

# PBDEs & PBBs: POLYBROMINATED DIPHENYL ETHERS (PBDES) & POLYBROMINATED BIPHENYLS (PBBs)

This section is devoted to polybrominated diphenyl ethers (PBDEs) and polybrominated biphenyls (PBBs) and contains the PBDE calibration solutions listed below:

BFR-CVS calibration set and support solutions  
BDE-CVS-F calibration set and support solutions  
BDE-CVS-G calibration set and support solutions

Also included in this section are individual native and mass-labelled PBDEs and PBBs as well as selected technical mixtures and individual PBDE metabolites:

Native and mass-labelled PBDEs  
Mass-labelled hydroxy-PBDEs  
Native and mass-labelled methoxy-PBDEs  
Native and mass-labelled PBBs

**AGENTE ESCLUSIVO**



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# BFR-CVS

Catalogue Number	Product (toluene solution)	Qty/Conc				
<b>BFR-CVS</b>	Polybrominated Diphenyl Ethers/Brominated Flame Retardants	1 kit				
	Calibration Solutions CS1-CS5	(5 ampoules)				
<b>BFR-CS1, BFR-CS2, BFR-CS3, BFR-CS4, BFR-CS5</b>	Individual Calibration Solutions	200 µl each				
		BFR-CS1 (ng/ml)	BFR-CS2 (ng/ml)	BFR-CS3 (ng/ml)	BFR-CS4 (ng/ml)	BFR-CS5 (ng/ml)
<b>NATIVE PBDEs/BFRs</b>						
2-Bromodiphenyl ether	BDE-1	0.25	1.0	5.0	20	100
3-Bromodiphenyl ether	BDE-2	0.25	1.0	5.0	20	100
4-Bromodiphenyl ether	BDE-3	0.25	1.0	5.0	20	100
2,4-Dibromodiphenyl ether	BDE-7	0.25	1.0	5.0	20	100
2,6-Dibromodiphenyl ether	BDE-10	0.25	1.0	5.0	20	100
4,4'-Dibromodiphenyl ether	BDE-15	0.25	1.0	5.0	20	100
2,2',4-Tribromodiphenyl ether	BDE-17 (>96%)	0.24	0.96	4.8	19	96
2,4,4'-Tribromodiphenyl ether	BDE-28	0.25	1.0	5.0	20	100
2,4,6-Tribromodiphenyl ether	BDE-30	0.25	1.0	5.0	20	100
Pentabromoethylbenzene	PBEB	0.25	1.0	5.0	20	100
Hexabromobenzene	HBZ	0.25	1.0	5.0	20	100
2,2',4,4'-Tetrabromodiphenyl ether	BDE-47	0.5	2.0	10	40	200
2,2',4,5'-Tetrabromodiphenyl ether	BDE-49	0.5	2.0	10	40	200
2,3',4,4'-Tetrabromodiphenyl ether	BDE-66	0.5	2.0	10	40	200
2,3',4',6-Tetrabromodiphenyl ether	BDE-71	0.5	2.0	10	40	200
3,3',4,4'-Tetrabromodiphenyl ether	BDE-77	0.5	2.0	10	40	200
2,2',3,4,4'-Pentabromodiphenyl ether	BDE-85	0.5	2.0	10	40	200
2,2',4,4',5-Pentabromodiphenyl ether	BDE-99	0.5	2.0	10	40	200
2,2',4,4',6-Pentabromodiphenyl ether	BDE-100	0.5	2.0	10	40	200
2,3',4,4',6-Pentabromodiphenyl ether	BDE-119	0.5	2.0	10	40	200
3,3',4,4',5-Pentabromodiphenyl ether	BDE-126	0.5	2.0	10	40	200
2,2',3,4,4',5'-Hexabromodiphenyl ether	BDE-138	0.5	2.0	10	40	200
2,2',3,4,4',6-Hexabromodiphenyl ether	BDE-139	0.5	2.0	10	40	200
2,2',3,4,4',6'-Hexabromodiphenyl ether	BDE-140	0.5	2.0	10	40	200
2,2',4,4',5,5'-Hexabromodiphenyl ether	BDE-153	0.5	2.0	10	40	200
2,2',4,4',5,6'-Hexabromodiphenyl ether	BDE-154	0.5	2.0	10	40	200
2,3,3',4,4',5-Hexabromodiphenyl ether	BDE-156	0.5	2.0	10	40	200
3,3',4,4',5,5'-Hexabromodiphenyl ether	BDE-169	0.5	2.0	10	40	200
2,2',4,4',5,5'-Hexabromobiphenyl	BB-153	0.5	2.0	10	40	200
1,2-Bis(2,4,6-tribromophenoxy)ethane	BTBPE	0.5	2.0	10	40	200
2,2',3,3',4,4',6-Heptabromodiphenyl ether	BDE-171	1.0	4.0	20	80	400
2,2',3,4,4',5,5'-Heptabromodiphenyl ether	BDE-180	1.0	4.0	20	80	400
2,2',3,4,4',5',6-Heptabromodiphenyl ether	BDE-183	1.0	4.0	20	80	400
2,2',3,4,4',6,6'-Heptabromodiphenyl ether	BDE-184	1.0	4.0	20	80	400
2,3,3',4,4',5',6-Heptabromodiphenyl ether	BDE-191	1.0	4.0	20	80	400
2,2',3,3',4,4',5,6'-Octabromodiphenyl ether	BDE-196	1.0	4.0	20	80	400
2,2',3,3',4,4',6,6'-Octabromodiphenyl ether	BDE-197	1.0	4.0	20	80	400
2,2',3,3',4,4',5,6,6'-Octabromodiphenyl ether	BDE-201	1.0	4.0	20	80	400
2,2',3,4,4',5,5',6-Octabromodiphenyl ether	BDE-203	1.0	4.0	20	80	400
2,2',3,4,4',5,6,6'-Octabromodiphenyl ether	BDE-204	1.0	4.0	20	80	400
2,3,3',4,4',5,5',6-Octabromodiphenyl ether	BDE-205	1.0	4.0	20	80	400
2,2',3,3',4,4',5,5',6-Nonabromodiphenyl ether	BDE-206	2.5	10	50	200	1000
2,2',3,3',4,4',5,6,6'-Nonabromodiphenyl ether	BDE-207	2.5	10	50	200	1000
2,2',3,3',4,4',5,5',6,6'-Nonabromodiphenyl ether	BDE-208	2.5	10	50	200	1000
Decabromodiphenyl ether	BDE-209	2.5	10	50	200	1000
Decabromodiphenylethane	DBDPE	5.0	20	100	400	2000
<b>BFR-LCS</b>						
4-Bromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	MBDE-3	25	25	25	25	25
4,4'-Dibromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	MBDE-15	25	25	25	25	25
2,4,4'-Tribromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	MBDE-28	25	25	25	25	25
Hexabromo[ <sup>13</sup> C <sub>12</sub> ]benzene	MHBBZ	25	25	25	25	25
2,2',4,4'-Tetrabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	MBDE-47	50	50	50	50	50
3,3',4,4'-Tetrabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	MBDE-77	50	50	50	50	50
2,2',4,4',5-Pentabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	MBDE-99	50	50	50	50	50
2,2',4,4',6-Pentabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	MBDE-100	50	50	50	50	50
3,3',4,4',5-Pentabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	MBDE-126	50	50	50	50	50
2,2',4,4',5,5'-Hexabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	MBDE-153	50	50	50	50	50
2,2',4,4',5,6'-Hexabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	MBDE-154	50	50	50	50	50
3,3',4,4',5,5'-Hexabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	MBDE-169	50	50	50	50	50
2,2',4,4',5,5'-Hexabromo[ <sup>13</sup> C <sub>12</sub> ]biphenyl	MBB-153	50	50	50	50	50
1,2-Bis(2,4,6-tribromo[ <sup>13</sup> C <sub>12</sub> ]phenoxy)ethane	MBTBPE	50	50	50	50	50
2,2',3,4,4',5',6-Heptabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	MBDE-183	100	100	100	100	100
2,2',3,3',4,4',6,6'-Octabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	MBDE-197	100	100	100	100	100
2,3,3',4,4',5,5',6-Octabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	MBDE-205	100	100	100	100	100
2,2',3,3',4,4',5,6,6'-Nonabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	MBDE-207	250	250	250	250	250
Decabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	MBDE-209	250	250	250	250	250
Decabromo[ <sup>13</sup> C <sub>12</sub> ]diphenylethane	MDBDPE	500	500	500	500	500
<b>BFR-ISS</b>						
3,3',4,5'-Tetrabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	MBDE-79	50	50	50	50	50
2,2',3,4,4',6-Hexabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	MBDE-139	50	50	50	50	50
2,2',3,4,4',5,5'-Heptabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	MBDE-180	100	100	100	100	100
2,2',3,3',4,4',5,5',6-Nonabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	MBDE-206	250	250	250	250	250
<b>BFR-SCS</b>						
2,2',3,4,4',5'-Hexabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	MBDE-138	50	50	50	50	50

