2021 - 2023



WELLINGTON LABORATORIES

Standards for Environmental Testing and Research

CERTIFICATE OF REGISTRATION

This is to certify that

Wellington Laboratories Inc.

345 Southgate Drive, Guelph, Ontario N1G 3M5 Canada

operates a

Quality Management System

which complies with the requirements of

ISO 9001:2015

for the following scope of certification

The Registration covers the Quality Management System as it applies to the design and provision of reference standards and chemicals for use in environmental analysis and toxicological research.

Certificate No.:	CERT-0106807	Original Certification Date:	December 30, 2004
File No.:	1039334	Certification Effective Date:	November 4, 2020
Issue Date:	November 3, 2020	Certificate Expiry Date:	November 3, 2023

Heather Mahon
Global Head of Technical Services
SAI Global Assurance

ISO 9001

ANAB ACCREDITED ISO/IEC 17021 MANAGEMENT SYSTEMS CERTIFICATION BODY

MEMBER OF MULTILATERAL RECOGNITION ARRANGEMENT IAF

Registered by:
QMI-SAI Canada Limited (SAI Global) 20 Carlson Court, Suite 200, Toronto, Ontario M9W 7K6 Canada. This registration is subject to the **SAI Global** Terms and Conditions for Certification. While all due care and skill was exercised in carrying out this assessment, **SAI Global** accepts responsibility only for proven negligence. This certificate remains the property of **SAI Global** and must be returned to them upon request.
To verify that this certificate is current, please refer to the **SAI Global** On-Line Certification Register
https://www.saiglobal.com/en-us/assurance/auditing_and_certification/certification_registry/

SAI GLOBAL

TRUSTED FOR QUALITY SINCE 1980

Wellington Laboratories Inc. (Wellington) celebrated its 40th anniversary in 2020. Without your continued support, we couldn't have achieved this milestone and we want to thank you for your loyalty. We hope that you will continue to trust us to provide you with high quality products, outstanding service, and efficient technical support for years to come.

As you look through this catalogue, you will notice substantial overlap with our previous printing. We have retained products that have demonstrated consistent sales, remained relevant for scientific research, and/or have been mandated by regulations in various jurisdictions. If you are unable to find items that you ordered in the past, please contact us or your local distributor (see page 10). Inventory of these withdrawn products might still be available and we will do our best to accommodate your request.

Some of the new products in this catalogue include:

- Additional Alkyl-, Aryl- and Alkyl/Aryl Phosphates
- More Per- and Polyfluoroalkyl Substances (PFAS)
- Native and Mass-Labelled Organochlorine Pesticides (OCPs)
- New Native and Mass-Labelled Chlorinated Naphthalenes (PCNs)

We announce new products between catalogue printings so please visit our website (www.well-labs.com) to subscribe to our newsletter, *The Wellington Reporter*, to receive new product announcements by e-mail.

Our Quality Management System (QMS) continues to be registered to ISO 9001 providing us with the structure and procedures required to prepare accurate and precise products. Wellington is also accredited to ISO 17034 for reference material production and to ISO/IEC 17025 for our testing activities. Current certificates for all registrations and accreditations are available upon request.

Wellington employs a dynamic group of people who are all highly qualified and come from diverse, yet complimentary backgrounds. Each one of them remain passionate about the science behind our products.

We trust that our products, service, and overall dedication will give you...***an Added Measure of Confidence***

President
Brock Chittim

Office Staff
Darlene Seifried
Heather Nell
Inge Kemsley
Emma Larente

Analytical Support
Dave Potter
Fiona Utley
Christine Frid
Vaishnavi Raja
Rita Sarkany

Robert McCrindle
Alex Konstantinov
Allison Brazeau
Jeff Klein
Curtis Kiteley
Jordan Stubbleski

Reference Standards Division
Nicole Riddell
Tom Stefanac
Yigang Zhou
Scott Synnott
Christine Espina

Research & Development
Bonnie Sharratt

Alan McAlees
Katrina Tait
Lauren Irwin
Connor McInroy
Etta Gunsolus
Jennifer Robinson

As Wellington marked our 40th anniversary, we reflected on the path that we've taken and looked forward to the opportunities, risks, and road ahead. As part of our journey, we are training a new generation of chemists who are dedicated to learning from those that have been with us from the beginning. The cover artwork recognises the intersection of past knowledge with new ideas and skill at Wellington.

Wellington is proud to distribute our products globally, but loves to call the city of Guelph home. Pictures featured in this catalogue showcase local scenery from Guelph, Ontario and the surrounding area.

TABLE OF CONTENTS

Introduction "Trusted for Quality Since 1980"	... ...	1
Table of Contents	... ...	2
"Support Solutions"	... ...	5
General Information	... ...	6
Ordering, Terms, Warranty & Use	... ...	8
Distributors	... ...	10

PCDD/PCDF ANALYTICAL METHOD SOLUTIONS

EPA Method 1613 Standard Solutions	... ...	14
Alternative Method 16130 Standard Solutions	... ...	16
CS3WT	... ...	17
EPA Method 8280 Standard Solutions	... ...	18
EPA Method 8290 Standard Solutions	... ...	20
EPA Method 23 Standard Solutions	... ...	22
European Method EN-1948 Standard Solutions	... ...	24
HRGC/HRMS TCDD/TCDF Analysis Solutions	... ...	26
Capillary Column Performance Test Mixtures	... ...	27
Mass-Labelled Capillary Column Performance Test Mixtures	... ...	30

INDIVIDUAL PCDD & PCDF CONGENERS: NATIVE AND MASS-LABELLED

Native Polychlorinated Dibenzo-*p*-dioxins (PCDDs)	... ...	32
Native Polychlorinated Dibenzofurans (PCDFs)	... ...	33
Mass-Labelled Polychlorinated Dibenzo-*p*-dioxins	... ...	35
Mass-Labelled Polychlorinated Dibenzofurans	... ...	38

PCDDs and PCDFs: JIS METHODS & SPECIALTY SOLUTION/MIXTURES

DF-CVS-A10	... ...	44
DF-CVS-B10	... ...	46
DF-CVS-C10	... ...	48
DFP-CVS-B10	... ...	50
NK-CVS-J	... ...	52
DF-LCS-A	... ...	53
DF-LCS-B	... ...	54
DF-LCS-C	... ...	55
Mass-Labelled PCDDs & PCDFs: Solution/Mixtures	... ...	56
Mass-Labelled PCDDs/PCDFs/PCBs: Solution/Mixtures	... ...	61
Mass-Labelled PCDDs & PCBs: Solution/Mixtures	... ...	63
Native PCDDs & PCDFs: Solution/Mixtures	... ...	64
PCDDs & PCDFs: Solution/Mixtures	... ...	66

PCBs: ANALYTICAL METHOD SOLUTIONS

WP-CVS Standard Solutions	... ...	70
EPA Method 1668C Standard Solutions	... ...	72
EPA Method 1668 Standard Solutions	... ...	74
Environment Canada Method 1/RM/31 Standard Solutions	... ...	76
P48-W-CVS	... ...	78
P48-M-CVS	... ...	79
WM48-CVS	... ...	80
P48-W-PAR	... ...	81
P48-M-PAR	... ...	81
Support Solutions for EN 1948-4:2010	... ...	82

PCBs: MASS-LABELLED CONGENERS

Mass-Labelled Polychlorinated Biphenyls	... ...	84

PCBs: SPECIALTY SOLUTION/MIXTURES

PCB-CVS-H ... 90
PCB-CVS-A10 ... 92
PCB-CVS-B10 ... 94
Mass-Labelled PCBs: Solution/Mixtures ... 96
Native PCBs: Solution/Mixtures ... 98
BP-CP81 ... 98
BP-WD ... 99
BP-MO ... 99
BP-MS ... 100
PCBs: Solution/Mixtures ... 101
Mass-Labelled PCDDs/PCDFs/PCBs: Solution/Mixtures ... 102

POLYBROMINATED DIPHENYL ETHERS & POLYBROMINATED BIPHENYLS

BFR-CVS ... 104
BDE-CVS-F ... 106
BDE-CVS-G ... 108
Native Polybrominated Diphenyl Ethers (PBDEs) ... 110
PBDE Window Defining Solution/Mixture ... 112
Native PBDEs: Solution/Mixtures ... 112
Mass-Labelled Polybrominated Diphenyl Ethers (PBDEs) ... 114
Mass-Labelled PBDEs: Solution/Mixtures ... 116
Polybrominated Diphenyl Ether Technical Mixtures ... 117
Native Methoxy-Bromodiphenyl Ethers (MeO-BDEs) ... 118
Methoxy-Bromodiphenyl Ethers: Solution/Mixture ... 119
Mass-Labelled Methoxy-Bromodiphenyl Ethers ... 119
Mass-Labelled Hydroxy-Bromodiphenyl Ethers ... 119
Native Polybrominated Biphenyls (PBBs) ... 120
Native PBBs: Solution/Mixture & Technical Mixtures ... 121
Mass-Labelled Polybrominated Biphenyls ... 121
Mass-Labelled PBBs: Solution/Mixture ... 122

HALOGENATED FLAME RETARDANTS & RELATED COMPOUNDS

Native Hexabromocyclododecanes (HBCDDs) ... 126
Native HBCDD Enantiomers ... 126
Mass-Labelled Hexabromocyclododecanes ... 127
Native Pentabromocyclododecene (PBCD) ... 127
Tetrabromobisphenol-A (TBBPA): Native and Mass-Labelled ... 127
Decabromodiphenylethane (DBDPE): Native and Mass-Labelled ... 128
1,2-Bis(2,4,6-tribromophenoxy)ethane (BTBPE): Native and Mass-Labelled ... 128
Hexabromobenzene (HBBZ): Native and Mass-Labelled ... 128
Pentabromobenzene (PBBZ): Native and Mass-Labelled ... 129
Native Pentabromoethylbenzene (PBEB) ... 129
Native Pentabromotoluene (PBT) ... 129
Native Tetrabromo-p-xylene (pTBX) ... 129
Native 1,2,5,6-Tetrabromocyclooctane (TBCO) ... 129
Native Tetrabromoethylcyclohexane (TBECH) ... 130
Native Octabromotrimethylphenylindane (OBIND) ... 130
Bis(2-ethylhexyl) tetrabromophthalate (BEHTBP): Native and Mass-Labelled ... 131
2-Ethylhexyl 2,3,4,5-tetrabromobenzoate (EHTBB): Native and Mass-Labelled ... 131
Native Hexachlorocyclopentenyl-dibromocyclooctane (HCDBCO) ... 131
Native Tetrabromo-o-chlorotoluene (TBCT) ... 131
Native Pentabromobenzyl acrylate (PBBA) ... 132
Native 2,4,6-Tribromophenyl ethers (ATE, DPTE, & BATE) ... 132
Dechlorane Plus® (DP): Native and Mass-Labelled ... 132
Dechlorinated Dechlorane Plus® ... 132
Native Dechlorane Plus® Mono Adducts ... 133
Native Experimental Flame Retardants ... 133
Native Tris(2,3-dibromopropyl)isocyanurate (T23BPIC) ... 134
2,3,4,5-Tetrabromobenzoic acid: Native and Mass-Labelled (TBBA) ... 134
Native Methyl-2,3,4,5-Tetrabromobenzoate (MeTBBA) ... 134

TABLE OF CONTENTS

Tetrabromophthalic anhydride: Native and Mass-Labelled (TBPAn) ... 134
Native Organophosphorus Compounds ... 135
Mass-Labelled Organophosphorus Compounds ... 139
Brominated Dibenzo-p-dioxins (PBDDs): Native and Mass-Labelled ... 140
Native Brominated Dibenzofurans (PBDFs) ... 141
Bromo/Chloro Dibenzo-*p*-dioxins: Native and Mass-Labelled ... 141
Bromo/Chloro Dibenzofurans: Native and Mass-Labelled ... 142

PER- & POLYFLUOROALKYL SUBSTANCES (PFAS)

PFC-CVS-C ... 144
Native Linear Perfluoroalkanesulfonates: Individual Solutions & Mixture ... 146
Native Perfluoroethylcyclohexanesulfonate (PFECHS) ... 146
Native Chloro-Perfluoroalkanesulfonate ... 147
Native Branched Perfluoroalkanesulfonates ... 147
Mass-Labelled Perfluoroalkanesulfonates ... 147
Native Linear Perfluoroalkylcarboxylic Acids: Individual Solutions & Mixture ... 148
Native Branched Perfluoroalkylcarboxylic Acids ... 148
Mass-Labelled Perfluoroalkylcarboxylic Acids ... 149
Mixed Native PFAS: Solution/Mixtures ... 151
Mixed Mass-Labelled PFAS: Solution/Mixture ... 153
Mixed Native and Mass-Labelled PFAS: Solution/Mixture ... 154
EPA Method 537.1 Solutions/Mixtures ... 156
ISO 21675:2019 Solutions/Mixtures ... 158
EPA Method 533 Solutions/Mixtures ... 160
PFOS/PFOA Isomers ... 161
Perfluoroalkanesulfonamides (FASA): Native and Mass-Labelled ... 162
Native Perfluoroalkanesulfonamidoethanols (N-MeFASE and N-EtFASE) ... 162
Mass-Labelled Perfluoroalkanesulfonamidoethanols ... 163
Perfluorooctanesulfonamidoacetic Acids (FOSAA): Native and Mass-Labelled ... 163
Native Fluorotelomer Alcohols (X:2FTOH) ... 163
Mass-Labelled Fluorotelomer Alcohols ... 164
Native Fluorotelomer Carboxylic Acids (FTCA): Individual Solutions ... 164
Native Fluorotelomer Carboxylic Acids (FTCA): Solution/Mixture ... 164
Mass-Labelled Fluorotelomer Carboxylic Acids: Individual Solutions & Mixture ... 165
Native Fluorotelomer Unsaturated Carboxylic Acids (FTUCA) ... 166
Mass-Labelled Fluorotelomer Unsaturated Carboxylic Acids ... 166
Native Chloroperfluoroalkyl Ether Sulfonates (Cl-PFESA) ... 166
Native Per- and Polyfluoroalkyl Ether Carboxylic Acids (PFECA) ... 166
Native Perfluoroalkyl Ether Sulfonates (PFESA) ... 167
Hexafluoropropylene Oxide Dimer Acid (HFPO-DA): Native and Mass-Labelled ... 167
Native and Mass-Labelled Fluorotelomer Sulfonates (X:2FTS) ... 167
Native Perfluoroalkylphosphonic Acids (PFAPA) ... 168
Native Sodium Perfluoroalkyl Phosphinates (X:XPFPi) ... 168
Polyfluorinated Phosphate Esters (PAP & diPAP): Native and Mass-Labelled ... 168
Native Polyfluorinated Phosphate Esters (SAmPAP) ... 169
Native Telomer Acrylates (X:2FTAcr) ... 170
Native Telomer Acetates (X:2FTOAc) ... 170
Native Cationic/Zwitterionic PFAS ... 171

ORGANOCHLORINE PESTICIDES (OCPs)

Individual Native Organochlorine Pesticides ... 174
Native Organochlorine Pesticides Solutions/Mixtures ... 175
Individual Mass-Labelled Organochlorine Pesticides ... 176
Mass-Labelled Organochlorine Pesticides Solutions/Mixtures ... 177

ENVIRONMENTAL REFERENCE MATERIALS (ERMs)

WMF-02: Reference Fish Tissue for Organic Contaminant Analysis ... 180
WMF-03: Reference Fish Tissue for Organic Contaminant Analysis ... 182
WMF-EX: Reference Fish Tissue Extract for Organic Contaminant Analysis ... 184
WMS-01: Reference Lake Sediment for Organic Contaminant Analysis ... 186
CARP-2: Reference Fish Tissue for Organic Contaminant Analysis ... 187

ADDITIONAL PRODUCTS

PAH-CVS-B ... 190
Method 429: HRGC/LRMS Calibration Solutions for PAHs ... 192
EPA & EU PAH Solution/Mixtures ... 194
Chlorinated Biphenylols (HO-PCBs): Native and Mass-Labelled ... 196
Mass-Labelled Chlorinated Biphenylols: Solution/Mixture ... 197
Native Methoxy-Chlorobiphenyls (MeO-PCBs) ... 198
Native Methoxy-Chlorobiphenyls: Solution/Mixtures ... 199
Mass-Labelled Methoxy-Chlorobiphenyls ... 200
Mass-Labelled Methoxy-Chlorobiphenyls: Solution/Mixture ... 201
Chlorinated Biphenylenes (PCBPs): Native and Mass-Labelled ... 201
Triclocarban (TCC): Native and Mass-Labelled ... 202
Triclosan and Methyl Triclosan: Native and Mass-Labelled ... 202
Chlorinated Derivatives of Triclosan and Methyl Triclosan ... 203
Native Chloroxanthene ... 203
Tris(4-chlorophenyl)methane: Native and Mass-Labelled ... 203
Tris(4-chlorophenyl)methanol: Native and Mass-Labelled ... 203
PCN-CVS-A ... 204
Native Polychlorinated Naphthalenes: Solution/Mixtures ... 206
Native Polychlorinated Naphthalenes (PCNs) ... 208
Mass-Labelled Polychlorinated Naphthalenes ... 210
Native Polychlorinated Diphenyl Ethers (PCDEs) ... 212
Mass-Labelled Polychlorinated Diphenyl Ethers ... 212
Native Chlorobenzenes: Solution/Mixture ... 213
Mass-Labelled Chlorobenzenes: Individual Solutions and Mixture ... 213
Native and Mass-Labelled Chlorophenols: Solution/Mixtures ... 214
Mass-Labelled Chlorophenols: Individual Solutions ... 215
Melamine & Cyanuric Acid: Native and Mass-Labelled ... 215
Bisphenol A: Native and Mass-Labelled ... 216
Native Bisphenol Analogues ... 216
Tetrachlorodibenzothiophenes: Native and Mass-Labelled ... 217
Native Chlorinated, Brominated, and Bromo/Chloro Carbazoles ... 217
Native Halogenated Carbazoles: Solution/Mixture ... 218
Mass-Labelled Chlorinated Carbazoles ... 218

APPENDIX

Guidelines for the Use and Handling of Wellington Products ... 222
General Structure and Numbering System of Selected Aromatic Hydrocarbons ... 224
Number of Possible Isomers for Selected Halogenated Aromatic Compounds ... 225
Molecular Weights for Selected Chlorinated and Brominated Aromatic Compounds ... 225
Exact Mass & Relative Ion Abundance of Selected Chlorinated Aromatic Hydrocarbons ... 226
Molecular Ion Clusters for Chlorinated Aromatic Hydrocarbons ... 228
Molecular Ion Clusters for Brominated Aromatic Hydrocarbons ... 229
Exact Mass & Relative Ion Abundance of Selected Brominated Aromatic Hydrocarbons ... 230
Systematic Numbering of Chlorinated Dibenzo-*p*-dioxins ... 231
Systematic Numbering of Chlorinated Dibenzofurans ... 233
Systematic Numbering of Chlorinated Biphenyls ... 238
Systematic Numbering of Chlorinated Naphthalenes ... 244
Reference Methods ... 247

SUPPORT SOLUTIONS

Throughout this catalogue, among the products listed are sets of Calibration and Verification Solutions designed for use with a variety of GC/MS applications. These solution sets are denoted by the incorporation of the code **CVS** into their catalogue numbers, for example **EPA-1613CVS** or **DFP-CVS-B10**. These calibration solutions are designed to be used with their corresponding "support solutions". These are the solution/mixtures of native or mass-labelled compounds required for sample processing and method validation as determined by the appropriate method.

WELLINGTON LABORATORIES INC.

Wellington Laboratories Inc. (Wellington) has been a reliable and respected supplier of reference standards for over 40 years. Moreover, the company has developed a global reputation and a loyal clientele.

This has been achieved due to:

- The superior quality of our products, which includes the accompanying documentation.
- Our consistent and timely service to all our clients.
- The technical support, pre- and post-delivery, that we gladly provide.
- Our overall dedication to customer service and continual improvement.

Considering that the products we provide are necessary to ensure the accuracy of environmental, trace contaminant analyses, and for toxicological research, the qualifications and performance of our staff is critical.

Wellington has put together a highly qualified team of synthetic chemists, analytical chemists, product development chemists and administrative personnel. They are all dedicated to preparing high quality products, supporting them with science, and delivering them to our clients.

THIS CATALOGUE / NEW PRODUCTS

As in our original catalogue, Wellington continues to offer an extensive collection of native and mass-labelled chlorinated dibenzo-*p*-dioxins (PCDDs), dibenzofurans (PCDFs) and biphenyls (PCBs). This includes ready-to-use calibration solutions and support solutions for:

- PCDD/PCDF methods, such as EPA Method 1613B, JIS Methods K 0311 and K 0312, and European Standard Method 1948-4.
- PCB methods, such as EPA Method 1668C and Environment Canada Method 1/RM/31.

As new products or groups of products were developed and offered, additional sections were added to our catalogue, including those presenting:

- Polybrominated Diphenyl Ethers (PBDEs) and Polybrominated Biphenyls (PBBs).
- Other Halogenated Flame Retardants (e.g. HBCDDs) and related compounds (e.g. organo phosphates).
- Per- and Polyfluoroalkyl substances (PFAS).
- Environmental Reference Materials (ERMs).
- Additional products including polyaromatic hydrocarbons (PAHs), polychlorinated naphthalenes (PCNs), and other reference standards.

In this new catalogue we have added many new native and mass-labelled PFAS, expanded our offerings of PCNs, and introduced a separate section for organochlorine pesticides (OCPs), including newly prepared native and mass-labelled OCPs.

Please refer to the Table of Contents to review our updated product line and continue to visit our website for new product announcements.

SYNTHESIS

The chemical standards offered by Wellington are prepared using unambiguous synthetic routes and purified using a battery of methods. All products are purified to a minimum of 98% chemical purity and the isotopic purity of ^{13}C-labelled products is required to be >99%. The structure of all of our compounds is unequivocally confirmed using a variety of techniques including, as appropriate, NMR (400 or 600 MHz), HRGC with LRMS and/or HRMS, UPLC-MS/MS, and SFC/UV/MS/MS.

ACCURACY/TRACEABILITY

All of the solutions listed in this catalogue are prepared in our laboratories using:

- Microbalances calibrated regularly by an external, ISO/IEC 17025 accredited laboratory
- External weights traceable to an ISO/IEC 17025 accredited laboratory to verify microbalance calibration
- Volumetric glassware of Class A tolerance calibrated and traceable to an ISO/IEC 17025 accredited laboratory
- Distilled-in-glass or HPLC grade solvents
- Replicate solutions to ensure accuracy and confirm homogeneity

When possible, these solutions are compared to standard reference materials or certified standards from another source. The expanded maximum percent relative uncertainty of solution concentrations is ± 5%, unless stated otherwise in this catalogue.

VALIDATION/CERTIFICATION

Wellington was the first supplier of PCDDs, PCDFs and WHO PCBs to validate their solution/mixtures using "truly blind" interlaboratory studies. Since 1991, solutions of our PCDD, PCDF and PCB standards have been submitted to more than 30 international round-robins, resulting in over 2000 independent sets of HRGC/HRMS data.

In addition, over the past several years, Wellington has also submitted standards for 18 interlaboratory studies on PBDEs and 23 studies involving PFAS.

Summaries of all of these interlaboratory studies are available on request. However, in all the studies, averages of the data received for all compounds were well within ±10% of the design values.

ANALYSIS/DOCUMENTATION

Each of our products comes with a detailed Certificate of Analysis (CofA) which includes data which the end user should be able to replicate using equivalent instrumentation and conditions. The CofA includes HRGC/LRMS and/or HRGC/HRMS data depending upon the intended use of the product. Those compounds that are not amenable to GC analysis come with LC/MS data.

Additionally, all of our mass-labelled products come with data that clearly shows their isotopic purity. All calibration sets include RRF summaries showing the required linearity. Safety Data Sheets and handling guidelines are available for all products.

OTHER PRODUCTS/CUSTOM REQUESTS

For products not listed in this catalogue, please visit our website for updates or contact us at **info@well-labs.com**. Custom solution preparation and synthetic services are also available.

ORDERING, TERMS, WARRANTY & USE

ORDERING INFORMATION

To place an order, please contact the distributor that serves your country. Distributors are listed on pages **10** and **11**, as well as on our website.

For Canada, and for other countries where we do not have a distributor, please contact:

Wellington Laboratories Inc.
345 Southgate Drive
Guelph, Ontario CANADA N1G 3M5

Telephone:	(519) 822-2436
Toll-free:	(800) 578-6985
FAX:	(519) 822-2849
E-mail:	orders@well-labs.com
Website:	www.well-labs.com

When ordering, please provide as much information as possible, including:

- Detailed shipping address and billing address
- Purchase order number, if known
- Catalogue number and description of product
- Quantity and unit size

TERMS & CONDITIONS OF SALE

Prices: A price list for the products listed in this catalogue *is available from your local distributor.* Prices are subject to change without notice.

Payment: Payment terms are net 30 days from date of invoice. Past due invoices will be subject to a 2% monthly finance charge.

Note: We may also accept credit card payments.

Shipping & Handling: All shipments will be arranged using a courier licensed to carry dangerous goods in excepted quantities.

Returns: Please contact Wellington Laboratories Inc. or your local distributor for a return authorization number. No credit or exchange will be approved after 30 days from shipment and without prior authorization.

LIMITED WARRANTY

At the time of shipment, all products are warranted to be free of defects in material and workmanship and to conform to the accompanying technical and purity specifications. Wellington Laboratories Inc. makes no other warranty, expressed or implied, pertaining to the suitability of the product for any specific application. In case of breach of this warranty, the entire liability of Wellington Laboratories Inc. will be limited to the invoice price of the goods. In no case will Wellington Laboratories Inc. be liable for any special, incidental or consequential damages resulting from the use of its products.

INTENDED USE

The products prepared by Wellington Laboratories Inc. are for laboratory use only. They are not for use in humans.

These chemicals should only be used by qualified personnel who are familiar with their potential hazards and are trained in their handling. With all of our products, due care should be exercised to prevent human contact and ingestion.

The absence of a toxicity warning on any of our products must not be interpreted as an indication that there is no possible health hazard.

Safety Data Sheets (SDSs) are supplied upon request.

PACKAGING

For the safety and convenience of our clients, the solutions provided by Wellington Laboratories Inc. are packaged in clear or amber glass flame-sealed ampoules. Crystalline materials are packaged in glass vials with teflon-lined screw caps.

The solution volumes stated in this catalogue are the minimum volumes which will be delivered and should be considered as approximate. To retain the accuracy of the solutions, dilutions should be made using volumetric glassware.

END USE ONLY/NOT FOR RESALE

The reference standards and materials supplied by Wellington Laboratories Inc. are for end use only by the original purchaser and are not to be resold without written authorization from Wellington Laboratories Inc.

DISTRIBUTORS

To determine which distributor serves your country, please visit our website at www.well-labs.com and follow the distributor link under order info.

