EO-5104-CS6	Brominated Diphenyl Ether Calibration Solution [CS6]	0.2 mL in nonane

All concentrations are in ng/mL (ppb)

Unlabeled	BDE	CS1	CS2	CS3	CS4	CS5	CS6
2-MonoBDE	1	0.2	1	5	25	100	500
3-MonoBDE	2	0.2	1	5	25	100	500
4-MonoBDE	3	0.2	1	5	25	100	500
2,4-DiBDE	7	0.2	1	5	25	100	500
2,4'-DiBDE	8	0.2	1	5	25	100	500
2,6-DiBDE	10	0.2	1	5	25	100	500
3,3'-DiBDE	11	0.2	1	5	25	100	500
3,4-DiBDE	12	0.2	1	5	25	100	500
3,4'-DiBDE	13	0.2	1	5	25	100	500
4,4'-DiBDE	15	0.2	1	5	25	100	500
2,2',4-TriBDE	17	0.2	1	5	25	100	500
2,3',4-TriBDE	25	0.2	1	5	25	100	500
2,4,4'-TriBDE	28	0.2	1	5	25	100	500
2,4,6-TriBDE	30	0.2	1	5	25	100	500
2,4',6-TriBDE	32	0.2	1	5	25	100	500
2',3,4-TriBDE	33	0.2	1	5	25	100	500
3,3',4-TriBDE	35	0.2	1	5	25	100	500
3,4,4'-TriBDE	37	0.2	1	5	25	100	500
2,2',4,4'-TetraBDE	47	0.2	1	5	25	100	500
2,2',4,5'-TetraBDE	49	0.2	1	5	25	100	500
2,3',4,4'-TetraBDE	66	0.2	1	5	25	100	500
2,3',4',6-TetraBDE	71	0.2	1	5	25	100	500
2,4,4',6-TetraBDE	75	0.2	1	5	25	100	500
3,3',4,4'-TetraBDE	77	0.2	1	5	25	100	500
2,2',3,4,4'-PentaBDE	85	0.3	1.5	7.5	37.5	150	750
2,2',4,4',5-PentaBDE	99	0.3	1.5	7.5	37.5	150	750
2,2',4,4',6-PentaBDE	100	0.3	1.5	7.5	37.5	150	750
2,3,4,5,6-PentaBDE	116	0.3	1.5	7.5	37.5	150	750
2,3',4,4',5-PentaBDE	118	0.3	1.5	7.5	37.5	150	750
2,3',4,4',6-PentaBDE	119	0.3	1.5	7.5	37.5	150	750
3,3',4,4',5-PentaBDE	126	0.3	1.5	7.5	37.5	150	750
2,2',3,4,4',5'-HexaBDE	138	0.6	3	15	75	300	1500
2,2',4,4',5,5'-HexaBDE	153	0.4	2	10	50	200	1000
2,2',4,4',5,6'-HexaBDE	154	0.4	2	10	50	200	1000
2,2',4,4',6,6'-HexaBDE	155	0.4	2	10	50	200	1000
2,3,4,4',5,6-HexaBDE	166	0.4	2	10	50	200	1000
2,2',3,4,4',5,6-HeptaBDE	181	0.5	2.5	12.5	62.5	250	1250
2,2',3,4,4',5',6-HeptaBDE	183	0.5	2.5	12.5	62.5	250	1250
2,3,3',4,4',5,6-HeptaBDE	190	0.5	2.5	12.5	62.5	250	1250
Surrogate							
4-MonoBDE (¹³ C ₁₂ , 99%)	3	100	100	100	100	100	100
4,4'-DiBDE (¹³ C ₁₂ , 99%)	15	100	100	100	100	100	100
2,4,4'-TriBDE (¹³ C ₁₂ , 99%)	28	100	100	100	100	100	100
2,2',4,4'-TetraBDE (¹³ C ₁₂ , 99%)	47	100	100	100	100	100	100
2,2',4,4',5-PentaBDE (¹³ C ₁₂ , 99%)	99	100	100	100	100	100	100
2,2',4,4',6-PentaBDE (¹³ C ₁₂ , 99%)	100	100	100	100	100	100	100
2,3',4,4',5-PentaBDE (¹³ C ₁₂ , 99%)	118	100	100	100	100	100	100
2,2',4,4',5,5'-HexaBDE (¹³ C ₁₂ , 99%)	153	200	200	200	200	200	200
2,2',3,4,4',5',6-HeptaBDE (¹³ C ₁₂ , 99%)	183	250	250	250	250	250	250
Performance							
3,3',4,4'-TetraBDE (¹³ C ₁₂ , 99%)	77	100	100	100	100	100	100
3,3',4,4',5-PentaBDE (¹³ C ₁₂ , 99%)	126	150	150	150	150	150	150

Brominated Diphenyl Ether (BDE) Standard Mixtures

Catalog No.	Compound	Amount
EO-5100	Polybrominated Diphenyl Ether Surrogate Spiking Solution	1.2 mL in nonane
EO-5100-10X-0.5	Polybrominated Diphenyl Ether Surrogate Spiking Solution (10X stock)	0.5 mL in nonane