Catalogue Number	Product (toluene solution)	Qty/Conc			
<b>BFR-LCS</b>	Labelled Compounds Stock Solution	1.2 ml			
<b>BFR-ISS</b>	Internal/Injection Standards	1.2 ml			
<b>BFR-SCS</b>	Sampling/Cleanup Standard	1.2 ml			
<b>BFR-PAR</b>	Native Compounds Stock Solution (nonane/toluene solution)	1.2 ml			
		BFR-LCS (ng/ml)	BFR-ISS (ng/ml)	BFR-SCS (ng/ml)	BFR-PAR (ng/ml)
<b>NATIVE PBDEs/BFRs</b>					
2-Bromodiphenyl ether	BDE-1	—	—	—	200
3-Bromodiphenyl ether	BDE-2	—	—	—	200
4-Bromodiphenyl ether	BDE-3	—	—	—	200
2,4-Dibromodiphenyl ether	BDE-7	—	—	—	200
2,6-Dibromodiphenyl ether	BDE-10	—	—	—	200
4,4'-Dibromodiphenyl ether	BDE-15	—	—	—	200
2,2',4-Tribromodiphenyl ether	BDE-17 (>96%)	—	—	—	192
2,4,4'-Tribromodiphenyl ether	BDE-28	—	—	—	200
2,4,6-Tribromodiphenyl ether	BDE-30	—	—	—	200
Pentabromoethylbenzene	PBEB	—	—	—	200
Hexabromobenzene	HBBZ	—	—	—	200
2,2',4,4'-Tetrabromodiphenyl ether	BDE-47	—	—	—	400
2,2',4,5'-Tetrabromodiphenyl ether	BDE-49	—	—	—	400
2,3',4,4'-Tetrabromodiphenyl ether	BDE-66	—	—	—	400
2,3',4',6-Tetrabromodiphenyl ether	BDE-71	—	—	—	400
3,3',4,4'-Tetrabromodiphenyl ether	BDE-77	—	—	—	400
2,2',3,4,4'-Pentabromodiphenyl ether	BDE-85	—	—	—	400
2,2',4,4',5-Pentabromodiphenyl ether	BDE-99	—	—	—	400
2,2',4,4',6-Pentabromodiphenyl ether	BDE-100	—	—	—	400
2,3',4,4',6-Pentabromodiphenyl ether	BDE-119	—	—	—	400
3,3',4,4',5-Pentabromodiphenyl ether	BDE-126	—	—	—	400
2,2',3,4,4',5'-Hexabromodiphenyl ether	BDE-138	—	—	—	400
2,2',3,4,4',6-Hexabromodiphenyl ether	BDE-139	—	—	—	400
2,2',3,4,4',6'-Hexabromodiphenyl ether	BDE-140	—	—	—	400
2,2',4,4',5,5'-Hexabromodiphenyl ether	BDE-153	—	—	—	400
2,2',4,4',5,6'-Hexabromodiphenyl ether	BDE-154	—	—	—	400
2,3,3',4,4',5-Hexabromodiphenyl ether	BDE-156	—	—	—	400
3,3',4,4',5,5'-Hexabromodiphenyl ether	BDE-169	—	—	—	400
2,2',4,4',5,5'-Hexabromobiphenyl	BB-153	—	—	—	400
1,2-Bis(2,4,6-tribromophenoxy)ethane	BTBPE	—	—	—	400
2,2',3,3',4,4',6-Heptabromodiphenyl ether	BDE-171	—	—	—	800
2,2',3,4,4',5,5'-Heptabromodiphenyl ether	BDE-180	—	—	—	800
2,2',3,4,4',5',6-Heptabromodiphenyl ether	BDE-183	—	—	—	800
2,2',3,4,4',6,6'-Heptabromodiphenyl ether	BDE-184	—	—	—	800
2,3,3',4,4',5',6-Heptabromodiphenyl ether	BDE-191	—	—	—	800
2,2',3,3',4,4',5,6'-Octabromodiphenyl ether	BDE-196	—	—	—	800
2,2',3,3',4,4',6,6'-Octabromodiphenyl ether	BDE-197	—	—	—	800
2,2',3,3',4,5',6,6'-Octabromodiphenyl ether	BDE-201	—	—	—	800
2,2',3,4,4',5,5',6-Octabromodiphenyl ether	BDE-203	—	—	—	800
2,2',3,4,4',5,6,6'-Octabromodiphenyl ether	BDE-204	—	—	—	800
2,3,3',4,4',5,5',6-Octabromodiphenyl ether	BDE-205	—	—	—	800
2,2',3,3',4,4',5,5',6-Nonabromodiphenyl ether	BDE-206	—	—	—	2000
2,2',3,3',4,4',5,6,6'-Nonabromodiphenyl ether	BDE-207	—	—	—	2000
2,2',3,3',4,5,5',6,6'-Nonabromodiphenyl ether	BDE-208	—	—	—	2000
Decabromodiphenyl ether	BDE-209	—	—	—	2000
Decabromodiphenylethane	DBDPE	—	—	—	4000
<b>BFR-LCS</b>					
4-Bromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	MBDE-3	100	—	—	—
4,4'-Dibromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	MBDE-15	100	—	—	—
2,4,4'-Tribromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	MBDE-28	100	—	—	—
Hexabromo[ <sup>13</sup> C <sub>12</sub> ]benzene	MHBBZ	100	—	—	—
2,2',4,4'-Tetrabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	MBDE-47	200	—	—	—
3,3',4,4'-Tetrabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	MBDE-77	200	—	—	—
2,2',4,4',5-Pentabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	MBDE-99	200	—	—	—
2,2',4,4',6-Pentabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	MBDE-100	200	—	—	—
3,3',4,4',5-Pentabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	MBDE-126	200	—	—	—
2,2',4,4',5,5'-Hexabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	MBDE-153	200	—	—	—
2,2',4,4',5,6'-Hexabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	MBDE-154	200	—	—	—
3,3',4,4',5,5'-Hexabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	MBDE-169	200	—	—	—
2,2',4,4',5,5'-Hexabromo[ <sup>13</sup> C <sub>12</sub> ]biphenyl	MBB-153	200	—	—	—
1,2-Bis(2,4,6-tribromo[ <sup>13</sup> C <sub>12</sub> ]phenoxy)ethane	MBTBPPE	200	—	—	—
2,2',3,4,4',5',6-Heptabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	MBDE-183	400	—	—	—
2,2',3,3',4,4',6,6'-Octabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	MBDE-197	400	—	—	—
2,3,3',4,4',5,5',6-Octabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	MBDE-205	400	—	—	—
2,2',3,3',4,4',5,6,6'-Nonabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	MBDE-207	1000	—	—	—
Decabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	MBDE-209	1000	—	—	—
Decabromo[ <sup>13</sup> C <sub>12</sub> ]diphenylethane	MDBDPE	2000	—	—	—
<b>BFR-ISS</b>					
3,3',4,5'-Tetrabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	MBDE-79	—	200	—	—
2,2',3,4,4',6-Hexabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	MBDE-139	—	200	—	—
2,2',3,4,4',5,5'-Heptabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	MBDE-180	—	400	—	—
2,2',3,3',4,4',5,5',6-Nonabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	MBDE-206	—	1000	—	—
<b>BFR-SCS</b>					
2,2',3,4,4',5'-Hexabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	MBDE-138	—	—	400	—

## BDE-CVS-F

Catalogue Number	Product (toluene solution)	Qty/Conc
<b>BDE-CVS-F</b>	BDE-CVS-F Calibration Solutions CS1-CS5	1 kit (5 ampoules)
<b>BDE-CS1-F</b>	CS1	200 µl
<b>BDE-CS2-F</b>	CS2	200 µl
<b>BDE-CS3-F</b>	CS3	200 µl
<b>BDE-CS4-F</b>	CS4	200 µl
<b>BDE-CS5-F</b>	CS5	200 µl

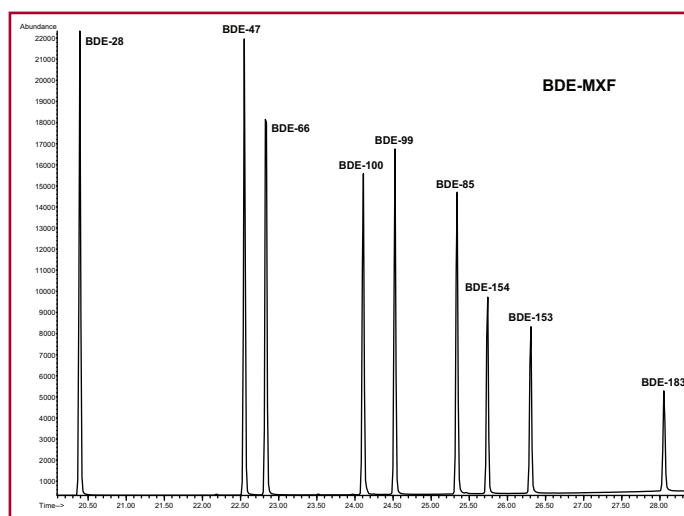
NATIVE PBDE CONGENERS	IUPAC	BDE- CS1-F (ng/ml)	BDE- CS2-F (ng/ml)	BDE- CS3-F (ng/ml)	BDE- CS4-F (ng/ml)	BDE- CS5-F (ng/ml)
2,4,4'-Tribromodiphenyl ether	28	1.0	5.0	25	100	500
2,2',4,4'-Tetrabromodiphenyl ether	47	1.0	5.0	25	100	500
2,3',4,4'-Tetrabromodiphenyl ether	66	1.0	5.0	25	100	500
2,2',3,4,4'-Pentabromodiphenyl ether	85	1.0	5.0	25	100	500
2,2',4,4',5-Pentabromodiphenyl ether	99	1.0	5.0	25	100	500
2,2',4,4',6-Pentabromodiphenyl ether	100	1.0	5.0	25	100	500
2,2',4,4',5,5'-Hexabromodiphenyl ether	153	1.0	5.0	25	100	500
2,2',4,4',5,6'-Hexabromodiphenyl ether	154	1.0	5.0	25	100	500
2,2',3,4,4',5,6'-Heptabromodiphenyl ether	183	1.0	5.0	25	100	500