DISTRIBUTOR	HEAD OFFICE	CONTACT INFORMATION
WELLINGTON LABORATORIES JAPAN INC.	JAPAN	1-22-12 Fujimidai Nerima-ku, Tokyo, Japan 177-0034 Phone: +(81) 3-5934-4184 Fax: +(81) 3-5241-4222 Website: www.well-labs.co.jp Email: info@well-labs.co.jp
KANTO CHEMICAL CO., INC.	JAPAN	East Muromachi Mitsui BLDG, 2-1, Nihonbashi Muromachi 2-chome, Chuo-ku, Tokyo, Japan 103-0022 Phone: +(81) 3-6214-1090 Fax: +(81) 3-3241-1047 Website: www.kanto.co.jp Email: reag-info@gms.kanto.co.jp
WELLINGTON LABORATORIES LLC.	UNITED STATES OF AMERICA	7208 West 80th Street, Suite 206 Overland Park, KS, USA 66204 Phone: (913) 722-4919 Toll Free: (877) 809-7039 Fax: (913) 722-4669 Website: www.well-labs.com Email: wellington@swbell.net
GREYHOUND CHROMATOGRAPHY & ALLIED CHEMICALS	ENGLAND	6 Kelvin Park, Birkenhead, Merseyside, England CH41 1LT Phone: (+44)-0-151-649-4000 Fax: (+44)-0-151-649-4001 Website: www.greyhoundchrom.com Email: info@greyhoundchrom.com
BCP INSTRUMENTS	FRANCE	12 avenue des Saules 69600 Oullins, France Phone: +33 (0)4 72 49 72 65 Website: www.bcp-instruments.com Email: contact@bcp-instruments.com
CHEMICAL RESEARCH 2000 S.R.L.	ITALY	Via Santa Margherita di Belice, 16 00133, Rome, Italy Phone: +(39) 06 20630997 Fax: +(39) 06 20685490 Website: www.cr2000.it Email: info@cr2000.it
CAMPRO SCIENTIFIC GMBH	GERMANY	Goerzallee 299 14167 Berlin Germany Phone: +49.(0)30.629.01.89.0 Fax: +49.(0)30.629.01.89.89 Website: www.campro.eu Email: info@campro.eu

If your country is not served by an official distributor, please contact Wellington Laboratories directly via e-mail at: info@well-labs.com

DISTRIBUTOR	HEAD OFFICE	CONTACT INFORMATION
TECHNO SPEC	SPAIN	Calle Pau Alsina, 112 08024 Barcelona, Spain Phone: +(34) 93-284-5676 Fax: +(34) 93-219-5626 Website: www.technospec.es Email: info@technospec.es
LABICOM, A DIVISION OF HPST S.R.O.	CZECH REPUBLIC	Na Jetelce 69/2, 19000 Praha 9, Czech Republic Phone: +(420) 604-931-771 Website: www.labicom.cz Email: info@hpst.cz E-shop: https://eshop.labicom.cz/
SMART E INTERNATIONAL (BJ) LTD.	CHINA	3107 Building D, SOHO New Town 88 Jianguo Road, Chaoyang District, Beijing, P.R. China 100022 Phone: +86-10-8580-1267 Fax: +86-10-8580-1268 Website: www.wellington-china.com Email: info@wellington-china.com
AURORA BOREALIS TECHNOLOGY CO., LTD.	TAIWAN	4F, No. 42, Huaining Street Zhongzheng District, Taipei City 10046, Taiwan R.O.C. Phone: +886-2-2375-7239 Fax: +886-2-2331-1829 Website: www.aubotech.com Email: edward.lee@aubotech.com
BK SCIENTIFIC CO., LTD.	KOREA	Rm. No. 1108, Daebang the MCity Office B/D, 255 Kintex-ro, Ilsanseo-gu, Goyang-si, Gyeonggi-do, Korea, 10390 Tel: 82-31-902-7986 Fax: 82-31-908-7986 e-mail: bkscientific@nate.com
BYMAZ PTY. LTD.	SOUTH AFRICA	61C 13th Avenue Boksburg North, Gauteng, South Africa Phone: +27(0) 11-894-4458 Cell: +27(0) 82-334-4007 Website: www.bymaz.co.za Email: byron@bymaz.co.za
SCANTEC NORDIC AB	SWEDEN	Fabriksstråket 29 433 76 Jonsered, Sweden Phone: +(46) 31 336 90 00 Website: www.scantecnordic.se Email: info@scantecnordic.se



Covered Bridge
Guelph, Ontario

PCDD/PCDF ANALYTICAL METHOD SOLUTIONS

Complete sets of calibration and support solutions are offered for the following methods:

U.S. EPA Method 1613B
U.S. EPA Method 8280
U.S. EPA Method 8290
U.S. EPA Method 23
European Standard Method EN 1948-4
HRGC/HRMS TCDD and TCDF Analysis Solutions

Also included in this section are the following solution/mixtures of PCDD and PCDF congeners. These are used to test and confirm the resolution of the HRGC column being used and to set retention time windows for the PCDD and PCDF congener groups:

CS3WT:	**EPA-1613CS3 calibration solution combined with PCDD/PCDF window defining congeners and 2,3,7,8-TCDD resolution testing isomers.**
5CWDS:	**PCDD/PCDF window defining congener mix.**
5TCDD:	**2,3,7,8-TCDD resolution test mixture.**
225TCDF:	**2,3,7,8-TCDF resolution test mixture.**
TDTFWD:	**Combined PCDD/PCDF window defining and resolution testing mixture for 3 HRGC columns of varying polarity.**

In this edition, we have added solution/mixtures of ^{13}C-labelled, window-defining PCDDs **(MD5CWDS)** and PCDFs **(MF5CWDS)**. These can be added to samples prior to extraction, or to extracts prior to analysis to confirm that the congener group HRGC windows have not shifted significantly during the analysis. Moreover, these solutions can also be used as injection or sampling standards.





EPA METHOD 1613 STANDARD SOLUTIONS

Catalogue Number	Product (nonane solution)	Qty/Conc
EPA-1613CVS	EPA Method 1613 Calibration and Verification Solutions CS1-CS5	1 kit (5 ampoules)
EPA-1613CSL*	CSL Extended Calibration/Low Level	500 µL
EPA-1613CS0.5*	CS0.5	500 µL
EPA-1613CS1	CS1	500 µL
EPA-1613CS2	CS2	500 µL
EPA-1613CS3	CS3 Calibration Verification	1.0 mL
EPA-1613CS4	CS4	500 µL
EPA-1613CS5	CS5	500 µL

NOTE: 200 µL AMPOULES OF THE CALIBRATION SOLUTIONS ARE ALSO AVAILABLE. PLEASE CONTACT WELLINGTON OR YOUR LOCAL DISTRIBUTOR FOR PRICING INFORMATION.

NATIVE PCDDs & PCDFs	1613CSL (ng/mL)	1613CS0.5 (ng/mL)	1613CS1 (ng/mL)	1613CS2 (ng/mL)	1613CS3 (ng/mL)	1613CS4 (ng/mL)	1613CS5 (ng/mL)
2,3,7,8-Tetrachlorodibenzo-*p*-dioxin	0.100	0.250	0.500	2.00	10.0	40.0	200
1,2,3,7,8-Pentachlorodibenzo-*p*-dioxin	0.500	1.25	2.50	10.0	50.0	200	1000
1,2,3,4,7,8-Hexachlorodibenzo-*p*-dioxin	0.500	1.25	2.50	10.0	50.0	200	1000
1,2,3,6,7,8-Hexachlorodibenzo-*p*-dioxin	0.500	1.25	2.50	10.0	50.0	200	1000
1,2,3,7,8,9-Hexachlorodibenzo-*p*-dioxin	0.500	1.25	2.50	10.0	50.0	200	1000
1,2,3,4,6,7,8-Heptachlorodibenzo-*p*-dioxin	0.500	1.25	2.50	10.0	50.0	200	1000
Octachlorodibenzo-*p*-dioxin	1.00	2.50	5.00	20.0	100	400	2000
2,3,7,8-Tetrachlorodibenzofuran	0.100	0.250	0.500	2.00	10.0	40.0	200
1,2,3,7,8-Pentachlorodibenzofuran	0.500	1.25	2.50	10.0	50.0	200	1000
2,3,4,7,8-Pentachlorodibenzofuran	0.500	1.25	2.50	10.0	50.0	200	1000
1,2,3,4,7,8-Hexachlorodibenzofuran	0.500	1.25	2.50	10.0	50.0	200	1000
1,2,3,6,7,8-Hexachlorodibenzofuran	0.500	1.25	2.50	10.0	50.0	200	1000
1,2,3,7,8,9-Hexachlorodibenzofuran	0.500	1.25	2.50	10.0	50.0	200	1000
2,3,4,6,7,8-Hexachlorodibenzofuran	0.500	1.25	2.50	10.0	50.0	200	1000
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.500	1.25	2.50	10.0	50.0	200	1000
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.500	1.25	2.50	10.0	50.0	200	1000
Octachlorodibenzofuran	1.00	2.50	5.00	20.0	100	400	2000
MASS-LABELLED PCDDs & PCDFs							
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	100	100	100	100	100	100	100
1,2,3,7,8-Pentachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	100	100	100	100	100	100	100
1,2,3,4,7,8-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	100	100	100	100	100	100	100
1,2,3,6,7,8-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	100	100	100	100	100	100	100
1,2,3,4,6,7,8-Heptachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	100	100	100	100	100	100	100
Octachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	200	200	200	200	200	200	200
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzofuran	100	100	100	100	100	100	100
1,2,3,7,8-Pentachloro($^{13}C_{12}$)dibenzofuran	100	100	100	100	100	100	100
2,3,4,7,8-Pentachloro($^{13}C_{12}$)dibenzofuran	100	100	100	100	100	100	100
1,2,3,4,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran	100	100	100	100	100	100	100
1,2,3,6,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran	100	100	100	100	100	100	100
1,2,3,7,8,9-Hexachloro($^{13}C_{12}$)dibenzofuran	100	100	100	100	100	100	100
2,3,4,6,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran	100	100	100	100	100	100	100
1,2,3,4,6,7,8-Heptachloro($^{13}C_{12}$)dibenzofuran	100	100	100	100	100	100	100
1,2,3,4,7,8,9-Heptachloro($^{13}C_{12}$)dibenzofuran	100	100	100	100	100	100	100
CLEANUP STANDARD							
2,3,7,8-($^{37}Cl_4$)Tetrachlorodibenzo-*p*-dioxin	0.100	0.250	0.500	2.00	10.0	40.0	200
INTERNAL STANDARDS							
1,2,3,4-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	100	100	100	100	100	100	100
1,2,3,7,8,9-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	100	100	100	100	100	100	100

* **EPA-1613CSL** and **EPA-1613CS0.5** are not included in the EPA-1613CVS kit and must be ordered separately.

EPA METHOD 1613 STANDARD SOLUTIONS

Catalogue Number	Product (nonane solution)	Qty/Conc
EPA-1613LCS*	Labelled Compound Stock Solution	1.2 mL
EPA-1613CSS*	Cleanup Standard Spiking Solution	1.2 mL
EPA-1613ISS	Internal Standard Spiking Solution	1.2 mL
EPA-1613PAR*	Precision and Recovery Stock Solution	1.2 mL
EPA-1613STOCK	EPA Method 1613 Native Stock Solution	1.2 mL

NATIVE PCDDs & PCDFs	**1613LCS (ng/mL)**	**1613CSS (ng/mL)**	**1613ISS (ng/mL)**	**1613PAR (ng/mL)**	**1613STOCK (ng/mL)**
2,3,7,8-Tetrachlorodibenzo-*p*-dioxin	—	—	—	40.0	400
1,2,3,7,8-Pentachlorodibenzo-*p*-dioxin	—	—	—	200	2000
1,2,3,4,7,8-Hexachlorodibenzo-*p*-dioxin	—	—	—	200	2000
1,2,3,6,7,8-Hexachlorodibenzo-*p*-dioxin	—	—	—	200	2000
1,2,3,7,8,9-Hexachlorodibenzo-*p*-dioxin	—	—	—	200	2000
1,2,3,4,6,7,8-Heptachlorodibenzo-*p*-dioxin	—	—	—	200	2000
Octachlorodibenzo-*p*-dioxin	—	—	—	400	4000
2,3,7,8-Tetrachlorodibenzofuran	—	—	—	40.0	400
1,2,3,7,8-Pentachlorodibenzofuran	—	—	—	200	2000
2,3,4,7,8-Pentachlorodibenzofuran	—	—	—	200	2000
1,2,3,4,7,8-Hexachlorodibenzofuran	—	—	—	200	2000
1,2,3,6,7,8-Hexachlorodibenzofuran	—	—	—	200	2000
1,2,3,7,8,9-Hexachlorodibenzofuran	—	—	—	200	2000
2,3,4,6,7,8-Hexachlorodibenzofuran	—	—	—	200	2000
1,2,3,4,6,7,8-Heptachlorodibenzofuran	—	—	—	200	2000
1,2,3,4,7,8,9-Heptachlorodibenzofuran	—	—	—	200	2000
Octachlorodibenzofuran	—	—	—	400	4000
MASS-LABELLED PCDDs & PCDFs					
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	100	—	—	—	—
1,2,3,7,8-Pentachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	100	—	—	—	—
1,2,3,4,7,8-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	100	—	—	—	—
1,2,3,6,7,8-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	100	—	—	—	—
1,2,3,4,6,7,8-Heptachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	100	—	—	—	—
Octachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	200	—	—	—	—
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzofuran	100	—	—	—	—
1,2,3,7,8-Pentachloro($^{13}C_{12}$)dibenzofuran	100	—	—	—	—
2,3,4,7,8-Pentachloro($^{13}C_{12}$)dibenzofuran	100	—	—	—	—
1,2,3,4,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran	100	—	—	—	—
1,2,3,6,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran	100	—	—	—	—
1,2,3,7,8,9-Hexachloro($^{13}C_{12}$)dibenzofuran	100	—	—	—	—
2,3,4,6,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran	100	—	—	—	—
1,2,3,4,6,7,8-Heptachloro($^{13}C_{12}$)dibenzofuran	100	—	—	—	—
1,2,3,4,7,8,9-Heptachloro($^{13}C_{12}$)dibenzofuran	100	—	—	—	—
CLEANUP STANDARD					
2,3,7,8-($^{37}Cl_4$)Tetrachlorodibenzo-*p*-dioxin	—	40.0	—	—	—
INTERNAL STANDARDS					
1,2,3,4-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	—	—	200	—	—
1,2,3,7,8,9-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	—	—	200	—	—

* Working solutions are prepared by diluting EPA-1613LCS (in acetone), EPA-1613CSS (in nonane) and EPA-1613PAR (in acetone) 1:50 (v/v)



ALTERNATIVE METHOD 16130 STANDARD SOLUTIONS

Catalogue Number	Product (nonane solution)	Qty/Conc
16130CVS	Alternative Method 16130 Calibration and Verification Solutions CS1-CS5	1 kit (5 ampoules)
16130CSL*	CSL Extended Calibration/Low Level	500 µL
16130CS05*	CS0.5	500 µL
16130CS1	CS1	500 µL
16130CS2	CS2	500 µL
16130CS3	CS3 Calibration Verification	1.0 mL
16130CS4	CS4	500 µL
16130CS5	CS5	500 µL

***FOR SUPPORT SOLUTIONS, see EPA-1613LCS, EPA-1613CSS, EPA-1613ISS, EPA-1613PAR, and EPA-1613STOCK.**

NATIVE PCDDs & PCDFs	16130CSL (ng/mL)	16130CS05 (ng/mL)	16130CS1 (ng/mL)	16130CS2 (ng/mL)	16130CS3 (ng/mL)	16130CS4 (ng/mL)	16130CS5 (ng/mL)
2,3,7,8-Tetrachlorodibenzo-*p*-dioxin	0.0100	0.0250	0.0500	0.200	1.00	4.00	20.0
1,2,3,7,8-Pentachlorodibenzo-*p*-dioxin	0.0500	0.125	0.250	1.00	5.00	20.0	100
1,2,3,4,7,8-Hexachlorodibenzo-*p*-dioxin	0.0500	0.125	0.250	1.00	5.00	20.0	100
1,2,3,6,7,8-Hexachlorodibenzo-*p*-dioxin	0.0500	0.125	0.250	1.00	5.00	20.0	100
1,2,3,7,8,9-Hexachlorodibenzo-*p*-dioxin	0.0500	0.125	0.250	1.00	5.00	20.0	100
1,2,3,4,6,7,8-Heptachlorodibenzo-*p*-dioxin	0.0500	0.125	0.250	1.00	5.00	20.0	100
Octachlorodibenzo-*p*-dioxin	0.100	0.250	0.500	2.00	10.0	40.0	200
2,3,7,8-Tetrachlorodibenzofuran	0.0100	0.0250	0.0500	0.200	1.00	4.00	20.0
1,2,3,7,8-Pentachlorodibenzofuran	0.0500	0.125	0.250	1.00	5.00	20.0	100
2,3,4,7,8-Pentachlorodibenzofuran	0.0500	0.125	0.250	1.00	5.00	20.0	100
1,2,3,4,7,8-Hexachlorodibenzofuran	0.0500	0.125	0.250	1.00	5.00	20.0	100
1,2,3,6,7,8-Hexachlorodibenzofuran	0.0500	0.125	0.250	1.00	5.00	20.0	100
1,2,3,7,8,9-Hexachlorodibenzofuran	0.0500	0.125	0.250	1.00	5.00	20.0	100
2,3,4,6,7,8-Hexachlorodibenzofuran	0.0500	0.125	0.250	1.00	5.00	20.0	100
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.0500	0.125	0.250	1.00	5.00	20.0	100
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.0500	0.125	0.250	1.00	5.00	20.0	100
Octachlorodibenzofuran	0.100	0.250	0.500	2.00	10.0	40.0	200
MASS-LABELLED PCDDs & PCDFs							
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	10.0	10.0	10.0	10.0	10.0	10.0	10.0
1,2,3,7,8-Pentachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	10.0	10.0	10.0	10.0	10.0	10.0	10.0
1,2,3,4,7,8-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	10.0	10.0	10.0	10.0	10.0	10.0	10.0
1,2,3,6,7,8-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	10.0	10.0	10.0	10.0	10.0	10.0	10.0
1,2,3,4,6,7,8-Heptachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	10.0	10.0	10.0	10.0	10.0	10.0	10.0
Octachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	20.0	20.0	20.0	20.0	20.0	20.0	20.0
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzofuran	10.0	10.0	10.0	10.0	10.0	10.0	10.0
1,2,3,7,8-Pentachloro($^{13}C_{12}$)dibenzofuran	10.0	10.0	10.0	10.0	10.0	10.0	10.0
2,3,4,7,8-Pentachloro($^{13}C_{12}$)dibenzofuran	10.0	10.0	10.0	10.0	10.0	10.0	10.0
1,2,3,4,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran	10.0	10.0	10.0	10.0	10.0	10.0	10.0
1,2,3,6,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran	10.0	10.0	10.0	10.0	10.0	10.0	10.0
1,2,3,7,8,9-Hexachloro($^{13}C_{12}$)dibenzofuran	10.0	10.0	10.0	10.0	10.0	10.0	10.0
2,3,4,6,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran	10.0	10.0	10.0	10.0	10.0	10.0	10.0
1,2,3,4,6,7,8-Heptachloro($^{13}C_{12}$)dibenzofuran	10.0	10.0	10.0	10.0	10.0	10.0	10.0
1,2,3,4,7,8,9-Heptachloro($^{13}C_{12}$)dibenzofuran	10.0	10.0	10.0	10.0	10.0	10.0	10.0
CLEANUP STANDARD							
2,3,7,8-($^{37}Cl_4$)Tetrachlorodibenzo-*p*-dioxin	0.0100	0.0250	0.0500	0.200	1.00	4.00	20.0
INTERNAL STANDARDS							
1,2,3,4-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	10.0	10.0	10.0	10.0	10.0	10.0	10.0
1,2,3,7,8,9-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	10.0	10.0	10.0	10.0	10.0	10.0	10.0

* **16130CSL** and **16130CS05** are not included in the 16130CVS kit and must be ordered separately.

This solution allows the HRGC/HRMS operator, with one injection, to:

- Set, or confirm, PCDD and PCDF congener group windows
- Test, or confirm, 2,3,7,8-TCDD resolution
- Verify the calibration

Catalogue Number	Product (nonane solution)	Qty/Conc
CS3WT	EPA Method 1613; Calibration and Verification Solution (CS3) combined with Window Defining and 2,3,7,8-TCDD Resolution Testing Congeners	500 µL

QUANTITATIVE ANALYTES		(ng/mL)
NATIVE PCDDs & PCDFs		
2,3,7,8-Tetrachlorodibenzo-*p*-dioxin		10.0
1,2,3,7,8-Pentachlorodibenzo-*p*-dioxin		50.0
1,2,3,4,7,8-Hexachlorodibenzo-*p*-dioxin		50.0
1,2,3,6,7,8-Hexachlorodibenzo-*p*-dioxin		50.0
1,2,3,7,8,9-Hexachlorodibenzo-*p*-dioxin		50.0
1,2,3,4,6,7,8-Heptachlorodibenzo-*p*-dioxin	(WD)	50.0
Octachlorodibenzo-*p*-dioxin		100
2,3,7,8-Tetrachlorodibenzofuran		10.0
1,2,3,7,8-Pentachlorodibenzofuran		50.0
2,3,4,7,8-Pentachlorodibenzofuran		50.0
1,2,3,4,7,8-Hexachlorodibenzofuran		50.0
1,2,3,6,7,8-Hexachlorodibenzofuran		50.0
1,2,3,7,8,9-Hexachlorodibenzofuran		50.0
2,3,4,6,7,8-Hexachlorodibenzofuran		50.0
1,2,3,4,6,7,8-Heptachlorodibenzofuran	(WD)	50.0
1,2,3,4,7,8,9-Heptachlorodibenzofuran	(WD)	50.0
Octachlorodibenzofuran		100
MASS-LABELLED PCDDs & PCDFs		
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin		100
1,2,3,7,8-Pentachloro($^{13}C_{12}$)dibenzo-*p*-dioxin		100
1,2,3,4,7,8-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin		100
1,2,3,6,7,8-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin		100
1,2,3,4,6,7,8-Heptachloro($^{13}C_{12}$)dibenzo-*p*-dioxin		100
Octachloro($^{13}C_{12}$)dibenzo-*p*-dioxin		200
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzofuran		100
1,2,3,7,8-Pentachloro($^{13}C_{12}$)dibenzofuran		100
2,3,4,7,8-Pentachloro($^{13}C_{12}$)dibenzofuran		100
1,2,3,4,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran		100
1,2,3,6,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran		100
1,2,3,7,8,9-Hexachloro($^{13}C_{12}$)dibenzofuran		100
2,3,4,6,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran		100
1,2,3,4,6,7,8-Heptachloro($^{13}C_{12}$)dibenzofuran		100
1,2,3,4,7,8,9-Heptachloro($^{13}C_{12}$)dibenzofuran		100
CLEANUP STANDARD		
2,3,7,8-($^{37}Cl_4$)Tetrachlorodibenzo-*p*-dioxin		10.0
INTERNAL STANDARDS		
1,2,3,4-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin		100
1,2,3,7,8,9-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin		100

SEMI-QUANTITATIVE ANALYTES	(ng/mL)
WINDOW DEFINERS*	
1,3,6,8-Tetrachlorodibenzo-*p*-dioxin	10.0
1,2,8,9-Tetrachlorodibenzo-*p*-dioxin	10.0
1,2,4,7,9-Pentachlorodibenzo-*p*-dioxin	50.0
1,2,3,8,9-Pentachlorodibenzo-*p*-dioxin	50.0
1,2,4,6,7,9-Hexachlorodibenzo-*p*-dioxin	50.0
1,2,3,4,6,7,9-Heptachlorodibenzo-*p*-dioxin	50.0
1,3,6,8-Tetrachlorodibenzofuran	10.0
1,2,8,9-Tetrachlorodibenzofuran	10.0
1,3,4,6,8-Pentachlorodibenzofuran	50.0
1,2,3,8,9-Pentachlorodibenzofuran	50.0
1,2,3,4,6,8-Hexachlorodibenzofuran	50.0
2,3,7,8-TCDD RESOLUTION TESTING ISOMERS	
1,2,3,4-Tetrachlorodibenzo-*p*-dioxin	5.00
1,2,3,7/1,2,3,8-Tetrachlorodibenzo-*p*-dioxin mix	5.00
1,2,3,9-Tetrachlorodibenzo-*p*-dioxin	10.0

(WD) - Window Definer

* 1,2,3,4,6,7-Hexachlorodibenzo-*p*-dioxin (last eluting HxCDD) was not included as it co-elutes with 1,2,3,7,8,9-Hexachlorodibenzo-*p*-dioxin. Use 1,2,3,7,8,9-Hexachlorodibenzo-*p*-dioxin and 1,2,3,4,6,7,9-Heptachlorodibenzo-*p*-dioxin to approximate the end of the HxCDD window.
* 1,2,3,4,8,9-Hexachlorodibenzofuran (last eluting HxCDF) was not included as it can interfere with 1,2,3,7,8,9-Hexachlorodibenzofuran. Use 1,2,3,4,6,7,8-Heptachlorodibenzofuran to approximate the end of the HxCDF window.



EPA METHOD 8280 STANDARD SOLUTIONS

Catalogue Number	Product (nonane solution)	Qty/Conc
EPA-8280CVS	EPA Method 8280 Calibration and Verification Solutions CC1-CC5	1 kit (5 ampoules)
EPA-8280CC1	CC1	500 µL
EPA-8280CC2	CC2	500 µL
EPA-8280CC3	CC3 Calibration Verification	1.0 mL
EPA-8280CC4	CC4	500 µL
EPA-8280CC5	CC5	500 µL

NOTE: 200 µL AMPOULES OF THE CALIBRATION SOLUTIONS ARE ALSO AVAILABLE. PLEASE CONTACT WELLINGTON OR YOUR LOCAL DISTRIBUTOR FOR PRICING INFORMATION.

NATIVE PCDDs & PCDFs	8280CC1 (ng/µL)	8280CC2 (ng/µL)	8280CC3 (ng/µL)	8280CC4 (ng/µL)	8280CC5 (ng/µL)
2,3,7,8-Tetrachlorodibenzo-*p*-dioxin	0.100	0.250	0.500	1.00	2.00
1,2,3,7,8-Pentachlorodibenzo-*p*-dioxin	0.100	0.250	0.500	1.00	2.00
1,2,3,4,7,8-Hexachlorodibenzo-*p*-dioxin	—	—	1.25	—	—
1,2,3,6,7,8-Hexachlorodibenzo-*p*-dioxin	0.250	0.625	1.25	2.50	5.00
1,2,3,7,8,9-Hexachlorodibenzo-*p*-dioxin	—	—	1.25	—	—
1,2,3,4,6,7,8-Heptachlorodibenzo-*p*-dioxin	0.250	0.625	1.25	2.50	5.00
Octachlorodibenzo-*p*-dioxin	0.500	1.25	2.50	5.00	10.0
2,3,7,8-Tetrachlorodibenzofuran	0.100	0.250	0.500	1.00	2.00
1,2,3,7,8-Pentachlorodibenzofuran	0.100	0.250	0.500	1.00	2.00
2,3,4,7,8-Pentachlorodibenzofuran	—	—	0.500	—	—
1,2,3,4,7,8-Hexachlorodibenzofuran	—	—	1.25	—	—
1,2,3,6,7,8-Hexachlorodibenzofuran	0.250	0.625	1.25	2.50	5.00
1,2,3,7,8,9-Hexachlorodibenzofuran	—	—	1.25	—	—
2,3,4,6,7,8-Hexachlorodibenzofuran	—	—	1.25	—	—
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.250	0.625	1.25	2.50	5.00
1,2,3,4,7,8,9-Heptachlorodibenzofuran	—	—	1.25	—	—
Octachlorodibenzofuran	0.500	1.25	2.50	5.00	10.0
INTERNAL STANDARDS					
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	0.500	0.500	0.500	0.500	0.500
1,2,3,6,7,8-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	0.500	0.500	0.500	0.500	0.500
Octachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	1.00	1.00	1.00	1.00	1.00
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzofuran	0.500	0.500	0.500	0.500	0.500
1,2,3,4,6,7,8-Heptachloro($^{13}C_{12}$)dibenzofuran	1.00	1.00	1.00	1.00	1.00
CLEANUP STANDARD					
2,3,7,8-($^{37}Cl_4$)Tetrachlorodibenzo-*p*-dioxin	—	—	0.250	—	—
RECOVERY STANDARDS					
1,2,3,4-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	0.500	0.500	0.500	0.500	0.500
1,2,3,7,8,9-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	0.500	0.500	0.500	0.500	0.500

EPA METHOD 8280 STANDARD SOLUTIONS

Catalogue Number	Product (nonane solution)	Qty/Conc
EPA-8280IS	Internal Standard Solution	1.2 mL
EPA-8280ISB*	Additional Internal Standard Solution	1.2 mL
EPA-8280CS	Cleanup Standard Solution	1.2 mL
EPA-8280RS	Recovery Standard Solution	1.2 mL
EPA-8280MSS	Matrix Spiking Solution	1.2 mL

NATIVE PCDDs & PCDFs	8280IS (ng/µL)	8280ISB (ng/µL)	8280CS (ng/µL)	8280RS (ng/µL)	8280MSS (ng/µL)
2,3,7,8-Tetrachlorodibenzo-*p*-dioxin	—	—	—	—	2.50
1,2,3,7,8-Pentachlorodibenzo-*p*-dioxin	—	—	—	—	6.25
1,2,3,4,7,8-Hexachlorodibenzo-*p*-dioxin	—	—	—	—	—
1,2,3,6,7,8-Hexachlorodibenzo-*p*-dioxin	—	—	—	—	6.25
1,2,3,7,8,9-Hexachlorodibenzo-*p*-dioxin	—	—	—	—	—
1,2,3,4,6,7,8-Heptachlorodibenzo-*p*-dioxin	—	—	—	—	6.25
Octachlorodibenzo-*p*-dioxin	—	—	—	—	12.5
2,3,7,8-Tetrachlorodibenzofuran	—	—	—	—	2.50
1,2,3,7,8-Pentachlorodibenzofuran	—	—	—	—	6.25
2,3,4,7,8-Pentachlorodibenzofuran	—	—	—	—	—
1,2,3,4,7,8-Hexachlorodibenzofuran	—	—	—	—	—
1,2,3,6,7,8-Hexachlorodibenzofuran	—	—	—	—	6.25
1,2,3,7,8,9-Hexachlorodibenzofuran	—	—	—	—	—
2,3,4,6,7,8-Hexachlorodibenzofuran	—	—	—	—	—
1,2,3,4,6,7,8-Heptachlorodibenzofuran	—	—	—	—	6.25
1,2,3,4,7,8,9-Heptachlorodibenzofuran	—	—	—	—	—
Octachlorodibenzofuran	—	—	—	—	12.5
INTERNAL STANDARDS					
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	5.00	—	—	—	—
1,2,3,6,7,8-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	5.00	—	—	—	—
Octachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	10.0	—	—	—	—
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzofuran	5.00	—	—	—	—
1,2,3,4,6,7,8-Heptachloro($^{13}C_{12}$)dibenzofuran	10.0	—	—	—	—
CLEANUP STANDARD					
2,3,7,8-($^{37}Cl_4$)Tetrachlorodibenzo-*p*-dioxin	—	—	5.00	—	—
RECOVERY STANDARDS					
1,2,3,4-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	—	—	—	5.00	—
1,2,3,7,8,9-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	—	—	—	5.00	—
ADDITIONAL INTERNAL STANDARDS					
1,2,3,7,8-Pentachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	—	5.00	—	—	—
1,2,3,4,6,7,8-Heptachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	—	10.0	—	—	—
1,2,3,7,8-Pentachloro($^{13}C_{12}$)dibenzofuran	—	5.00	—	—	—
1,2,3,4,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran	—	5.00	—	—	—
Octachloro($^{13}C_{12}$)dibenzofuran	—	10.0	—	—	—

* Not required by US EPA Method 8280



EPA METHOD 8290 STANDARD SOLUTIONS

Catalogue Number	Product (nonane solution)	Qty/Conc
EPA-8290HRCC1-5	EPA Method 8290 High Resolution Calibration Solutions HRCC1-HRCC5	1 kit (5 ampoules)
EPA-8290HRCC0.25*	HRCC0.25 Supplemental Calibration Solution	500 µL
EPA-8290HRCC0.5*	HRCC0.5 Supplemental Calibration Solution	500 µL
EPA-8290HRCC1	HRCC1	500 µL
EPA-8290HRCC2	HRCC2	500 µL
EPA-8290HRCC3	HRCC3 Calibration Verification	1.0 mL
EPA-8290HRCC4	HRCC4	500 µL
EPA-8290HRCC5	HRCC5	500 µL

NOTE: 200 µL AMPOULES OF THE CALIBRATION SOLUTIONS ARE ALSO AVAILABLE. PLEASE CONTACT WELLINGTON OR YOUR LOCAL DISTRIBUTOR FOR PRICING INFORMATION.