Labeled	BDE	EO-5100 (ng/mL)	EO-5100-10X-0.5 (ng/mL)
4-MonoBDE (¹³ C ₁₂ , 99%)	3	100	1000
4,4'-DiBDE (¹³ C ₁₂ , 99%)	15	100	1000
2,4,4'-TriBDE (¹³ C ₁₂ , 99%)	28	100	1000
2,2',4,4'-TetraBDE (¹³ C ₁₂ , 99%)	47	100	1000
2,2',4,4',5-PentaBDE (¹³ C ₁₂ , 99%)	99	150	1500
2,2',4,4',6-PentaBDE (¹³ C ₁₂ , 99%)	100	150	1500
2,3',4,4',5-PentaBDE (¹³ C ₁₂ , 99%)	118	150	1500
2,2',4,4',5,5'-HexaBDE (¹³ C ₁₂ , 99%)	153	200	2000
2,2',3,4,4',5',6-HeptaBDE (¹³ C ₁₂ , 99%)	183	250	2500

EO-5101	Polybrominated Diphenyl Ether Performance Standard Solution	1.2 mL in nonane
EO-5101-10X-1.2	Polybrominated Diphenyl Ether Performance Standard Solution (10X stock)	1.2 mL in nonane

Labeled	BDE	EO-5101 (ng/mL)	EO-5101-10X-1.2 (ng/mL)
3,3',4,4'-TetraBDE (¹³ C ₁₂ , 99%)	77	100	1000
3,3',4,4',5-PentaBDE (¹³ C ₁₂ , 99%)	126	150	1500

NEW EO-5507	Polybrominated Diphenyl Ether Injection Internal Standard	1.2 mL in nonane
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Labeled	BDE	(ng/mL)
2,2',4,4',5-PentaBDE (¹³ C ₁₂ , 99%)	99	200
2,2',4,4',5,6'-HexaBDE (¹³ C ₁₂ , 99%)	154	200

NEW EO-5509	Polybrominated Diphenyl Ether Native Injection Internal Standard	1.2 mL in nonane
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Unlabeled	BDE	(ng/mL)
2,2',4,4',5-PentaBDE	99	200
2,2',4,4',5,6'-HexaBDE	154	200

NEW EO-5506	Polybrominated Diphenyl Ether Surrogate Standard	1.2 mL in nonane
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Labeled	BDE	(ng/mL)
2,2',4,4',6-PentaBDE (¹³ C ₁₂ , 99%)	100	200
2,2',3,4,4',5',6-HeptaBDE (¹³ C ₁₂ , 99%)	183	200

NEW EO-5508	Polybrominated Diphenyl Ether Native Surrogate Standard	1.2 mL in nonane
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Unlabeled	BDE	(ng/mL)
2,2',4,4',6-PentaBDE	100	200
2,2',3,4,4',5',6-HeptaBDE	183	200

Brominated Diphenyl Ether (BDE) Standard Mixtures

Catalog No.	Compound	Amount
EO-5099	Polybrominated Diphenyl Ether Analytical Standard Solution	1.2 mL in nonane

Unlabeled	BDE	(ng/mL)
2-MonoBDE	1	100
3-MonoBDE	2	100
4-MonoBDE	3	100
2,4-DiBDE	7	100
2,4'-DiBDE	8	100
2,6-DiBDE	10	100
3,3'-DiBDE	11	100
3,4-DiBDE	12	100
3,4'-DiBDE	13	100
4,4'-DiBDE	15	100
2,2',4-TriBDE	17	100
2,3',4-TriBDE	25	100
2,4,4'-TriBDE	28	100
2,4,6-TriBDE	30	100
2,4',6-TriBDE	32	100
2',3,4-TriBDE	33	100
3,3',4-TriBDE	35	100
3,4,4'-TriBDE	37	100
2,2',4,4'-TetraBDE	47	100
2,2',4,5'-TetraBDE	49	100
2,3',4,4'-TetraBDE	66	100
2,3',4',6-TetraBDE	71	100
2,4,4',6-TetraBDE	75	100
3,3',4,4'-TetraBDE	77	100
2,2',3,4,4'-PentaBDE	85	150
2,2',4,4',5-PentaBDE	99	150
2,2',4,4',6-PentaBDE	100	150
2,3,4,5,6-PentaBDE	116	150
2,3',4,4',5-PentaBDE	118	150
2,3',4,4',6-PentaBDE	119	150
3,3',4,4',5-PentaBDE	126	150
2,2',3,4,4',5'-HexaBDE	138	300
2,2',4,4',5,5'-HexaBDE	153	200
2,2',4,4',5,6'-HexaBDE	154	200
2,2',4,4',6,6'-HexaBDE	155	200
2,3,4,4',5,6-HexaBDE	166	200
2,2',3,4,4',5,6-HeptaBDE	181	250
2,2',3,4,4',5',6-HeptaBDE	183	250
2,3,3',4,4',5,6-HeptaBDE	190	250
Labeled		
4-MonoBDE (¹³ C ₁₂ , 99%)	3	100
4,4'-DiBDE (¹³ C ₁₂ , 99%)	15	100
2,4,4'-TriBDE (¹³ C ₁₂ , 99%)	28	100
2,2',4,4'-TetraBDE (¹³ C ₁₂ , 99%)	47	100
3,3',4,4'-TetraBDE (¹³ C ₁₂ , 99%)	77	100
2,2',4,4',5-PentaBDE (¹³ C ₁₂ , 99%)	99	150
2,2',4,4',6-PentaBDE (¹³ C ₁₂ , 99%)	100	150
2,3',4,4',5-PentaBDE (¹³ C ₁₂ , 99%)	118	150
3,3',4,4',5-PentaBDE (¹³ C ₁₂ , 99%)	126	150
2,2',4,4',5,5'-HexaBDE (¹³ C ₁₂ , 99%)	153	200
2,2',3,4,4',5',6-HeptaBDE (¹³ C ₁₂ , 99%)	183	250

