

PBDD/PBDF Calibration Solution

EDF-5381 enables PBDD/F analysis of OBDD, HpBDF, and OBDF at higher concentrations.

EDF-5381 PBDD/F Calibration Solutions (unlabeled/¹³C₁₂,99%) 7 X 0.2 mL in Nonane

Native Analytes	CS1	CS2	CS3	CS4	CS5	CS6	CS7
2,3,7,8-TeBDD	0.1	0.4	2	10	20	40	—
1,2,3,7,8-PeBDD	0.2	0.8	4	20	40	80	—
1,2,3,4,7,8-HxBDD	0.75	3	15	75	150	300	—
1,2,3,6,7,8-HxBDD	0.75	3	15	75	150	300	—
1,2,3,7,8,9-HxBDD	0.75	3	15	75	150	300	—
OBDD	1	4	20	100	200	400	800
2,3,7,8-TeBDF	0.5	2	10	50	100	200	—
2,4,6,8-TeBDF	0.5	2	10	50	100	200	—
1,2,3,7,8-PeBDF	0.5	2	10	50	100	200	—
2,3,4,7,8-PeBDF	0.5	2	10	50	100	200	—
1,2,3,4,7,8-HxBDF	0.75	3	15	75	150	300	—
1,2,3,4,6,7,8-HpBDF	0.75	3	15	75	150	300	600
OBDF	1	4	20	100	200	400	800
Cleanup Standards							
2,3,7,8-TeBDD (¹³ C ₁₂ ,99%)	10	10	10	10	10	10	—
1,2,3,7,8-PeBDD (¹³ C ₁₂ ,99%)	20	20	20	20	20	20	—
1,2,3,4,7,8-HxBDD (¹³ C ₁₂ ,99%)	75	75	75	75	75	75	—
1,2,3,6,7,8-HxBDD (¹³ C ₁₂ ,99%)	75	75	75	75	75	75	—
1,2,3,4,6,7,8-HpBDD (¹³ C ₁₂ ,99%)	100	100	100	100	100	100	—
OBDD (¹³ C ₁₂ ,99%)	225	225	225	225	225	225	225
2,3,7,8-TeBDF (¹³ C ₁₂ ,99%)	40	40	40	40	40	40	—
2,3,4,7,8-PeBDF (¹³ C ₁₂ ,99%)	40	40	40	40	40	40	—
1,2,3,4,7,8-HxBDF (¹³ C ₁₂ ,99%)	40	40	40	40	40	40	—
1,2,3,4,6,7,8-HpBDF (¹³ C ₁₂ ,99%)	100	100	100	100	100	100	—
OBDF (¹³ C ₁₂ ,99%)	225	225	225	225	225	225	225
Syringe Standards							
1,2,3,7,8,9-HxBDD (¹³ C ₁₂ ,99%)	100	100	100	100	100	100	—
1,2,3,7,8-PeBDF (¹³ C ₁₂ ,99%)	40	40	40	40	40	40	—
Sampling Standards							
2,4,6,8-TeBDF (¹³ C ₁₂ ,99%)	40	40	40	40	40	40	—