NATIVE PCDDs & PCDFs	8290-HRCC0.25 (ng/mL)	8290-HRCC0.5 (ng/mL)	8290-HRCC1 (ng/mL)	8290-HRCC2 (ng/mL)	8290-HRCC3 (ng/mL)	8290-HRCC4 (ng/mL)	8290-HRCC5 (ng/mL)
2,3,7,8-Tetrachlorodibenzo-*p*-dioxin	0.250	0.500	1.00	2.50	10.0	50.0	200
1,2,3,7,8-Pentachlorodibenzo-*p*-dioxin	0.625	1.25	2.50	6.25	25.0	125	500
1,2,3,4,7,8-Hexachlorodibenzo-*p*-dioxin	0.625	1.25	2.50	6.25	25.0	125	500
1,2,3,6,7,8-Hexachlorodibenzo-*p*-dioxin	0.625	1.25	2.50	6.25	25.0	125	500
1,2,3,7,8,9-Hexachlorodibenzo-*p*-dioxin	0.625	1.25	2.50	6.25	25.0	125	500
1,2,3,4,6,7,8-Heptachlorodibenzo-*p*-dioxin	0.625	1.25	2.50	6.25	25.0	125	500
Octachlorodibenzo-*p*-dioxin	1.25	2.50	5.00	12.5	50.0	250	1000
2,3,7,8-Tetrachlorodibenzofuran	0.250	0.500	1.00	2.50	10.0	50.0	200
1,2,3,7,8-Pentachlorodibenzofuran	0.625	1.25	2.50	6.25	25.0	125	500
2,3,4,7,8-Pentachlorodibenzofuran	0.625	1.25	2.50	6.25	25.0	125	500
1,2,3,4,7,8-Hexachlorodibenzofuran	0.625	1.25	2.50	6.25	25.0	125	500
1,2,3,6,7,8-Hexachlorodibenzofuran	0.625	1.25	2.50	6.25	25.0	125	500
1,2,3,7,8,9-Hexachlorodibenzofuran	0.625	1.25	2.50	6.25	25.0	125	500
2,3,4,6,7,8-Hexachlorodibenzofuran	0.625	1.25	2.50	6.25	25.0	125	500
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.625	1.25	2.50	6.25	25.0	125	500
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.625	1.25	2.50	6.25	25.0	125	500
Octachlorodibenzofuran	1.25	2.50	5.00	12.5	50.0	250	1000
INTERNAL STANDARDS							
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	50.0	50.0	50.0	50.0	50.0	50.0	50.0
1,2,3,7,8-Pentachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	50.0	50.0	50.0	50.0	50.0	50.0	50.0
1,2,3,6,7,8-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	125	125	125	125	125	125	125
1,2,3,4,6,7,8-Heptachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	125	125	125	125	125	125	125
Octachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	250	250	250	250	250	250	250
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzofuran	50.0	50.0	50.0	50.0	50.0	50.0	50.0
1,2,3,7,8-Pentachloro($^{13}C_{12}$)dibenzofuran	50.0	50.0	50.0	50.0	50.0	50.0	50.0
1,2,3,4,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran	125	125	125	125	125	125	125
1,2,3,4,6,7,8-Heptachloro($^{13}C_{12}$)dibenzofuran	125	125	125	125	125	125	125
RECOVERY STANDARDS							
1,2,3,4-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	50.0	50.0	50.0	50.0	50.0	50.0	50.0
1,2,3,7,8,9-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	125	125	125	125	125	125	125

* **EPA-8290HRCC0.25** and **EPA-8290HRCC0.5** are not included in the EPA-8290HRCC1-5 kit and must be ordered separately.

EPA METHOD 8290 STANDARD SOLUTIONS

Catalogue Number	Product (nonane solution)	Qty/Conc
EPA-8290SFS	Sample Fortification Solution	1.2 mL
EPA-8290RSS	Recovery Standard Solution	1.2 mL
EPA-8290MSS	Matrix Spiking Solution	1.2 mL
EPA-8290STN	Native Stock PCDDs and PCDFs	1.2 mL

NATIVE PCDDs & PCDFs	8290SFS (ng/mL)	8290RSS (ng/mL)	8290MSS (ng/mL)	8290STN (µg/mL)
2,3,7,8-Tetrachlorodibenzo-*p*-dioxin	—	—	100	1.00
1,2,3,7,8-Pentachlorodibenzo-*p*-dioxin	—	—	250	2.50
1,2,3,4,7,8-Hexachlorodibenzo-*p*-dioxin	—	—	250	2.50
1,2,3,6,7,8-Hexachlorodibenzo-*p*-dioxin	—	—	250	2.50
1,2,3,7,8,9-Hexachlorodibenzo-*p*-dioxin	—	—	250	2.50
1,2,3,4,6,7,8-Heptachlorodibenzo-*p*-dioxin	—	—	250	2.50
Octachlorodibenzo-*p*-dioxin	—	—	500	5.00
2,3,7,8-Tetrachlorodibenzofuran	—	—	100	1.00
1,2,3,7,8-Pentachlorodibenzofuran	—	—	250	2.50
2,3,4,7,8-Pentachlorodibenzofuran	—	—	250	2.50
1,2,3,4,7,8-Hexachlorodibenzofuran	—	—	250	2.50
1,2,3,6,7,8-Hexachlorodibenzofuran	—	—	250	2.50
1,2,3,7,8,9-Hexachlorodibenzofuran	—	—	250	2.50
2,3,4,6,7,8-Hexachlorodibenzofuran	—	—	250	2.50
1,2,3,4,6,7,8-Heptachlorodibenzofuran	—	—	250	2.50
1,2,3,4,7,8,9-Heptachlorodibenzofuran	—	—	250	2.50
Octachlorodibenzofuran	—	—	500	5.00
INTERNAL STANDARDS				
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	100	—	—	—
1,2,3,7,8-Pentachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	100	—	—	—
1,2,3,6,7,8-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	250	—	—	—
1,2,3,4,6,7,8-Heptachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	250	—	—	—
Octachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	500	—	—	—
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzofuran	100	—	—	—
1,2,3,7,8-Pentachloro($^{13}C_{12}$)dibenzofuran	100	—	—	—
1,2,3,4,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran	250	—	—	—
1,2,3,4,6,7,8-Heptachloro($^{13}C_{12}$)dibenzofuran	250	—	—	—
RECOVERY STANDARDS				
1,2,3,4-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	—	500	—	—
1,2,3,7,8,9-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	—	500	—	—



EPA METHOD 23 STANDARD SOLUTIONS

Catalogue Number	Product (nonane solution)	Qty/Conc
EPA-23CS1-5	EPA Method 23 HRGC/HRMS Calibration Solutions CS1-CS5	1 kit (5 ampoules)
EPA-23CS1	CS1	500 µL
EPA-23CS2	CS2	500 µL
EPA-23CS3	CS3 Calibration Verification	1.0 mL
EPA-23CS4	CS4	500 µL
EPA-23CS5	CS5	500 µL

NOTE: 200 µL AMPOULES OF THE CALIBRATION SOLUTIONS ARE ALSO AVAILABLE. PLEASE CONTACT WELLINGTON OR YOUR LOCAL DISTRIBUTOR FOR PRICING INFORMATION.

NATIVE PCDDs & PCDFs	23CS1 (ng/mL)	23CS2 (ng/mL)	23CS3 (ng/mL)	23CS4 (ng/mL)	23CS5 (ng/mL)
2,3,7,8-Tetrachlorodibenzo-*p*-dioxin	0.500	1.00	5.00	50.0	100
1,2,3,7,8-Pentachlorodibenzo-*p*-dioxin	2.50	5.00	25.0	250	500
1,2,3,4,7,8-Hexachlorodibenzo-*p*-dioxin	2.50	5.00	25.0	250	500
1,2,3,6,7,8-Hexachlorodibenzo-*p*-dioxin	2.50	5.00	25.0	250	500
1,2,3,7,8,9-Hexachlorodibenzo-*p*-dioxin	2.50	5.00	25.0	250	500
1,2,3,4,6,7,8-Heptachlorodibenzo-*p*-dioxin	2.50	5.00	25.0	250	500
Octachlorodibenzo-*p*-dioxin	5.00	10.0	50.0	500	1000
2,3,7,8-Tetrachlorodibenzofuran	0.500	1.00	5.00	50.0	100
1,2,3,7,8-Pentachlorodibenzofuran	2.50	5.00	25.0	250	500
2,3,4,7,8-Pentachlorodibenzofuran	2.50	5.00	25.0	250	500
1,2,3,4,7,8-Hexachlorodibenzofuran	2.50	5.00	25.0	250	500
1,2,3,6,7,8-Hexachlorodibenzofuran	2.50	5.00	25.0	250	500
1,2,3,7,8,9-Hexachlorodibenzofuran	2.50	5.00	25.0	250	500
2,3,4,6,7,8-Hexachlorodibenzofuran	2.50	5.00	25.0	250	500
1,2,3,4,6,7,8-Heptachlorodibenzofuran	2.50	5.00	25.0	250	500
1,2,3,4,7,8,9-Heptachlorodibenzofuran	2.50	5.00	25.0	250	500
Octachlorodibenzofuran	5.00	10.0	50.0	500	1000
INTERNAL STANDARDS					
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	100	100	100	100	100
1,2,3,7,8-Pentachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	100	100	100	100	100
1,2,3,6,7,8-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	100	100	100	100	100
1,2,3,4,6,7,8-Heptachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	100	100	100	100	100
Octachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	200	200	200	200	200
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzofuran	100	100	100	100	100
1,2,3,7,8-Pentachloro($^{13}C_{12}$)dibenzofuran	100	100	100	100	100
1,2,3,6,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran	100	100	100	100	100
1,2,3,4,6,7,8-Heptachloro($^{13}C_{12}$)dibenzofuran	100	100	100	100	100
SURROGATE STANDARDS					
2,3,7,8-($^{37}Cl_4$)Tetrachlorodibenzo-*p*-dioxin	0.500	1.00	5.00	50.0	100
1,2,3,4,7,8-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	2.50	5.00	25.0	250	500
2,3,4,7,8-Pentachloro($^{13}C_{12}$)dibenzofuran	2.50	5.00	25.0	250	500
1,2,3,4,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran	2.50	5.00	25.0	250	500
1,2,3,4,7,8,9-Heptachloro($^{13}C_{12}$)dibenzofuran	2.50	5.00	25.0	250	500
ALTERNATIVE STANDARD					
1,2,3,7,8,9-Hexachloro($^{13}C_{12}$)dibenzofuran	2.50	5.00	25.0	250	500
RECOVERY STANDARDS					
1,2,3,4-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	100	100	100	100	100
1,2,3,7,8,9-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	100	100	100	100	100

EPA METHOD 23 STANDARD SOLUTIONS

Catalogue Number	Product (nonane solution)	Qty/Conc
EPA-23IS	Internal Standard Solution	1.2 mL
EPA-23ISS	Internal Standard Stock Solution	1.2 mL
EPA-23SS	Surrogate Standard Solution	1.2 mL
EPA-23SSS	Surrogate Standard Stock Solution	1.2 mL
EPA-23RS	Recovery Standard Solution	1.2 mL
EPA-23AS	Alternative Standard Solution	1.2 mL

INTERNAL STANDARDS	**23IS (ng/mL)**	**23ISS (µg/mL)**	**23SS (ng/mL)**	**23SSS (µg/mL)**	**23RS (ng/mL)**	**23AS (ng/mL)**
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	100	1.00	—	—	—	—
1,2,3,7,8-Pentachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	100	1.00	—	—	—	—
1,2,3,6,7,8-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	100	1.00	—	—	—	—
1,2,3,4,6,7,8-Heptachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	100	1.00	—	—	—	—
Octachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	200	2.00	—	—	—	—
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzofuran	100	1.00	—	—	—	—
1,2,3,7,8-Pentachloro($^{13}C_{12}$)dibenzofuran	100	1.00	—	—	—	—
1,2,3,6,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran	100	1.00	—	—	—	—
1,2,3,4,6,7,8-Heptachloro($^{13}C_{12}$)dibenzofuran	100	1.00	—	—	—	—
SURROGATE STANDARDS						
2,3,7,8-($^{37}Cl_4$)Tetrachlorodibenzo-*p*-dioxin	—	—	100	1.00	—	—
1,2,3,4,7,8-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	—	—	100	1.00	—	—
2,3,4,7,8-Pentachloro($^{13}C_{12}$)dibenzofuran	—	—	100	1.00	—	—
1,2,3,4,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran	—	—	100	1.00	—	—
1,2,3,4,7,8,9-Heptachloro($^{13}C_{12}$)dibenzofuran	—	—	100	1.00	—	—
ALTERNATIVE STANDARD						
1,2,3,7,8,9-Hexachloro($^{13}C_{12}$)dibenzofuran	—	—	—	—	—	250
RECOVERY STANDARDS						
1,2,3,4-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	—	—	—	—	500	—
1,2,3,7,8,9-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	—	—	—	—	500	—



EUROPEAN METHOD EN-1948 STANDARD SOLUTIONS

Catalogue Number	Product (nonane solution)	Qty/Conc
EN-1948CVS	European Method EN-1948 Calibration and Verification Solutions CS1-CS6	1 kit (6 ampoules)
EN-1948CSL*	CSL Extended Calibration/Low Level	500 µL
EN-1948CS1	CS1	500 µL
EN-1948CS2	CS2	500 µL
EN-1948CS3	CS3	500 µL
EN-1948CS4	CS4	500 µL
EN-1948CS5	CS5	500 µL
EN-1948CS6	CS6	500 µL

NOTE: 200 µL AMPOULES OF THE CALIBRATION SOLUTIONS ARE ALSO AVAILABLE. PLEASE CONTACT WELLINGTON OR YOUR LOCAL DISTRIBUTOR FOR PRICING INFORMATION.

NATIVE PCDDs & PCDFs	1948CSL (pg/µL)	1948CS1 (pg/µL)	1948CS2 (pg/µL)	1948CS3 (pg/µL)	1948CS4 (pg/µL)	1948CS5 (pg/µL)	1948CS6 (pg/µL)
2,3,7,8-Tetrachlorodibenzo-*p*-dioxin	0.0400	0.200	0.800	4.00	16.0	80.0	320
1,2,3,7,8-Pentachlorodibenzo-*p*-dioxin	0.0800	0.400	1.60	8.00	32.0	160	640
1,2,3,4,7,8-Hexachlorodibenzo-*p*-dioxin	0.0800	0.400	1.60	8.00	32.0	160	640
1,2,3,6,7,8-Hexachlorodibenzo-*p*-dioxin	0.0800	0.400	1.60	8.00	32.0	160	640
1,2,3,7,8,9-Hexachlorodibenzo-*p*-dioxin	0.0800	0.400	1.60	8.00	32.0	160	640
1,2,3,4,6,7,8-Heptachlorodibenzo-*p*-dioxin	0.160	0.800	3.20	16.0	64.0	320	1280
Octachlorodibenzo-*p*-dioxin	0.160	0.800	3.20	16.0	64.0	320	1280
2,3,7,8-Tetrachlorodibenzofuran	0.0400	0.200	0.800	4.00	16.0	80.0	320
1,2,3,7,8-Pentachlorodibenzofuran	0.0800	0.400	1.60	8.00	32.0	160	640
2,3,4,7,8-Pentachlorodibenzofuran	0.0800	0.400	1.60	8.00	32.0	160	640
1,2,3,4,7,8-Hexachlorodibenzofuran	0.0800	0.400	1.60	8.00	32.0	160	640
1,2,3,6,7,8-Hexachlorodibenzofuran	0.0800	0.400	1.60	8.00	32.0	160	640
1,2,3,7,8,9-Hexachlorodibenzofuran	0.0800	0.400	1.60	8.00	32.0	160	640
2,3,4,6,7,8-Hexachlorodibenzofuran	0.0800	0.400	1.60	8.00	32.0	160	640
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.160	0.800	3.20	16.0	64.0	320	1280
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.160	0.800	3.20	16.0	64.0	320	1280
Octachlorodibenzofuran	0.160	0.800	3.20	16.0	64.0	320	1280
SAMPLING STANDARDS							
1,2,3,7,8-Pentachloro($^{13}C_{12}$)dibenzofuran	16.0	16.0	16.0	16.0	16.0	16.0	16.0
1,2,3,7,8,9-Hexachloro($^{13}C_{12}$)dibenzofuran	16.0	16.0	16.0	16.0	16.0	16.0	16.0
1,2,3,4,7,8,9-Heptachloro($^{13}C_{12}$)dibenzofuran	32.0	32.0	32.0	32.0	32.0	32.0	32.0
EXTRACTION STANDARDS							
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	16.0	16.0	16.0	16.0	16.0	16.0	16.0
1,2,3,7,8-Pentachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	16.0	16.0	16.0	16.0	16.0	16.0	16.0
1,2,3,4,7,8-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	16.0	16.0	16.0	16.0	16.0	16.0	16.0
1,2,3,6,7,8-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	16.0	16.0	16.0	16.0	16.0	16.0	16.0
1,2,3,4,6,7,8-Heptachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	32.0	32.0	32.0	32.0	32.0	32.0	32.0
Octachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	32.0	32.0	32.0	32.0	32.0	32.0	32.0
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzofuran	16.0	16.0	16.0	16.0	16.0	16.0	16.0
2,3,4,7,8-Pentachloro($^{13}C_{12}$)dibenzofuran	16.0	16.0	16.0	16.0	16.0	16.0	16.0
1,2,3,4,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran	16.0	16.0	16.0	16.0	16.0	16.0	16.0
1,2,3,6,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran	16.0	16.0	16.0	16.0	16.0	16.0	16.0
2,3,4,6,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran	16.0	16.0	16.0	16.0	16.0	16.0	16.0
1,2,3,4,6,7,8-Heptachloro($^{13}C_{12}$)dibenzofuran	32.0	32.0	32.0	32.0	32.0	32.0	32.0
Octachloro($^{13}C_{12}$)dibenzofuran	32.0	32.0	32.0	32.0	32.0	32.0	32.0
SYRINGE STANDARDS							
1,2,3,4-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	16.0	16.0	16.0	16.0	16.0	16.0	16.0
1,2,3,7,8,9-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	16.0	16.0	16.0	16.0	16.0	16.0	16.0

* **EN-1948CSL** is not included in the EN-1948CVS kit and must be ordered separately.

EUROPEAN METHOD EN-1948 STANDARD SOLUTIONS

Catalogue Number	Product (nonane solution)	Qty/Conc
EN-1948ES	Extraction Standard Solution	1.2 mL
EN-1948IS	Syringe Standard Solution	1.2 mL
EN-1948SS	Sampling Standard Solution	1.2 mL
EN-1948STK	PCDD/PCDF Solution/Mixture	1.2 mL

NATIVE PCDDs & PCDFs	1948ES (pg/µL)	1948IS (pg/µL)	1948SS (pg/µL)	1948STK (µg/mL)
2,3,7,8-Tetrachlorodibenzo-*p*-dioxin	—	—	—	0.500
1,2,3,7,8-Pentachlorodibenzo-*p*-dioxin	—	—	—	1.00
1,2,3,4,7,8-Hexachlorodibenzo-*p*-dioxin	—	—	—	1.00
1,2,3,6,7,8-Hexachlorodibenzo-*p*-dioxin	—	—	—	1.00
1,2,3,7,8,9-Hexachlorodibenzo-*p*-dioxin	—	—	—	1.00
1,2,3,4,6,7,8-Heptachlorodibenzo-*p*-dioxin	—	—	—	2.00
Octachlorodibenzo-*p*-dioxin	—	—	—	2.00
2,3,7,8-Tetrachlorodibenzofuran	—	—	—	0.500
1,2,3,7,8-Pentachlorodibenzofuran	—	—	—	1.00
2,3,4,7,8-Pentachlorodibenzofuran	—	—	—	1.00
1,2,3,4,7,8-Hexachlorodibenzofuran	—	—	—	1.00
1,2,3,6,7,8-Hexachlorodibenzofuran	—	—	—	1.00
1,2,3,7,8,9-Hexachlorodibenzofuran	—	—	—	1.00
2,3,4,6,7,8-Hexachlorodibenzofuran	—	—	—	1.00
1,2,3,4,6,7,8-Heptachlorodibenzofuran	—	—	—	2.00
1,2,3,4,7,8,9-Heptachlorodibenzofuran	—	—	—	2.00
Octachlorodibenzofuran	—	—	—	2.00
SAMPLING STANDARDS				
1,2,3,7,8-Pentachloro($^{13}C_{12}$)dibenzofuran	—	—	200	—
1,2,3,7,8,9-Hexachloro($^{13}C_{12}$)dibenzofuran	—	—	200	—
1,2,3,4,7,8,9-Heptachloro($^{13}C_{12}$)dibenzofuran	—	—	400	—
EXTRACTION STANDARDS				
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	200	—	—	—
1,2,3,7,8-Pentachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	200	—	—	—
1,2,3,4,7,8-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	200	—	—	—
1,2,3,6,7,8-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	200	—	—	—
1,2,3,4,6,7,8-Heptachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	400	—	—	—
Octachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	400	—	—	—
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzofuran	200	—	—	—
2,3,4,7,8-Pentachloro($^{13}C_{12}$)dibenzofuran	200	—	—	—
1,2,3,4,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran	200	—	—	—
1,2,3,6,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran	200	—	—	—
2,3,4,6,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran	200	—	—	—
1,2,3,4,6,7,8-Heptachloro($^{13}C_{12}$)dibenzofuran	400	—	—	—
Octachloro($^{13}C_{12}$)dibenzofuran	400	—	—	—
SYRINGE STANDARDS				
1,2,3,4-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	—	800	—	—
1,2,3,7,8,9-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	—	800	—	—



HRGC/HRMS TCDD/TCDF ANALYSIS SOLUTIONS

Catalogue Number	Product (nonane solution)	Qty/Conc
EPA-513CVS	EPA Method 513 Calibration and Verification Solutions CS1-CS6	1 kit (6 ampoules)
513-CS0.25*	CS0.25 Custom Calibration Solution	500 µL
513-CS1		500 µL
513-CS2		500 µL
513-CS3		500 µL
513-CS4		500 µL
513-CS5		500 µL
513-CS6		500 µL

NATIVE TCDD & TCDF	513-CS0.25 (ng/mL)	513-CS1 (ng/mL)	513-CS2 (ng/mL)	513-CS3 (ng/mL)	513-CS4 (ng/mL)	513-CS5 (ng/mL)	513-CS6 (ng/mL)
2,3,7,8-Tetrachlorodibenzo-*p*-dioxin	0.250	0.100	0.500	2.00	10.0	40.0	200
2,3,7,8-Tetrachlorodibenzofuran	0.250	0.100	0.500	2.00	10.0	40.0	200
MASS-LABELLED TCDD & TCDF							
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	100	100	100	100	100	100	100
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzofuran	100	100	100	100	100	100	100
INTERNAL STANDARDS							
1,2,3,4-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	100	100	100	100	100	100	100
1,2,3,4-Tetrachloro($^{13}C_{12}$)dibenzofuran	100	100	100	100	100	100	100
CLEANUP STANDARDS							
2,3,7,8-($^{37}Cl_4$)Tetrachlorodibenzo-*p*-dioxin	0.250	0.100	0.500	2.00	10.0	40.0	200
1,3,6,8-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	100	100	100	100	100	100	100
1,3,6,8-Tetrachloro($^{13}C_{12}$)dibenzofuran	100	100	100	100	100	100	100

EPA-513LCSS	EPA Method 513 Labelled TCDD/TCDF Spiking Solution	1.2 mL
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin		100 ng/mL
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzofuran		100 ng/mL
EPA-513ISS	EPA Method 513 Internal Standard Spiking Solution	1.2 ml
1,2,3,4-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin		200 ng/mL
1,2,3,4-Tetrachloro($^{13}C_{12}$)dibenzofuran		200 ng/mL
EPA-513CSSA	EPA Method 513 Cleanup Standard Spiking Solution	1.2 mL
2,3,7,8-($^{37}Cl_4$)Tetrachlorodibenzo-*p*-dioxin		40.0 ng/mL
EPA-513CSSB	EPA Method 513 Alternative Cleanup Standard Spiking Solution	1.2 mL
1,3,6,8-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin		100 ng/mL
1,3,6,8-Tetrachloro($^{13}C_{12}$)dibenzofuran		100 ng/mL
EPA-513PAR	EPA Method 513 Precision and Recovery Solution	1.2 mL
2,3,7,8-Tetrachlorodibenzo-*p*-dioxin		40.0 ng/mL
2,3,7,8-Tetrachlorodibenzofuran		40.0 ng/mL

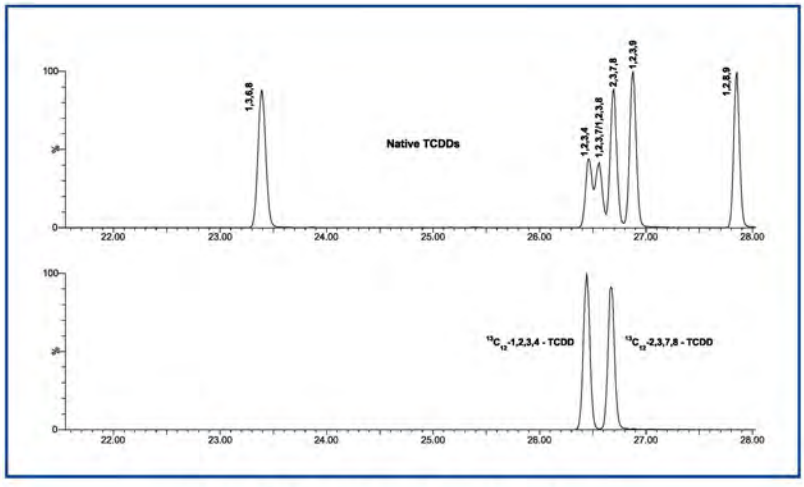
* **513-CS0.25** is not included in the EPA-513CVS kit and must be ordered separately.