Brominated Diphenyl Ether (BDE) Standard Mixtures

Catalog No.	Compound	Amount
EO-5103	Polybrominated Diphenyl Ether Predominant Congener Mixture	1.2 mL in nonane

Unlabeled	BDE	(ng/mL)	Unlabeled	BDE	(ng/mL)
2,2',4-TriBDE	17	2500	2,2',4,4',6-PentaBDE	100	2500
2,4,4'-TriBDE	28	2500	2,2',3,4,4',5'-HexaBDE	138	3750
2,2',4,4'-TetraBDE	47	2500	2,2',4,4',5,5'-HexaBDE	153	2500
2,3',4,4'-TetraBDE	66	2500	2,2',4,4',5,6'-HexaBDE	154	2500
2,3',4',6-TetraBDE	71	2500	2,2',3,4,4',5',6-HeptaBDE	183	2500
2,2',3,4,4'-PentaBDE	85	2500	2,3,3',4,4',5,6-HeptaBDE	190	2500
2,2',4,4',5-PentaBDE	99	2500	DecaBDE	209	10,000

EO-5113	Polybrominated Diphenyl Ether PAR Solution	0.5 mL in nonane
EO-5113-7.5X-0.5	Polybrominated Diphenyl Ether PAR Solution (7.5X stock)	0.5 mL in nonane

Unlabeled	BDE	EO-5113 (ng/mL)	EO-5113-7.5X-0.5 (ng/mL)
2-MonoBDE	1	100	750
3-MonoBDE	2	100	750
4-MonoBDE	3	100	750
2,4-DiBDE	7	100	750
2,4'-DiBDE	8	100	750
2,6-DiBDE	10	100	750
3,3'-DiBDE	11	100	750
3,4-DiBDE	12	100	750
3,4'-DiBDE	13	100	750
4,4'-DiBDE	15	100	750
2,2',4-TriBDE	17	100	750
2,3',4-TriBDE	25	100	750
2,4,4'-TriBDE	28	100	750
2,4,6-TriBDE	30	100	750
2,4',6-TriBDE	32	100	750
2',3,4-TriBDE	33	100	750
3,3',4-TriBDE	35	100	750
3,4,4'-TriBDE	37	100	750
2,2',4,4'-TetraBDE	47	100	750
2,2',4,5'-TetraBDE	49	100	750
2,3',4,4'-TetraBDE	66	100	750
2,3',4',6-TetraBDE	71	100	750
2,4,4',6-TetraBDE	75	100	750
3,3',4,4'-TetraBDE	77	100	750
2,2',3,4,4'-PentaBDE	85	150	1125
2,2',4,4',5-PentaBDE	99	150	1125
2,2',4,4',6-PentaBDE	100	150	1125
2,3,4,5,6-PentaBDE	116	150	1125
2,3',4,4',5-PentaBDE	118	150	1125
2,3',4,4',6-PentaBDE	119	150	1125
3,3',4,4',5-PentaBDE	126	150	1125
2,2',3,4,4',5'-HexaBDE	138	300	2250
2,2',4,4',5,5'-HexaBDE	153	200	1500
2,2',4,4',5,6'-HexaBDE	154	200	1500
2,2',4,4',6,6'-HexaBDE	155	200	1500
2,3,4,4',5,6-HexaBDE	166	200	1500
2,2',3,4,4',5,6-HeptaBDE	181	250	1875
2,2',3,4,4',5',6-HeptaBDE	183	250	1875
2,3,3',4,4',5,6-HeptaBDE	190	250	1875

Brominated Diphenyl Ether (BDE) Technical Mixtures

Catalog No.	Compound	Concentration	Amount
EO-4958-1.2	Pentabromodiphenyl Ether Technical Mix (Bromkal™ 70-5)	50 µg/mL in methanol	1.2 mL
EO-5031	Pentabromodiphenyl Ether Technical Mix (DE-71™)	50 µg/mL in methanol	1.2 mL
EO-5030	Octabromodiphenyl Ether Technical Mix (DE-79™)	50 µg/mL in methanol	1.2 mL
EO-5060	Decabromodiphenyl Ether Technical Mix (Saytex® 102E)	10 µg/mL in methanol	10 mL

Bromkal is a trademark of Chemische Fabrik Kalk GmbH. DE-71 is a trademark of Chemtura (Great Lakes Chemical Company). DE-79 is a trademark of Chemtura (Great Lakes Chemical Company). Saytex is a registered trademark of Albemarle Corporation.