MASS-LABELLED PBDE SURROGATE STANDARDS	IUPAC	BDE- CS1-F (ng/ml)	BDE- CS2-F (ng/ml)	BDE- CS3-F (ng/ml)	BDE- CS4-F (ng/ml)	BDE- CS5-F (ng/ml)
2,4,4'-Tribromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	28L	20	20	20	20	20
2,2',4,4'-Tetrabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	47L	20	20	20	20	20
2,2',4,4',5-Pentabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	99L	20	20	20	20	20
2,2',4,4',6-Pentabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	100L	20	20	20	20	20
2,2',4,4',5,5'-Hexabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	153L	20	20	20	20	20
2,2',4,4',5,6'-Hexabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	154L	20	20	20	20	20
2,2',3,4,4',5,6'-Heptabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	183L	20	20	20	20	20

MASS-LABELLED PBDE RECOVERY STANDARDS	IUPAC	BDE- CS1-F (ng/ml)	BDE- CS2-F (ng/ml)	BDE- CS3-F (ng/ml)	BDE- CS4-F (ng/ml)	BDE- CS5-F (ng/ml)
3,3',4,4'-Tetrabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	77L	20	20	20	20	20
2,2',3,4,4',5'-Hexabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	138L	20	20	20	20	20



BDE-MXF; HRGC/LRMS TIC Chromatogram

Catalogue Number	Product (toluene solution)	Qty/Conc
<b>MBDE-MXFS</b>	Mass-Labelled PBDE Surrogate Stock	1.2 ml
<b>MBDE-MXFR</b>	Mass-Labelled PBDE Recovery Stock	1.2 ml
<b>BDE-MXF</b>	Native PBDE Stock	1.2 ml

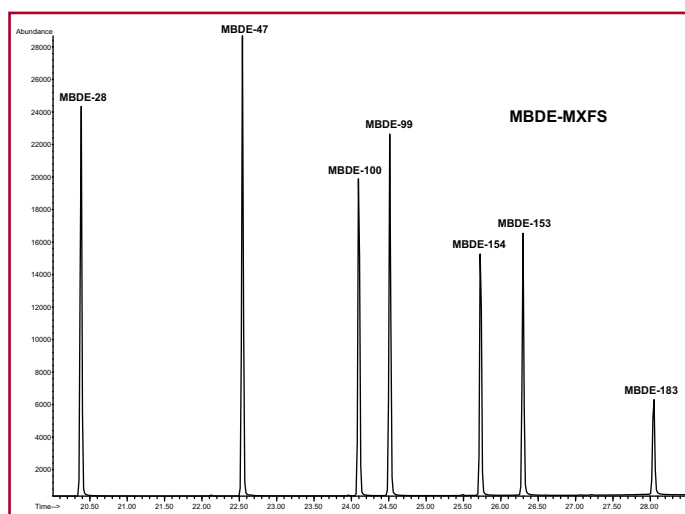
NATIVE PBDE CONGENERS	IUPAC	MBDE-MXFS (ng/ml)	MBDE-MXFR (ng/ml)	BDE-MXF (ng/ml)
2,4,4'-Tribromodiphenyl ether	28	—	—	2000
2,2',4,4'-Tetrabromodiphenyl ether	47	—	—	2000
2,3',4,4'-Tetrabromodiphenyl ether	66	—	—	2000
2,2',3,4,4'-Pentabromodiphenyl ether	85	—	—	2000
2,2',4,4',5-Pentabromodiphenyl ether	99	—	—	2000
2,2',4,4',6-Pentabromodiphenyl ether	100	—	—	2000
2,2',4,4',5,5'-Hexabromodiphenyl ether	153	—	—	2000
2,2',4,4',5,6'-Hexabromodiphenyl ether	154	—	—	2000
2,2',3,4,4',5',6-Heptabromodiphenyl ether	183	—	—	2000

**MASS-LABELLED PBDE SURROGATE STANDARDS**

2,4,4'-Tribromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	28L	2000	—	—
2,2',4,4'-Tetrabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	47L	2000	—	—
2,2',4,4',5-Pentabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	99L	2000	—	—
2,2',4,4',6-Pentabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	100L	2000	—	—
2,2',4,4',5,5'-Hexabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	153L	2000	—	—
2,2',4,4',5,6'-Hexabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	154L	2000	—	—
2,2',3,4,4',5',6-Heptabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	183L	2000	—	—

**MASS-LABELLED PBDE RECOVERY STANDARDS**

3,3',4,4'-Tetrabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	77L	—	2000	—
2,2',3,4,4',5'-Hexabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	138L	—	2000	—



MBDE-MXFS; HRGC/LRMS TIC Chromatogram



## BDE-CVS-G

Catalogue Number	Product (nonane/toluene solution)	Qty/Conc
<b>BDE-CVS-G</b>	BDE-CVS-G Calibration Solutions CS1-CS5	1 kit (5 ampoules)
<b>BDE-CS1-G</b>	CS1	200 µl
<b>BDE-CS2-G</b>	CS2	200 µl
<b>BDE-CS3-G</b>	CS3	200 µl
<b>BDE-CS4-G</b>	CS4	200 µl
<b>BDE-CS5-G</b>	CS5	200 µl

**NOTE:** This set of calibration solutions were designed to be used with BDE-MXE as the native PBDE stock solution.

NATIVE PBDE CONGENERS	IUPAC	BDE- CS1-G (ng/ml)	BDE- CS2-G (ng/ml)	BDE- CS3-G (ng/ml)	BDE- CS4-G (ng/ml)	BDE- CS5-G (ng/ml)
4-Bromodiphenyl ether	3	1.0	5.0	20	100	400
2,4-Dibromodiphenyl ether	7	1.0	5.0	20	100	400
4,4'-Dibromodiphenyl ether	15	1.0	5.0	20	100	400
2,2',4-Tribromodiphenyl ether (>96%)	17	0.96	4.8	19.2	96	384
2,4,4'-Tribromodiphenyl ether	28	1.0	5.0	20	100	400
2,2',4,4'-Tetrabromodiphenyl ether	47	1.0	5.0	20	100	400
2,2',4,5'-Tetrabromodiphenyl ether	49	1.0	5.0	20	100	400
2,3',4,4'-Tetrabromodiphenyl ether	66	1.0	5.0	20	100	400
2,3',4',6-Tetrabromodiphenyl ether	71	1.0	5.0	20	100	400
3,3',4,4'-Tetrabromodiphenyl ether	77	1.0	5.0	20	100	400
2,2',3,4,4'-Pentabromodiphenyl ether	85	1.0	5.0	20	100	400
2,2',4,4',5-Pentabromodiphenyl ether	99	1.0	5.0	20	100	400
2,2',4,4',6-Pentabromodiphenyl ether	100	1.0	5.0	20	100	400
2,3',4,4',6-Pentabromodiphenyl ether	119	1.0	5.0	20	100	400
3,3',4,4',5-Pentabromodiphenyl ether	126	1.0	5.0	20	100	400
2,2',3,4,4',5'-Hexabromodiphenyl ether	138	2.0	10	40	200	800
2,2',4,4',5,5'-Hexabromodiphenyl ether	153	2.0	10	40	200	800
2,2',4,4',5,6'-Hexabromodiphenyl ether	154	2.0	10	40	200	800
2,3',3',4,4',5-Hexabromodiphenyl ether	156	2.0	10	40	200	800
2,2',3,4,4',5,6'-Heptabromodiphenyl ether	183	2.0	10	40	200	800
2,2',3,4,4',6,6'-Heptabromodiphenyl ether	184	2.0	10	40	200	800
2,3',3',4,4',5,6'-Heptabromodiphenyl ether	191	2.0	10	40	200	800
2,2',3,3',4,4',5,6'-Octabromodiphenyl ether	196	2.0	10	40	200	800
2,2',3,3',4,4',6,6'-Octabromodiphenyl ether	197	2.0	10	40	200	800
2,2',3,3',4,4',5,5',6-Nonabromodiphenyl ether	206	5.0	25	100	500	2000
2,2',3,3',4,4',5,6,6'-Nonabromodiphenyl ether	207	5.0	25	100	500	2000
Decabromodiphenyl ether	209	5.0	25	100	500	2000
<b>MASS-LABELLED PBDE CONGENERS</b>						
4-Bromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	3L	100	100	100	100	100
4,4'-Dibromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	15L	100	100	100	100	100
2,4,4'-Tribromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	28L	100	100	100	100	100
2,2',4,4'-Tetrabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	47L	100	100	100	100	100
2,2',4,4',5-Pentabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	99L	100	100	100	100	100
2,2',4,4',6-Pentabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	100L	100	100	100	100	100
3,3',4,4',5-Pentabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	126L	100	100	100	100	100
2,2',4,4',5,5'-Hexabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	153L	200	200	200	200	200
2,2',4,4',5,6'-Hexabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	154L	200	200	200	200	200
2,2',3,4,4',5,6'-Heptabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	183L	200	200	200	200	200
2,2',3,3',4,4',6,6'-Octabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	197L	200	200	200	200	200
2,2',3,3',4,4',5,6,6'-Nonabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	207L	500	500	500	500	500
Decabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	209L	500	500	500	500	500
<b>MASS-LABELLED PBDE INTERNAL STANDARD</b>						
3,3',4,5'-Tetrabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	79L	100	100	100	100	100
2,2',3,4,4',5'-Hexabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	138L	200	200	200	200	200
2,2',3,3',4,4',5,5',6-Nonabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	206L	500	500	500	500	500

Catalogue Number	Product (nonane/toluene solution)	Qty/Conc
<b>MBDE-MXG</b>	Mass-Labelled PBDE Solution/Mixture	1.2 ml
<b>MBDE-ISS-G</b>	Mass-Labelled PBDE Internal Standard Solution	1.2 ml
<b>BDE-MXE</b>	Native PBDE Solution/Mixture	1.2 ml