CAPILLARY COLUMN PERFORMANCE TEST MIXTURES

Catalogue Number	Product (nonane solution)	Qty/Conc
5CWDS	Window Defining Mixture for DB-5, BP5, HP-2, Rtx-5, SPB-5, or Equivalent Capillary Columns	1.2 mL
1,3,6,8-Tetrachlorodibenzo-*p*-dioxin		1.00 µg/mL
1,2,8,9-Tetrachlorodibenzo-*p*-dioxin		1.00 µg/mL
1,2,4,7,9-Pentachlorodibenzo-*p*-dioxin		1.00 µg/mL
1,2,3,8,9-Pentachlorodibenzo-*p*-dioxin		1.00 µg/mL
1,2,4,6,7,9-Hexachlorodibenzo-*p*-dioxin		1.00 µg/mL
1,2,3,4,6,7-Hexachlorodibenzo-*p*-dioxin		1.00 µg/mL
1,2,3,4,6,7,9-Heptachlorodibenzo-*p*-dioxin		1.00 µg/mL
1,2,3,4,6,7,8-Heptachlorodibenzo-*p*-dioxin		1.00 µg/mL
Octachlorodibenzo-*p*-dioxin		1.00 µg/mL
1,3,6,8-Tetrachlorodibenzofuran		1.00 µg/mL
1,2,8,9-Tetrachlorodibenzofuran		1.00 µg/mL
1,3,4,6,8-Pentachlorodibenzofuran		1.00 µg/mL
1,2,3,8,9-Pentachlorodibenzofuran		1.00 µg/mL
1,2,3,4,6,8-Hexachlorodibenzofuran		1.00 µg/mL
1,2,3,4,8,9-Hexachlorodibenzofuran		1.00 µg/mL
1,2,3,4,6,7,8-Heptachlorodibenzofuran		1.00 µg/mL
1,2,3,4,7,8,9-Heptachlorodibenzofuran		1.00 µg/mL
Octachlorodibenzofuran		1.00 µg/mL
5TCDD	2,3,7,8-TCDD Isomer Specificity Test Mixture for DB-5, BP5, HP-2, Rtx-5, SPB-5, or Equivalent Capillary Columns	1.2 mL
1,2,3,4-Tetrachlorodibenzo-*p*-dioxin		0.500 µg/mL
1,2,3,7 and 1,2,3,8-Tetrachlorodibenzo-*p*-dioxin mix		0.500 µg/mL
1,2,3,9-Tetrachlorodibenzo-*p*-dioxin		1.00 µg/mL
2,3,7,8-Tetrachlorodibenzo-*p*-dioxin		1.00 µg/mL
1,2,3,4-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin		0.500 µg/mL
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin		0.500 µg/mL
225TCDF	2,3,7,8-TCDF Isomer Specificity Test Mixture for DB-225, BP225, HP-225, Rtx-225, SPB-225, or Equivalent Capillary Columns	1.2 mL
1,2,3,9-Tetrachlorodibenzofuran		1.00 µg/mL
1,2,8,9-Tetrachlorodibenzofuran		1.00 µg/mL
1,3,6,8-Tetrachlorodibenzofuran		1.00 µg/mL
2,3,4,7-Tetrachlorodibenzofuran		1.00 µg/mL
2,3,7,8-Tetrachlorodibenzofuran		2.00 µg/mL
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzofuran		0.500 µg/mL

CAPILLARY COLUMN PERFORMANCE TEST MIXTURES

Catalogue Number	Product (nonane solution)	Qty/Conc
5TDWD	Combined Window Defining/TCDD Resolution Testing Mixture for DB-5, BP5, HP-2, Rtx-5, SPB-5, or Equivalent Capillary Columns	1.2 mL
	WINDOW DEFINERS	
	1,3,6,8-Tetrachlorodibenzo-*p*-dioxin	100 ng/mL
	1,2,8,9-Tetrachlorodibenzo-*p*-dioxin	100 ng/mL
	1,2,4,7,9-Pentachlorodibenzo-*p*-dioxin	100 ng/mL
	1,2,3,8,9-Pentachlorodibenzo-*p*-dioxin	100 ng/mL
	1,2,4,6,7,9-Hexachlorodibenzo-*p*-dioxin	100 ng/mL
	1,2,3,4,6,7-Hexachlorodibenzo-*p*-dioxin	100 ng/mL
	1,2,3,4,6,7,9-Heptachlorodibenzo-*p*-dioxin	100 ng/mL
	1,2,3,4,6,7,8-Heptachlorodibenzo-*p*-dioxin	100 ng/mL
	Octachlorodibenzo-*p*-dioxin	100 ng/mL
	1,3,6,8-Tetrachlorodibenzofuran	100 ng/mL
	1,2,8,9-Tetrachlorodibenzofuran	100 ng/mL
	1,3,4,6,8-Pentachlorodibenzofuran	100 ng/mL
	1,2,3,8,9-Pentachlorodibenzofuran	100 ng/mL
	1,2,3,4,8,9-Hexachlorodibenzofuran	100 ng/mL
	1,2,3,4,6,8-Hexachlorodibenzofuran	100 ng/mL
	1,2,3,4,6,7,8-Heptachlorodibenzofuran	100 ng/mL
	1,2,3,4,7,8,9-Heptachlorodibenzofuran	100 ng/mL
	Octachlorodibenzofuran	100 ng/mL
	2,3,7,8-TCDD RESOLUTION TESTING ISOMERS	
	1,2,3,4-Tetrachlorodibenzo-*p*-dioxin	50.0 ng/mL
	1,2,3,7 and 1,2,3,8-Tetrachlorodibenzo-*p*-dioxin mix	50.0 ng/mL
	2,3,7,8-Tetrachlorodibenzo-*p*-dioxin	100 ng/mL
	1,2,3,9-Tetrachlorodibenzo-*p*-dioxin	100 ng/mL
	2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	50.0 ng/mL
	1,2,3,4-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	50.0 ng/mL
	OTHERS	
	1,2,3,7,8,9-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	50.0 ng/mL



GC/MS DATA: TCDDs on a 60m DB-5 Column.

Catalogue Number	Product (nonane solution)	Qty/Conc
TDTFWD	Combined Window Defining and Resolution Testing Mixture for 3 Capillary Columns	1.2 mL

Concentrations for each compound are listed in brackets (ng/mL ± 20%)[a]

WINDOW DEFINING STANDARDS

5/2[b]		2331[c]/225[d]	
FIRST	**LAST**	**FIRST**	**LAST**
1368-TCDD (50.0)	1289-TCDD (50.0)	1368-TCDD (50.0)	1289-TCDD (50.0)
12479-PeCDD (50.0)	12389-PeCDD (50.0)	12479-PeCDD (50.0)	12389-PeCDD (50.0)
124679-HxCDD (50.0)	123467-HxCDD (50.0)	124679-HxCDD (50.0)	123467-HxCDD (50.0)
1234679-HpCDD (50.0)	1234678-HpCDD (50.0)	1234679-HpCDD (50.0)	1234678-HpCDD (50.0)
	OCDD (50.0)		OCDD (50.0)
1368-TCDF (100)	1289-TCDF (110)	1368-TCDF (100)	1289-TCDF (110)
13468-PeCDF (50.0)	12389-PeCDF (50.0)	13468-PeCDF (50.0)	23467-PeCDF (50.0)
123468-HxCDF (50.0)	123489-HxCDF (50.0)	123468-HxCDF (50.0)	234678-HxCDF (50.0)
1234678-HpCDF (50.0)	1234789-HpCDF (50.0)	1234678-HpCDF (50.0)	1234789-HpCDF (50.0)
	OCDF (50.0)		OCDF (50.0)

RESOLUTION TESTING MIXTURES

	5/2[b]	2331[c]	225[d]
2378-TCDD	1234-TCDD (25.0) 1237- and 1238-TCDD (25.0)[e] 2378-TCDD (50.0) 1239-TCDD (50.0)	1478-TCDD (25.0) 2378-TCDD (50.0) 1237- and 1238-TCDD (25.0)[e] 1234-TCDD (25.0)	1478-TCDD (25.0) 2378-TCDD (50.0) 1237- and 1238-TCDD (25.0)[e] 1234-TCDD (25.0)
2378-TCDF	2347-TCDF, 2348-TCDF, and 2378-TCDF (not resolved) (200)[e]	1269-TCDF (50.0) 2378-TCDF (100) 2348-TCDF (50.0)	2347-TCDF (50.0) 2378-TCDF (100) 1239-TCDF (65.0)

OTHER PCDDs AND PCDFs INCLUDED

12378-PeCDD (50.0)	123478-HxCDD (50.0)	123478-HxCDF (50.0)	$^{13}C_{12}$-1234-TCDD (25.0)
12378-PeCDF (50.0)	123678-HxCDD (50.0)	123678-HxCDF (50.0)	$^{13}C_{12}$-2378-TCDD (25.0)
23478-PeCDF (50.0)	123789-HxCDD (50.0)	123789-HxCDF (50.0)	$^{13}C_{12}$-2378-TCDF (25.0)
			$^{13}C_{12}$-123789-HxCDD (50.0)

a Maximum percent relative combined uncertainty of weights and volumes
b 5/2 - DB-5, BP5, HP-2, Rtx-5, SPB-5 or equivalent capillary column
c 2331 - SP-2331, Rtx-2330 or equivalent capillary column
d 225 - DB-225, BP225, HP-225, Rtx-225, SPB-225 or equivalent capillary column
e Total concentration of isomers



MASS-LABELLED CAPILLARY COLUMN PERFORMANCE TEST MIXTURES

The two mixtures detailed below, MD5CWDS and MF5CWDS, contain 13C-labelled PCDD and 13C-labelled PCDF congeners, respectively. These solutions were designed to be run on a DB-5 (or equivalent) capillary column to confirm the congener group windows for tetra-, penta-, hexa- and heptachloro- PCDDs and PCDFs. It is intended that these mixtures, or dilutions thereof, be added to the samples prior to extraction, at some stage during cleanup, or just prior to instrumental analysis. The final, cleaned-up, sample extracts would thus contain all the PCDD and PCDF window defining 13C-labelled congeners when used in concert with our calibration set support solutions. This would allow the analyst to immediately confirm that the congener group windows had not shifted and that all the PCDDs and PCDFs had been detected where present.

Please note that some 2,3,7,8-substituted PCDDs or PCDFs are also window defining congeners and are already present in 13C-labelled PCDD and PCDF solution/mixes added as sampling (e.g. EPA-23SS), extraction (e.g. EPA-1613LCS), cleanup, or internal standards (e.g. EPA-1613ISS). Therefore, they are not included in these window defining mixtures.

Catalogue Number	Product (nonane solution)	Qty/Conc
MD5CWDS	PCDD Window Defining Mixture for DB-5, BP5, HP-2, Rtx-5, SPB-5, or Equivalent Capillary Columns	1.2 mL

Concentrations for each compound are listed in brackets (ng/mL ± 20%)[a]

FIRST	LAST
1,3,6,8-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin (1000)	1,2,8,9-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin (1000)
1,2,4,7,9-Pentachloro($^{13}C_{12}$)dibenzo-*p*-dioxin (1000)	1,2,3,8,9-Pentachloro($^{13}C_{12}$)dibenzo-*p*-dioxin (1000)
1,2,4,6,7,9-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin (1000)	*
1,2,3,4,6,7,9-Heptachloro($^{13}C_{12}$)dibenzo-*p*-dioxin (1000)	**

* 1,2,3,4,6,7-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin (last eluting HxCDD) is not included in this solution as it co-elutes with 1,2,3,7,8,9-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin which is present in compatible support solutions.

** 1,2,3,4,6,7,8-Heptachloro($^{13}C_{12}$)dibenzo-*p*-dioxin (last eluting HpCDD) is not included in this solution as it is present in compatible support solutions.

MF5CWDS	PCDF Window Defining Mixture for DB-5, BP5, HP-2, Rtx-5, SPB-5, or Equivalent Capillary Columns	1.2 mL

Concentrations for each compound are listed in brackets (ng/mL ± 20%)[a]

FIRST	LAST
1,3,6,8-Tetrachloro($^{13}C_{12}$)dibenzofuran (1000)	1,2,8,9-Tetrachloro($^{13}C_{12}$)dibenzofuran (1000)
1,3,4,6,8-Pentachloro($^{13}C_{12}$)dibenzofuran (1000)	1,2,3,8,9-Pentachloro($^{13}C_{12}$)dibenzofuran (1000)
1,2,3,4,6,8-Hexachloro($^{13}C_{12}$)dibenzofuran (1000)	***
****	****

*** 1,2,3,4,8,9-Hexachloro($^{13}C_{12}$)dibenzofuran (last eluting HxCDF) is not included in this solution as it co-elutes with 1,2,3,7,8,9-Hexachloro($^{13}C_{12}$)dibenzofuran which is present in compatible support solutions.

**** 1,2,3,4,6,7,8-Heptachloro($^{13}C_{12}$)dibenzofuran (first eluting HpCDF) and 1,2,3,4,7,8,9-Heptachloro($^{13}C_{12}$)dibenzofuran (last eluting HpCDF) are not included in this solution as they are present in compatible support solutions.

a Maximum percent relative combined uncertainty of weights and volumes

INDIVIDUAL PCDD & PCDF CONGENERS:
NATIVE AND MASS-LABELLED

Wellington offers a large selection of individual polychlorinated dibenzo-*p*-dioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs). We now also offer the largest selection of mass-labelled PCDD and PCDF congeners.

The following product groups are presented in this section:

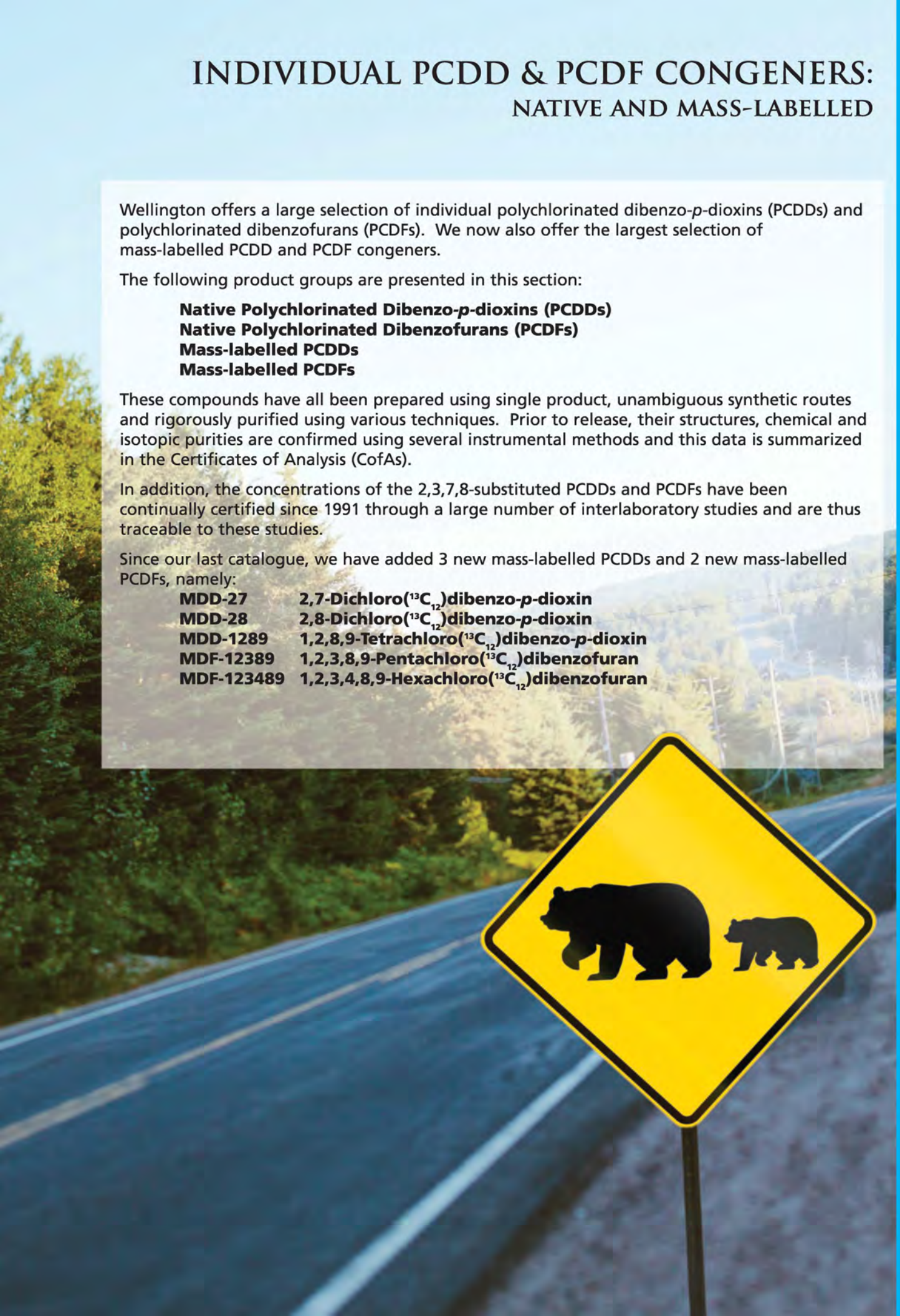
Native Polychlorinated Dibenzo-*p*-dioxins (PCDDs)
Native Polychlorinated Dibenzofurans (PCDFs)
Mass-labelled PCDDs
Mass-labelled PCDFs

These compounds have all been prepared using single product, unambiguous synthetic routes and rigorously purified using various techniques. Prior to release, their structures, chemical and isotopic purities are confirmed using several instrumental methods and this data is summarized in the Certificates of Analysis (CofAs).

In addition, the concentrations of the 2,3,7,8-substituted PCDDs and PCDFs have been continually certified since 1991 through a large number of interlaboratory studies and are thus traceable to these studies.

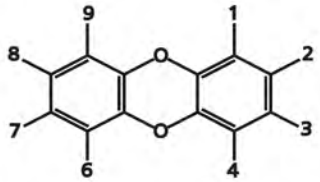
Since our last catalogue, we have added 3 new mass-labelled PCDDs and 2 new mass-labelled PCDFs, namely:

MDD-27	**2,7-Dichloro($^{13}C_{12}$)dibenzo-*p*-dioxin**
MDD-28	**2,8-Dichloro($^{13}C_{12}$)dibenzo-*p*-dioxin**
MDD-1289	**1,2,8,9-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin**
MDF-12389	**1,2,3,8,9-Pentachloro($^{13}C_{12}$)dibenzofuran**
MDF-123489	**1,2,3,4,8,9-Hexachloro($^{13}C_{12}$)dibenzofuran**



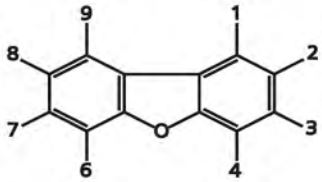
NATIVE POLYCHLORINATED DIBENZO-*p*-DIOXINS (PCDDs)

Catalogue Number	Product (toluene or nonane solution)	Qty/Conc	
DD-0-S	Dibenzo-*p*-dioxin	1.2 mL	50.0 µg/mL
DD-1-S	1-Chlorodibenzo-*p*-dioxin	1.2 mL	50.0 µg/mL
DD-2-S	2-Chlorodibenzo-*p*-dioxin	1.2 mL	50.0 µg/mL
DD-23-S	2,3-Dichlorodibenzo-*p*-dioxin	1.2 mL	50.0 µg/mL
DD-27-S	2,7-Dichlorodibenzo-*p*-dioxin	1.2 mL	50.0 µg/mL
DD-28-S	2,8-Dichlorodibenzo-*p*-dioxin	1.2 mL	50.0 µg/mL
DD-123-S	1,2,3-Trichlorodibenzo-*p*-dioxin	1.2 mL	50.0 µg/mL
DD-124-S	1,2,4-Trichlorodibenzo-*p*-dioxin	1.2 mL	50.0 µg/mL
DD-237-S	2,3,7-Trichlorodibenzo-*p*-dioxin	1.2 mL	50.0 µg/mL
DD-1234-S	1,2,3,4-Tetrachlorodibenzo-*p*-dioxin	1.2 mL	50.0 µg/mL
DD-1247/8-S	1,2,4,7/1,2,4,8-Tetrachlorodibenzo-*p*-dioxin mix	1.2 mL	50.0 µg/mL
DD-1278-S	1,2,7,8-Tetrachlorodibenzo-*p*-dioxin	1.2 mL	50.0 µg/mL
DD-1289-S	1,2,8,9-Tetrachlorodibenzo-*p*-dioxin	1.2 mL	50.0 µg/mL
DD-1368-S	1,3,6,8-Tetrachlorodibenzo-*p*-dioxin	1.2 mL	50.0 µg/mL
DD-1378-S	1,3,7,8-Tetrachlorodibenzo-*p*-dioxin	1.2 mL	50.0 µg/mL
DD-1379-S	1,3,7,9-Tetrachlorodibenzo-*p*-dioxin	1.2 mL	50.0 µg/mL
DD-1478-S	1,4,7,8-Tetrachlorodibenzo-*p*-dioxin	1.2 mL	50.0 µg/mL
DD-2378-S	2,3,7,8-Tetrachlorodibenzo-*p*-dioxin	1.2 mL	50.0 µg/mL
DD-12378-S	1,2,3,7,8-Pentachlorodibenzo-*p*-dioxin	1.2 mL	50.0 µg/mL
DD-12478-S	1,2,4,7,8-Pentachlorodibenzo-*p*-dioxin	1.2 mL	50.0 µg/mL
DD-123467-S	1,2,3,4,6,7-Hexachlorodibenzo-*p*-dioxin	1.2 mL	50.0 µg/mL
DD-123468-S	1,2,3,4,6,8-Hexachlorodibenzo-*p*-dioxin	1.2 mL	50.0 µg/mL
DD-123478-S	1,2,3,4,7,8-Hexachlorodibenzo-*p*-dioxin	1.2 mL	50.0 µg/mL
DD-123678-S	1,2,3,6,7,8-Hexachlorodibenzo-*p*-dioxin	1.2 mL	50.0 µg/mL
DD-123789-S	1,2,3,7,8,9-Hexachlorodibenzo-*p*-dioxin	1.2 mL	50.0 µg/mL
DD-124679-S	1,2,4,6,7,9-Hexachlorodibenzo-*p*-dioxin	1.2 mL	50.0 µg/mL
DD-1234678-S	1,2,3,4,6,7,8-Heptachlorodibenzo-*p*-dioxin	1.2 mL	50.0 µg/mL
DD-12346789-S	Octachlorodibenzo-*p*-dioxin	1.2 mL	50.0 µg/mL



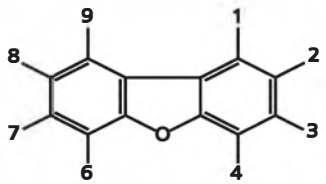
NATIVE POLYCHLORINATED DIBENZOFURANS (PCDFs)

Catalogue Number	Product (toluene or nonane solution)	Qty/Conc	
DF-0-S	Dibenzofuran	1.2 mL	50.0 µg/mL
DF-2-S	2-Chlorodibenzofuran	1.2 mL	50.0 µg/mL
DF-4-S	4-Chlorodibenzofuran	1.2 mL	50.0 µg/mL
DF-23-S	2,3-Dichlorodibenzofuran	1.2 mL	50.0 µg/mL
DF-24-S	2,4-Dichlorodibenzofuran	1.2 mL	50.0 µg/mL
DF-26-S	2,6-Dichlorodibenzofuran	1.2 mL	50.0 µg/mL
DF-27-S	2,7-Dichlorodibenzofuran	1.2 mL	50.0 µg/mL
DF-28-S	2,8-Dichlorodibenzofuran	1.2 mL	50.0 µg/mL
DF-136-S	1,3,6-Trichlorodibenzofuran	1.2 mL	50.0 µg/mL
DF-138-S	1,3,8-Trichlorodibenzofuran	1.2 mL	50.0 µg/mL
DF-146-S	1,4,6-Trichlorodibenzofuran	1.2 mL	50.0 µg/mL
DF-147-S	1,4,7-Trichlorodibenzofuran	1.2 mL	50.0 µg/mL
DF-149-S	1,4,9-Trichlorodibenzofuran	1.2 mL	50.0 µg/mL
DF-234-S	2,3,4-Trichlorodibenzofuran	1.2 mL	50.0 µg/mL
DF-236-S	2,3,6-Trichlorodibenzofuran	1.2 mL	50.0 µg/mL
DF-238-S	2,3,8-Trichlorodibenzofuran	1.2 mL	50.0 µg/mL
DF-246-S	2,4,6-Trichlorodibenzofuran	1.2 mL	50.0 µg/mL
DF-247-S	2,4,7-Trichlorodibenzofuran	1.2 mL	50.0 µg/mL
DF-248-S	2,4,8-Trichlorodibenzofuran	1.2 mL	50.0 µg/mL
DF-267-S	2,6,7-Trichlorodibenzofuran	1.2 mL	50.0 µg/mL
DF-1236-S	1,2,3,6-Tetrachlorodibenzofuran	1.2 mL	50.0 µg/mL
DF-1238-S	1,2,3,8-Tetrachlorodibenzofuran	1.2 mL	50.0 µg/mL
DF-1239-S	1,2,3,9-Tetrachlorodibenzofuran	1.2 mL	50.0 µg/mL
DF-1246-S	1,2,4,6-Tetrachlorodibenzofuran	1.2 mL	50.0 µg/mL
DF-1247-S	1,2,4,7-Tetrachlorodibenzofuran	1.2 mL	50.0 µg/mL
DF-1248-S	1,2,4,8-Tetrachlorodibenzofuran	1.2 mL	50.0 µg/mL
DF-1267-S	1,2,6,7-Tetrachlorodibenzofuran	1.2 mL	50.0 µg/mL
DF-1278-S	1,2,7,8-Tetrachlorodibenzofuran	1.2 mL	50.0 µg/mL
DF-1279-S	1,2,7,9-Tetrachlorodibenzofuran	1.2 mL	50.0 µg/mL
DF-1347-S	1,3,4,7-Tetrachlorodibenzofuran	1.2 mL	50.0 µg/mL



NATIVE POLYCHLORINATED DIBENZOFURANS (PCDFs)

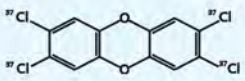
Catalogue Number	Product (toluene or nonane solution)	Qty/Conc	
DF-1348-S	1,3,4,8-Tetrachlorodibenzofuran	1.2 mL	50.0 µg/mL
DF-1349-S	1,3,4,9-Tetrachlorodibenzofuran	1.2 mL	50.0 µg/mL
DF-1367-S	1,3,6,7-Tetrachlorodibenzofuran	1.2 mL	50.0 µg/mL
DF-1368-S	1,3,6,8-Tetrachlorodibenzofuran	1.2 mL	50.0 µg/mL
DF-1369-S	1,3,6,9-Tetrachlorodibenzofuran	1.2 mL	50.0 µg/mL
DF-1378-S	1,3,7,8-Tetrachlorodibenzofuran	1.2 mL	50.0 µg/mL
DF-1467-S	1,4,6,7-Tetrachlorodibenzofuran	1.2 mL	50.0 µg/mL
DF-1478-S	1,4,7,8-Tetrachlorodibenzofuran	1.2 mL	50.0 µg/mL
DF-2346-S	2,3,4,6-Tetrachlorodibenzofuran	1.2 mL	50.0 µg/mL
DF-2347-S	2,3,4,7-Tetrachlorodibenzofuran	1.2 mL	50.0 µg/mL
DF-2348-S	2,3,4,8-Tetrachlorodibenzofuran	1.2 mL	50.0 µg/mL
DF-2368-S	2,3,6,8-Tetrachlorodibenzofuran	1.2 mL	50.0 µg/mL
DF-2378-S	2,3,7,8-Tetrachlorodibenzofuran	1.2 mL	50.0 µg/mL
DF-2467-S	2,4,6,7-Tetrachlorodibenzofuran	1.2 mL	50.0 µg/mL
DF-2468-S	2,4,6,8-Tetrachlorodibenzofuran	1.2 mL	50.0 µg/mL
DF-3467-S	3,4,6,7-Tetrachlorodibenzofuran	1.2 mL	50.0 µg/mL
DF-12347-S	1,2,3,4,7-Pentachlorodibenzofuran	1.2 mL	50.0 µg/mL
DF-12348-S	1,2,3,4,8-Pentachlorodibenzofuran	1.2 mL	50.0 µg/mL
DF-12367-S	1,2,3,6,7-Pentachlorodibenzofuran	1.2 mL	50.0 µg/mL
DF-12378-S	1,2,3,7,8-Pentachlorodibenzofuran	1.2 mL	50.0 µg/mL
DF-12379-S	1,2,3,7,9-Pentachlorodibenzofuran	1.2 mL	50.0 µg/mL
DF-12389-S	1,2,3,8,9-Pentachlorodibenzofuran	1.2 mL	50.0 µg/mL
DF-12467-S	1,2,4,6,7-Pentachlorodibenzofuran	1.2 mL	50.0 µg/mL
DF-12468-S	1,2,4,6,8-Pentachlorodibenzofuran	1.2 mL	50.0 µg/mL
DF-12478-S	1,2,4,7,8-Pentachlorodibenzofuran	1.2 mL	50.0 µg/mL
DF-13467-S	1,3,4,6,7-Pentachlorodibenzofuran	1.2 mL	50.0 µg/mL
DF-13478-S	1,3,4,7,8-Pentachlorodibenzofuran	1.2 mL	50.0 µg/mL
DF-13479-S	1,3,4,7,9-Pentachlorodibenzofuran	1.2 mL	50.0 µg/mL
DF-13678-S	1,3,6,7,8-Pentachlorodibenzofuran (97% pure)	1.2 mL	48.5 µg/mL
DF-14678-S	1,4,6,7,8-Pentachlorodibenzofuran	1.2 mL	50.0 µg/mL
DF-23467-S	2,3,4,6,7-Pentachlorodibenzofuran	1.2 mL	50.0 µg/mL
DF-23478-S	2,3,4,7,8-Pentachlorodibenzofuran	1.2 mL	50.0 µg/mL