Brominated Diphenyl Ether (BDE) Metabolite Standards

Catalog No.	Compound	Concentration	Amount
OH-BDE			
OHBDE-5190-1.2	6-Hydroxy-2,2',4,4'-tetrabromodiphenyl ether (ring- ¹³ C ₁₂ , 99%) CP 92%	50 µg/mL in toluene	1.2 mL
OHBDE-5206-1.2	6-Hydroxy-2,2',4,4'-tetrabromodiphenyl ether (unlabeled)	50 µg/mL in nonane	1.2 mL
OHBDE-5191-1.2	2-Hydroxy-2',4,4',5',6-pentabromodiphenyl ether (ring- ¹³ C ₁₂ , 99%) CP 94%	50 µg/mL in toluene	1.2 mL
OHBDE-5212-1.2	4'-Hydroxy-2,2',4,5'-tetrabromodiphenyl ether (unlabeled)	50 µg/mL in nonane	1.2 mL
OHBDE-5228-1.2	6-Hydroxy-2,2',4,4',5-pentabromodiphenyl ether (unlabeled)	50 µg/mL in nonane	1.2 mL
MeO-BDE			
MEOBDE-5153-1.2	2'-Methoxy-2,3',4,5'-tetrabromodiphenyl ether (unlabeled)	50 µg/mL in nonane	1.2 mL
NEW MEOBDE-5207-1.2	3-Methoxy-2,2',4,4'-tetrabromodiphenyl ether (unlabeled)	50 µg/mL in nonane	1.2 mL
NEW MEOBDE-5203-1.2	4-Methoxy-2,2',3,4'-tetrabromodiphenyl ether (unlabeled)	50 µg/mL in nonane	1.2 mL
NEW MEOBDE-5211-1.2	4'-Methoxy-2,2',4,5'-tetrabromodiphenyl ether (unlabeled)	50 µg/mL in nonane	1.2 mL
NEW MEOBDE-5209-1.2	5-Methoxy-2,2',4,4'-tetrabromodiphenyl ether (unlabeled)	50 µg/mL in nonane	1.2 mL
NEW MEOBDE-5260-1.2	6-Methoxy-2,2',4,4'-tetrabromodiphenyl ether (ring- ¹³ C ₁₂ , 99%)	50 µg/mL in nonane	1.2 mL
MEOBDE-5205-1.2	6-Methoxy-2,2',4,4'-tetrabromodiphenyl ether (unlabeled)	50 µg/mL in nonane	1.2 mL
NEW MEOBDE-5227-1.2	6-Methoxy-2,2',4,4',5-pentabromodiphenyl ether (unlabeled)	50 µg/mL in nonane	1.2 mL

Tetrabromobisphenol A (TBBPA) and Tetrachlorobisphenol A Standards

Catalog No.	Compound	Concentration	Amount
NEW CLM-9374-1.2	Dimethyl tetrabromobisphenol A (ring- ¹³ C ₁₂ , 99%)	100 µg/mL in toluene	1.2 mL
ULM-6236-1.2	Dimethyl tetrabromobisphenol A (unlabeled)	50 µg/mL in nonane	1.2 mL
CLM-4694-1.2	Tetrabromobisphenol A (TBBPA) (ring- ¹³ C ₁₂ , 99%)	50 µg/mL in methanol	1.2 mL
NEW CLM-4694-T-1.2	Tetrabromobisphenol A (TBBPA) (ring- ¹³ C ₁₂ , 99%)	50 µg/mL in toluene	1.2 mL
ULM-8734-1.2	Tetrabromobisphenol A (TBBPA) (unlabeled)	50 µg/mL in methanol	1.2 mL
NEW ULM-8734-T-1.2	Tetrabromobisphenol A (TBBPA) (unlabeled)	50 µg/mL in toluene	1.2 mL
CLM-8006-1.2	Tetrachlorobisphenol A (ring- ¹³ C ₁₂ , 99%)	50 µg/mL in methanol	1.2 mL
ULM-7606-1.2	Tetrachlorobisphenol A (unlabeled)	50 µg/mL in methanol	1.2 mL