NATIVE PBDE CONGENERS	IUPAC	MBDE-MXG (ng/ml)	MBDE-ISS-G (ng/ml)	BDE-MXE (ng/ml)
4-Bromodiphenyl ether	3	—	—	1000
2,4-Dibromodiphenyl ether	7	—	—	1000
4,4'-Dibromodiphenyl ether	15	—	—	1000
2,2',4'-Tribromodiphenyl ether	17	—	—	1000
2,4,4'-Tribromodiphenyl ether	28	—	—	1000
2,2',4,4'-Tetrabromodiphenyl ether	47	—	—	1000
2,2',4,5'-Tetrabromodiphenyl ether	49	—	—	1000
2,3',4,4'-Tetrabromodiphenyl ether	66	—	—	1000
2,3',4',6-Tetrabromodiphenyl ether	71	—	—	1000
3,3',4,4'-Tetrabromodiphenyl ether	77	—	—	1000
2,2',3,4,4'-Pentabromodiphenyl ether	85	—	—	1000
2,2',4,4',5-Pentabromodiphenyl ether	99	—	—	1000
2,2',4,4',6-Pentabromodiphenyl ether	100	—	—	1000
2,3',4,4',6-Pentabromodiphenyl ether	119	—	—	1000
3,3',4,4',5-Pentabromodiphenyl ether	126	—	—	1000
2,2',3,4,4',5'-Hexabromodiphenyl ether	138	—	—	2000
2,2',4,4',5,5'-Hexabromodiphenyl ether	153	—	—	2000
2,2',4,4',5,6'-Hexabromodiphenyl ether	154	—	—	2000
2,3,3',4,4',5-Hexabromodiphenyl ether	156	—	—	2000
2,2',3,4,4',5',6-Heptabromodiphenyl ether	183	—	—	2000
2,2',3,4,4',6,6'-Heptabromodiphenyl ether	184	—	—	2000
2,3,3',4,4',5',6-Heptabromodiphenyl ether	191	—	—	2000
2,2',3,3',4,4',5,6'-Octabromodiphenyl ether	196	—	—	2000
2,2',3,3',4,4',6,6'-Octabromodiphenyl ether	197	—	—	2000
2,2',3,3',4,4',5,5',6-Nonabromodiphenyl ether	206	—	—	5000
2,2',3,3',4,4',5,6,6'-Nonabromodiphenyl ether	207	—	—	5000
Decabromodiphenyl ether	209	—	—	5000

**MASS-LABELLED PBDE CONGENERS**

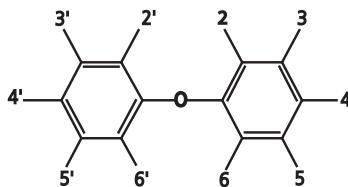
4-Bromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	3L	100	—	—
4,4'-Dibromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	15L	100	—	—
2,4,4'-Tribromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	28L	100	—	—
2,2',4,4'-Tetrabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	47L	100	—	—
2,2',4,4',5-Pentabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	99L	100	—	—
2,2',4,4',6-Pentabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	100L	100	—	—
3,3',4,4',5-Pentabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	126L	100	—	—
2,2',4,4',5,5'-Hexabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	153L	200	—	—
2,2',4,4',5,6'-Hexabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	154L	200	—	—
2,2',3,4,4',5',6-Heptabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	183L	200	—	—
2,2',3,3',4,4',6,6'-Octabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	197L	200	—	—
2,2',3,3',4,4',5,6,6'-Nonabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	207L	500	—	—
Decabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	209L	500	—	—

**MASS-LABELLED PBDE INTERNAL STANDARD**

3,3',4,5'-Tetrabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	79L	—	100	—
2,2',3,4,4',5'-Hexabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	138L	—	200	—
2,2',3,3',4,4',5,5',6-Nonabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	206L	—	500	—

## NATIVE BROMINATED DIPHENYL ETHERS (PBDEs)

Catalogue Number	Product (nonane solution)	Qty/Conc
<b>BDE-1</b>	2-Bromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-2</b>	3-Bromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-3</b>	4-Bromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-7</b>	2,4-Dibromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-10</b>	2,6-Dibromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-15</b>	4,4'-Dibromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-17</b>	2,2',4-Tribromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-21</b>	2,3,4-Tribromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-28</b>	2,4,4'-Tribromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-30</b>	2,4,6-Tribromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-37</b>	3,4,4'-Tribromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-47</b>	2,2',4,4'-Tetrabromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-49</b>	2,2',4,5'-Tetrabromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-54</b>	2,2',6,6'-Tetrabromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-60</b>	2,3,4,4'-Tetrabromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-66</b>	2,3',4,4'-Tetrabromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-71</b>	2,3',4',6-Tetrabromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-77</b>	3,3',4,4'-Tetrabromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-82</b>	2,2',3,3',4-Pentabromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-85</b>	2,2',3,4,4'-Pentabromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-99</b>	2,2',4,4',5-Pentabromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-100</b>	2,2',4,4',6-Pentabromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-104</b>	2,2',4,6,6'-Pentabromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-105</b>	2,3,3',4,4'-Pentabromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-119</b>	2,3',4,4',6-Pentabromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-126</b>	3,3',4,4',5-Pentabromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-128</b>	2,2',3,3',4,4'-Hexabromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-138</b>	2,2',3,4,4',5'-Hexabromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-139</b>	2,2',3,4,4',6-Hexabromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-140</b>	2,2',3,4,4',6'-Hexabromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-149</b>	2,2',3,4',5,6-Hexabromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-153</b>	2,2',4,4',5,5'-Hexabromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-154</b>	2,2',4,4',5,6'-Hexabromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-155</b>	2,2',4,4',6,6'-Hexabromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-156</b>	2,3,3',4,4',5-Hexabromodiphenyl ether	1.2 ml 50 µg/ml



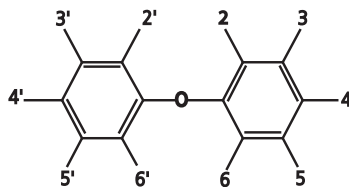


## NATIVE BROMINATED DIPHENYL ETHERS (PBDEs)

Catalogue Number	Product (nonane solution)	Qty/Conc
<b>BDE-169</b>	3,3',4,4',5,5'-Hexabromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-170</b>	2,2',3,3',4,4',5-Heptabromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-171</b>	2,2',3,3',4,4',6-Heptabromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-175</b>	2,2',3,3',4,5',6-Heptabromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-176</b>	2,2',3,3',4,6,6'-Heptabromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-177</b>	2,2',3,3',4',5,6-Heptabromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-179</b>	2,2',3,3',5,6,6'-Heptabromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-180</b>	2,2',3,4,4',5,5'-Heptabromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-181</b>	2,2',3,4,4',5,6-Heptabromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-182</b>	2,2',3,4,4',5,6'-Heptabromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-183</b>	2,2',3,4,4',5',6-Heptabromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-184</b>	2,2',3,4,4',6,6'-Heptabromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-188</b>	2,2',3,4',5,6,6'-Heptabromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-189</b>	2,3,3',4,4',5,5'-Heptabromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-191*</b>	2,3,3',4,4',5',6-Heptabromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-194*</b>	2,2',3,3',4,4',5,5'-Octabromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-195*</b>	2,2',3,3',4,4',5,6-Octabromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-196*</b>	2,2',3,3',4,4',5,6'-Octabromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-197*</b>	2,2',3,3',4,4',6,6'-Octabromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-198*</b>	2,2',3,3',4,5,5',6,-Octabromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-199*</b>	2,2',3,3',4,5,5',6'-Octabromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-200*</b>	2,2',3,3',4,5,6,6'-Octabromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-201*</b>	2,2',3,3',4,5',6,6'-Octabromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-202*</b>	2,2',3,3',5,5',6,6'-Octabromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-203*</b>	2,2',3,4,4',5,5',6-Octabromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-204*</b>	2,2',3,4,4',5,6,6'-Octabromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-205*</b>	2,3,3',4,4',5,5',6-Octabromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-206*</b>	2,2',3,3',4,4',5,5',6-Nonabromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-207*</b>	2,2',3,3',4,4',5,6,6'-Nonabromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-208*</b>	2,2',3,3',4,5,5',6,6'-Nonabromodiphenyl ether	1.2 ml 50 µg/ml
<b>BDE-209*</b>	Decabromodiphenyl ether	1.2 ml 50 µg/ml
<b>4PC-BDE-208*</b>	2,2',3,3',4,5,5',6,6'-Nonabromo-4'-chlorodiphenyl ether	1.2 ml 50 µg/ml

4PC-BDE-208 may be useful as an internal or surrogate standard for HRGC/ECD, HRGC/FID, and/or HRGC/MS analyses.