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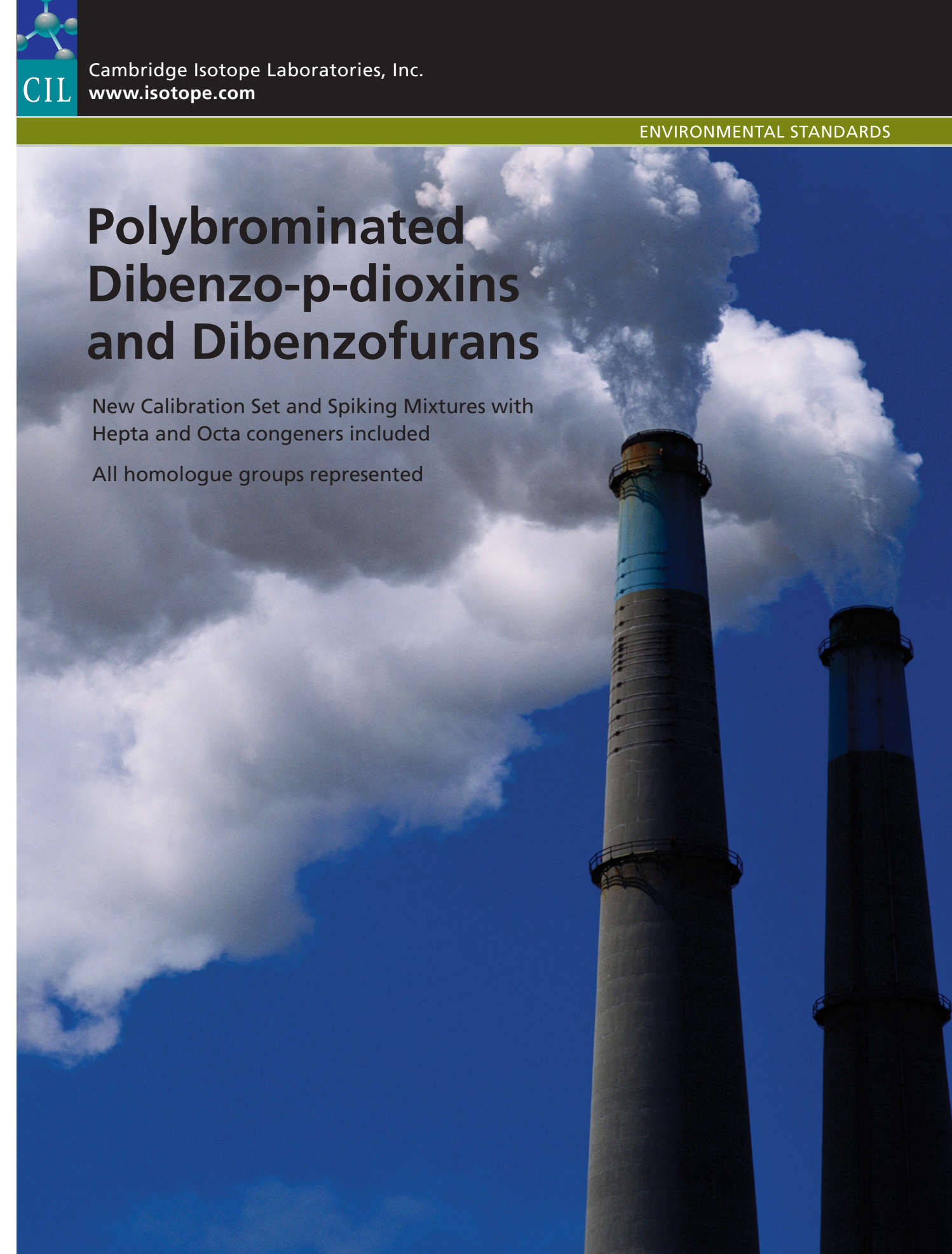
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ENVIRONMENTAL STANDARDS

Polybrominated Dibenzo-p-dioxins and Dibenzofurans

New Calibration Set and Spiking Mixtures with
Hepta and Octa congeners included

All homologue groups represented



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Polybrominated Dibenzo-p-dioxins (PBDDs) and Dibenzofurans (PBDFs)

PBDDs AND PBDFs can be found at trace levels in technical brominated flame retardant products. They are also formed during combustion of these chemicals, or incineration of other organic compounds in the presence of bromine, e.g., in municipal and industrial incinerators.

The biological effects of PBDDs and PBDFs are similar to those of PCDDs and PCDFs, which have been regulated for many years.