Hexabromocyclododecane (HBCD) Standards

Catalog No.	Compound	Concentration	Amount
CLM-7922-0.5	α-Hexabromocyclododecane (HBCD) (¹³ C ₁₂ , 99%)	50 µg/mL in toluene	0.5 mL
ULM-4834-1.2	α-Hexabromocyclododecane (HBCD) (unlabeled)	50 µg/mL in toluene	1.2 mL
CLM-7923-1.2	β-Hexabromocyclododecane (HBCD) (¹³ C ₁₂ , 99%)	50 µg/mL in toluene	1.2 mL
ULM-4835-1.2	β-Hexabromocyclododecane (HBCD) (unlabeled)	50 µg/mL in toluene	1.2 mL
CLM-7924-1.2	γ-Hexabromocyclododecane (HBCD) (¹³ C ₁₂ , 99%)	50 µg/mL in toluene	1.2 mL
ULM-4836-1.2	γ-Hexabromocyclododecane (HBCD) (unlabeled)	50 µg/mL in toluene	1.2 mL
CLM-7102-1.2	Hexabromocyclododecane (HBCD) (¹³ C ₁₂ , 99%) unequal mixture of α, β, and γ isomers	50 µg/mL in toluene	1.2 mL

Dechlorane Standards

Catalog No.	Compound	Concentration	Amount
NEW CLM-8569-1.2	Dechlorane Plus <i>syn</i> (bis-cyclopentene- ¹³ C ₁₀ , 99%)	100 µg/mL in nonane	1.2 mL
CLM-8569-T-1.2		100 µg/mL in toluene	1.2 mL
NEW ULM-7886-1.2	Dechlorane Plus <i>syn</i> (unlabeled)	100 µg/mL in nonane	1.2 mL
ULM-7886-T-1.2		100 µg/mL in toluene	1.2 mL
NEW CLM-8588-1.2	Dechlorane Plus <i>anti</i> (bis-cyclopentene- ¹³ C ₁₀ , 99%)	100 µg/mL in nonane	1.2 mL
CLM-8588-T-1.2		100 µg/mL in toluene	1.2 mL
NEW ULM-7887-1.2	Dechlorane Plus <i>anti</i> (unlabeled)	100 µg/mL in nonane	1.2 mL
ULM-7887-T-1.2		100 µg/mL in toluene	1.2 mL
ULM-7777-1.2	Dechlorane Plus Technical Product (unlabeled) mix of <i>syn/anti</i> isomers	100 µg/mL in nonane	1.2 mL
NEW CLM-9282-1.2	Dechlorane 602 (¹³ C ₁₀ , 99%)	100 µg/mL in nonane	1.2 mL
NEW ULM-9283-1.2	Dechlorane 602 (unlabeled)	100 µg/mL in nonane	1.2 mL
NEW ULM-9621-1.2	Dechlorane 603 (unlabeled)	100 µg/mL in nonane	1.2 mL
NEW ULM-9622-1.2	Dechlorane 604 (Component A) (unlabeled) CP >95%	100 µg/mL in nonane	1.2 mL

Polybrominated Biphenyl (PBB) Standards

Catalog No.	Compound	PBB	Concentration	Amount
EB-5055	3,3',4,4'-Tetrabromobiphenyl (¹³ C ₁₂ , 99%)	77	40 µg/mL in nonane	3 mL
PBB-77-CS	3,3',4,4'-Tetrabromobiphenyl Certified Standard (unlabeled)	77	100 µg/mL in isooctane	1.2 mL
EB-5056	3,3',4,4',5-Pentabromobiphenyl (¹³ C ₁₂ , 99%)	126	40 µg/mL in nonane	3 mL
PBB-126	3,3',4,4',5-Pentabromobiphenyl (unlabeled)	126	100 µg/mL in isooctane	1.2 mL
EB-5162	2,2',4,4',5,5'-Hexabromobiphenyl (¹³ C ₁₂ , 99%)	153	40 µg/mL in nonane	3 mL
PBB-153-CS	2,2',4,4',5,5'-Hexabromobiphenyl Certified Standard (unlabeled)	153	100 µg/mL in isooctane	1.2 mL
EB-5106	2,3,3',4,4',5'-Hexabromobiphenyl (¹³ C ₁₂ , 99%)	157	40 µg/mL in nonane	3 mL
PBB-157-CS	2,3,3',4,4',5'-Hexabromobiphenyl Certified Standard (unlabeled)	157	100 µg/mL in isooctane	1.2 mL
EB-5439	Decabromobiphenyl (¹³ C ₁₂ , 99%)	209	40 µg/mL in nonane	3 mL
PBB-209-CS	Decabromobiphenyl Certified Standard (unlabeled)	209	100 µg/mL in isooctane	1.2 mL