\* Toluene solution



## PBDE WINDOW DEFINING SOLUTION/MIXTURE

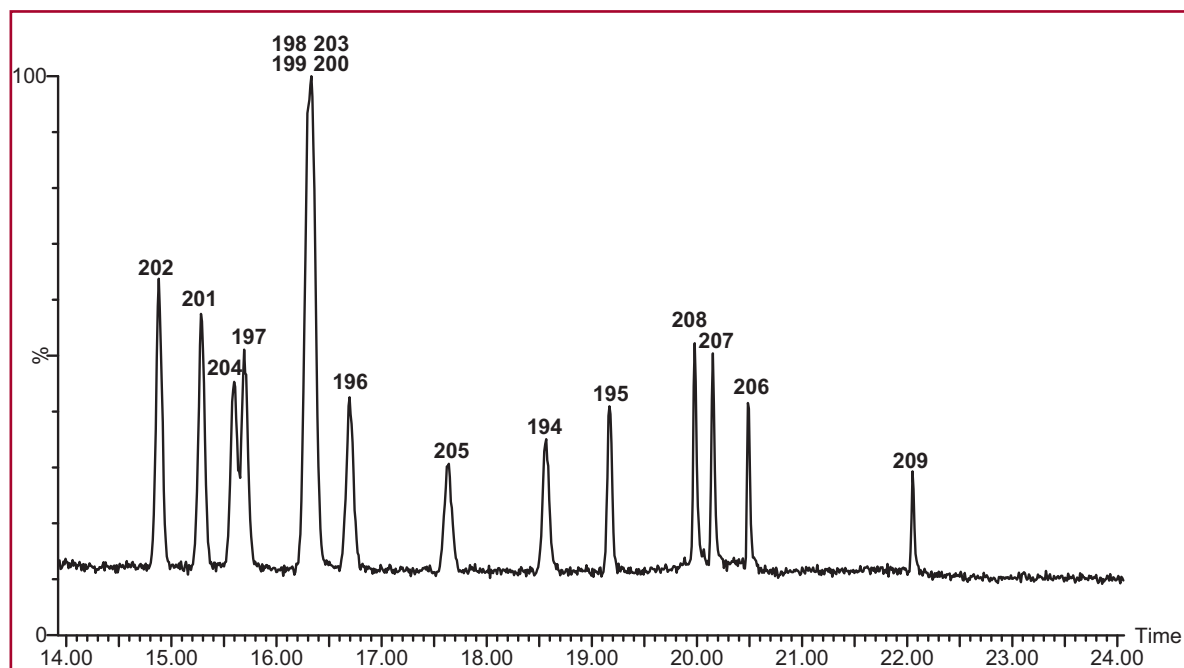
Catalogue Number	Product (nonane solution)	Qty/Conc	
<b>BDE-WD</b>	PBDE Window Defining Solution/Mixture for use with a J&W DB-5HT column	1.2 ml	
		<b>FIRST ELUTER (IUPAC)</b>	<b>LAST ELUTER (IUPAC)</b>
			<b>CONCENTRATION (µg/ml each)</b>
Bromodiphenyl ethers		1	3
Dibromodiphenyl ethers		10	15
Tribromodiphenyl ethers		30	37
Tetrabromodiphenyl ethers		54	60
Pentabromodiphenyl ethers		104	82
Hexabromodiphenyl ethers		155	128
Heptabromodiphenyl ethers		188	170
Octabromodiphenyl ethers		202	195
Nonabromodiphenyl ethers		208	206
Decabromodiphenyl ether		209	206
			5.0
			5.0

## NATIVE BROMINATED DIPHENYL ETHERS: SOLUTION/MIXTURES

Catalogue Number	Product (nonane solution)	Qty/Conc	
<b>BDE-MXA</b>	Native PBDE Solution/Mixture	1.2 ml	
		<b>IUPAC</b>	
2,2',4,4'-Tetrabromodiphenyl ether		47	5 µg/ml
2,2',4,4',5-Pentabromodiphenyl ether		99	5 µg/ml
2,2',4,4',5,5'-Hexabromodiphenyl ether		153	5 µg/ml
<b>BDE-MXB</b>	Native PBDE Solution/Mixture	1.2 ml	
		<b>IUPAC</b>	
2,4,4'-Tribromodiphenyl ether		28	5 µg/ml
2,2',4,4',5,6'-Hexabromodiphenyl ether		154	5 µg/ml
2,2',3,4,4',5',6-Heptabromodiphenyl ether		183	5 µg/ml
<b>BDE-MXD</b>	Native PBDE Solution/Mixture	1.2 ml	
		<b>IUPAC</b>	
2,2',4-Tribromodiphenyl ether		17	5 µg/ml
2,2',4,4'-Tetrabromodiphenyl ether		47	5 µg/ml
2,3',4,4'-Tetrabromodiphenyl ether		66	5 µg/ml
2,2',4,4',6-Pentabromodiphenyl ether		100	5 µg/ml
2,2',4,4',5,5'-Hexabromodiphenyl ether		153	5 µg/ml
2,2',3,4,4',5',6-Heptabromodiphenyl ether		183	5 µg/ml
Decabromodiphenyl ether		209	10 µg/ml

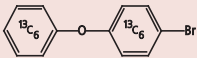
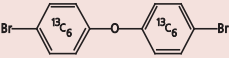
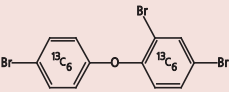
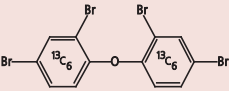
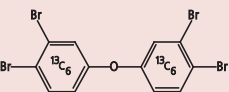
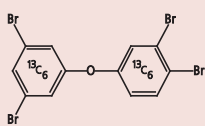
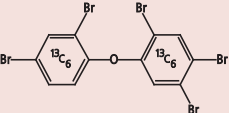
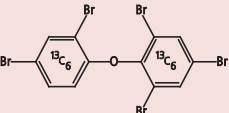
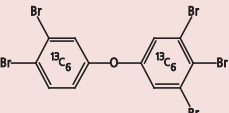
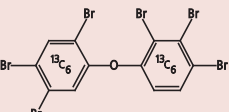
## NATIVE BROMINATED DIPHENYL ETHERS: SOLUTION/MIXTURE

Catalogue Number	Product (nonane/toluene solution)	Qty/Conc
<b>BDE-OND</b>	Solution/Mixture of Octa-, Nona-, and Deca-BDEs	1.2 ml
	<b>IUPAC</b>	
2,2',3,3',4,4',5,5'-Octabromodiphenyl ether	194	1.0 µg/ml
2,2',3,3',4,4',5,6-Octabromodiphenyl ether	195	1.0 µg/ml
2,2',3,3',4,4',5,6'-Octabromodiphenyl ether	196	1.0 µg/ml
2,2',3,3',4,4',6,6'-Octabromodiphenyl ether	197	1.0 µg/ml
2,2',3,3',4,5,5',6-Octabromodiphenyl ether	198	1.0 µg/ml
2,2',3,3',4,5,5',6'-Octabromodiphenyl ether	199	1.0 µg/ml
2,2',3,3',4,5,6,6'-Octabromodiphenyl ether	200	1.0 µg/ml
2,2',3,3',4,5',6,6'-Octabromodiphenyl ether	201	1.0 µg/ml
2,2',3,3',5,5',6,6'-Octabromodiphenyl ether	202	1.0 µg/ml
2,2',3,4,4',5,5',6-Octabromodiphenyl ether	203	1.0 µg/ml
2,2',3,4,4',5,6,6'-Octabromodiphenyl ether	204	1.0 µg/ml
2,3,3',4,4',5,5',6-Octabromodiphenyl ether	205	1.0 µg/ml
2,2',3,3',4,4',5,5',6-Nonabromodiphenyl ether	206	2.5 µg/ml
2,2',3,3',4,4',5,6,6'-Nonabromodiphenyl ether	207	2.5 µg/ml
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Decabromodiphenyl ether	209	2.5 µg/ml



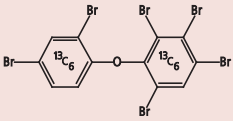
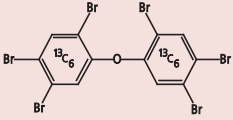
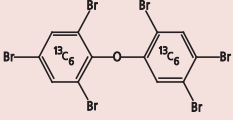
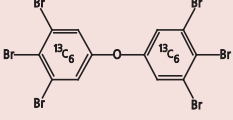
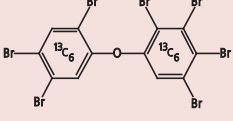
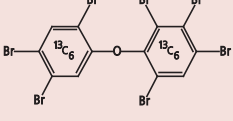
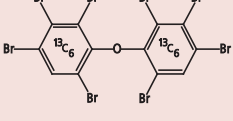
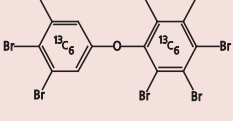
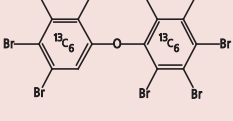
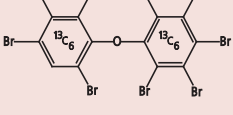
HRGC/HRMS Data for BDE-OND on a 15m DB-5HT column.

## MASS-LABELLED BROMINATED DIPHENYL ETHERS

Catalogue Number	Product
<b>MBDE-3</b>	 <p>4-Bromo[<sup>13</sup>C<sub>12</sub>]diphenyl ether 1.2 ml; 50 µg/ml (±2.5 µg/ml); in nonane</p>
<b>MBDE-15</b>	 <p>4,4'-Dibromo[<sup>13</sup>C<sub>12</sub>]diphenyl ether 1.2 ml; 50 µg/ml (±2.5 µg/ml); in nonane</p>
<b>MBDE-28</b>	 <p>2,4,4'-Tribromo[<sup>13</sup>C<sub>12</sub>]diphenyl ether 1.2 ml; 50 µg/ml (±2.5 µg/ml); in nonane</p>
<b>MBDE-47</b>	 <p>2,2',4,4'-Tetrabromo[<sup>13</sup>C<sub>12</sub>]diphenyl ether 1.2 ml; 50 µg/ml (±2.5 µg/ml); in nonane</p>
<b>MBDE-77</b>	 <p>3,3',4,4'-Tetrabromo[<sup>13</sup>C<sub>12</sub>]diphenyl ether 1.2 ml; 50 µg/ml (±2.5 µg/ml); in nonane</p>
<b>MBDE-79</b>	 <p>3,3',4,5'-Tetrabromo[<sup>13</sup>C<sub>12</sub>]diphenyl ether 1.2 ml; 50 µg/ml (±2.5 µg/ml); in nonane</p>
<b>MBDE-99</b>	 <p>2,2',4,4',5-Pentabromo[<sup>13</sup>C<sub>12</sub>]diphenyl ether 1.2 ml; 50 µg/ml (±2.5 µg/ml); in nonane</p>
<b>MBDE-100</b>	 <p>2,2',4,4',6-Pentabromo[<sup>13</sup>C<sub>12</sub>]diphenyl ether 1.2 ml; 50 µg/ml (±2.5 µg/ml); in nonane</p>
<b>MBDE-126</b>	 <p>3,3',4,4',5-Pentabromo[<sup>13</sup>C<sub>12</sub>]diphenyl ether 1.2 ml; 50 µg/ml (±2.5 µg/ml); in nonane</p>
<b>MBDE-138</b>	 <p>2,2',3,4,4',5'-Hexabromo[<sup>13</sup>C<sub>12</sub>]diphenyl ether 1.2 ml; 50 µg/ml (±2.5 µg/ml); in nonane</p>

\* Unless stated otherwise, isotopic purities of these compounds are 99% or greater.