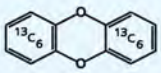
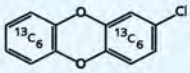
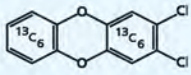
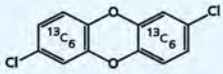
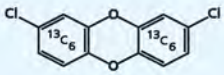
NATIVE POLYCHLORINATED DIBENZOFURANS (PCDFs)

Catalogue Number	Product (toluene or nonane solution)	Qty/Conc
DF-123467-S	1,2,3,4,6,7-Hexachlorodibenzofuran	1.2 mL 50.0 µg/mL
DF-123468-S	1,2,3,4,6,8-Hexachlorodibenzofuran	1.2 mL 50.0 µg/mL
DF-123478-S	1,2,3,4,7,8-Hexachlorodibenzofuran	1.2 mL 50.0 µg/mL
DF-123489-S	1,2,3,4,8,9-Hexachlorodibenzofuran	1.2 mL 50.0 µg/mL
DF-123678-S	1,2,3,6,7,8-Hexachlorodibenzofuran	1.2 mL 50.0 µg/mL
DF-123789-S	1,2,3,7,8,9-Hexachlorodibenzofuran	1.2 mL 50.0 µg/mL
DF-234678-S	2,3,4,6,7,8-Hexachlorodibenzofuran	1.2 mL 50.0 µg/mL
DF-1234678-S	1,2,3,4,6,7,8-Heptachlorodibenzofuran	1.2 mL 50.0 µg/mL
DF-1234689-S	1,2,3,4,6,8,9-Heptachlorodibenzofuran	1.2 mL 50.0 µg/mL
DF-1234789-S	1,2,3,4,7,8,9-Heptachlorodibenzofuran	1.2 mL 50.0 µg/mL
DF-12346789-S	Octachlorodibenzofuran	1.2 mL 50.0 µg/mL

^{37}Cl-MASS-LABELLED DIBENZO-*p*-DIOXIN

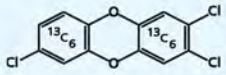
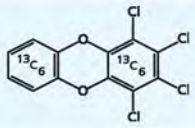
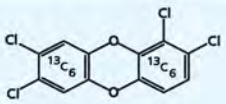
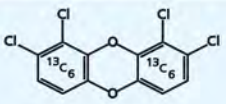
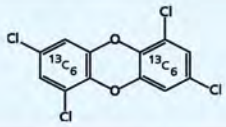
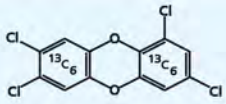
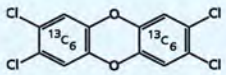
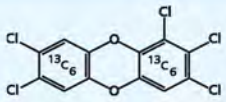
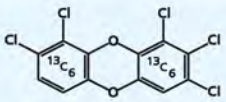
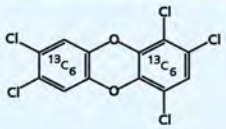
Catalogue Number		Product
MCDD-2378		2,3,7,8-($^{37}Cl_4$)Tetrachlorodibenzo-*p*-dioxin 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene (isotopic purity 94 to 95%)

MASS-LABELLED POLYCHLORINATED DIBENZO-*p*-DIOXINS

Catalogue Number		Product
MDD-0		($^{13}C_{12}$)Dibenzo-*p*-dioxin 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
MDD-2		2-Chloro($^{13}C_{12}$)dibenzo-*p*-dioxin 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
MDD-23		2,3-Dichloro($^{13}C_{12}$)dibenzo-*p*-dioxin 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
MDD-27		2,7-Dichloro($^{13}C_{12}$)dibenzo-*p*-dioxin 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
MDD-28		2,8-Dichloro($^{13}C_{12}$)dibenzo-*p*-dioxin 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene

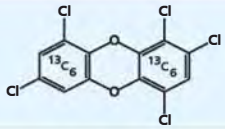
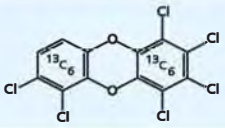
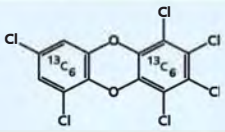
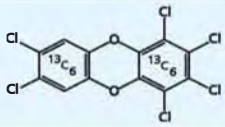
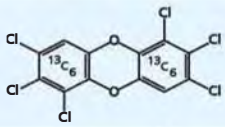
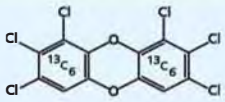
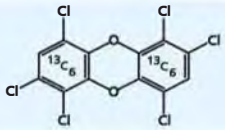
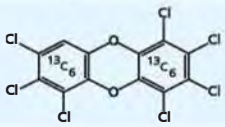
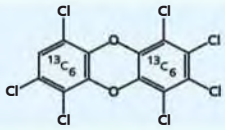
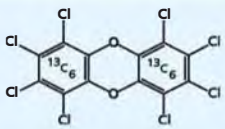
* Unless stated otherwise, isotopic purities of these compounds are 99% or greater.

MASS-LABELLED POLYCHLORINATED DIBENZO-*p*-DIOXINS

Catalogue Number		Product
MDD-237		2,3,7-Trichloro($^{13}C_{12}$)dibenzo-*p*-dioxin 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
MDD-1234		1,2,3,4-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
MDD-1278		1,2,7,8-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
MDD-1289		1,2,8,9-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
MDD-1368		1,3,6,8-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
MDD-1378		1,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
MDD-2378		2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
MDD-12378		1,2,3,7,8-Pentachloro($^{13}C_{12}$)dibenzo-*p*-dioxin 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
MDD-12389		1,2,3,8,9-Pentachloro($^{13}C_{12}$)dibenzo-*p*-dioxin 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
MDD-12478		1,2,4,7,8-Pentachloro($^{13}C_{12}$)dibenzo-*p*-dioxin 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene

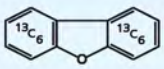
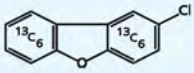
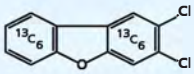
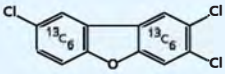
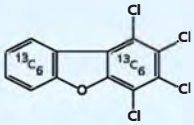
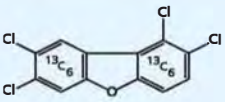
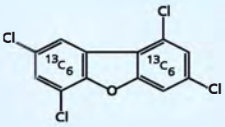
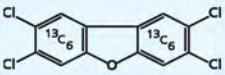
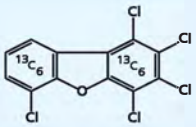
* Unless stated otherwise, isotopic purities of these compounds are 99% or greater.

MASS-LABELLED POLYCHLORINATED DIBENZO-*p*-DIOXINS

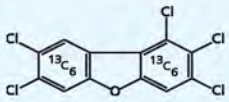
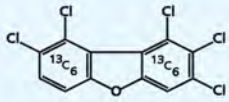
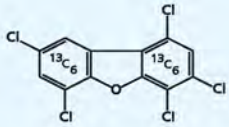
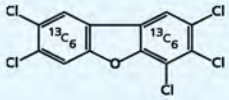
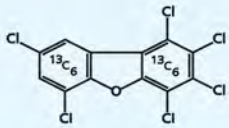
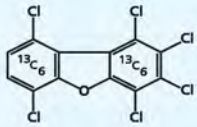
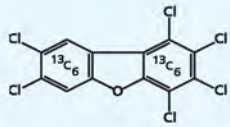
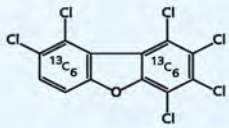
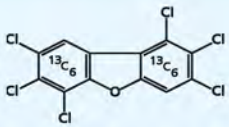
Catalogue Number		Product
MDD-12479		1,2,4,7,9-Pentachloro($^{13}C_{12}$)dibenzo-*p*-dioxin 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
MDD-123467		1,2,3,4,6,7-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
MDD-123468		1,2,3,4,6,8-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
MDD-123478		1,2,3,4,7,8-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
MDD-123678		1,2,3,6,7,8-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
MDD-123789		1,2,3,7,8,9-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
MDD-124679		1,2,4,6,7,9-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
MDD-1234678		1,2,3,4,6,7,8-Heptachloro($^{13}C_{12}$)dibenzo-*p*-dioxin 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
MDD-1234679		1,2,3,4,6,7,9-Heptachloro($^{13}C_{12}$)dibenzo-*p*-dioxin 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
MDD-12346789		Octachloro($^{13}C_{12}$)dibenzo-*p*-dioxin 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene

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

MASS-LABELLED POLYCHLORINATED DIBENZOFURANS

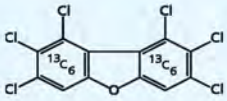
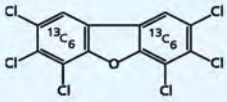
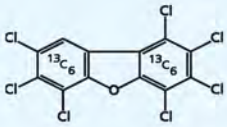
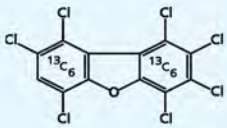
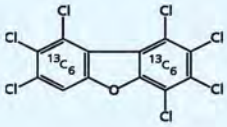
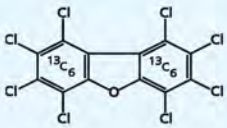
Catalogue Number		Product
MDF-0		($^{13}C_{12}$)Dibenzofuran 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
MDF-2		2-Chloro($^{13}C_{12}$)dibenzofuran 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
MDF-23		2,3-Dichloro($^{13}C_{12}$)dibenzofuran 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
MDF-238		2,3,8-Trichloro($^{13}C_{12}$)dibenzofuran 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
MDF-1234		1,2,3,4-Tetrachloro($^{13}C_{12}$)dibenzofuran 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
MDF-1278		1,2,7,8-Tetrachloro($^{13}C_{12}$)dibenzofuran 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
MDF-1368		1,3,6,8-Tetrachloro($^{13}C_{12}$)dibenzofuran 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
MDF-2378		2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzofuran 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
MDF-12346		1,2,3,4,6-Pentachloro($^{13}C_{12}$)dibenzofuran 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene

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

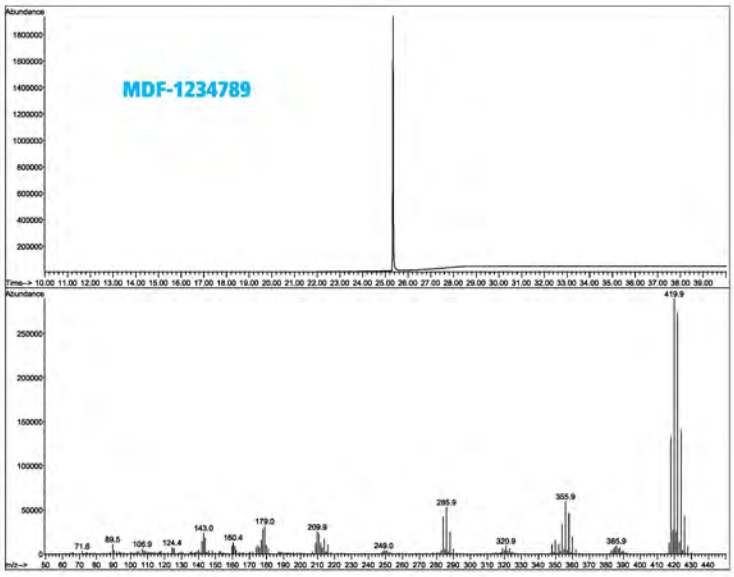
Catalogue Number		Product
MDF-12378		1,2,3,7,8-Pentachloro($^{13}C_{12}$)dibenzofuran 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
MDF-12389		1,2,3,8,9-Pentachloro($^{13}C_{12}$)dibenzofuran 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
MDF-13468		1,3,4,6,8-Pentachloro($^{13}C_{12}$)dibenzofuran 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
MDF-23478		2,3,4,7,8-Pentachloro($^{13}C_{12}$)dibenzofuran 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
MDF-123468		1,2,3,4,6,8-Hexachloro($^{13}C_{12}$)dibenzofuran 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
MDF-123469		1,2,3,4,6,9-Hexachloro($^{13}C_{12}$)dibenzofuran 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
MDF-123478		1,2,3,4,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
MDF-123489		1,2,3,4,8,9-Hexachloro($^{13}C_{12}$)dibenzofuran 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
MDF-123678		1,2,3,6,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene

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

MASS-LABELLED POLYCHLORINATED DIBENZOFURANS

Catalogue Number		Product
MDF-123789		1,2,3,7,8,9-Hexachloro($^{13}C_{12}$)dibenzofuran 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
MDF-234678		2,3,4,6,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
MDF-1234678		1,2,3,4,6,7,8-Heptachloro($^{13}C_{12}$)dibenzofuran 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
MDF-1234689		1,2,3,4,6,8,9-Heptachloro($^{13}C_{12}$)dibenzofuran 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
MDF-1234789		1,2,3,4,7,8,9-Heptachloro($^{13}C_{12}$)dibenzofuran 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
MDF-12346789		Octachloro($^{13}C_{12}$)dibenzofuran 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene

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



HRGC/LRMS data of 1,2,3,4,7,8,9-Heptachloro($^{13}C_{12}$)dibenzofuran (30m DB-5 column).

In order to keep up-to-date on new releases from Wellington Laboratories Inc., please visit our website at www.well-labs.com.

New Products are announced in the Wellington Reporter.



Country Backroads
Elmira, Ontario

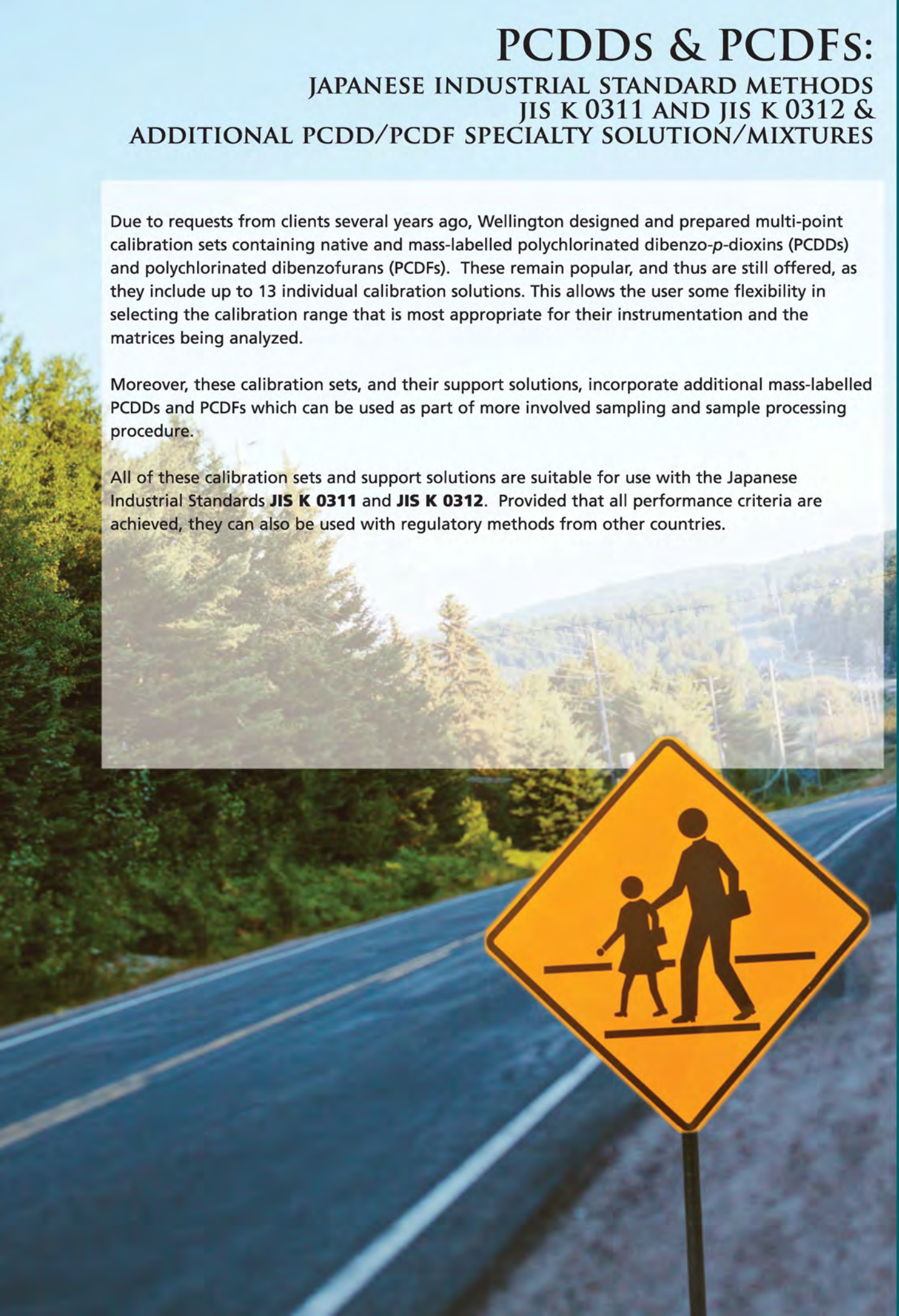
PCDDs & PCDFs:

JAPANESE INDUSTRIAL STANDARD METHODS JIS K 0311 AND JIS K 0312 & ADDITIONAL PCDD/PCDF SPECIALTY SOLUTION/MIXTURES

Due to requests from clients several years ago, Wellington designed and prepared multi-point calibration sets containing native and mass-labelled polychlorinated dibenzo-*p*-dioxins (PCDDs) and polychlorinated dibenzofurans (PCDFs). These remain popular, and thus are still offered, as they include up to 13 individual calibration solutions. This allows the user some flexibility in selecting the calibration range that is most appropriate for their instrumentation and the matrices being analyzed.

Moreover, these calibration sets, and their support solutions, incorporate additional mass-labelled PCDDs and PCDFs which can be used as part of more involved sampling and sample processing procedure.

All of these calibration sets and support solutions are suitable for use with the Japanese Industrial Standards **JIS K 0311** and **JIS K 0312**. Provided that all performance criteria are achieved, they can also be used with regulatory methods from other countries.





DF-CVS-A10

Catalogue Number	Product (nonane solution)	Qty/Conc
DF-CVS-A10-Set 1	CS1/CS3/CS5/CS7/CS9	1 kit (5 ampoules)
DF-CVS-A10-Set 2	CS2/CS4/CS6/CS8/CS10	1 kit (5 ampoules)
DF-CVS-A10-Set 3	CS3/CS5/CS7/CS9/CS11	1 kit (5 ampoules)
DF-A10-CSL	CSL Extended Calibration/Low Level	200 µL
DF-A10-CS1	CS1	200 µL
DF-A10-CS2	CS2	200 µL
DF-A10-CS3	CS3	200 µL
DF-A10-CS4	CS4	200 µL

NATIVE PCDDs & PCDFs	DF-A10-CSL (ng/mL)	DF-A10-CS1 (ng/mL)	DF-A10-CS2 (ng/mL)	DF-A10-CS3 (ng/mL)	DF-A10-CS4 (ng/mL)
1,3,6,8-Tetrachlorodibenzo-*p*-dioxin	0.0500	0.100	0.200	0.500	1.00
1,3,7,9-Tetrachlorodibenzo-*p*-dioxin	0.0500	0.100	0.200	0.500	1.00
1,2,8,9-Tetrachlorodibenzo-*p*-dioxin	0.0500	0.100	0.200	0.500	1.00
2,3,7,8-Tetrachlorodibenzo-*p*-dioxin	0.0500	0.100	0.200	0.500	1.00
1,2,3,7,8-Pentachlorodibenzo-*p*-dioxin	0.0500	0.100	0.200	0.500	1.00
1,2,3,4,7,8-Hexachlorodibenzo-*p*-dioxin	0.0500	0.100	0.200	0.500	1.00
1,2,3,6,7,8-Hexachlorodibenzo-*p*-dioxin	0.0500	0.100	0.200	0.500	1.00
1,2,3,7,8,9-Hexachlorodibenzo-*p*-dioxin	0.0500	0.100	0.200	0.500	1.00
1,2,3,4,6,7,8-Heptachlorodibenzo-*p*-dioxin	0.0500	0.100	0.200	0.500	1.00
Octachlorodibenzo-*p*-dioxin	0.100	0.200	0.400	1.00	2.00
1,3,6,8-Tetrachlorodibenzofuran	0.0500	0.100	0.200	0.500	1.00
1,2,7,8-Tetrachlorodibenzofuran	0.0500	0.100	0.200	0.500	1.00
1,2,8,9-Tetrachlorodibenzofuran	0.0500	0.100	0.200	0.500	1.00
2,3,7,8-Tetrachlorodibenzofuran	0.0500	0.100	0.200	0.500	1.00
1,2,3,7,8-Pentachlorodibenzofuran	0.0500	0.100	0.200	0.500	1.00
2,3,4,7,8-Pentachlorodibenzofuran	0.0500	0.100	0.200	0.500	1.00
1,2,3,4,7,8-Hexachlorodibenzofuran	0.0500	0.100	0.200	0.500	1.00
1,2,3,6,7,8-Hexachlorodibenzofuran	0.0500	0.100	0.200	0.500	1.00
1,2,3,7,8,9-Hexachlorodibenzofuran	0.0500	0.100	0.200	0.500	1.00
2,3,4,6,7,8-Hexachlorodibenzofuran	0.0500	0.100	0.200	0.500	1.00
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.0500	0.100	0.200	0.500	1.00
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.0500	0.100	0.200	0.500	1.00
Octachlorodibenzofuran	0.100	0.200	0.400	1.00	2.00
EXTRACTION SPIKE:					
MASS-LABELLED PCDDs & PCDFs					
1,3,6,8-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	10.0	10.0	10.0	10.0	10.0
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	10.0	10.0	10.0	10.0	10.0
1,2,3,7,8-Pentachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	10.0	10.0	10.0	10.0	10.0
1,2,3,4,7,8-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	10.0	10.0	10.0	10.0	10.0
1,2,3,6,7,8-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	10.0	10.0	10.0	10.0	10.0
1,2,3,7,8,9-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	10.0	10.0	10.0	10.0	10.0
1,2,3,4,6,7,8-Heptachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	10.0	10.0	10.0	10.0	10.0
Octachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	20.0	20.0	20.0	20.0	20.0
1,3,6,8-Tetrachloro($^{13}C_{12}$)dibenzofuran	10.0	10.0	10.0	10.0	10.0
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzofuran	10.0	10.0	10.0	10.0	10.0
1,2,3,7,8-Pentachloro($^{13}C_{12}$)dibenzofuran	10.0	10.0	10.0	10.0	10.0
2,3,4,7,8-Pentachloro($^{13}C_{12}$)dibenzofuran	10.0	10.0	10.0	10.0	10.0
1,2,3,4,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran	10.0	10.0	10.0	10.0	10.0
1,2,3,6,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran	10.0	10.0	10.0	10.0	10.0
1,2,3,7,8,9-Hexachloro($^{13}C_{12}$)dibenzofuran	10.0	10.0	10.0	10.0	10.0
2,3,4,6,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran	10.0	10.0	10.0	10.0	10.0
1,2,3,4,6,7,8-Heptachloro($^{13}C_{12}$)dibenzofuran	10.0	10.0	10.0	10.0	10.0
1,2,3,4,7,8,9-Heptachloro($^{13}C_{12}$)dibenzofuran	10.0	10.0	10.0	10.0	10.0
Octachloro($^{13}C_{12}$)dibenzofuran	20.0	20.0	20.0	20.0	20.0
SYRINGE SPIKE:					
MASS-LABELLED PCDFs					
1,2,7,8-Tetrachloro($^{13}C_{12}$)dibenzofuran	10.0	10.0	10.0	10.0	10.0
1,2,3,4,6-Pentachloro($^{13}C_{12}$)dibenzofuran	10.0	10.0	10.0	10.0	10.0
1,2,3,4,6,9-Hexachloro($^{13}C_{12}$)dibenzofuran	10.0	10.0	10.0	10.0	10.0
1,2,3,4,6,8,9-Heptachloro($^{13}C_{12}$)dibenzofuran	10.0	10.0	10.0	10.0	10.0
SAMPLING SPIKE:					
MASS-LABELLED PCDDs & PCDFs					
1,2,3,4-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	10.0	10.0	10.0	10.0	10.0
1,2,3,4-Tetrachloro($^{13}C_{12}$)dibenzofuran	10.0	10.0	10.0	10.0	10.0

Catalogue Number	Product (nonane solution)		Qty/Conc
DF-A10-CS5	CS5		200 µL
DF-A10-CS6	CS6		200 µL
DF-A10-CS7	CS7		200 µL
DF-A10-CS8	CS8		200 µL
DF-A10-CS9	CS9		200 µL
DF-A10-CS10	CS10		200 µL
DF-A10-CS11	CS11		200 µL
DF-A10-CSH	CSH	Extended Calibration/High Level	200 µL

***FOR SUPPORT SOLUTIONS, see DF-ST-A, DF-LCS-A, DF-IS-B, and DF-IS-I (and their dilutions).**

DF-A10-CS5 (ng/mL)	DF-A10-CS6 (ng/mL)	DF-A10-CS7 (ng/mL)	DF-A10-CS8 (ng/mL)	DF-A10-CS9 (ng/mL)	DF-A10-CS10 (ng/mL)	DF-A10-CS11 (ng/mL)	DF-A10-CSH (ng/mL)
2.00	5.00	10.0	20.0	50.0	100	200	1000
2.00	5.00	10.0	20.0	50.0	100	200	1000
2.00	5.00	10.0	20.0	50.0	100	200	1000
2.00	5.00	10.0	20.0	50.0	100	200	1000
2.00	5.00	10.0	20.0	50.0	100	200	1000
2.00	5.00	10.0	20.0	50.0	100	200	1000
2.00	5.00	10.0	20.0	50.0	100	200	1000
2.00	5.00	10.0	20.0	50.0	100	200	1000
4.00	10.0	20.0	40.0	100	200	400	2000
2.00	5.00	10.0	20.0	50.0	100	200	1000
2.00	5.00	10.0	20.0	50.0	100	200	1000
2.00	5.00	10.0	20.0	50.0	100	200	1000
2.00	5.00	10.0	20.0	50.0	100	200	1000
2.00	5.00	10.0	20.0	50.0	100	200	1000
2.00	5.00	10.0	20.0	50.0	100	200	1000
2.00	5.00	10.0	20.0	50.0	100	200	1000
2.00	5.00	10.0	20.0	50.0	100	200	1000
2.00	5.00	10.0	20.0	50.0	100	200	1000
2.00	5.00	10.0	20.0	50.0	100	200	1000
2.00	5.00	10.0	20.0	50.0	100	200	1000
4.00	10.0	20.0	40.0	100	200	400	2000
10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0



DF-CVS-B10

Catalogue Number	Product (nonane solution)	Qty/Conc
DF-CVS-B10-Set 1	CS1/CS3/CS5/CS7/CS9	1 kit (5 ampoules)
DF-CVS-B10-Set 2	CS2/CS4/CS6/CS8/CS10	1 kit (5 ampoules)
DF-CVS-B10-Set 3	CS3/CS5/CS7/CS9/CS11	1 kit (5 ampoules)
DF-B10-CS1	CS1	200 µL
DF-B10-CS2	CS2	200 µL
DF-B10-CS3	CS3	200 µL
DF-B10-CS4	CS4	200 µL