Other Flame-Retardant Standards

Catalog No.	Compound	Concentration	Amount
ULM-7375-2X1.2	1,2-Bis(pentabromophenyl) ethane (DBDPE) (unlabeled) CP 96%	25 µg/mL in toluene	2 × 1.2 mL
ULM-7595-1.2	1,2-Bis(2,4,6-tribromophenoxy) ethane (BTBPE) (unlabeled)	50 µg/mL in nonane	1.2 mL
NEW CLM-1921-1.2	Hexabromobenzene (¹³ C ₆ , 99%)	100 µg/mL in toluene	1.2 mL
NEW ULM-7607-1.2	Hexabromobenzene (unlabeled)	100 µg/mL in toluene	1.2 mL
NEW CLM-9535-1.2	Tris(2,4,6-tribromophenoxy)-1,3,5-triazine (TTBP-TAZ) (¹³ C ₁₈ , 99%)	50 µg/mL in dioxane	1.2 mL
NEW ULM-9506-1.2	Tris(2,4,6-tribromophenoxy)-1,3,5-triazine (TTBP-TAZ) (unlabeled)	50 µg/mL in dioxane	1.2 mL
NEW DLM-9945-1.2	TBB (2-ethylhexyl-2,3,4,5-tetrabromobenzoate) (D ₁₇ , 98%)	50 µg/mL in toluene	Inquire
NEW ULM-9944-1.2	TBB (2-ethylhexyl-2,3,4,5-tetrabromobenzoate) (unlabeled)	50 µg/mL in toluene	Inquire
NEW DLM-9947-1.2	TBPH (bis(2-ethylhexyl)tetrabromophthalate) (D ₃₄ , 98%)	50 µg/mL in toluene	Inquire
NEW ULM-9946-1.2	TBPH (bis(2-ethylhexyl)tetrabromophthalate) (unlabeled)	50 µg/mL in toluene	Inquire

Brominated Flame-Retardant (BFR) Standard Mixtures

Catalog No.	Compound	Amount
EO-5319-A	CDC BFR Calibration Standards [CS1-CS10]	Set of 10 × 0.5 mL in nonane
EO-5319-A-CS1	CDC BFR Calibration Standard [CS1]	0.5 mL in nonane
EO-5319-A-CS2	CDC BFR Calibration Standard [CS2]	0.5 mL in nonane
EO-5319-A-CS3	CDC BFR Calibration Standard [CS3]	0.5 mL in nonane
EO-5319-A-CS4	CDC BFR Calibration Standard [CS4]	0.5 mL in nonane
EO-5319-A-CS5	CDC BFR Calibration Standard [CS5]	0.5 mL in nonane
EO-5319-A-CS6	CDC BFR Calibration Standard [CS6]	0.5 mL in nonane
EO-5319-A-CS7	CDC BFR Calibration Standard [CS7]	0.5 mL in nonane
EO-5319-A-CS8	CDC BFR Calibration Standard [CS8]	0.5 mL in nonane
EO-5319-A-CS9	CDC BFR Calibration Standard [CS9]	0.5 mL in nonane
EO-5319-A-CS10	CDC BFR Calibration Standard [CS10]	0.5 mL in nonane

All concentrations are in ng/mL (ppb)

