



# Dioxins, PCBs, and PAHs in Air

ALS employs high-resolution gas chromatography/high-resolution mass spectrometry (HRGC/HRMS) methods for low-level detection of dioxins, furans, and PCBs.

## Dioxin Testing

EPA Method 23 is used for testing of dioxins and furans from stationary sources such as boilers. This method uses traps filled with XAD resin for sampling. For testing of dioxins and furans in ambient air using a polyurethane foam (PUF) trap, EPA Method TO-9A is used.

## PCB Testing

Since no EPA method exists for the determination of PCB congeners in ambient air by high-resolution gas chromatography/high-resolution mass spectrometry (HRGC/HRMS), ALS uses polyurethane foam (PUF) sampling in order to test ambient air for all 209 PCB congeners. This modified method includes the addition of surrogate standards to the PUF before sampling so that sampling efficiency can be measured.

## Polyurethane Foam Sampling

PUFs are available for high-volume and low-volume sampling. If testing for both PCB congeners and dioxin/furans (PCDDs/PCDFs) is required, the PUF or XAD resin traps can be spiked with PCB and PCDD/PCDF surrogate standards prior to being shipped to the client. As a result, both PCBs and PCDDs/PCDFs may be analyzed with only one trap.

Quality control samples made up of the sampling material (XAD resin or PUF) are analyzed with each extraction batch. LCS, DLCS, and method blank samples measure batch accuracy and precision as well as monitor background contamination levels.

## SERVICE

- On-time data delivery and rapid TAT
- Experienced staff with expertise
- Available after-hours and weekends

## VALUE

- Instant access to data with Webtrieve™ and Webtrieve™ Mobile App
- Custom bottle kits with pre-printed labels and COCs

## RELIABILITY

- Technical experts that can answer your most difficult questions
- A real focus on quality and process control with a rigorous QA/QC program

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## Dioxins and Furans Reporting Limits

Analyte	Congener Abbreviation	EPA Method 23*		EPA Method TO-9A*	
		EDL (pg)	MRL (pg)	EDL (pg)	MRL (pg)
2,3,7,8-Tetrachlorodibenzo-p-dioxin	2,3,7,8-TCDD	.792	2.0	.734	2.0
1,2,3,7,8-Pentachlorodibenzo-p-dioxin	1,2,3,7,8-PeCDD	.891	10	.631	10
1,2,3,4,7,8-Hexachlorodibenzo-p-dioxin	1,2,3,4,7,8-HxCDD	.968	10	.586	10
1,2,3,6,7,8-Hexachlorodibenzo-p-dioxin	1,2,3,6,7,8-HxCDD	1.05	10	.611	10
1,2,3,7,8,9-Hexachlorodibenzo-p-dioxin	1,2,3,7,8,9-HxCDD	.955	10	.576	10
1,2,3,4,6,7,8-Heptachlorodibenzo-p-dioxin	1,2,3,4,6,7,8-HxCDD	1.19	10	.727	10
1,2,3,4,6,7,8,9-Octachlorodibenzo-p-dioxin	OCDD	1.78	20	.872	20
2,3,7,8-Tetrachlorodibenzofuran	2,3,7,8-TCDF	.794	2.0	.793	2.0
1,2,3,7,8-Pentachlorodibenzofuran	1,2,3,7,8-PeCDF	.741	10	.439	10
2,3,4,7,8-Pentachlorodibenzofuran	2,3,4,7,8-PeCDF	.707	10	.426	10
1,2,3,4,7,8-Hexachlorodibenzofuran	1,2,3,4,7,8-HxCDF	.628	10	.410	10
1,2,3,6,7,8-Hexachlorodibenzofuran	1,2,3,6,7,8-HxCDF	.656	10	.391	10
1,2,3,7,8,9-Hexachlorodibenzofuran	1,2,3,7,8,9-HxCDF	.811	10	.468	10
2,3,4,6,7,8-Hexachlorodibenzofuran	2,3,4,6,7,8-HxCDF	.729	10	.432	10
1,2,3,4,6,7,8-Heptachlorodibenzofuran	1,2,3,4,6,7,8-HpCDF	.943	10	.570	10
1,2,3,4,7,8,9-Heptachlorodibenzofuran	1,2,3,4,7,8,9-HpCDF	1.18	10	.691	10
1,2,3,4,6,7,8,9-Octachlorodibenzofuran	OCDF	1.60	20	.965	20

EDL = Average estimated detection limits specific to each method and matrix. MRL = Method Reporting Limit.

\* These reporting limits are calculated using an ICAL with an extra lowest point making the reporting limit five times lower than those specified in Method 23 and TO-9A.

## PCB Reporting Limits\*

Co-Planar PCBs	Congener Number	CARB 428	
		EDL (pg)	MRL (pg)
3,3',4,4'-TCB	77	11.3	2500
3,4,4',5-TCB	81	10.7	2500
3,3',4,4',5-PeCB	126	9.3	2500
2,3,3',4,4'-PeCB	105	7.49	1000
2,3,4,4',5-PeCB	114	8.24	2500
2,3',4,4',5-PeCB	118	8.13	2500
2',3,4,4',5-PeCB	123	7.68	2500
2,3,3',4,4',5-PeCB	156/157	12.4	2500
2,3',4,4',5,5'-HxCB	167	8.44	2500
3,3',4,4',5,5'-HxCB	169	10.5	2500
2,3,3',4,4',5,5'-HpCB	189	12.2	2500

\* Reporting limits for 209 PCB congeners upon request.