NATIVE PCDDs & PCDFs	DF-B10-CS1 (ng/mL)	DF-B10-CS2 (ng/mL)	DF-B10-CS3 (ng/mL)	DF-B10-CS4 (ng/mL)
1,3,6,8-Tetrachlorodibenzo-*p*-dioxin	0.100	0.200	0.500	1.00
1,3,7,9-Tetrachlorodibenzo-*p*-dioxin	0.100	0.200	0.500	1.00
1,2,8,9-Tetrachlorodibenzo-*p*-dioxin	0.100	0.200	0.500	1.00
2,3,7,8-Tetrachlorodibenzo-*p*-dioxin	0.100	0.200	0.500	1.00
1,2,3,7,8-Pentachlorodibenzo-*p*-dioxin	0.100	0.200	0.500	1.00
1,2,3,4,7,8-Hexachlorodibenzo-*p*-dioxin	0.200	0.400	1.00	2.00
1,2,3,6,7,8-Hexachlorodibenzo-*p*-dioxin	0.200	0.400	1.00	2.00
1,2,3,7,8,9-Hexachlorodibenzo-*p*-dioxin	0.200	0.400	1.00	2.00
1,2,3,4,6,7,8-Heptachlorodibenzo-*p*-dioxin	0.200	0.400	1.00	2.00
Octachlorodibenzo-*p*-dioxin	0.500	1.00	2.50	5.00
1,3,6,8-Tetrachlorodibenzofuran	0.100	0.200	0.500	1.00
1,2,7,8-Tetrachlorodibenzofuran	0.100	0.200	0.500	1.00
1,2,8,9-Tetrachlorodibenzofuran	0.100	0.200	0.500	1.00
2,3,7,8-Tetrachlorodibenzofuran	0.100	0.200	0.500	1.00
1,2,3,7,8-Pentachlorodibenzofuran	0.100	0.200	0.500	1.00
2,3,4,7,8-Pentachlorodibenzofuran	0.100	0.200	0.500	1.00
1,2,3,4,7,8-Hexachlorodibenzofuran	0.200	0.400	1.00	2.00
1,2,3,6,7,8-Hexachlorodibenzofuran	0.200	0.400	1.00	2.00
1,2,3,7,8,9-Hexachlorodibenzofuran	0.200	0.400	1.00	2.00
2,3,4,6,7,8-Hexachlorodibenzofuran	0.200	0.400	1.00	2.00
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.200	0.400	1.00	2.00
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.200	0.400	1.00	2.00
Octachlorodibenzofuran	0.500	1.00	2.50	5.00
EXTRACTION SPIKE: MASS-LABELLED PCDDs & PCDFs				
1,3,6,8-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	10.0	10.0	10.0	10.0
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	10.0	10.0	10.0	10.0
1,2,3,7,8-Pentachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	10.0	10.0	10.0	10.0
1,2,3,4,7,8-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	10.0	10.0	10.0	10.0
1,2,3,6,7,8-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	10.0	10.0	10.0	10.0
1,2,3,7,8,9-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	10.0	10.0	10.0	10.0
1,2,3,4,6,7,8-Heptachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	10.0	10.0	10.0	10.0
Octachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	20.0	20.0	20.0	20.0
1,3,6,8-Tetrachloro($^{13}C_{12}$)dibenzofuran	10.0	10.0	10.0	10.0
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzofuran	10.0	10.0	10.0	10.0
1,2,3,7,8-Pentachloro($^{13}C_{12}$)dibenzofuran	10.0	10.0	10.0	10.0
2,3,4,7,8-Pentachloro($^{13}C_{12}$)dibenzofuran	10.0	10.0	10.0	10.0
1,2,3,4,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran	10.0	10.0	10.0	10.0
1,2,3,6,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran	10.0	10.0	10.0	10.0
1,2,3,7,8,9-Hexachloro($^{13}C_{12}$)dibenzofuran	10.0	10.0	10.0	10.0
2,3,4,6,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran	10.0	10.0	10.0	10.0
1,2,3,4,6,7,8-Heptachloro($^{13}C_{12}$)dibenzofuran	10.0	10.0	10.0	10.0
1,2,3,4,7,8,9-Heptachloro($^{13}C_{12}$)dibenzofuran	10.0	10.0	10.0	10.0
Octachloro($^{13}C_{12}$)dibenzofuran	20.0	20.0	20.0	20.0
SYRINGE SPIKE: MASS-LABELLED PCDFs				
1,2,7,8-Tetrachloro($^{13}C_{12}$)dibenzofuran	10.0	10.0	10.0	10.0
1,2,3,4,6-Pentachloro($^{13}C_{12}$)dibenzofuran	10.0	10.0	10.0	10.0
1,2,3,4,6,9-Hexachloro($^{13}C_{12}$)dibenzofuran	10.0	10.0	10.0	10.0
1,2,3,4,6,8,9-Heptachloro($^{13}C_{12}$)dibenzofuran	10.0	10.0	10.0	10.0
SAMPLING SPIKE: MASS-LABELLED PCDDs & PCDFs				
1,2,3,4-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	10.0	10.0	10.0	10.0
1,2,3,4-Tetrachloro($^{13}C_{12}$)dibenzofuran	10.0	10.0	10.0	10.0

Catalogue Number	Product (nonane solution)	Qty/Conc
DF-B10-CS5	CS5	200 µL
DF-B10-CS6	CS6	200 µL
DF-B10-CS7	CS7	200 µL
DF-B10-CS8	CS8	200 µL
DF-B10-CS9	CS9	200 µL
DF-B10-CS10	CS10	200 µL
DF-B10-CS11	CS11	200 µL

***FOR SUPPORT SOLUTIONS, see DF-ST-B, DF-LCS-A, DF-IS-B, and DF-IS-I (and their dilutions).**

DF-B10-CS5 (ng/mL)	DF-B10-CS6 (ng/mL)	DF-B10-CS7 (ng/mL)	DF-B10-CS8 (ng/mL)	DF-B10-CS9 (ng/mL)	DF-B10-CS10 (ng/mL)	DF-B10-CS11 (ng/mL)
2.00	5.00	10.0	20.0	50.0	100	200
2.00	5.00	10.0	20.0	50.0	100	200
2.00	5.00	10.0	20.0	50.0	100	200
2.00	5.00	10.0	20.0	50.0	100	200
2.00	5.00	10.0	20.0	50.0	100	200
4.00	10.0	20.0	40.0	100	200	400
4.00	10.0	20.0	40.0	100	200	400
4.00	10.0	20.0	40.0	100	200	400
4.00	10.0	20.0	40.0	100	200	400
10.0	25.0	50.0	100	250	500	1000
2.00	5.00	10.0	20.0	50.0	100	200
2.00	5.00	10.0	20.0	50.0	100	200
2.00	5.00	10.0	20.0	50.0	100	200
2.00	5.00	10.0	20.0	50.0	100	200
2.00	5.00	10.0	20.0	50.0	100	200
2.00	5.00	10.0	20.0	50.0	100	200
4.00	10.0	20.0	40.0	100	200	400
4.00	10.0	20.0	40.0	100	200	400
4.00	10.0	20.0	40.0	100	200	400
4.00	10.0	20.0	40.0	100	200	400
4.00	10.0	20.0	40.0	100	200	400
4.00	10.0	20.0	40.0	100	200	400
10.0	25.0	50.0	100	250	500	1000
10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0
20.0	20.0	20.0	20.0	20.0	20.0	20.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0
20.0	20.0	20.0	20.0	20.0	20.0	20.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0



DF-CVS-C10

Catalogue Number	Product (nonane solution)	Qty/Conc
DF-CVS-C10	PCDD & PCDF Calibration Solutions CS1/CS2/CS3/CS4/CS5/CS6/CS7	1 kit (7 ampoules)
DF-C10-CS1	CS1	200 µL
DF-C10-CS2	CS2	200 µL
DF-C10-CS3	CS3	200 µL

	DF-C10-CS1 (ng/mL)	DF-C10-CS2 (ng/mL)	DF-C10-CS3 (ng/mL)
NATIVE PCDDs & PCDFs			
1,3,6,8-Tetrachlorodibenzo-*p*-dioxin	0.100	0.500	2.00
1,2,8,9-Tetrachlorodibenzo-*p*-dioxin	0.100	0.500	2.00
2,3,7,8-Tetrachlorodibenzo-*p*-dioxin	0.100	0.500	2.00
1,2,3,7,8-Pentachlorodibenzo-*p*-dioxin	0.100	0.500	2.00
1,2,3,4,7,8-Hexachlorodibenzo-*p*-dioxin	0.200	1.00	4.00
1,2,3,6,7,8-Hexachlorodibenzo-*p*-dioxin	0.200	1.00	4.00
1,2,3,7,8,9-Hexachlorodibenzo-*p*-dioxin	0.200	1.00	4.00
1,2,3,4,6,7,8-Heptachlorodibenzo-*p*-dioxin	0.200	1.00	4.00
Octachlorodibenzo-*p*-dioxin	0.500	2.50	10.0
1,3,6,8-Tetrachlorodibenzofuran	0.100	0.500	2.00
1,2,8,9-Tetrachlorodibenzofuran	0.100	0.500	2.00
2,3,7,8-Tetrachlorodibenzofuran	0.100	0.500	2.00
1,2,3,7,8-Pentachlorodibenzofuran	0.100	0.500	2.00
2,3,4,7,8-Pentachlorodibenzofuran	0.100	0.500	2.00
1,2,3,4,7,8-Hexachlorodibenzofuran	0.200	1.00	4.00
1,2,3,6,7,8-Hexachlorodibenzofuran	0.200	1.00	4.00
1,2,3,7,8,9-Hexachlorodibenzofuran	0.200	1.00	4.00
2,3,4,6,7,8-Hexachlorodibenzofuran	0.200	1.00	4.00
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.200	1.00	4.00
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.200	1.00	4.00
Octachlorodibenzofuran	0.500	2.50	10.0
EXTRACTION SPIKE: MASS-LABELLED PCDDs & PCDFs			
1,3,6,8-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	10.0	10.0	10.0
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	10.0	10.0	10.0
1,2,3,7,8-Pentachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	10.0	10.0	10.0
1,2,3,4,7,8-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	10.0	10.0	10.0
1,2,3,6,7,8-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	10.0	10.0	10.0
1,2,3,7,8,9-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	10.0	10.0	10.0
1,2,3,4,6,7,8-Heptachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	10.0	10.0	10.0
Octachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	20.0	20.0	20.0
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzofuran	10.0	10.0	10.0
1,2,3,7,8-Pentachloro($^{13}C_{12}$)dibenzofuran	10.0	10.0	10.0
2,3,4,7,8-Pentachloro($^{13}C_{12}$)dibenzofuran	10.0	10.0	10.0
1,2,3,4,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran	10.0	10.0	10.0
1,2,3,6,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran	10.0	10.0	10.0
1,2,3,7,8,9-Hexachloro($^{13}C_{12}$)dibenzofuran	10.0	10.0	10.0
2,3,4,6,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran	10.0	10.0	10.0
1,2,3,4,6,7,8-Heptachloro($^{13}C_{12}$)dibenzofuran	10.0	10.0	10.0
1,2,3,4,7,8,9-Heptachloro($^{13}C_{12}$)dibenzofuran	10.0	10.0	10.0
Octachloro($^{13}C_{12}$)dibenzofuran	20.0	20.0	20.0
SYRINGE SPIKE: MASS-LABELLED PCDDs			
1,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	10.0	10.0	10.0
1,2,4,7,8-Pentachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	10.0	10.0	10.0
1,2,3,4,6,8-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	10.0	10.0	10.0
1,2,3,4,6,7,9-Heptachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	10.0	10.0	10.0
SAMPLING SPIKE			
1,2,3,4-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	10.0	10.0	10.0

Catalogue Number	Product (nonane solution)	Qty/Conc
DF-C10-CS4	CS4	200 µL
DF-C10-CS5	CS5	200 µL
DF-C10-CS6	CS6	200 µL
DF-C10-CS7	CS7	200 µL

***FOR SUPPORT SOLUTIONS, see DF-ST-C, DF-LCS-B, DF-IS-J, and DF-SS-A (and their dilutions).**

NATIVE PCDDs & PCDFs	DF-C10-CS4 (ng/mL)	DF-C10-CS5 (ng/mL)	DF-C10-CS6 (ng/mL)	DF-C10-CS7 (ng/mL)
1,3,6,8-Tetrachlorodibenzo-*p*-dioxin	10.0	50.0	200	500
1,2,8,9-Tetrachlorodibenzo-*p*-dioxin	10.0	50.0	200	500
2,3,7,8-Tetrachlorodibenzo-*p*-dioxin	10.0	50.0	200	500
1,2,3,7,8-Pentachlorodibenzo-*p*-dioxin	10.0	50.0	200	500
1,2,3,4,7,8-Hexachlorodibenzo-*p*-dioxin	20.0	100	400	1000
1,2,3,6,7,8-Hexachlorodibenzo-*p*-dioxin	20.0	100	400	1000
1,2,3,7,8,9-Hexachlorodibenzo-*p*-dioxin	20.0	100	400	1000
1,2,3,4,6,7,8-Heptachlorodibenzo-*p*-dioxin	20.0	100	400	1000
Octachlorodibenzo-*p*-dioxin	50.0	250	1000	2500
1,3,6,8-Tetrachlorodibenzofuran	10.0	50.0	200	500
1,2,8,9-Tetrachlorodibenzofuran	10.0	50.0	200	500
2,3,7,8-Tetrachlorodibenzofuran	10.0	50.0	200	500
1,2,3,7,8-Pentachlorodibenzofuran	10.0	50.0	200	500
2,3,4,7,8-Pentachlorodibenzofuran	10.0	50.0	200	500
1,2,3,4,7,8-Hexachlorodibenzofuran	20.0	100	400	1000
1,2,3,6,7,8-Hexachlorodibenzofuran	20.0	100	400	1000
1,2,3,7,8,9-Hexachlorodibenzofuran	20.0	100	400	1000
2,3,4,6,7,8-Hexachlorodibenzofuran	20.0	100	400	1000
1,2,3,4,6,7,8-Heptachlorodibenzofuran	20.0	100	400	1000
1,2,3,4,7,8,9-Heptachlorodibenzofuran	20.0	100	400	1000
Octachlorodibenzofuran	50.0	250	1000	2500
EXTRACTION SPIKE: MASS-LABELLED PCDDs & PCDFs				
1,3,6,8-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	10.0	10.0	10.0	10.0
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	10.0	10.0	10.0	10.0
1,2,3,7,8-Pentachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	10.0	10.0	10.0	10.0
1,2,3,4,7,8-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	10.0	10.0	10.0	10.0
1,2,3,6,7,8-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	10.0	10.0	10.0	10.0
1,2,3,7,8,9-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	10.0	10.0	10.0	10.0
1,2,3,4,6,7,8-Heptachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	10.0	10.0	10.0	10.0
Octachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	20.0	20.0	20.0	20.0
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzofuran	10.0	10.0	10.0	10.0
1,2,3,7,8-Pentachloro($^{13}C_{12}$)dibenzofuran	10.0	10.0	10.0	10.0
2,3,4,7,8-Pentachloro($^{13}C_{12}$)dibenzofuran	10.0	10.0	10.0	10.0
1,2,3,4,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran	10.0	10.0	10.0	10.0
1,2,3,6,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran	10.0	10.0	10.0	10.0
1,2,3,7,8,9-Hexachloro($^{13}C_{12}$)dibenzofuran	10.0	10.0	10.0	10.0
2,3,4,6,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran	10.0	10.0	10.0	10.0
1,2,3,4,6,7,8-Heptachloro($^{13}C_{12}$)dibenzofuran	10.0	10.0	10.0	10.0
1,2,3,4,7,8,9-Heptachloro($^{13}C_{12}$)dibenzofuran	10.0	10.0	10.0	10.0
Octachloro($^{13}C_{12}$)dibenzofuran	20.0	20.0	20.0	20.0
SYRINGE SPIKE: MASS-LABELLED PCDDs				
1,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	10.0	10.0	10.0	10.0
1,2,4,7,8-Pentachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	10.0	10.0	10.0	10.0
1,2,3,4,6,8-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	10.0	10.0	10.0	10.0
1,2,3,4,6,7,9-Heptachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	10.0	10.0	10.0	10.0
SAMPLING SPIKE				
1,2,3,4-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	10.0	10.0	10.0	10.0



DFP-CVS-B10

Catalogue Number	Product (nonane solution)	Qty/Conc
DFP-CVS-B10	PCDD/PCDF/PCB Calibration Solutions CS1/CS2/CS3/CS4/CS5/CS6/CS7	1 kit (7 ampoules)
DFP-B10-CS1	CS1	200 µL
DFP-B10-CS2	CS2	200 µL
DFP-B10-CS3	CS3	200 µL

		DFP-B10-CS1 (ng/mL)	DFP-B10-CS2 (ng/mL)	DFP-B10-CS3 (ng/mL)
NATIVE PCDDs & PCDFs				
1,3,6,8-Tetrachlorodibenzo-*p*-dioxin		0.100	0.500	2.00
1,2,8,9-Tetrachlorodibenzo-*p*-dioxin		0.100	0.500	2.00
2,3,7,8-Tetrachlorodibenzo-*p*-dioxin		0.100	0.500	2.00
1,2,3,7,8-Pentachlorodibenzo-*p*-dioxin		0.100	0.500	2.00
1,2,3,4,7,8-Hexachlorodibenzo-*p*-dioxin		0.200	1.00	4.00
1,2,3,6,7,8-Hexachlorodibenzo-*p*-dioxin		0.200	1.00	4.00
1,2,3,7,8,9-Hexachlorodibenzo-*p*-dioxin		0.200	1.00	4.00
1,2,3,4,6,7,8-Heptachlorodibenzo-*p*-dioxin		0.200	1.00	4.00
Octachlorodibenzo-*p*-dioxin		0.500	2.50	10.0
1,3,6,8-Tetrachlorodibenzofuran		0.100	0.500	2.00
1,2,8,9-Tetrachlorodibenzofuran		0.100	0.500	2.00
2,3,7,8-Tetrachlorodibenzofuran		0.100	0.500	2.00
1,2,3,7,8-Pentachlorodibenzofuran		0.100	0.500	2.00
2,3,4,7,8-Pentachlorodibenzofuran		0.100	0.500	2.00
1,2,3,4,7,8-Hexachlorodibenzofuran		0.200	1.00	4.00
1,2,3,6,7,8-Hexachlorodibenzofuran		0.200	1.00	4.00
1,2,3,7,8,9-Hexachlorodibenzofuran		0.200	1.00	4.00
2,3,4,6,7,8-Hexachlorodibenzofuran		0.200	1.00	4.00
1,2,3,4,6,7,8-Heptachlorodibenzofuran		0.200	1.00	4.00
1,2,3,4,7,8,9-Heptachlorodibenzofuran		0.200	1.00	4.00
Octachlorodibenzofuran		0.500	2.50	10.0
NATIVE PCBs	***IUPAC***			
3,3',4,4'-Tetrachlorobiphenyl	*77*	0.200	1.00	4.00
3,4,4',5-Tetrachlorobiphenyl	*81*	0.200	1.00	4.00
2,3,3',4,4'-Pentachlorobiphenyl	*105*	0.200	1.00	4.00
2,3,4,4',5-Pentachlorobiphenyl	*114*	0.200	1.00	4.00
2,3',4,4',5-Pentachlorobiphenyl	*118*	0.200	1.00	4.00
2',3,4,4',5-Pentachlorobiphenyl	*123*	0.200	1.00	4.00
3,3',4,4',5-Pentachlorobiphenyl	*126*	0.200	1.00	4.00
2,3,3',4,4',5-Hexachlorobiphenyl	*156*	0.200	1.00	4.00
2,3,3',4,4',5'-Hexachlorobiphenyl	*157*	0.200	1.00	4.00
2,3',4,4',5,5'-Hexachlorobiphenyl	*167*	0.200	1.00	4.00
3,3',4,4',5,5'-Hexachlorobiphenyl	*169*	0.200	1.00	4.00
2,2',3,3',4,4',5-Heptachlorobiphenyl	*170*	0.200	1.00	4.00
2,2',3,4,4',5,5'-Heptachlorobiphenyl	*180*	0.200	1.00	4.00
2,3,3',4,4',5,5'-Heptachlorobiphenyl	*189*	0.200	1.00	4.00
EXTRACTION SPIKE: ^{13}C PCDDs/PCDFs/PCBs				
1,3,6,8-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin		10.0	10.0	10.0
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin		10.0	10.0	10.0
1,2,3,7,8-Pentachloro($^{13}C_{12}$)dibenzo-*p*-dioxin		10.0	10.0	10.0
1,2,3,4,7,8-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin		10.0	10.0	10.0
1,2,3,6,7,8-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin		10.0	10.0	10.0
1,2,3,7,8,9-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin		10.0	10.0	10.0
1,2,3,4,6,7,8-Heptachloro($^{13}C_{12}$)dibenzo-*p*-dioxin		10.0	10.0	10.0
Octachloro($^{13}C_{12}$)dibenzo-*p*-dioxin		20.0	20.0	20.0
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzofuran		10.0	10.0	10.0
1,2,3,7,8-Pentachloro($^{13}C_{12}$)dibenzofuran		10.0	10.0	10.0
2,3,4,7,8-Pentachloro($^{13}C_{12}$)dibenzofuran		10.0	10.0	10.0
1,2,3,4,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran		10.0	10.0	10.0
1,2,3,6,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran		10.0	10.0	10.0
1,2,3,7,8,9-Hexachloro($^{13}C_{12}$)dibenzofuran		10.0	10.0	10.0
2,3,4,6,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran		10.0	10.0	10.0
1,2,3,4,6,7,8-Heptachloro($^{13}C_{12}$)dibenzofuran		10.0	10.0	10.0
1,2,3,4,7,8,9-Heptachloro($^{13}C_{12}$)dibenzofuran		10.0	10.0	10.0
Octachloro($^{13}C_{12}$)dibenzofuran		20.0	20.0	20.0
3,3',4,4'-Tetrachloro($^{13}C_{12}$)biphenyl	*77L*	10.0	10.0	10.0
3,4,4',5-Tetrachloro($^{13}C_{12}$)biphenyl	*81L*	10.0	10.0	10.0
2,3,3',4,4'-Pentachloro($^{13}C_{12}$)biphenyl	*105L*	10.0	10.0	10.0
2,3,4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*114L*	10.0	10.0	10.0
2,3',4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*118L*	10.0	10.0	10.0
2',3,4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*123L*	10.0	10.0	10.0
3,3',4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*126L*	10.0	10.0	10.0
2,3,3',4,4',5-Hexachloro($^{13}C_{12}$)biphenyl	*156L*	10.0	10.0	10.0
2,3,3',4,4',5'-Hexachloro($^{13}C_{12}$)biphenyl	*157L*	10.0	10.0	10.0
2,3',4,4',5,5'-Hexachloro($^{13}C_{12}$)biphenyl	*167L*	10.0	10.0	10.0
3,3',4,4',5,5'-Hexachloro($^{13}C_{12}$)biphenyl	*169L*	10.0	10.0	10.0
2,2',3,3',4,4',5-Heptachloro($^{13}C_{12}$)biphenyl	*170L*	10.0	10.0	10.0
2,2',3,4,4',5,5'-Heptachloro($^{13}C_{12}$)biphenyl	*180L*	10.0	10.0	10.0
2,3,3',4,4',5,5'-Heptachloro($^{13}C_{12}$)biphenyl	*189L*	10.0	10.0	10.0
SYRINGE SPIKE: ^{13}C PCDDs & PCBs				
1,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin		10.0	10.0	10.0
1,2,4,7,8-Pentachloro($^{13}C_{12}$)dibenzo-*p*-dioxin		10.0	10.0	10.0
1,2,3,4,6,8-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin		10.0	10.0	10.0
1,2,3,4,6,7,9-Heptachloro($^{13}C_{12}$)dibenzo-*p*-dioxin		10.0	10.0	10.0
2,3',4',5-Tetrachloro($^{13}C_{12}$)biphenyl	*70L*	10.0	10.0	10.0
2,3,3',5,5'-Pentachloro($^{13}C_{12}$)biphenyl	*111L*	10.0	10.0	10.0
2,2',3,4,4',5'-Hexachloro($^{13}C_{12}$)biphenyl	*138L*	10.0	10.0	10.0
2,2',3,3',5,5',6-Heptachloro($^{13}C_{12}$)biphenyl	*178L*	10.0	10.0	10.0
SAMPLING SPIKE				
1,2,3,4-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin		10.0	10.0	10.0
3,3',4,5'-Tetrachloro($^{13}C_{12}$)biphenyl	*79L*	10.0	10.0	10.0

Catalogue Number	Product (nonane solution)	Qty/Conc
DFP-B10-CS4	CS4	200 µL
DFP-B10-CS5	CS5	200 µL
DFP-B10-CS6	CS6	200 µL
DFP-B10-CS7	CS7	200 µL

***FOR PCDD/PCDF/PCB SUPPORT SOLUTIONS, see DFP-LCS-B, DFP-IS-B10, and DFP-SS-A10 (and their dilutions).**
***FOR PCDD/PCDF SUPPORT SOLUTIONS, see DF-ST-C, DF-LCS-B, DF-IS-J, and DF-SS-A (and their dilutions).**
***FOR PCB SUPPORT SOLUTIONS, see pages 96 and 98.**

		DFP-B10-CS4 (ng/mL)	DFP-B10-CS5 (ng/mL)	DFP-B10-CS6 (ng/mL)	DFP-B10-CS7 (ng/mL)
NATIVE PCDDs & PCDFs					
1,3,6,8-Tetrachlorodibenzo-*p*-dioxin		10.0	50.0	200	500
1,2,8,9-Tetrachlorodibenzo-*p*-dioxin		10.0	50.0	200	500
2,3,7,8-Tetrachlorodibenzo-*p*-dioxin		10.0	50.0	200	500
1,2,3,7,8-Pentachlorodibenzo-*p*-dioxin		10.0	50.0	200	500
1,2,3,4,7,8-Hexachlorodibenzo-*p*-dioxin		20.0	100	400	1000
1,2,3,6,7,8-Hexachlorodibenzo-*p*-dioxin		20.0	100	400	1000
1,2,3,7,8,9-Hexachlorodibenzo-*p*-dioxin		20.0	100	400	1000
1,2,3,4,6,7,8-Heptachlorodibenzo-*p*-dioxin		20.0	100	400	1000
Octachlorodibenzo-*p*-dioxin		50.0	250	1000	2500
1,3,6,8-Tetrachlorodibenzofuran		10.0	50.0	200	500
1,2,8,9-Tetrachlorodibenzofuran		10.0	50.0	200	500
2,3,7,8-Tetrachlorodibenzofuran		10.0	50.0	200	500
1,2,3,7,8-Pentachlorodibenzofuran		10.0	50.0	200	500
2,3,4,7,8-Pentachlorodibenzofuran		10.0	50.0	200	500
1,2,3,4,7,8-Hexachlorodibenzofuran		20.0	100	400	1000
1,2,3,6,7,8-Hexachlorodibenzofuran		20.0	100	400	1000
1,2,3,7,8,9-Hexachlorodibenzofuran		20.0	100	400	1000
2,3,4,6,7,8-Hexachlorodibenzofuran		20.0	100	400	1000
1,2,3,4,6,7,8-Heptachlorodibenzofuran		20.0	100	400	1000
1,2,3,4,7,8,9-Heptachlorodibenzofuran		20.0	100	400	1000
Octachlorodibenzofuran		50.0	250	1000	2500
NATIVE PCBs	***IUPAC***				
3,3',4,4'-Tetrachlorobiphenyl	*77*	20.0	100	400	1000
3,4,4',5-Tetrachlorobiphenyl	*81*	20.0	100	400	1000
2,3,3',4,4'-Pentachlorobiphenyl	*105*	20.0	100	400	1000
2,3,4,4',5-Pentachlorobiphenyl	*114*	20.0	100	400	1000
2,3',4,4',5-Pentachlorobiphenyl	*118*	20.0	100	400	1000
2',3,4,4',5-Pentachlorobiphenyl	*123*	20.0	100	400	1000
3,3',4,4',5-Pentachlorobiphenyl	*126*	20.0	100	400	1000
2,3,3',4,4',5-Hexachlorobiphenyl	*156*	20.0	100	400	1000
2,3,3',4,4',5'-Hexachlorobiphenyl	*157*	20.0	100	400	1000
2,3',4,4',5,5'-Hexachlorobiphenyl	*167*	20.0	100	400	1000
3,3',4,4',5,5'-Hexachlorobiphenyl	*169*	20.0	100	400	1000
2,2',3,3',4,4',5-Heptachlorobiphenyl	*170*	20.0	100	400	1000
2,2',3,4,4',5,5'-Heptachlorobiphenyl	*180*	20.0	100	400	1000
2,3,3',4,4',5,5'-Heptachlorobiphenyl	*189*	20.0	100	400	1000
EXTRACTION SPIKE: ^{13}C PCDDs/PCDFs/PCBs					
1,3,6,8-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin		10.0	10.0	10.0	10.0
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin		10.0	10.0	10.0	10.0
1,2,3,7,8-Pentachloro($^{13}C_{12}$)dibenzo-*p*-dioxin		10.0	10.0	10.0	10.0
1,2,3,4,7,8-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin		10.0	10.0	10.0	10.0
1,2,3,6,7,8-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin		10.0	10.0	10.0	10.0
1,2,3,7,8,9-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin		10.0	10.0	10.0	10.0
1,2,3,4,6,7,8-Heptachloro($^{13}C_{12}$)dibenzo-*p*-dioxin		10.0	10.0	10.0	10.0
Octachloro($^{13}C_{12}$)dibenzo-*p*-dioxin		20.0	20.0	20.0	20.0
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzofuran		10.0	10.0	10.0	10.0
1,2,3,7,8-Pentachloro($^{13}C_{12}$)dibenzofuran		10.0	10.0	10.0	10.0
2,3,4,7,8-Pentachloro($^{13}C_{12}$)dibenzofuran		10.0	10.0	10.0	10.0
1,2,3,4,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran		10.0	10.0	10.0	10.0
1,2,3,6,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran		10.0	10.0	10.0	10.0
1,2,3,7,8,9-Hexachloro($^{13}C_{12}$)dibenzofuran		10.0	10.0	10.0	10.0
2,3,4,6,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran		10.0	10.0	10.0	10.0
1,2,3,4,6,7,8-Heptachloro($^{13}C_{12}$)dibenzofuran		10.0	10.0	10.0	10.0
1,2,3,4,7,8,9-Heptachloro($^{13}C_{12}$)dibenzofuran		10.0	10.0	10.0	10.0
Octachloro($^{13}C_{12}$)dibenzofuran		20.0	20.0	20.0	20.0
3,3',4,4'-Tetrachloro($^{13}C_{12}$)biphenyl	*77L*	10.0	10.0	10.0	10.0
3,4,4',5-Tetrachloro($^{13}C_{12}$)biphenyl	*81L*	10.0	10.0	10.0	10.0
2,3,3',4,4'-Pentachloro($^{13}C_{12}$)biphenyl	*105L*	10.0	10.0	10.0	10.0
2,3,4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*114L*	10.0	10.0	10.0	10.0
2,3',4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*118L*	10.0	10.0	10.0	10.0
2',3,4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*123L*	10.0	10.0	10.0	10.0
3,3',4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*126L*	10.0	10.0	10.0	10.0
2,3,3',4,4',5-Hexachloro($^{13}C_{12}$)biphenyl	*156L*	10.0	10.0	10.0	10.0
2,3,3',4,4',5'-Hexachloro($^{13}C_{12}$)biphenyl	*157L*	10.0	10.0	10.0	10.0
2,3',4,4',5,5'-Hexachloro($^{13}C_{12}$)biphenyl	*167L*	10.0	10.0	10.0	10.0
3,3',4,4',5,5'-Hexachloro($^{13}C_{12}$)biphenyl	*169L*	10.0	10.0	10.0	10.0
2,2',3,3',4,4',5-Heptachloro($^{13}C_{12}$)biphenyl	*170L*	10.0	10.0	10.0	10.0
2,2',3,4,4',5,5'-Heptachloro($^{13}C_{12}$)biphenyl	*180L*	10.0	10.0	10.0	10.0
2,3,3',4,4',5,5'-Heptachloro($^{13}C_{12}$)biphenyl	*189L*	10.0	10.0	10.0	10.0
SYRINGE SPIKE: ^{13}C PCDDs & PCBs					
1,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin		10.0	10.0	10.0	10.0
1,2,4,7,8-Pentachloro($^{13}C_{12}$)dibenzo-*p*-dioxin		10.0	10.0	10.0	10.0
1,2,3,4,6,8-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin		10.0	10.0	10.0	10.0
1,2,3,4,6,7,9-Heptachloro($^{13}C_{12}$)dibenzo-*p*-dioxin		10.0	10.0	10.0	10.0
2,3',4',5-Tetrachloro($^{13}C_{12}$)biphenyl	*70L*	10.0	10.0	10.0	10.0
2,3,3',5,5'-Pentachloro($^{13}C_{12}$)biphenyl	*111L*	10.0	10.0	10.0	10.0
2,2',3,4,4',5'-Hexachloro($^{13}C_{12}$)biphenyl	*138L*	10.0	10.0	10.0	10.0
2,2',3,3',5,5',6-Heptachloro($^{13}C_{12}$)biphenyl	*178L*	10.0	10.0	10.0	10.0
SAMPLING SPIKE					
1,2,3,4-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin		10.0	10.0	10.0	10.0
3,3',4,5'-Tetrachloro($^{13}C_{12}$)biphenyl	*79L*	10.0	10.0	10.0	10.0