Polybrominated Dibenzo-p-dioxins			
5 µg/mL in Nonane (unless otherwise noted) 70:30=70% n-Nonane/30% Toluene			
	ED-2532	2,3,7-TriBDD (¹³ C _{12r} , 99%)	50 µg/mL 1.2 mL
	ED-1763	2,3,7-TriBDD Unlabeled	50 µg/mL 1.2 mL
	ED-1440	2,3,7,8-TetraBDD (¹³ C _{12r} , 99%)	4 X 1.2 mL
<i>NEW</i>	ED-1440-1.2	2,3,7,8-TetraBDD (¹³ C _{12r} , 99%)	1.2 mL
	ED-1441	2,3,7,8-TetraBDD Unlabeled	8 X 1.2 mL
<i>NEW</i>	ED-1441-1.2	2,3,7,8-TetraBDD Unlabeled	1.2 mL
	ED-1450	1,2,3,7,8-PentaBDD (¹³ C _{12r} , 99%)	4 X 1.2 mL
<i>NEW</i>	ED-1450-1.2	1,2,3,7,8-PentaBDD (¹³ C _{12r} , 99%)	1.2 mL
	ED-1451	1,2,3,7,8-PentaBDD Unlabeled	8 X 1.2 mL
<i>NEW</i>	ED-1451-1.2	1,2,3,7,8-PentaBDD Unlabeled	1.2 mL
	ED-2534	1,2,3,4,7,8-HexaBDD (¹³ C _{12r} , 99%)	4 X 1.2 mL
<i>NEW</i>	ED-2534-1.2	1,2,3,4,7,8-HexaBDD (¹³ C _{12r} , 99%)	1.2 mL
	ED-1462	1,2,3,4,7,8-HexaBDD Unlabeled	8 X 1.2 mL
<i>NEW</i>	ED-1462-1.2	1,2,3,4,7,8-HexaBDD Unlabeled	1.2 mL
	ED-5237	1,2,3,6,7,8-HexaBDD (¹³ C _{12r} , 99%)	70:30 4 X 1.2 mL
<i>NEW</i>	ED-5237-1.2	1,2,3,6,7,8-HexaBDD (¹³ C _{12r} , 99%)	70:30 1.2 mL
	ED-1465	1,2,3,4,7,8-HexaBDD Unlabeled	70:30 8 X 1.2 mL
<i>NEW</i>	ED-1465-1.2	1,2,3,6,7,8-HexaBDD Unlabeled	70:30 1.2 mL
	ED-5238	1,2,3,7,8,9-HexaBDD (¹³ C _{12r} , 99%)	4 X 1.2 mL
<i>NEW</i>	ED-5238-1.2	1,2,3,7,8,9-HexaBDD (¹³ C _{12r} , 99%)	1.2 mL
	ED-1466	1,2,3,7,8,9-HexaBDD Unlabeled	8 X 1.2 mL
<i>NEW</i>	ED-1466-1.2	1,2,3,7,8,9-HexaBDD Unlabeled	1.2 mL
<i>NEW</i>	ED-5357	1,2,3,4,6,7,8-HeptaBDD (¹³ C _{12r} , 99%)	70:30 4 X 1.2 mL
	ED-5357-1.2	1,2,3,4,6,7,8-HeptaBDD (¹³ C _{12r} , 99%)	70:30 1.2 mL
<i>NEW</i>	ED-5356	1,2,3,4,6,7,8-HeptaBDD Unlabeled	70:30 8 X 1.2 mL
<i>NEW</i>	ED-5356-1.2	1,2,3,4,6,7,8-HeptaBDD Unlabeled	70:30 1.2 mL
	ED-5089	OBDD (¹³ C _{12r} , 99%)	70:30 4 X 1.2 mL
	ED-5089-1.2	OBDD (¹³ C _{12r} , 99%)	70:30 1.2 mL
	ED-1481	OBDD Unlabeled in Toluene	8 X 1.2 mL
	ED-1481-1.2	OBDD Unlabeled in Toluene	1.2 mL

NEW PBDD and PBDF Standard mixtures are Now Available

- The most comprehensive PBDD and PBDF calibration series, including 13 of the 17 2,3,7,8-containing congeners.
- The first and only mixtures to include Hepta BDD congener.
- Calibration sets with corresponding Sampling, Cleanup, and Syringe spiking solutions.
- All homologue groups with at least one congener.