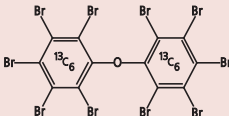
## MASS-LABELLED BROMINATED DIPHENYL ETHERS

Catalogue Number	Product
<b>MBDE-139</b>	 <p>2,2',3,4,4',6-Hexabromo[<sup>13</sup>C<sub>12</sub>]diphenyl ether 1.2 ml; 50 µg/ml (±2.5 µg/ml); in nonane</p>
<b>MBDE-153</b>	 <p>2,2',4,4',5,5'-Hexabromo[<sup>13</sup>C<sub>12</sub>]diphenyl ether 1.2 ml; 50 µg/ml (±2.5 µg/ml); in nonane</p>
<b>MBDE-154</b>	 <p>2,2',4,4',5,6'-Hexabromo[<sup>13</sup>C<sub>12</sub>]diphenyl ether 1.2 ml; 50 µg/ml (±2.5 µg/ml); in nonane</p>
<b>MBDE-169</b>	 <p>3,3',4,4',5,5'-Hexabromo[<sup>13</sup>C<sub>12</sub>]diphenyl ether 1.2 ml; 50 µg/ml (±2.5 µg/ml); in nonane</p>
<b>MBDE-180</b>	 <p>2,2',3,4,4',5,5'-Heptabromo[<sup>13</sup>C<sub>12</sub>]diphenyl ether 1.2 ml; 50 µg/ml (±2.5 µg/ml); in nonane</p>
<b>MBDE-183</b>	 <p>2,2',3,4,4',5,6-Heptabromo[<sup>13</sup>C<sub>12</sub>]diphenyl ether 1.2 ml; 50 µg/ml (±2.5 µg/ml); in nonane</p>
<b>MBDE-197</b>	 <p>2,2',3,3',4,4',6,6'-Octabromo[<sup>13</sup>C<sub>12</sub>]diphenyl ether 1.2 ml; 50 µg/ml (±2.5 µg/ml); in toluene</p>
<b>MBDE-205</b>	 <p>2,3,3',4,4',5,5',6-Octabromo[<sup>13</sup>C<sub>12</sub>]diphenyl ether 1.2 ml; 50 µg/ml (±2.5 µg/ml); in toluene</p>
<b>MBDE-206</b>	 <p>2,2',3,3',4,4',5,5',6-Nonabromo[<sup>13</sup>C<sub>12</sub>]diphenyl ether 1.2 ml; 50 µg/ml (±2.5 µg/ml); in toluene</p>
<b>MBDE-207</b>	 <p>2,2',3,3',4,4',5,6,6'-Nonabromo[<sup>13</sup>C<sub>12</sub>]diphenyl ether 1.2 ml; 50 µg/ml (±2.5 µg/ml); in toluene</p>

\* Unless stated otherwise, isotopic purities of these compounds are 99% or greater.



## MASS-LABELLED BROMINATED DIPHENYL ETHERS

Catalogue Number	Product
<b>MBDE-209</b>	 <p>Decabromo[<sup>13</sup>C<sub>12</sub>]diphenyl ether 1.2 ml; 25 µg/ml (±1.2 µg/ml); in toluene</p>

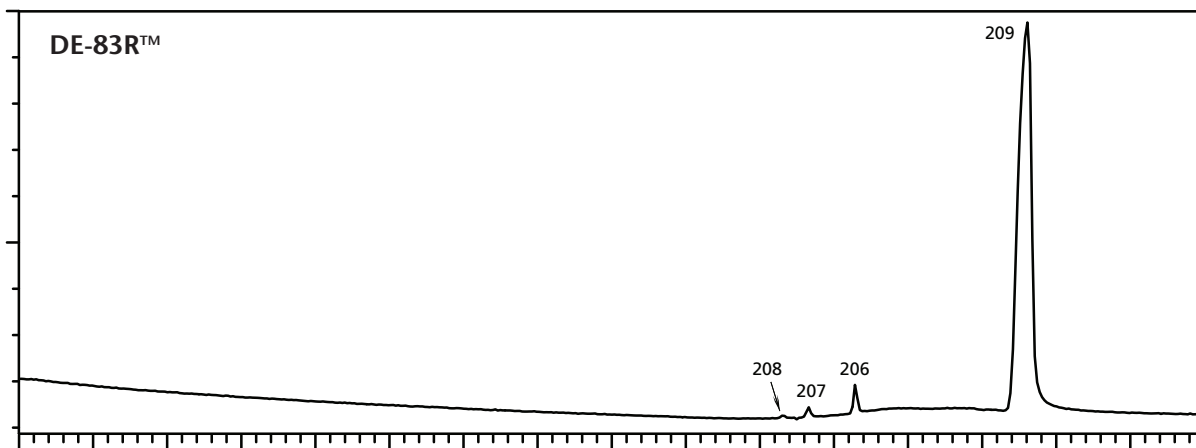
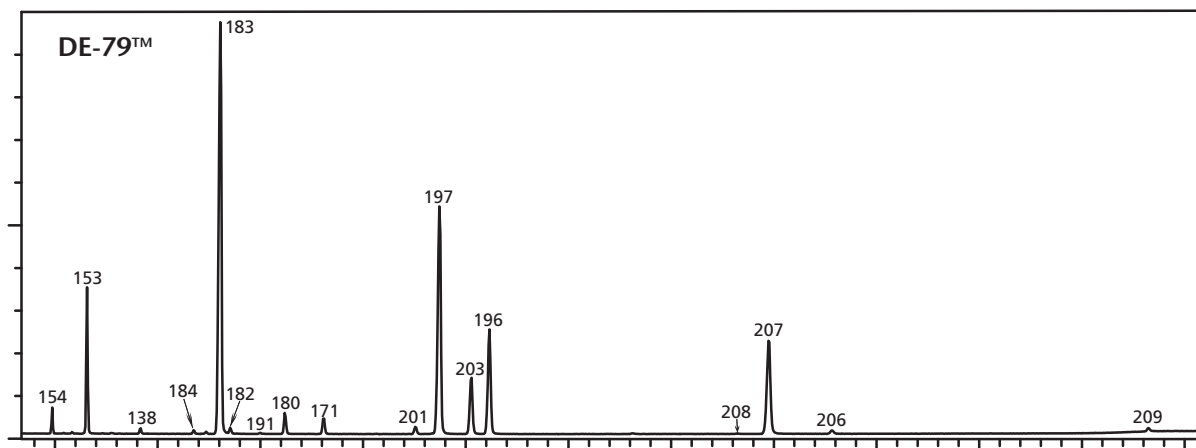
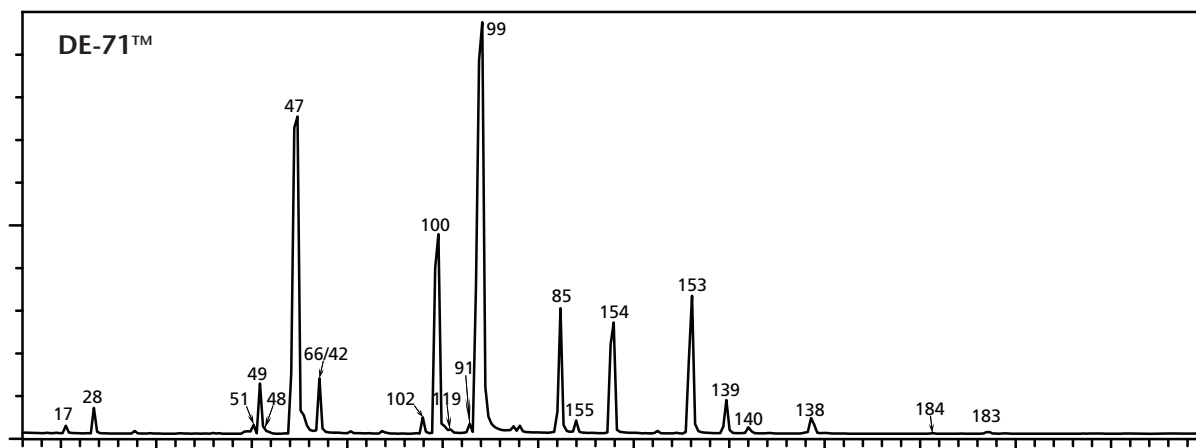
\* Unless stated otherwise, isotopic purities of these compounds are 99% or greater.