Unlabeled	Congener	CS1	CS2	CS3	CS4	CS5	CS6	CS7	CS8	CS9	CS10
2,2',4'-TriBDE	17	0.2	0.5	1	5	10	50	100	500	1000	2000
2,4,4'-TriBDE	28	0.2	0.5	1	5	10	50	100	500	1000	2000
2,2',4,4'-TetraBDE	47	0.2	0.5	1	5	10	50	100	500	1000	2000
2,3',4,4'-TetraBDE	66	0.2	0.5	1	5	10	50	100	500	1000	2000
2,2',4,4',6-PentaBDE	100	0.2	0.5	1	5	10	50	100	500	1000	2000
2,2',4,4',5-PentaBDE	99	0.2	0.5	1	5	10	50	100	500	1000	2000
2,2',3,4,4'-PentaBDE	85	0.2	0.5	1	5	10	50	100	500	1000	2000
2,2',4,4',5,6'-HexaBDE	154	0.2	0.5	1	5	10	50	100	500	1000	2000
2,2',4,4',5,5'-HexaBDE	153	0.2	0.5	1	5	10	50	100	500	1000	2000
2,2',3,4,4',5',6-HeptaBDE	183	0.2	0.5	1	5	10	50	100	500	1000	2000
2,2',3,3',4,4',5,6'-OctaBDE	196	0.2	0.5	1	5	10	50	100	500	1000	2000
2,2',3,3',4,4',6,6'-OctaBDE	197	0.2	0.5	1	5	10	50	100	500	1000	2000
2,2',3,4,4',5,5',6-OctaBDE	203	0.2	0.5	1	5	10	50	100	500	1000	2000
2,2',3,3',4,4',5,5',6-NonaBDE	206	0.2	0.5	1	5	10	50	100	500	1000	2000
2,2',3,3',4,4',5,6,6'-NonaBDE	207	0.2	0.5	1	5	10	50	100	500	1000	2000
2,2',3,3',4,5,5',6,6'-NonaBDE	208	0.2	0.5	1	5	10	50	100	500	1000	2000
DecaBDE	209	0.2	0.5	1	5	10	50	100	500	1000	2000
2,2',4,4',5,5'-HexaBB	PBB-153	0.2	0.5	1	5	10	50	100	500	1000	2000
Hexabromobenzene		0.2	0.5	1	5	10	50	100	500	1000	2000
1,2-Bis(pentabromophenyl) ethane		0.2	0.5	1	5	10	50	100	500	1000	2000
1,2-Bis(2,4,6-tribromophenoxy) ethane		0.2	0.5	1	5	10	50	100	500	1000	2000
γ-Hexabromobenzene		0.2	0.5	1	5	10	50	100	500	1000	2000
Labeled											
1,2,3,4-TetraCDD (¹³ C ₆ , 99%)		25	25	25	25	25	25	25	25	25	25
2,2',3,3',4,5,5',6,6'-NonaCB (¹³ C ₁₂ , 99%)	208	100	100	100	100	100	100	100	100	100	100
2,4,4'-TriBDE (¹³ C ₁₂ , 99%)	28	75	75	75	75	75	75	75	75	75	75
2,2',4,4'-TetraBDE (¹³ C ₁₂ , 99%)	47	75	75	75	75	75	75	75	75	75	75
3,3',4,4'-TetraBDE (¹³ C ₁₂ , 99%)	77	75	75	75	75	75	75	75	75	75	75
2,2',4,4',6-PentaBDE (¹³ C ₁₂ , 99%)	100	75	75	75	75	75	75	75	75	75	75
2,2',4,4',5-PentaBDE (¹³ C ₁₂ , 99%)	99	75	75	75	75	75	75	75	75	75	75
2,2',4,4',5,6'-HexaBDE (¹³ C ₁₂ , 99%)	154	75	75	75	75	75	75	75	75	75	75
2,2',4,4',5,5'-HexaBDE (¹³ C ₁₂ , 99%)	153	75	75	75	75	75	75	75	75	75	75
2,2',3,4,4',6-HexaBDE (¹³ C ₁₂ , 99%)	139	75	75	75	75	75	75	75	75	75	75
2,2',3,4,4',5',6-HeptaBDE (¹³ C ₁₂ , 99%)	183	75	75	75	75	75	75	75	75	75	75
2,2',3,3',4,4',6,6'-OctaBDE (¹³ C ₁₂ , 99%)	197	75	75	75	75	75	75	75	75	75	75
2,2',3,4,4',5,5',6-OctaBDE (¹³ C ₁₂ , 99%)	203	75	75	75	75	75	75	75	75	75	75
2,2',3,3',4,4',5,5',6-NonaBDE (¹³ C ₁₂ , 99%)	206	75	75	75	75	75	75	75	75	75	75
2,2',3,3',4,4',5,6,6'-NonaBDE (¹³ C ₁₂ , 99%)	207	75	75	75	75	75	75	75	75	75	75
2,2',3,3',4,5,5',6,6'-NonaBDE (¹³ C ₁₂ , 99%)	208	75	75	75	75	75	75	75	75	75	75
DecaBDE (¹³ C ₁₂ , 99%)	209	500	500	500	500	500	500	500	500	500	500
2,2',4,4',5,5'-HexaBB (¹³ C ₁₂ , 99%)	PBB-153	75	75	75	75	75	75	75	75	75	75
Hexabromobenzene (¹³ C ₆ , 99%)		75	75	75	75	75	75	75	75	75	75
1,2-Bis(pentabromophenyl) ethane (¹³ C ₁₄ , 99%)		75	75	75	75	75	75	75	75	75	75
1,2-Bis(2,4,6-tribromophenoxy) ethane (¹³ C ₁₂ , 99%)		75	75	75	75	75	75	75	75	75	75
γ-Hexabromocyclododecane (¹³ C ₁₂ , 99%)		75	75	75	75	75	75	75	75	75	75

Brominated Flame-Retardant (BFR) Standard Mixtures

Catalog No.	Compound	Amount
EO-5320-A	CDC BFR Spiking Standard	10 mL in methanol
EO-5320-200X-1.2	CDC BFR Spiking Standard	1.2 mL in nonane/toluene

Labeled	Congener	EC-5320-A (ng/mL)	EO-5320-200X-1.2 (ng/mL)
2,4,4'-TriBDE (¹³ C ₁₂ , 99%)	28	7.5	1500
2,2',4,4'-TetraBDE (¹³ C ₁₂ , 99%)	47	7.5	1500
2,2',4,4',6-PentaBDE (¹³ C ₁₂ , 99%)	100	7.5	1500
2,2',4,4',5-PentaBDE (¹³ C ₁₂ , 99%)	99	7.5	1500
2,2',4,4',5,6'-HexaBDE (¹³ C ₁₂ , 99%)	154	7.5	1500
2,2',4,4',5,5'-HexaBDE (¹³ C ₁₂ , 99%)	153	7.5	1500
2,2',3,4,4',5',6-HeptaBDE (¹³ C ₁₂ , 99%)	183	7.5	1500
2,2',3,3',4,4',6,6'-OctaBDE (¹³ C ₁₂ , 99%)	197	7.5	1500
2,2',3,4,4',5,5',6-OctaBDE (¹³ C ₁₂ , 99%)	203	7.5	1500
2,2',3,3',4,4',5,5',6-NonaBDE (¹³ C ₁₂ , 99%)	206	7.5	1500
2,2',3,3',4,4',5,6,6'-NonaBDE (¹³ C ₁₂ , 99%)	207	7.5	1500
2,2',3,3',4,5,5',6,6'-NonaBDE (¹³ C ₁₂ , 99%)	208	7.5	1500
DecaBDE (¹³ C ₁₂ , 99%)	209	50	10,000
2,2',4,4',5,5'-HexaBB (¹³ C ₁₂ , 99%)	PBB-153	7.5	1500
Hexabromobenzene (¹³ C ₆ , 99%)		7.5	1500
1,2-Bis(pentabromophenyl) ethane (¹³ C ₁₄ , 99%)		7.5	1500
1,2-Bis(2,4,6-tribromophenoxy) ethane (¹³ C ₁₂ , 99%)		7.5	1500
γ-Hexabromocyclododecane (¹³ C ₁₂ , 99%)		7.5	1500