Polybrominated Dibenzofurans			
5 µg/mL in Nonane (unless otherwise noted) 70:30=70% n-Nonane/30% Toluene, 93:7=93% n-Nonane/7% Toluene			
<i>NEW</i>	EF-5076	2-MonoBDF (¹³ C _{12r} , 99%)	4 X 1.2 mL
<i>NEW</i>	EF-5075	2-MonoBDF Unlabeled	8 X 1.2 mL
	EF-5078	2,8-DiBDF (¹³ C _{12r} , 99%)	4 X 1.2 mL
	EF-5077	2,8-DiBDF Unlabeled	8 X 1.2 mL
<i>NEW</i>	EF-5080	2,4,8-TriBDF (¹³ C _{12r} , 99%)	4 X 1.2 mL
<i>NEW</i>	EF-5079	2,4,8-TriBDF Unlabeled	8 X 1.2 mL
	EF-1442	2,3,7,8-TetraBDF (¹³ C _{12r} , 99%)	4 X 1.2 mL
	EF-1442-1.2	2,3,7,8-TetraBDF (¹³ C _{12r} , 99%)	1.2 mL
	EF-1443	2,3,7,8-TetraBDF Unlabeled	8 X 1.2 mL
<i>NEW</i>	EF-1443-1.2	2,3,7,8-TetraBDF Unlabeled	1.2 mL
<i>NEW</i>	EF-5082	2,4,6,8-TetraBDF (¹³ C _{12r} , 99%)	4 X 1.2 mL
<i>NEW</i>	EF-5082-1.2	2,4,6,8-TetraBDF (¹³ C _{12r} , 99%)	1.2 mL
	EF-5081	2,4,6,8-TetraBDF Unlabeled	8 X 1.2 mL
	EF-1452	1,2,3,7,8-PentaBDF (¹³ C _{12r} , 99%)	4 X 1.2 mL
	EF-1452-1.2	1,2,3,7,8-PentaBDF (¹³ C _{12r} , 99%)	1.2 mL
	EF-1453	1,2,3,7,8-PentaBDF Unlabeled	8 X 1.2 mL
<i>NEW</i>	EF-1453-1.2	1,2,3,7,8-PentaBDF Unlabeled	1.2 mL
	EF-1454	2,3,4,7,8-PentaBDF (¹³ C _{12r} , 99%)	4 X 1.2 mL
<i>NEW</i>	EF-1454-1.2	2,3,4,7,8-PentaBDF (¹³ C _{12r} , 99%)	1.2 mL
	EF-1455	2,3,4,7,8-PentaBDF Unlabeled	8 X 1.2 mL
<i>NEW</i>	EF-1455-1.2	2,3,4,7,8-PentaBDF Unlabeled	1.2 mL
	EF-1463	1,2,3,4,7,8-HexaBDF (¹³ C _{12r} , 99%)	4 X 1.2 mL
	EF-1463-1.2	1,2,3,4,7,8-HexaBDF (¹³ C _{12r} , 99%)	1.2 mL
	EF-1464	1,2,3,4,7,8-HexaBDF Unlabeled	70:30 8 X 1.2 mL
<i>NEW</i>	EF-1464-1.2	1,2,3,4,7,8-HexaBDF Unlabeled	70:30 1.2 mL
	EF-5259	1,2,3,4,6,7,8-HeptaBDF (¹³ C _{12r} , 99%)	70:30 4 X 1.2 mL
<i>NEW</i>	EF-5259-1.2	1,2,3,4,6,7,8-HeptaBDF (¹³ C _{12r} , 99%)	70:30 1.2 mL
	EF-1486	1,2,3,4,6,7,8-HeptaBDF Unlabeled	93:7 8 X 1.2 mL
	EF-1486-1.2	1,2,3,4,6,7,8-HeptaBDF Unlabeled	93:7 1.2 mL
<i>NEW</i>	EF-5266	OBDF (¹³ C _{12r} , 99%)	70:30 4 X 1.2 mL
<i>NEW</i>	EF-5266-1.2	OBDF (¹³ C _{12r} , 99%)	70:30 1.2 mL
	EF-5263	OBDF Unlabeled	70:30 8 X 1.2 mL
<i>NEW</i>	EF-5263-1.2	OBDF Unlabeled	70:30 1.2 mL

For a complete listing of Environmental Standards, visit isotope.com

Isotope Labeled PBDD/PBDF Spikes

CIL has prepared isotope-labeled spikes to be used with the calibration solutions on the following pages.

EDF-5408 contains at least one congener from each homologue group, and can be used in conjunction with EDF-5407.

EDF-5382 enables analysis of congeners at higher concentrations and can be used in conjunction with EDF-5381.

Bromodioxin/Furan Cleanup Spikes

¹³ C-Labeled Component Concentration (ng/mL)	<i>NEW</i> EDF-5408 0.5 mL in Nonane	EDF-5382 0.55 mL in Nonane
2,3,7,8-TeBDD (¹³ C _{12r} , 99%)	100	50
1,2,3,7,8-PeBDD (¹³ C _{12r} , 99%)	100	100
1,2,3,4,7,8-HxBDD (¹³ C _{12r} , 99%)	250	375
1,2,3,6,7,8-HxBDD (¹³ C _{12r} , 99%)	250	375
1,2,3,4,6,7,8-HpBDD (¹³ C _{12r} , 99%)	500	
OBDD (¹³ C _{12r} , 99%)	750	1125
2,3,7,8-TeBDF (¹³ C _{12r} , 99%)	100	200
2,3,4,7,8-PeBDF (¹³ C _{12r} , 99%)	100	200
1,2,3,4,7,8-HxBDF (¹³ C _{12r} , 99%)	250	375
1,2,3,4,6,7,8-HpBDF (¹³ C _{12r} , 99%)	500	500
OBDF (¹³ C _{12r} , 99%)	750	1125