## MASS-LABELLED BROMINATED DIPHENYL ETHERS: SOLUTION/MIXTURES

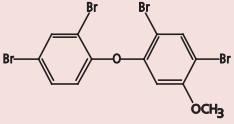
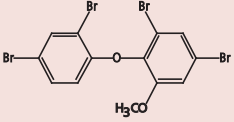
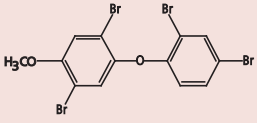
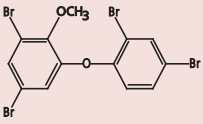
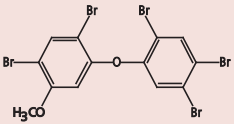
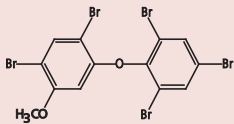
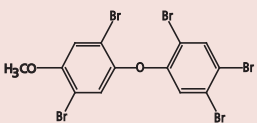
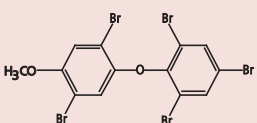
Catalogue Number	Product (nonane solution)	Qty/Conc
<b>MBDE-MXA</b>	Mass-Labelled PBDE Solution/Mixture	1.2 ml
	<b>IUPAC</b>	
	2,2',4,4'-Tetrabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	5 µg/ml
	2,2',4,4',5-Pentabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	5 µg/ml
	2,2',4,4',5,5'-Hexabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	5 µg/ml
<b>MBDE-MXB</b>	Mass-Labelled PBDE Solution/Mixture	1.2 ml
	<b>IUPAC</b>	
	2,4,4'-Tribromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	5 µg/ml
	2,2',4,4',5,6'-Hexabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	5 µg/ml
	2,2',3,4,4',5',6-Heptabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	5 µg/ml
<b>MBDE-MXC</b>	Mass-Labelled PBDE Solution/Mixture	1.2 ml
	<b>IUPAC</b>	
	4-Bromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	5 µg/ml
	4,4'-Dibromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	5 µg/ml
	2,4,4'-Tribromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	5 µg/ml
	2,2',4,4'-Tetrabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	5 µg/ml
	2,2',4,4',5-Pentabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	5 µg/ml
	2,2',4,4',5,5'-Hexabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	5 µg/ml
	2,2',4,4',5,6'-Hexabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	5 µg/ml
	2,2',3,4,4',5',6-Heptabromo[ <sup>13</sup> C <sub>12</sub> ]diphenyl ether	5 µg/ml

## BROMINATED DIPHENYL ETHER TECHNICAL MIXTURES

Catalogue Number	Product (toluene solution)	Qty/Conc
<b>TBDE-71</b>	Great Lakes Chemical DE-71™ Pentabromodiphenyl Oxide	1.2 ml 100 µg/ml
<b>TBDE-79</b>	Great Lakes Chemical DE-79™ Octabromodiphenyl Oxide	1.2 ml 100 µg/ml
<b>TBDE-83R</b>	Great Lakes Chemical DE-83R™ Decabromodiphenyl Oxide	1.2 ml 100 µg/ml



## NATIVE METHOXY-BROMODIPHENYL ETHERS (MeO-BDEs)

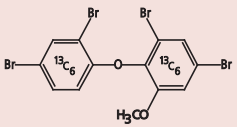
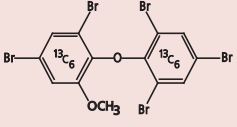
Catalogue Number	Product
<b>5MBDE47</b>	 <p>2,2',4,4'-Tetrabromo-5-methoxydiphenyl ether 1.2 ml; 50 µg/ml (±2.5 µg/ml); in nonane</p>
<b>6MBDE47</b>	 <p>2,2',4,4'-Tetrabromo-6-methoxydiphenyl ether 1.2 ml; 50 µg/ml (±2.5 µg/ml); in nonane</p>
<b>4PMBDE49</b>	 <p>2,2',4',5-Tetrabromo-4-methoxydiphenyl ether 1.2 ml; 50 µg/ml (±2.5 µg/ml); in nonane</p>
<b>2PMBDE68</b>	 <p>2',3,4',5-Tetrabromo-2-methoxydiphenyl ether 1.2 ml; 50 µg/ml (±2.5 µg/ml); in nonane</p>
<b>5PMBDE99</b>	 <p>2,2',4,4',5-Pentabromo-5'-methoxydiphenyl ether 1.2 ml; 50 µg/ml (±2.5 µg/ml); in nonane</p>
<b>5PMBDE100</b>	 <p>2,2',4,4',6'-Pentabromo-5-methoxydiphenyl ether 1.2 ml; 50 µg/ml (±2.5 µg/ml); in nonane</p>
<b>4PMBDE101</b>	 <p>2,2',4,5,5'-Pentabromo-4'-methoxydiphenyl ether 1.2 ml; 50 µg/ml (±2.5 µg/ml); in nonane</p>
<b>4PMBDE103</b>	 <p>2,2',4',5,6'-Pentabromo-4-methoxydiphenyl ether 1.2 ml; 50 µg/ml (±2.5 µg/ml); in nonane</p>

**NOTE:** In order to emphasize their relationship to the corresponding PBDE, these compounds have been numbered based on the diphenyl ether as the parent molecule with bromines retaining their BDE numbers. The methoxy groups are treated as additional substituents and listed alphabetically.

## METHOXY-BROMODIPHENYL ETHERS: SOLUTION/MIXTURE

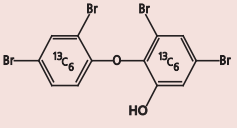
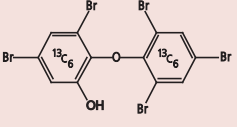
Catalogue Number	Product (nonane solution)	Qty/Conc
<b>MeOBDES</b>	Methoxy-Bromodiphenyl Ethers Solution/Mixture	1.2 ml
	2,2',4,4'-Tetrabromo-5-methoxydiphenyl ether	5 µg/ml
	2,2',4,4'-Tetrabromo-6-methoxydiphenyl ether	5 µg/ml
	2,2',4',5-Tetrabromo-4-methoxydiphenyl ether	5 µg/ml
	2',3,4',5-Tetrabromo-2-methoxydiphenyl ether	5 µg/ml
	2,2',4,4',5-Pentabromo-5'-methoxydiphenyl ether	5 µg/ml
	2,2',4,4',6'-Pentabromo-5-methoxydiphenyl ether	5 µg/ml
	2,2',4,5,5'-Pentabromo-4'-methoxydiphenyl ether	5 µg/ml
	2,2',4',5,6'-Pentabromo-4-methoxydiphenyl ether	5 µg/ml

## MASS-LABELLED METHOXY-BROMODIPHENYL ETHERS

Catalogue Number	Product
<b>M6MBDE47</b>	 <p>2,2',4,4'-Tetrabromo-6-methoxy[<sup>13</sup>C<sub>12</sub>]diphenyl ether 1.2 ml; 50 µg/ml (±2.5 µg/ml); in nonane</p>
<b>M6PMBDE100</b>	 <p>2,2',4,4',6'-Pentabromo-6'-methoxy[<sup>13</sup>C<sub>12</sub>]diphenyl ether 1.2 ml; 50 µg/ml (±2.5 µg/ml); in nonane</p>

\* Unless stated otherwise, isotopic purities of these compounds are 99% or greater.

## MASS-LABELLED HYDROXY-BROMODIPHENYL ETHERS

Catalogue Number	Product
<b>M6HBDE47</b>	 <p>2,2',4,4'-Tetrabromo-6-hydroxy[<sup>13</sup>C<sub>12</sub>]diphenyl ether 1.2 ml; 50 µg/ml (±2.5 µg/ml); in toluene</p>
<b>M6PHBDE100</b>	 <p>2,2',4,4',6'-Pentabromo-6'-hydroxy[<sup>13</sup>C<sub>12</sub>]diphenyl ether 1.2 ml; 50 µg/ml (±2.5 µg/ml); in toluene</p>

\* Unless stated otherwise, isotopic purities of these compounds are 99% or greater.

**NOTE:** In order to emphasize their relationship to the corresponding PBDE, these compounds have been numbered based on the diphenyl ether as the parent molecule with bromines retaining their BDE numbers. The methoxy and hydroxy groups are treated as additional substituents and listed alphabetically.