NK-CVS-J

Catalogue Number	Product (nonane solution)	Qty/Conc
NK-CVS-J	PCDD & PCDF Calibration Solutions CS1-J/CS2-J/CS3-J/CS4-J/CS5-J/CS6-J	1 kit (6 ampoules)
NK-CS1-J	CS1-J	200 µL
NK-CS2-J	CS2-J	200 µL
NK-CS3-J	CS3-J	200 µL
NK-CS4-J	CS4-J	200 µL
NK-CS5-J	CS5-J	200 µL
NK-CS6-J	CS6-J	200 µL

***FOR SUPPORT SOLUTIONS, see NK-LCS-T, NK-IS-J4, and NK-IS-J5.**

NATIVE PCDDs & PCDFs	NK-CS1-J (ng/mL)	NK-CS2-J (ng/mL)	NK-CS3-J (ng/mL)	NK-CS4-J (ng/mL)	NK-CS5-J (ng/mL)	NK-CS6-J (ng/mL)
1,3,6,8-Tetrachlorodibenzo-*p*-dioxin	0.100	0.400	2.00	10.0	50.0	100
1,3,7,9-Tetrachlorodibenzo-*p*-dioxin	0.100	0.400	2.00	10.0	50.0	100
2,3,7,8-Tetrachlorodibenzo-*p*-dioxin	0.100	0.400	2.00	10.0	50.0	100
1,2,3,7,8-Pentachlorodibenzo-*p*-dioxin	0.100	0.400	2.00	10.0	50.0	100
1,2,3,4,7,8-Hexachlorodibenzo-*p*-dioxin	0.200	0.800	4.00	20.0	100	200
1,2,3,6,7,8-Hexachlorodibenzo-*p*-dioxin	0.200	0.800	4.00	20.0	100	200
1,2,3,7,8,9-Hexachlorodibenzo-*p*-dioxin	0.200	0.800	4.00	20.0	100	200
1,2,3,4,6,7,8-Heptachlorodibenzo-*p*-dioxin	0.200	0.800	4.00	20.0	100	200
Octachlorodibenzo-*p*-dioxin	0.500	2.00	10.0	50.0	250	500
1,2,7,8-Tetrachlorodibenzofuran	0.100	0.400	2.00	10.0	50.0	100
2,3,7,8-Tetrachlorodibenzofuran	0.100	0.400	2.00	10.0	50.0	100
1,2,3,7,8-Pentachlorodibenzofuran	0.100	0.400	2.00	10.0	50.0	100
2,3,4,7,8-Pentachlorodibenzofuran	0.100	0.400	2.00	10.0	50.0	100
1,2,3,4,7,8-Hexachlorodibenzofuran	0.200	0.800	4.00	20.0	100	200
1,2,3,6,7,8-Hexachlorodibenzofuran	0.200	0.800	4.00	20.0	100	200
1,2,3,7,8,9-Hexachlorodibenzofuran	0.200	0.800	4.00	20.0	100	200
2,3,4,6,7,8-Hexachlorodibenzofuran	0.200	0.800	4.00	20.0	100	200
1,2,3,4,6,7,8-Heptachlorodibenzofuran	0.200	0.800	4.00	20.0	100	200
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.200	0.800	4.00	20.0	100	200
Octachlorodibenzofuran	0.500	2.00	10.0	50.0	250	500
MASS-LABELLED PCDDs & PCDFs						
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	20.0	20.0	20.0	20.0	20.0	20.0
1,2,3,7,8-Pentachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	20.0	20.0	20.0	20.0	20.0	20.0
1,2,3,4,7,8-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	20.0	20.0	20.0	20.0	20.0	20.0
1,2,3,6,7,8-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	20.0	20.0	20.0	20.0	20.0	20.0
1,2,3,4,6,7,8-Heptachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	20.0	20.0	20.0	20.0	20.0	20.0
Octachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	40.0	40.0	40.0	40.0	40.0	40.0
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzofuran	20.0	20.0	20.0	20.0	20.0	20.0
2,3,4,7,8-Pentachloro($^{13}C_{12}$)dibenzofuran	20.0	20.0	20.0	20.0	20.0	20.0
1,2,3,4,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran	20.0	20.0	20.0	20.0	20.0	20.0
1,2,3,6,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran	20.0	20.0	20.0	20.0	20.0	20.0
2,3,4,6,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran	20.0	20.0	20.0	20.0	20.0	20.0
1,2,3,4,6,7,8-Heptachloro($^{13}C_{12}$)dibenzofuran	20.0	20.0	20.0	20.0	20.0	20.0
1,2,3,4,7,8,9-Heptachloro($^{13}C_{12}$)dibenzofuran	20.0	20.0	20.0	20.0	20.0	20.0
Octachloro($^{13}C_{12}$)dibenzofuran	40.0	40.0	40.0	40.0	40.0	40.0
INTERNAL STANDARDS						
1,2,3,4-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	20.0	20.0	20.0	20.0	20.0	20.0
1,2,3,7,8,9-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	20.0	20.0	20.0	20.0	20.0	20.0
1,2,3,7,8-Pentachloro($^{13}C_{12}$)dibenzofuran	20.0	20.0	20.0	20.0	20.0	20.0
1,2,3,7,8,9-Hexachloro($^{13}C_{12}$)dibenzofuran	20.0	20.0	20.0	20.0	20.0	20.0

Support solutions for **DF-CVS-A10** and **DF-CVS-B10.**

Catalogue Number	Product (nonane solution)	Qty/Conc
DF-LCS-A	Mass-Labelled PCDD/PCDF Solution/Mixture	1.2 mL
DF-LCS-A200	Mass-Labelled PCDD/PCDF Solution/Mixture	1.2 mL
DF-LCS-A40	Mass-Labelled PCDD/PCDF Solution/Mixture	1.2 mL

MASS-LABELLED PCDDs	DF-LCS-A (ng/mL)	DF-LCS-A200 (ng/mL)	DF-LCS-A40 (ng/mL)
1,3,6,8-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	1000	200	40.0
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	1000	200	40.0
1,2,3,7,8-Pentachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	1000	200	40.0
1,2,3,4,7,8-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	1000	200	40.0
1,2,3,6,7,8-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	1000	200	40.0
1,2,3,7,8,9-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	1000	200	40.0
1,2,3,4,6,7,8-Heptachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	1000	200	40.0
Octachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	2000	400	80.0
MASS-LABELLED PCDFs			
1,3,6,8-Tetrachloro($^{13}C_{12}$)dibenzofuran	1000	200	40.0
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzofuran	1000	200	40.0
1,2,3,7,8-Pentachloro($^{13}C_{12}$)dibenzofuran	1000	200	40.0
2,3,4,7,8-Pentachloro($^{13}C_{12}$)dibenzofuran	1000	200	40.0
1,2,3,4,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran	1000	200	40.0
1,2,3,6,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran	1000	200	40.0
1,2,3,7,8,9-Hexachloro($^{13}C_{12}$)dibenzofuran	1000	200	40.0
2,3,4,6,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran	1000	200	40.0
1,2,3,4,6,7,8-Heptachloro($^{13}C_{12}$)dibenzofuran	1000	200	40.0
1,2,3,4,7,8,9-Heptachloro($^{13}C_{12}$)dibenzofuran	1000	200	40.0
Octachloro($^{13}C_{12}$)dibenzofuran	2000	400	80.0



DF-LCS-B

Support solutions for **DF-CVS-A10**, **DF-CVS-B10**, **DF-CVS-C10**, and **DFP-CVS-B10.**

Catalogue Number	Product (nonane solution)	Qty/Conc
DF-LCS-B	Mass-Labelled PCDD/PCDF Solution/Mixture	1.2 mL
DF-LCS-B200	Mass-Labelled PCDD/PCDF Solution/Mixture	1.2 mL
DF-LCS-B40	Mass-Labelled PCDD/PCDF Solution/Mixture	1.2 mL

MASS-LABELLED PCDDs	**DF-LCS-B (ng/mL)**	**DF-LCS-B200 (ng/mL)**	**DF-LCS-B40 (ng/mL)**
1,3,6,8-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	1000	200	40.0
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	1000	200	40.0
1,2,3,7,8-Pentachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	1000	200	40.0
1,2,3,4,7,8-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	1000	200	40.0
1,2,3,6,7,8-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	1000	200	40.0
1,2,3,7,8,9-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	1000	200	40.0
1,2,3,4,6,7,8-Heptachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	1000	200	40.0
Octachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	2000	400	80.0
MASS-LABELLED PCDFs			
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzofuran	1000	200	40.0
1,2,3,7,8-Pentachloro($^{13}C_{12}$)dibenzofuran	1000	200	40.0
2,3,4,7,8-Pentachloro($^{13}C_{12}$)dibenzofuran	1000	200	40.0
1,2,3,4,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran	1000	200	40.0
1,2,3,6,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran	1000	200	40.0
1,2,3,7,8,9-Hexachloro($^{13}C_{12}$)dibenzofuran	1000	200	40.0
2,3,4,6,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran	1000	200	40.0
1,2,3,4,6,7,8-Heptachloro($^{13}C_{12}$)dibenzofuran	1000	200	40.0
1,2,3,4,7,8,9-Heptachloro($^{13}C_{12}$)dibenzofuran	1000	200	40.0
Octachloro($^{13}C_{12}$)dibenzofuran	2000	400	80.0

Support solutions for **DF-CVS-A10**, **DF-CVS-B10**, **DF-CVS-C10**, and **DFP-CVS-B10.**

Catalogue Number	Product (nonane solution)	Qty/Conc
DF-LCS-C	Mass-Labelled PCDD/PCDF Solution/Mixture	1.2 mL
DF-LCS-C200	Mass-Labelled PCDD/PCDF Solution/Mixture	1.2 mL
DF-LCS-C40	Mass-Labelled PCDD/PCDF Solution/Mixture	1.2 mL

MASS-LABELLED PCDDs	DF-LCS-C (ng/mL)	DF-LCS-C200 (ng/mL)	DF-LCS-C40 (ng/mL)
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	1000	200	40.0
1,2,3,7,8-Pentachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	1000	200	40.0
1,2,3,4,7,8-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	1000	200	40.0
1,2,3,6,7,8-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	1000	200	40.0
1,2,3,7,8,9-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	1000	200	40.0
1,2,3,4,6,7,8-Heptachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	1000	200	40.0
Octachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	2000	400	80.0
MASS-LABELLED PCDFs			
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzofuran	1000	200	40.0
1,2,3,7,8-Pentachloro($^{13}C_{12}$)dibenzofuran	1000	200	40.0
2,3,4,7,8-Pentachloro($^{13}C_{12}$)dibenzofuran	1000	200	40.0
1,2,3,4,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran	1000	200	40.0
1,2,3,6,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran	1000	200	40.0
1,2,3,7,8,9-Hexachloro($^{13}C_{12}$)dibenzofuran	1000	200	40.0
2,3,4,6,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran	1000	200	40.0
1,2,3,4,6,7,8-Heptachloro($^{13}C_{12}$)dibenzofuran	1000	200	40.0
1,2,3,4,7,8,9-Heptachloro($^{13}C_{12}$)dibenzofuran	1000	200	40.0
Octachloro($^{13}C_{12}$)dibenzofuran	2000	400	80.0



MASS-LABELLED PCDDs & PCDFs: SOLUTION/MIXTURES

NOTE CONCENTRATIONS: DS-1000 and FS-1000 = µg/mL
NK-LCS-O and NK-LCS-T = ng/mL

Catalogue Number	Product (nonane solution)	Qty/Conc
DS-1000	Mass-Labelled PCDD Solution/Mixture	1.2 mL
FS-1000	Mass-Labelled PCDF Solution/Mixture	1.2 mL
NK-LCS-O	Mass-Labelled PCDD/PCDF Solution/Mixture	1.2 mL
NK-LCS-T	Mass-Labelled PCDD/PCDF Solution/Mixture	1.2 mL

MASS-LABELLED PCDDs	**DS-1000 (µg/mL)**	**FS-1000 (µg/mL)**	**NK-LCS-O (ng/mL)**	**NK-LCS-T (ng/mL)**
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	1.00	—	100	40.0
1,2,3,7,8-Pentachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	1.00	—	100	40.0
1,2,3,4,7,8-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	1.00	—	100	40.0
1,2,3,6,7,8-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	1.00	—	100	40.0
1,2,3,4,6,7,8-Heptachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	1.00	—	100	40.0
Octachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	2.00	—	200	80.0
MASS-LABELLED PCDFs				
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzofuran	—	1.00	100	40.0
1,2,3,7,8-Pentachloro($^{13}C_{12}$)dibenzofuran	—	1.00	100	—
2,3,4,7,8-Pentachloro($^{13}C_{12}$)dibenzofuran	—	1.00	100	40.0
1,2,3,4,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran	—	1.00	100	40.0
1,2,3,6,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran	—	1.00	100	40.0
1,2,3,7,8,9-Hexachloro($^{13}C_{12}$)dibenzofuran	—	1.00	100	—
2,3,4,6,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran	—	1.00	100	40.0
1,2,3,4,6,7,8-Heptachloro($^{13}C_{12}$)dibenzofuran	—	1.00	100	40.0
1,2,3,4,7,8,9-Heptachloro($^{13}C_{12}$)dibenzofuran	—	1.00	100	40.0
Octachloro($^{13}C_{12}$)dibenzofuran	—	—	200	80.0

Support solutions for **DF-CVS-A10** and **DF-CVS-B10.**

Catalogue Number	Product (nonane solution)	Qty/Conc
DF-IS-A	Mass-Labelled PCDD Internal Standard Solution	1.2 mL
DF-IS-A200	Mass-Labelled PCDD Internal Standard Solution	1.2 mL
DF-IS-A40	Mass-Labelled PCDD Internal Standard Solution	1.2 mL

MASS-LABELLED PCDD	DF-IS-A (µg/mL)	DF-IS-A200 (ng/mL)	DF-IS-A40 (ng/mL)
1,2,3,4-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	1.00	200	40.0

Catalogue Number	Product (nonane solution)	Qty/Conc
DF-IS-B	Mass-Labelled PCDD/PCDF Internal Standard Solution	1.2 mL
DF-IS-B200	Mass-Labelled PCDD/PCDF Internal Standard Solution	1.2 mL
DF-IS-B40	Mass-Labelled PCDD/PCDF Internal Standard Solution	1.2 mL

MASS-LABELLED PCDD/PCDF	DF-IS-B (µg/mL)	DF-IS-B200 (ng/mL)	DF-IS-B40 (ng/mL)
1,2,3,4-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	1.00	200	40.0
1,2,3,4-Tetrachloro($^{13}C_{12}$)dibenzofuran	1.00	200	40.0

Catalogue Number	Product (nonane solution)	Qty/Conc
DF-IS-C	Mass-Labelled PCDD/PCDF Internal Standard Solution	1.2 mL
DF-IS-C200	Mass-Labelled PCDD/PCDF Internal Standard Solution	1.2 mL
DF-IS-C40	Mass-Labelled PCDD/PCDF Internal Standard Solution	1.2 mL

MASS-LABELLED PCDD/PCDF	DF-IS-C (µg/mL)	DF-IS-C200 (ng/mL)	DF-IS-C40 (ng/mL)
1,2,3,4-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	1.00	200	40.0
1,2,7,8-Tetrachloro($^{13}C_{12}$)dibenzofuran	1.00	200	40.0



MASS-LABELLED PCDDs & PCDFs: SOLUTION/MIXTURES

Support solutions for **DF-CVS-A10** and **DF-CVS-B10.**

Catalogue Number	Product (nonane solution)	Qty/Conc
DF-IS-D	Mass-Labelled PCDD/PCDF Internal Standard Solution	1.2 mL
DF-IS-D200	Mass-Labelled PCDD/PCDF Internal Standard Solution	1.2 mL
DF-IS-D40	Mass-Labelled PCDD/PCDF Internal Standard Solution	1.2 mL

MASS-LABELLED PCDD/PCDF	DF-IS-D (µg/mL)	DF-IS-D200 (ng/mL)	DF-IS-D40 (ng/mL)
1,3,6,8-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	1.00	200	40.0
1,3,6,8-Tetrachloro($^{13}C_{12}$)dibenzofuran	1.00	200	40.0

DF-IS-E	Mass-Labelled PCDF Internal Standard Solution	1.2 mL
DF-IS-E200	Mass-Labelled PCDF Internal Standard Solution	1.2 mL
DF-IS-E40	Mass-Labelled PCDF Internal Standard Solution	1.2 mL

MASS-LABELLED PCDFs	DF-IS-E (µg/mL)	DF-IS-E200 (ng/mL)	DF-IS-E40 (ng/mL)
1,3,6,8-Tetrachloro($^{13}C_{12}$)dibenzofuran	1.00	200	40.0
1,2,3,4,6,8,9-Heptachloro($^{13}C_{12}$)dibenzofuran	1.00	200	40.0

DF-IS-F	Mass-Labelled PCDF Internal Standard Solution	1.2 mL
DF-IS-F200	Mass-Labelled PCDF Internal Standard Solution	1.2 mL
DF-IS-F40	Mass-Labelled PCDF Internal Standard Solution	1.2 mL

MASS-LABELLED PCDFs	DF-IS-F (µg/mL)	DF-IS-F200 (ng/mL)	DF-IS-F40 (ng/mL)
1,2,7,8-Tetrachloro($^{13}C_{12}$)dibenzofuran	1.00	200	40.0
1,2,3,4,6,8,9-Heptachloro($^{13}C_{12}$)dibenzofuran	1.00	200	40.0

Support solutions for **DF-CVS-A10** and **DF-CVS-B10.**

Catalogue Number	Product (nonane solution)	Qty/Conc
DF-IS-G	Mass-Labelled PCDF Internal Standard Solution	1.2 mL
DF-IS-G200	Mass-Labelled PCDF Internal Standard Solution	1.2 mL
DF-IS-G40	Mass-Labelled PCDF Internal Standard Solution	1.2 mL

MASS-LABELLED PCDFs	DF-IS-G (µg/mL)	DF-IS-G200 (ng/mL)	DF-IS-G40 (ng/mL)
1,2,3,4,6-Pentachloro($^{13}C_{12}$)dibenzofuran	1.00	200	40.0
1,2,3,4,6,8,9-Heptachloro($^{13}C_{12}$)dibenzofuran	1.00	200	40.0

DF-IS-H	Mass-Labelled PCDF Internal Standard Solution	1.2 mL
DF-IS-H200	Mass-Labelled PCDF Internal Standard Solution	1.2 mL
DF-IS-H40	Mass-Labelled PCDF Internal Standard Solution	1.2 mL

MASS-LABELLED PCDFs	DF-IS-H (µg/mL)	DF-IS-H200 (ng/mL)	DF-IS-H40 (ng/mL)
1,2,3,4,6,9-Hexachloro($^{13}C_{12}$)dibenzofuran	1.00	200	40.0
1,2,3,4,6,8,9-Heptachloro($^{13}C_{12}$)dibenzofuran	1.00	200	40.0

DF-IS-I	Mass-Labelled PCDF Internal Standard Solution	1.2 mL
DF-IS-I200	Mass-Labelled PCDF Internal Standard Solution	1.2 mL
DF-IS-I40	Mass-Labelled PCDF Internal Standard Solution	1.2 mL

MASS-LABELLED PCDFs	DF-IS-I (µg/mL)	DF-IS-I200 (ng/mL)	DF-IS-I40 (ng/mL)
1,2,7,8-Tetrachloro($^{13}C_{12}$)dibenzofuran	1.00	200	40.0
1,2,3,4,6-Pentachloro($^{13}C_{12}$)dibenzofuran	1.00	200	40.0
1,2,3,4,6,9-Hexachloro($^{13}C_{12}$)dibenzofuran	1.00	200	40.0
1,2,3,4,6,8,9-Heptachloro($^{13}C_{12}$)dibenzofuran	1.00	200	40.0



MASS-LABELLED PCDDs & PCDFs: SOLUTION/MIXTURES

Support solutions for **DFP-CVS-B10** and **DF-CVS-C10.**

Catalogue Number	Product (nonane solution)	Qty/Conc
DF-IS-J	Mass-Labelled PCDD Internal Standard Solution	1.2 mL
DF-IS-J100	Mass-Labelled PCDD Internal Standard Solution	1.2 mL
DF-IS-J20	Mass-Labelled PCDD Internal Standard Solution	1.2 mL

MASS-LABELLED PCDDs	DF-IS-J (ng/mL)	DF-IS-J100 (ng/mL)	DF-IS-J20 (ng/mL)
1,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	1000	100	20.0
1,2,4,7,8-Pentachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	1000	100	20.0
1,2,3,4,6,8-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	1000	100	20.0
1,2,3,4,6,7,9-Heptachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	1000	100	20.0

DF-SS-A	Mass-Labelled PCDD Sampling Spike Solution	1.2 mL
DF-SS-A100	Mass-Labelled PCDD Sampling Spike Solution	1.2 mL
DF-SS-A20	Mass-Labelled PCDD Sampling Spike Solution	1.2 mL

MASS-LABELLED PCDD	DF-SS-A (ng/mL)	DF-SS-A100 (ng/mL)	DF-SS-A20 (ng/mL)
1,2,3,4-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin	1000	100	20.0

Catalogue Number	Product (nonane solution)	Qty/Conc
MDF-1278-1		1.2 mL
1,2,7,8-Tetrachloro($^{13}C_{12}$)dibenzofuran		1.00 µg/mL
MDF-12346-1		1.2 mL
1,2,3,4,6-Pentachloro($^{13}C_{12}$)dibenzofuran		1.00 µg/mL
MDF-123469-1		1.2 mL
1,2,3,4,6,9-Hexachloro($^{13}C_{12}$)dibenzofuran		1.00 µg/mL
MDF-1234689-1		1.2 mL
1,2,3,4,6,8,9-Heptachloro($^{13}C_{12}$)dibenzofuran		1.00 µg/mL
NK-IS-J4	Internal Standard Solution	1.2 mL
1,2,3,4-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin		40.0 ng/mL
1,2,3,7,8,9-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin		40.0 ng/mL
NK-IS-J5	Internal Standard Solution	1.2 mL
1,2,3,7,8-Pentachloro($^{13}C_{12}$)dibenzofuran		40.0 ng/mL
1,2,3,7,8,9-Hexachloro($^{13}C_{12}$)dibenzofuran		40.0 ng/mL

Support solutions for **DFP-CVS-B10**, **DF-CVS-C10**, and **PCB-CVS-B10** (see page 94).

Catalogue Number	Product (nonane solution)	Qty/Conc
DFP-LCS-B	Mass-Labelled PCDDs/PCDFs/PCBs Solution/Mixture	1.2 mL
DFP-LCS-B100	Mass-Labelled PCDDs/PCDFs/PCBs Solution/Mixture	1.2 mL
DFP-LCS-B20	Mass-Labelled PCDDs/PCDFs/PCBs Solution/Mixture	1.2 mL

MASS-LABELLED PCDDs & PCDFs		DFP-LCS-B (ng/mL)	DFP-LCS-B100 (ng/mL)	DFP-LCS-B20 (ng/mL)
1,3,6,8-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin		1000	100	20.0
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin		1000	100	20.0
1,2,3,7,8-Pentachloro($^{13}C_{12}$)dibenzo-*p*-dioxin		1000	100	20.0
1,2,3,4,7,8-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin		1000	100	20.0
1,2,3,6,7,8-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin		1000	100	20.0
1,2,3,7,8,9-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin		1000	100	20.0
1,2,3,4,6,7,8-Heptachloro($^{13}C_{12}$)dibenzo-*p*-dioxin		1000	100	20.0
Octachloro($^{13}C_{12}$)dibenzo-*p*-dioxin		2000	200	40.0
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzofuran		1000	100	20.0
1,2,3,7,8-Pentachloro($^{13}C_{12}$)dibenzofuran		1000	100	20.0
2,3,4,7,8-Pentachloro($^{13}C_{12}$)dibenzofuran		1000	100	20.0
1,2,3,4,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran		1000	100	20.0
1,2,3,6,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran		1000	100	20.0
1,2,3,7,8,9-Hexachloro($^{13}C_{12}$)dibenzofuran		1000	100	20.0
2,3,4,6,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran		1000	100	20.0
1,2,3,4,6,7,8-Heptachloro($^{13}C_{12}$)dibenzofuran		1000	100	20.0
1,2,3,4,7,8,9-Heptachloro($^{13}C_{12}$)dibenzofuran		1000	100	20.0
Octachloro($^{13}C_{12}$)dibenzofuran		2000	200	40.0
MASS-LABELLED PCBs	***IUPAC***			
3,3',4,4'-Tetrachloro($^{13}C_{12}$)biphenyl	*77L*	1000	100	20.0
3,4,4',5-Tetrachloro($^{13}C_{12}$)biphenyl	*81L*	1000	100	20.0
2,3,3',4,4'-Pentachloro($^{13}C_{12}$)biphenyl	*105L*	1000	100	20.0
2,3,4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*114L*	1000	100	20.0
2,3',4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*118L*	1000	100	20.0
2',3,4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*123L*	1000	100	20.0
3,3',4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*126L*	1000	100	20.0
2,3,3',4,4',5-Hexachloro($^{13}C_{12}$)biphenyl	*156L*	1000	100	20.0
2,3,3',4,4',5'-Hexachloro($^{13}C_{12}$)biphenyl	*157L*	1000	100	20.0
2,3',4,4',5,5'-Hexachloro($^{13}C_{12}$)biphenyl	*167L*	1000	100	20.0
3,3',4,4',5,5'-Hexachloro($^{13}C_{12}$)biphenyl	*169L*	1000	100	20.0
2,2',3,3',4,4',5-Heptachloro($^{13}C_{12}$)biphenyl	*170L*	1000	100	20.0
2,2',3,4,4',5,5'-Heptachloro($^{13}C_{12}$)biphenyl	*180L*	1000	100	20.0
2,3,3',4,4',5,5'-Heptachloro($^{13}C_{12}$)biphenyl	*189L*	1000	100	20.0



MASS-LABELLED PCDDs/PCDFs/PCBs: SOLUTION/MIXTURES

Support solutions for **DF-CVS-A10**, **DF-CVS-B10**, and **PCB-CVS-A10** (page 92).