EO-5169	BFR Recovery Spiking Solution	10 mL in 88% hexane/ 2% dodecane/10% nonane
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Labeled	Congener	(ng/mL)
1,2,3,4-TetraCDD (¹³ C ₆ , 99%)		2.5
3,3',4,4'-TetraBDE (¹³ C ₁₂ , 99%)	77	7.5
2,2',3,4,4',6-HexaBDE (¹³ C ₁₂ , 99%)	139	7.5
2,2',3,3',4,5,5',6,6'-NonaCB (¹³ C ₁₂ , 99%)	208	10

Phosphorus Flame-Retardant (PFR) Standards

	Catalog No.	Compound	Concentration	Amount
NEW	ULM-9693-1.2	Resorcinol <i>bis</i> (diphenyl phosphate) (unlabeled)	100 µg/mL in toluene	1.2 mL
NEW	DLM-8074-1.2	Triethyl phosphate (D ₁₅ , 98%)	1 mg/mL in acetonitrile	1.2 mL
NEW	ULM-9032-1.2	Triethyl phosphate (unlabeled)	1 mg/mL in acetonitrile	1.2 mL
NEW	DLM-8901-1.2	Tripropyl phosphate (D ₂₁ , 98%)	1 mg/mL in acetonitrile	1.2 mL
NEW	ULM-9090-1.2	Tripropyl phosphate (unlabeled)	1 mg/mL in acetonitrile	1.2 mL
NEW	DLM-3940-1.2	Tributyl phosphate (D ₂₇ , 98%)	1 mg/mL in acetonitrile	1.2 mL
NEW	ULM-9033-1.2	Tributyl phosphate (unlabeled)	1 mg/mL in acetonitrile	1.2 mL
NEW	DLM-9070-1.2	Triphenyl phosphate (D ₁₅ , 98%)	1 mg/mL in acetonitrile	1.2 mL
NEW	ULM-9091-1.2	Triphenyl phosphate (unlabeled)	1 mg/mL in acetonitrile	1.2 mL
NEW	DLM-9313-1.2	Tris(2-chloroethyl) phosphate (D ₁₂ , 98%)	100 µg/mL in acetonitrile	1.2 mL
NEW	ULM-9314-1.2	Tris(2-chloroethyl) phosphate (unlabeled)	100 µg/mL in acetonitrile	1.2 mL
NEW	DLM-9317-1.2	Tris(2-chloroisopropyl) phosphate (D ₁₈ , 98%)	100 µg/mL in acetonitrile	1.2 mL
NEW	ULM-9318-1.2	Tris(2-chloroisopropyl) phosphate (unlabeled)	100 µg/mL in acetonitrile	1.2 mL
NEW	DLM-9315-1.2	Tris(1,3-dichloro-2-propyl) phosphate (D ₁₅ , 98%)	100 µg/mL in acetonitrile	1.2 mL
NEW	ULM-9316-1.2	Tris(1,3-dichloro-2-propyl) phosphate (unlabeled)	100 µg/mL in acetonitrile	1.2 mL

Phosphorus Flame-Retardant PFR Standard Mixtures

NEW	ES-5529	Phosphorus Flame-Retardant Standard Mixture (D, 98%)	1.2 mL in acetonitrile
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Labeled	(µg/mL)
Tris(2-chloroethyl) phosphate (D ₁₂ , 98%)	10
Tris(2-chloroisopropyl) phosphate (D ₁₈ , 98%)	10
Tris(1,3-dichloro-2-propyl) phosphate (D ₁₅ , 98%)	10
Triethyl phosphate (D ₁₅ , 98%)	10
Tripropyl phosphate (D ₂₁ , 98%)	10
Tributyl phosphate (D ₂₇ , 98%)	10
Triphenyl phosphate (D ₁₅ , 98%)	10

NEW	ES-5530	Phosphorus Flame-Retardant Standard Mixture	1.2 mL in acetonitrile
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Unlabeled	(µg/mL)
Tris(2-chloroethyl) phosphate	10
Tris(2-chloroisopropyl) phosphate	10
Tris(1,3-dichloro-2-propyl) phosphate	10
Triethyl phosphate	10
Tripropyl phosphate	10
Tributyl phosphate	10
Triphenyl phosphate	10