## NATIVE BROMINATED BIPHENYLS (PBBs)

Catalogue Number	Product (nonane solution)	Qty/Conc
<b>BB-1</b>	2-Bromobiphenyl	1.2 ml 50 µg/ml
<b>BB-2</b>	3-Bromobiphenyl	1.2 ml 50 µg/ml
<b>BB-3</b>	4-Bromobiphenyl	1.2 ml 50 µg/ml
<b>BB-4</b>	2,2'-Dibromobiphenyl	1.2 ml 50 µg/ml
<b>BB-7</b>	2,4-Dibromobiphenyl	1.2 ml 50 µg/ml
<b>BB-9</b>	2,5-Dibromobiphenyl	1.2 ml 50 µg/ml
<b>BB-10</b>	2,6-Dibromobiphenyl	1.2 ml 50 µg/ml
<b>BB-15</b>	4,4'-Dibromobiphenyl	1.2 ml 50 µg/ml
<b>BB-18</b>	2,2',5-Tribromobiphenyl	1.2 ml 50 µg/ml
<b>BB-22</b>	2,3,4'-Tribromobiphenyl	1.2 ml 50 µg/ml
<b>BB-26</b>	2,3',5-Tribromobiphenyl	1.2 ml 50 µg/ml
<b>BB-29</b>	2,4,5-Tribromobiphenyl	1.2 ml 50 µg/ml
<b>BB-30</b>	2,4,6-Tribromobiphenyl	1.2 ml 50 µg/ml
<b>BB-31</b>	2,4',5-Tribromobiphenyl	1.2 ml 50 µg/ml
<b>BB-37</b>	3,4,4'-Tribromobiphenyl	1.2 ml 50 µg/ml
<b>BB-38</b>	3,4,5-Tribromobiphenyl	1.2 ml 50 µg/ml
<b>BB-49</b>	2,2',4,5'-Tetrabromobiphenyl	1.2 ml 50 µg/ml
<b>BB-52</b>	2,2',5,5'-Tetrabromobiphenyl	1.2 ml 50 µg/ml
<b>BB-53</b>	2,2',5,6'-Tetrabromobiphenyl	1.2 ml 50 µg/ml
<b>BB-56</b>	2,3,3',4'-Tetrabromobiphenyl	1.2 ml 50 µg/ml
<b>BB-75</b>	2,4,4',6-Tetrabromobiphenyl	1.2 ml 50 µg/ml
<b>BB-77</b>	3,3',4,4'-Tetrabromobiphenyl	1.2 ml 50 µg/ml
<b>BB-80</b>	3,3',5,5'-Tetrabromobiphenyl	1.2 ml 50 µg/ml
<b>BB-101</b>	2,2',4,5,5'-Pentabromobiphenyl	1.2 ml 50 µg/ml
<b>BB-103</b>	2,2',4,5',6-Pentabromobiphenyl	1.2 ml 50 µg/ml
<b>BB-153</b>	2,2',4,4',5,5'-Hexabromobiphenyl	1.2 ml 50 µg/ml
<b>BB-154</b>	2,2',4,4',5,6'-Hexabromobiphenyl	1.2 ml 50 µg/ml
<b>BB-155</b>	2,2',4,4',6,6'-Hexabromobiphenyl	1.2 ml 50 µg/ml
<b>BB-156</b>	2,3,3',4,4',5-Hexabromobiphenyl	1.2 ml 50 µg/ml
<b>BB-169</b>	3,3',4,4',5,5'-Hexabromobiphenyl	1.2 ml 50 µg/ml
<b>BB-180</b>	2,2',3,4,4',5,5'-Heptabromobiphenyl	1.2 ml 50 µg/ml
<b>BB-194</b>	2,2',3,3',4,4',5,5'-Octabromobiphenyl	1.2 ml 50 µg/ml
<b>BB-205</b>	2,3,3',4,4',5,5',6-Octabromobiphenyl	1.2 ml 50 µg/ml
<b>BB-206*</b>	2,2',3,3',4,4',5,5',6-Nonabromobiphenyl	1.2 ml 50 µg/ml
<b>BB-209*</b>	Decabromobiphenyl	1.2 ml 50 µg/ml

\* 50% Nonane/50% Toluene Solution



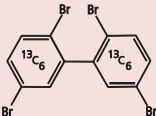
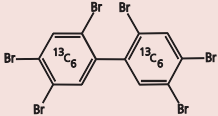
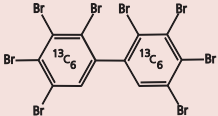
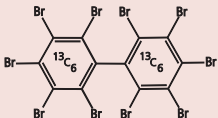
## NATIVE BROMINATED BIPHENYLS: SOLUTION/MIXTURE

Catalogue Number	Product (nonane solution)	Qty/Conc
<b>PBB-MXA</b>	Native PBB Solution/Mixture	1.2 ml
	<b>IUPAC</b>	
4-Bromobiphenyl	3	1 µg/ml
4,4'-Dibromobiphenyl	15	1 µg/ml
2,2',5-Tribromobiphenyl	18	1 µg/ml
2,2',5,5'-Tetrabromobiphenyl	52	1 µg/ml
2,2',4,5,5'-Pentabromobiphenyl	101	2 µg/ml
2,2',4,4',5,5'-Hexabromobiphenyl	153	2 µg/ml
2,2',3,4,4',5,5'-Heptabromobiphenyl	180	2 µg/ml
2,2',3,3',4,4',5,5'-Octabromobiphenyl	194	2 µg/ml
2,2',3,3',4,4',5,5',6-Nonabromobiphenyl	206	5 µg/ml
Decabromobiphenyl	209	5 µg/ml

## POLYBROMINATED BIPHENYL TECHNICAL MIXTURES

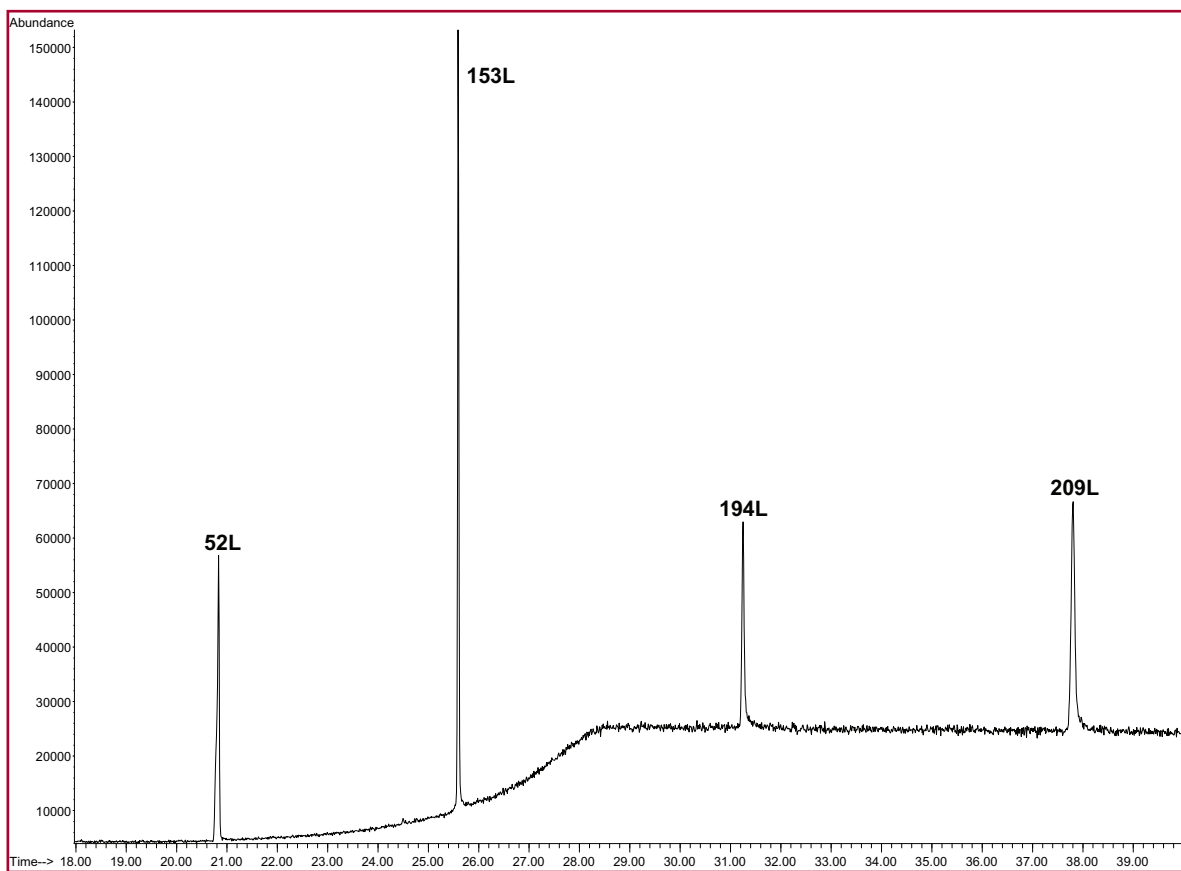
Catalogue Number	Product (nonane solution)	Qty/Conc
<b>TBB-BP6</b>	Great Lakes Chemical Firemaster BP-6™ Hexabromobiphenyl	1.2 ml 100 µg/ml
<b>TBB-809D</b>	Chemische Fabrik Kalk Bromkal80-9D™ Nonabromobiphenyl	1.2 ml 100 µg/ml

## MASS-LABELLED BROMINATED BIPHENYLS

Catalogue Number	Product
<b>MBB-52</b>	 <p>2,2',5,5'-Tetrabromo[<sup>13</sup>C<sub>12</sub>]biphenyl 1.2 ml; 50 µg/ml (±2.5 µg/ml); in nonane; Isotopic purity; 99% or greater</p>
<b>MBB-153</b>	 <p>2,2',4,4',5,5'-Hexabromo[<sup>13</sup>C<sub>12</sub>]biphenyl 1.2 ml; 50 µg/ml (±2.5 µg/ml); in nonane; Isotopic purity; 99% or greater</p>
<b>MBB-194</b>	 <p>2,2',3,3',4,4',5,5'-Octabromo[<sup>13</sup>C<sub>12</sub>]biphenyl 1.2 ml; 50 µg/ml (±2.5 µg/ml); in nonane; Isotopic purity; 99% or greater</p>
<b>MBB-209</b>	 <p>Decabromo[<sup>13</sup>C<sub>12</sub>]biphenyl 1.2 ml; 50 µg/ml (±2.5 µg/ml); in nonane; Isotopic purity; 99% or greater</p>

## MASS-LABELLED BROMINATED BIPHENYLS: SOLUTION/MIXTURE

Catalogue Number	Product (nonane solution)	Qty/Conc
<b>MBB-MXA</b>	Mass-Labelled PBB Solution/Mixture	1.2 ml
	<b>IUPAC</b>	
2,2',5,5'-Tetrabromo[ <sup>13</sup> C <sub>12</sub> ]biphenyl	52L	1 µg/ml
2,2',4,4',5,5'-Hexabromo[ <sup>13</sup> C <sub>12</sub> ]biphenyl	153L	2 µg/ml
2,2',3,3',4,4',5,5'-Octabromo[ <sup>13</sup> C <sub>12</sub> ]biphenyl	194L	2 µg/ml
Decabromo[ <sup>13</sup> C <sub>12</sub> ]biphenyl	209L	5 µg/ml



HRGC/LRMS Data for MBB-MXA on a 30m DB-5 column.