Bromodioxin/Furan Syringe Spike (¹³C_{12r}, 99%)

¹³ C-Labeled Component Concentration (ng/mL)	<i>NEW</i> EDF-5409 1.2 mL in Nonane	EDF-5383 1.2 mL in Nonane
1,2,3,7,8,9-HxBDD (¹³ C _{12r} , 99%)	500	500
1,2,3,7,8-PeBDF (¹³ C _{12r} , 99%)	200	200

Bromodioxin/Furan Sampling Spike (¹³C_{12r}, 99%)

¹³ C-Labeled Component Concentration (ng/mL)	<i>NEW</i> EF-5410 1.2 mL in Nonane	EF-5384 1.2 mL in Nonane
2,4,6,8-TeBDD (¹³ C _{12r} , 99%)	200	200

NEW PBDD/PBDF Calibration Solution

EDF-5407 contains analysis from all homologue groups representing the 2,3,7,8-containing analytes believed to have similar toxicity to the 2,3,7,8-containing PCDDs and PCDFs.

NEW EDF-5407 Bromodioxin/Furan Calibration Standards Solutions (unlabeled/¹³C_{12r}, 99%) 5 X 0.2 mL in Nonane

Native Analytes	CS1	CS2	CS3	CS4	CS5
2,3,7,8-TeBDD	0.1	0.4	2.0	10	50
1,2,3,7,8-PeBDD	0.2	0.8	4.0	20	100
1,2,3,4,7,8-HxBDD	0.6	2.4	12.0	60	300
1,2,3,6,7,8-HxBDD	0.6	2.4	12.0	60	300
1,2,3,4,6,7,8-HpBDD	0.75	3.0	15.0	75	375
OBDD	1.0	4.0	20.0	100	500
2,3,7,8-TeBDF	0.2	0.8	4.0	20	100
2,4,6,8-TeBDF	0.2	0.8	4.0	20	100
1,2,3,7,8-PeBDF	0.4	1.6	8.0	40	200
2,3,4,7,8-PeBDF	0.4	1.6	8.0	40	200
1,2,3,4,7,8-HxBDF	0.6	2.4	12.0	60	300
1,2,3,4,6,7,8-HpBDF	0.75	3.0	15.0	75	375
OBDF	1.0	4.0	20.0	100	500

Cleanup Standards

2,3,7,8-TeBDD (¹³ C _{12r} , 99%)	20	20	20	20	20
1,2,3,7,8-PeBDD (¹³ C _{12r} , 99%)	20	20	20	20	20
1,2,3,4,7,8-HxBDD (¹³ C _{12r} , 99%)	50	50	50	50	50
1,2,3,6,7,8-HxBDD (¹³ C _{12r} , 99%)	50	50	50	50	50
1,2,3,4,6,7,8-HpBDD (¹³ C _{12r} , 99%)	100	100	100	100	100
OBDD (¹³ C _{12r} , 99%)	150	150	150	150	150
2,3,7,8-TeBDF (¹³ C _{12r} , 99%)	20	20	20	20	20
2,3,4,7,8-PeBDF (¹³ C _{12r} , 99%)	20	20	20	20	20
1,2,3,4,7,8-HxBDF (¹³ C _{12r} , 99%)	50	50	50	50	50
1,2,3,4,6,7,8-HpBDF (¹³ C _{12r} , 99%)	100	100	100	100	100
OBDF (¹³ C _{12r} , 99%)	150	150	150	150	150

Syringe Standards

1,2,3,7,8,9-HxBDD (¹³ C _{12r} , 99%)	50	50	50	50	50
1,2,3,7,8-PeBDF (¹³ C _{12r} , 99%)	20	20	20	20	20

Sampling Standards

2,4,6,8-TeBDF (¹³ C _{12r} , 99%)	20	20	20	20	20
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Polybrominated Dibenzo-p-dioxins (PBDDs) and Dibenzofurans (PBDFs)

Polybrominated Dibenzo-p-dioxins (PBDDs) and Dibenzofurans (PBDFs)