Catalogue Number	Product (nonane solution)		Qty/Conc
DFP-LCS-A	Mass-Labelled PCDD/PCDF/PCB Solution/Mixture		1.2 mL
MASS-LABELLED PCDDs			
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin			10.0 ng/mL
1,2,3,7,8-Pentachloro($^{13}C_{12}$)dibenzo-*p*-dioxin			10.0 ng/mL
1,2,3,4,7,8-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin			10.0 ng/mL
1,2,3,6,7,8-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin			10.0 ng/mL
1,2,3,7,8,9-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin			10.0 ng/mL
1,2,3,4,6,7,8-Heptachloro($^{13}C_{12}$)dibenzo-*p*-dioxin			10.0 ng/mL
Octachloro($^{13}C_{12}$)dibenzo-*p*-dioxin			20.0 ng/mL
MASS-LABELLED PCDFs			
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzofuran			10.0 ng/mL
1,2,3,7,8-Pentachloro($^{13}C_{12}$)dibenzofuran			10.0 ng/mL
2,3,4,7,8-Pentachloro($^{13}C_{12}$)dibenzofuran			10.0 ng/mL
1,2,3,4,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran			10.0 ng/mL
1,2,3,6,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran			10.0 ng/mL
1,2,3,7,8,9-Hexachloro($^{13}C_{12}$)dibenzofuran			10.0 ng/mL
2,3,4,6,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran			10.0 ng/mL
1,2,3,4,6,7,8-Heptachloro($^{13}C_{12}$)dibenzofuran			10.0 ng/mL
1,2,3,4,7,8,9-Heptachloro($^{13}C_{12}$)dibenzofuran			10.0 ng/mL
Octachloro($^{13}C_{12}$)dibenzofuran			20.0 ng/mL
MASS-LABELLED PCBs		***IUPAC***	
3,3',4,4'-Tetrachloro($^{13}C_{12}$)biphenyl		*77L*	10.0 ng/mL
3,4,4',5-Tetrachloro($^{13}C_{12}$)biphenyl		*81L*	10.0 ng/mL
2,3,3',4,4'-Pentachloro($^{13}C_{12}$)biphenyl		*105L*	10.0 ng/mL
2,3,4,4',5-Pentachloro($^{13}C_{12}$)biphenyl		*114L*	10.0 ng/mL
2,3',4,4',5-Pentachloro($^{13}C_{12}$)biphenyl		*118L*	10.0 ng/mL
2',3,4,4',5-Pentachloro($^{13}C_{12}$)biphenyl		*123L*	10.0 ng/mL
3,3',4,4',5-Pentachloro($^{13}C_{12}$)biphenyl		*126L*	10.0 ng/mL
2,3,3',4,4',5-Hexachloro($^{13}C_{12}$)biphenyl		*156L*	10.0 ng/mL
2,3,3',4,4',5'-Hexachloro($^{13}C_{12}$)biphenyl		*157L*	10.0 ng/mL
2,3',4,4',5,5'-Hexachloro($^{13}C_{12}$)biphenyl		*167L*	10.0 ng/mL
3,3',4,4',5,5'-Hexachloro($^{13}C_{12}$)biphenyl		*169L*	10.0 ng/mL
2,2',3,3',4,4',5-Heptachloro($^{13}C_{12}$)biphenyl		*170L*	10.0 ng/mL
2,2',3,4,4',5,5'-Heptachloro($^{13}C_{12}$)biphenyl		*180L*	10.0 ng/mL
2,3,3',4,4',5,5'-Heptachloro($^{13}C_{12}$)biphenyl		*189L*	10.0 ng/mL
DFP-IS-A	Mass-Labelled PCDF/PCB Syringe Spike Solution		1.2 mL
		IUPAC	
1,2,3,4,6,9-Hexachloro($^{13}C_{12}$)dibenzofuran		—	10.0 ng/mL
1,2,3,4,6,8,9-Heptachloro($^{13}C_{12}$)dibenzofuran		—	10.0 ng/mL
2,3',4',5-Tetrachloro($^{13}C_{12}$)biphenyl		*70L*	10.0 ng/mL
DFP-SS-A	Mass-Labelled PCDD/PCB Sampling Spike Solution		1.2 mL
		IUPAC	
1,2,3,4-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin		—	50.0 ng/mL
3,3',4,5'-Tetrachloro($^{13}C_{12}$)biphenyl		*79L*	50.0 ng/mL

Support solutions for **DFP-CVS-B10**, **DF-CVS-C10**, and **PCB-CVS-B10** (page 94).

Catalogue Number	Product (nonane solution)		Qty/Conc
DFP-IS-B10	Mass-Labelled PCDD/PCB Internal Standard Solution		1.2 mL
MASS-LABELLED PCDDs			
1,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin			10.0 ng/mL
1,2,4,7,8-Pentachloro($^{13}C_{12}$)dibenzo-*p*-dioxin			10.0 ng/mL
1,2,3,4,6,8-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin			10.0 ng/mL
1,2,3,4,6,7,9-Heptachloro($^{13}C_{12}$)dibenzo-*p*-dioxin			10.0 ng/mL
MASS-LABELLED PCBs		***IUPAC***	
2,3',4',5-Tetrachloro($^{13}C_{12}$)biphenyl		*70L*	10.0 ng/mL
2,3,3',5,5-Pentachloro($^{13}C_{12}$)biphenyl		*111L*	10.0 ng/mL
2,2',3,4,4',5'-Hexachloro($^{13}C_{12}$)biphenyl		*138L*	10.0 ng/mL
2,2',3,3',5,5',6-Heptachloro($^{13}C_{12}$)biphenyl		*178L*	10.0 ng/mL
DFP-SS-A10	Mass-Labelled PCDD/PCB Sampling Spike Solution		1.2 mL
MASS-LABELLED PCDD & PCB		***IUPAC***	
1,2,3,4-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin		—	10.0 ng/mL
3,3',4,5'-Tetrachloro($^{13}C_{12}$)biphenyl		*79L*	10.0 ng/mL



NATIVE PCDDs & PCDFs: SOLUTION/MIXTURES

* Support solutions for **DF-CVS-A10** and **DF-CVS-B10.**
** Support solution for **DF-CVS-C10** and **DFP-CVS-B10.**

Catalogue Number	Product (nonane solution)	Qty/Conc
DF-ST-A*	Native PCDD/PCDF Solution/Mixture	1.2 mL
DF-ST-B*	Native PCDD/PCDF Solution/Mixture	1.2 mL
DF-ST-C**	Native PCDD/PCDF Solution/Mixture	1.2 mL

NATIVE PCDDs	DF-ST-A* (µg/mL)	DF-ST-B* (µg/mL)	DF-ST-C** (µg/mL)
1,2,8,9-Tetrachlorodibenzo-*p*-dioxin	1.00	1.00	1.00
1,3,6,8-Tetrachlorodibenzo-*p*-dioxin	1.00	1.00	1.00
1,3,7,9-Tetrachlorodibenzo-*p*-dioxin	1.00	1.00	—
2,3,7,8-Tetrachlorodibenzo-*p*-dioxin	1.00	1.00	1.00
1,2,3,7,8-Pentachlorodibenzo-*p*-dioxin	1.00	1.00	1.00
1,2,3,4,7,8-Hexachlorodibenzo-*p*-dioxin	1.00	2.00	2.00
1,2,3,6,7,8-Hexachlorodibenzo-*p*-dioxin	1.00	2.00	2.00
1,2,3,7,8,9-Hexachlorodibenzo-*p*-dioxin	1.00	2.00	2.00
1,2,3,4,6,7,8-Heptachlorodibenzo-*p*-dioxin	1.00	2.00	2.00
Octachlorodibenzo-*p*-dioxin	2.00	5.00	5.00
NATIVE PCDFs			
1,2,7,8-Tetrachlorodibenzofuran	1.00	1.00	—
1,2,8,9-Tetrachlorodibenzofuran	1.00	1.00	1.00
1,3,6,8-Tetrachlorodibenzofuran	1.00	1.00	1.00
2,3,7,8-Tetrachlorodibenzofuran	1.00	1.00	1.00
1,2,3,7,8-Pentachlorodibenzofuran	1.00	1.00	1.00
2,3,4,7,8-Pentachlorodibenzofuran	1.00	1.00	1.00
1,2,3,4,7,8-Hexachlorodibenzofuran	1.00	2.00	2.00
1,2,3,6,7,8-Hexachlorodibenzofuran	1.00	2.00	2.00
1,2,3,7,8,9-Hexachlorodibenzofuran	1.00	2.00	2.00
2,3,4,6,7,8-Hexachlorodibenzofuran	1.00	2.00	2.00
1,2,3,4,6,7,8-Heptachlorodibenzofuran	1.00	2.00	2.00
1,2,3,4,7,8,9-Heptachlorodibenzofuran	1.00	2.00	2.00
Octachlorodibenzofuran	2.00	5.00	5.00

Catalogue Number	Product (nonane solution)	Qty/Conc
NK-ST-A	Native PCDD/PCDF Solution/Mixture	1.2 mL
NK-ST-A4	Native PCDD/PCDF Solution/Mixture	1.2 mL
NK-ST-B2	Native PCDD/PCDF Solution/Mixture	1.2 mL
NK-ST-B4	Native PCDD/PCDF Solution/Mixture	1.2 mL

NATIVE PCDDs	NK-ST-A (µg/mL)	NK-ST-A4 (ng/mL)	NK-ST-B2 (ng/mL)	NK-ST-B4 (µg/mL)
2,3,7,8-Tetrachlorodibenzo-*p*-dioxin	2.00	2.00	100	1.00
1,2,3,7,8-Pentachlorodibenzo-*p*-dioxin	2.00	2.00	100	1.00
1,2,3,4,7,8-Hexachlorodibenzo-*p*-dioxin	2.00	2.00	200	2.00
1,2,3,6,7,8-Hexachlorodibenzo-*p*-dioxin	2.00	2.00	200	2.00
1,2,3,7,8,9-Hexachlorodibenzo-*p*-dioxin	2.00	2.00	200	2.00
1,2,3,4,6,7,8-Heptachlorodibenzo-*p*-dioxin	2.00	2.00	200	2.00
Octachlorodibenzo-*p*-dioxin	4.00	4.00	400	5.00
NATIVE PCDFs				
2,3,7,8-Tetrachlorodibenzofuran	2.00	2.00	100	1.00
1,2,3,7,8-Pentachlorodibenzofuran	2.00	2.00	100	1.00
2,3,4,7,8-Pentachlorodibenzofuran	2.00	2.00	100	1.00
1,2,3,4,7,8-Hexachlorodibenzofuran	2.00	2.00	200	2.00
1,2,3,6,7,8-Hexachlorodibenzofuran	2.00	2.00	200	2.00
1,2,3,7,8,9-Hexachlorodibenzofuran	2.00	2.00	200	2.00
2,3,4,6,7,8-Hexachlorodibenzofuran	2.00	2.00	200	2.00
1,2,3,4,6,7,8-Heptachlorodibenzofuran	2.00	2.00	200	2.00
1,2,3,4,7,8,9-Heptachlorodibenzofuran	2.00	2.00	200	2.00
Octachlorodibenzofuran	4.00	4.00	400	5.00



PCDDs & PCDFs: SOLUTION/MIXTURES

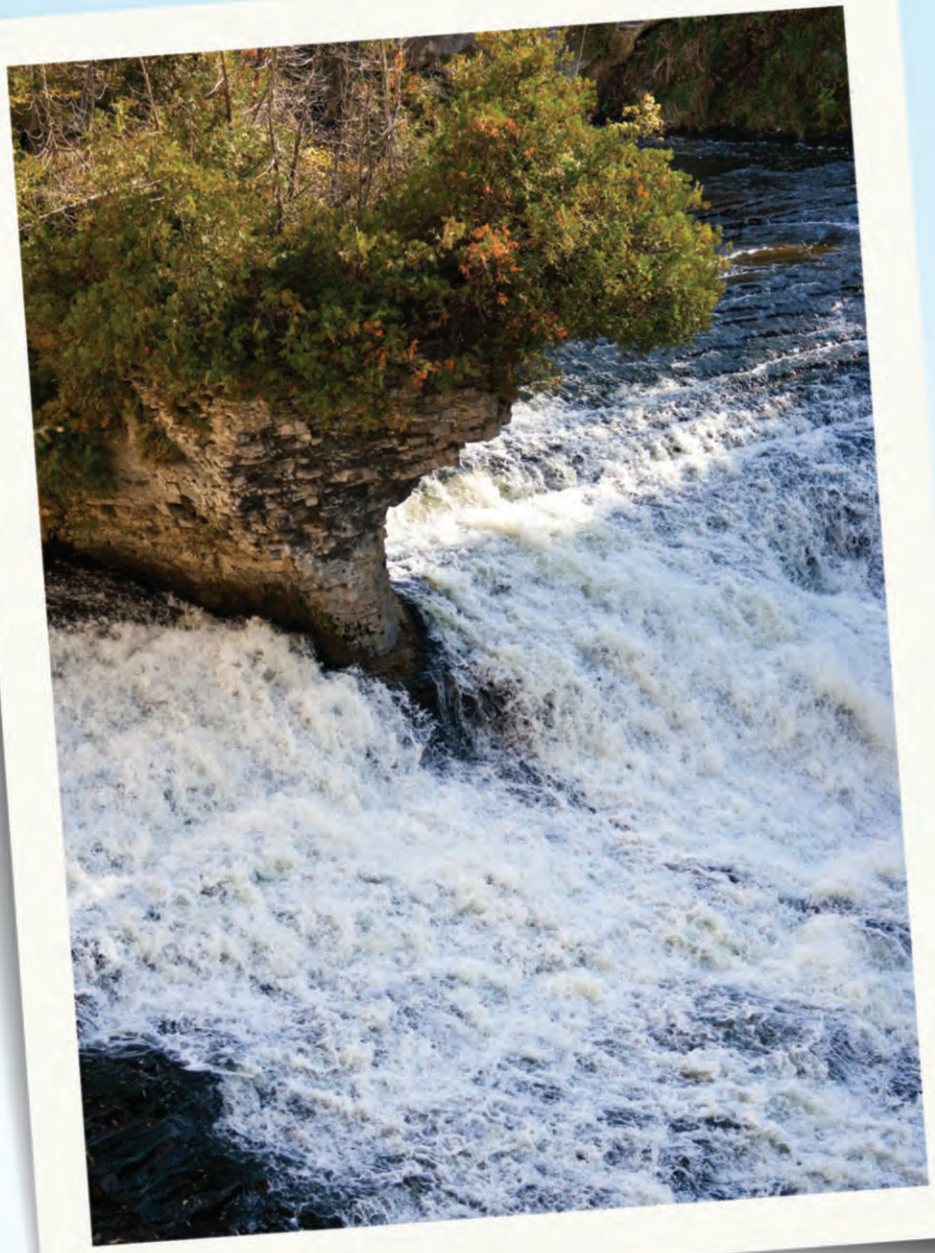
Catalogue Number	Product (nonane/toluene solution)	Qty/Conc
DDF-MDT	Native PCDD/PCDF Solution/Mixture	1.2 mL
MDDF-MDT	Mass-Labelled PCDD/PCDF Solution/Mixture	1.2 mL

NATIVE PCDDs & PCDFs	**DDF-MDT (µg/mL)**
Dibenzo-*p*-dioxin	1.00
2-Chlorodibenzo-*p*-dioxin	1.00
2,3-Dichlorodibenzo-*p*-dioxin	1.00
2,3,7-Trichlorodibenzo-*p*-dioxin	1.00
Dibenzofuran	1.00
2-Chlorodibenzofuran	1.00
2,3-Dichlorodibenzofuran	1.00
2,3,8-Trichlorodibenzofuran	1.00

MASS-LABELLED PCDDs & PCDFs	**MDDF-MDT (µg/mL)**
($^{13}C_{12}$)Dibenzo-*p*-dioxin	1.00
2-Chloro($^{13}C_{12}$)dibenzo-*p*-dioxin	1.00
2,3-Dichloro($^{13}C_{12}$)dibenzo-*p*-dioxin	1.00
2,3,7-Trichloro($^{13}C_{12}$)dibenzo-*p*-dioxin	1.00
($^{13}C_{12}$)Dibenzofuran	1.00
2-Chloro($^{13}C_{12}$)dibenzofuran	1.00
2,3-Dichloro($^{13}C_{12}$)dibenzofuran	1.00
2,3,8-Trichloro($^{13}C_{12}$)dibenzofuran	1.00

In order to keep up-to-date on new releases from Wellington Laboratories Inc., please visit our website at www.well-labs.com.

New Products are announced in the Wellington Reporter.



Elora Gorge
Elora, Ontario

PCBs:
ANALYTICAL METHOD SOLUTIONS

Wellington offers several calibration kits, along with support solutions, for the analysis of individual PCB congeners.

WP-CVS
This set of solutions is to be used for the analysis of the 12 'dioxin-like' PCB congeners by HRGC/HRMS.

EPA Method 1668C
This series of calibration solutions, and corresponding support solutions, were prepared to be used according to U.S. EPA Method 1668, Revision C.

EPA Method 1668
This calibration kit, and support solutions, were designed and prepared to be used with the Draft version (March, 1997) of U.S. EPA Method 1668 which is still popular with some laboratories.

EC-9605-CVS
Environment Canada Method 1/RM/31 is a HRGC/LRMS method for PCB analysis and these solutions were prepared to be used with this method.

P48-W-CVS and P48-M-CVS
European Standard Method EN 1948-4 is to be used for the analysis of the 12 'dioxin-like' PCB congeners and the 6 'marker' PCB congeners in stationary source emissions. These two calibration kits, and their support solutions, were prepared for this method.

WM48-CVS
This calibration set is a combination of P48-W-CVS and P48-M-CVS.





WP-CVS STANDARD SOLUTIONS

Catalogue Number	Product (nonane solution)	Qty/Conc
WP-CVS	Dioxin-Like PCBs Calibration and Verification Solutions CS1-CS7	1 kit (7 ampoules)
WP-CS1	CS1	500 µL
WP-CS2	CS2	500 µL
WP-CS3	CS3	500 µL
WP-CS4	CS4	500 µL
WP-CS5	CS5	500 µL
WP-CS6	CS6	500 µL
WP-CS7	CS7	500 µL

NATIVE PCBs	*IUPAC*	WP-CS1 (ng/mL)	WP-CS2 (ng/mL)	WP-CS3 (ng/mL)	WP-CS4 (ng/mL)	WP-CS5 (ng/mL)	WP-CS6 (ng/mL)	WP-CS7 (ng/mL)
3,3',4,4'-Tetrachlorobiphenyl	*77*	0.100	0.500	2.00	10.0	40.0	200	800
3,4,4',5-Tetrachlorobiphenyl	*81*	0.100	0.500	2.00	10.0	40.0	200	800
2,3,3',4,4'-Pentachlorobiphenyl	*105*	0.100	0.500	2.00	10.0	40.0	200	800
2,3,4,4',5-Pentachlorobiphenyl	*114*	0.100	0.500	2.00	10.0	40.0	200	800
2,3',4,4',5-Pentachlorobiphenyl	*118*	0.100	0.500	2.00	10.0	40.0	200	800
2',3,4,4',5-Pentachlorobiphenyl	*123*	0.100	0.500	2.00	10.0	40.0	200	800
3,3',4,4',5-Pentachlorobiphenyl	*126*	0.100	0.500	2.00	10.0	40.0	200	800
2,3,3',4,4',5-Hexachlorobiphenyl	*156*	0.100	0.500	2.00	10.0	40.0	200	800
2,3,3',4,4',5'-Hexachlorobiphenyl	*157*	0.100	0.500	2.00	10.0	40.0	200	800
2,3',4,4',5,5'-Hexachlorobiphenyl	*167*	0.100	0.500	2.00	10.0	40.0	200	800
3,3',4,4',5,5'-Hexachlorobiphenyl	*169*	0.100	0.500	2.00	10.0	40.0	200	800
2,3,3',4,4',5,5'-Heptachlorobiphenyl	*189*	0.100	0.500	2.00	10.0	40.0	200	800
MASS-LABELLED PCBs								
3,3',4,4'-Tetrachloro($^{13}C_{12}$)biphenyl	*77L*	50.0	50.0	50.0	50.0	50.0	50.0	50.0
3,4,4',5-Tetrachloro($^{13}C_{12}$)biphenyl	*81L*	50.0	50.0	50.0	50.0	50.0	50.0	50.0
2,3,3',4,4'-Pentachloro($^{13}C_{12}$)biphenyl	*105L*	50.0	50.0	50.0	50.0	50.0	50.0	50.0
2,3,4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*114L*	50.0	50.0	50.0	50.0	50.0	50.0	50.0
2,3',4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*118L*	50.0	50.0	50.0	50.0	50.0	50.0	50.0
2',3,4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*123L*	50.0	50.0	50.0	50.0	50.0	50.0	50.0
3,3',4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*126L*	50.0	50.0	50.0	50.0	50.0	50.0	50.0
2,3,3',4,4',5-Hexachloro($^{13}C_{12}$)biphenyl	*156L*	50.0	50.0	50.0	50.0	50.0	50.0	50.0
2,3,3',4,4',5'-Hexachloro($^{13}C_{12}$)biphenyl	*157L*	50.0	50.0	50.0	50.0	50.0	50.0	50.0
2,3',4,4',5,5'-Hexachloro($^{13}C_{12}$)biphenyl	*167L*	50.0	50.0	50.0	50.0	50.0	50.0	50.0
3,3',4,4',5,5'-Hexachloro($^{13}C_{12}$)biphenyl	*169L*	50.0	50.0	50.0	50.0	50.0	50.0	50.0
2,3,3',4,4',5,5'-Heptachloro($^{13}C_{12}$)biphenyl	*189L*	50.0	50.0	50.0	50.0	50.0	50.0	50.0
INTERNAL STANDARDS								
2,3',4',5-Tetrachloro($^{13}C_{12}$)biphenyl	*70L*	50.0	50.0	50.0	50.0	50.0	50.0	50.0
2,3,3',5,5'-Pentachloro($^{13}C_{12}$)biphenyl	*111L*	50.0	50.0	50.0	50.0	50.0	50.0	50.0
2,2',3,4,4',5'-Hexachloro($^{13}C_{12}$)biphenyl	*138L*	50.0	50.0	50.0	50.0	50.0	50.0	50.0
2,2',3,3',4,4',5-Heptachloro($^{13}C_{12}$)biphenyl	*170L*	50.0	50.0	50.0	50.0	50.0	50.0	50.0

Catalogue Number	Product (nonane solution)	Qty/Conc
WP-LCS	Surrogate Spiking Solution	1.2 mL
WP-ISS	Internal Standard Solution	1.2 mL
WP-STK	Native PCB Solution	1.2 mL

NATIVE PCBs	*IUPAC*	WP-LCS (ng/mL)	WP-ISS (ng/mL)	WP-STK (ng/mL)
3,3',4,4'-Tetrachlorobiphenyl	*77*	—	—	2000
3,4,4',5-Tetrachlorobiphenyl	*81*	—	—	2000
2,3,3',4,4'-Pentachlorobiphenyl	*105*	—	—	2000
2,3,4,4',5-Pentachlorobiphenyl	*114*	—	—	2000
2,3',4,4',5-Pentachlorobiphenyl	*118*	—	—	2000
2',3,4,4',5-Pentachlorobiphenyl	*123*	—	—	2000
3,3',4,4',5-Pentachlorobiphenyl	*126*	—	—	2000
2,3,3',4,4',5-Hexachlorobiphenyl	*156*	—	—	2000
2,3,3',4,4',5'-Hexachlorobiphenyl	*157*	—	—	2000
2,3',4,4',5,5'-Hexachlorobiphenyl	*167*	—	—	2000
3,3',4,4',5,5'-Hexachlorobiphenyl	*169*	—	—	2000
2,3,3',4,4',5,5'-Heptachlorobiphenyl	*189*	—	—	2000
MASS-LABELLED PCBs				
3,3',4,4'-Tetrachloro($^{13}C_{12}$)biphenyl	*77L*	1000	—	—
3,4,4',5-Tetrachloro($^{13}C_{12}$)biphenyl	*81L*	1000	—	—
2,3,3',4,4'-Pentachloro($^{13}C_{12}$)biphenyl	*105L*	1000	—	—
2,3,4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*114L*	1000	—	—
2,3',4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*118L*	1000	—	—
2',3,4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*123L*	1000	—	—
3,3',4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*126L*	1000	—	—
2,3,3',4,4',5-Hexachloro($^{13}C_{12}$)biphenyl	*156L*	1000	—	—
2,3,3',4,4',5'-Hexachloro($^{13}C_{12}$)biphenyl	*157L*	1000	—	—
2,3',4,4',5,5'-Hexachloro($^{13}C_{12}$)biphenyl	*167L*	1000	—	—
3,3',4,4',5,5'-Hexachloro($^{13}C_{12}$)biphenyl	*169L*	1000	—	—
2,3,3',4,4',5,5'-Heptachloro($^{13}C_{12}$)biphenyl	*189L*	1000	—	—
INTERNAL STANDARDS				
2,3',4',5-Tetrachloro($^{13}C_{12}$)biphenyl	*70L*	—	1000	—
2,3,3',5,5'-Pentachloro($^{13}C_{12}$)biphenyl	*111L*	—	1000	—
2,2',3,4,4',5'-Hexachloro($^{13}C_{12}$)biphenyl	*138L*	—	1000	—
2,2',3,3',4,4',5-Heptachloro($^{13}C_{12}$)biphenyl	*170L*	—	1000	—



EPA METHOD 1668C STANDARD SOLUTIONS

Catalogue Number	Product (nonane solution)	Qty/Conc
68C-CVS	EPA Method 1668C Calibration and Verification Solutions CS0.2-CS5	1 kit (6 ampoules)
68C-CS0.2	CS0.2 High Sensitivity	200 µL
68C-CS1	CS1	200 µL
68C-CS2	CS2	200 µL
68C-CS3	CS3 Calibration Verification	500 µL
68C-CS4	CS4	200 µL
68C-CS5	CS5	200 µL

NOTE: The above product codes were updated to reflect the change of EPA Method 1668B to 1668C in April of 2010.

NATIVE TOXICS/LOC STANDARDS	*IUPAC*	68C-CS0.2 (ng/mL)	68C-CS1 (ng/mL)	68C-CS2 (ng/mL)	68C-CS3 (ng/mL)	68C-CS4 (ng/mL)	68C-CS5 (ng/mL)
2-Chlorobiphenyl	*1*	0.200	1.00	5.00	50.0	400	2000
4-Chlorobiphenyl	*3*	0.200	1.00	5.00	50.0	400	2000
2,2'-Dichlorobiphenyl	*4*	0.200	1.00	5.00	50.0	400	2000
4,4'-Dichlorobiphenyl	*15*	0.200	1.00	5.00	50.0	400	2000
2,2',6-Trichlorobiphenyl	*19*	0.200	1.00	5.00	50.0	400	2000
3,4,4'-Trichlorobiphenyl	*37*	0.200	1.00	5.00	50.0	400	2000
2,2',6,6'-Tetrachlorobiphenyl	*54*	0.200	1.00	5.00	50.0	400	2000
3,3',4,4'-Tetrachlorobiphenyl	*77*	0.200	1.00	5.00	50.0	400	2000
3,4,4',5-Tetrachlorobiphenyl	*81*	0.200	1.00	5.00	50.0	400	2000
2,2',4,6,6'-Pentachlorobiphenyl	*104*	0.200	1.00	5.00	50.0	400	2000
2,3,3',4,4'-Pentachlorobiphenyl	*105*	0.200	1.00	5.00	50.0	400	2000
2,3,4,4',5-Pentachlorobiphenyl	*114*	0.200	1.00	5.00	50.0	400	2000
2,3',4,4',5-Pentachlorobiphenyl	*118*	0.200	1.00	5.00	50.0	400	2000
2',3,4,4',5-Pentachlorobiphenyl	*123*	0.200	1.00	5.00	50.0	400	2000
3,3',4,4',5-Pentachlorobiphenyl	*126*	0.200	1.00	5.00	50.0	400	2000
2,2',4,4',6,6'-Hexachlorobiphenyl	*155*	0.200	1.00	5.00	50.0	400	2000
2,3,3',4,4',5-Hexachlorobiphenyl	*156*	0.200	1.00	5.00	50.0	400	2000
2,3,3',4,4',5'-Hexachlorobiphenyl	*157*	0.200	1.00	5.00	50.0	400	2000
2,3',4,4',5,5'-Hexachlorobiphenyl	*167*	0.200	1.00	5.00	50.0	400	2000
3,3',4,4',5,5'-Hexachlorobiphenyl	*169*	0.200	1.00	5.00	50.0	400	2000
2,2',3,4',5,6,6'-Heptachlorobiphenyl	*188*	0.200	1.00	5.00	50.0	400	2000
2,3,3',4,4',5,5'-Heptachlorobiphenyl	*189*	0.200	1.00	5.00	50.0	400	2000
2,2',3,3',5,5',6,6'-Octachlorobiphenyl	*202*	0.200	1.00	5.00	50.0	400	2000
2,3,3',4,4',5,5',6-Octachlorobiphenyl	*205*	0.200	1.00	5.00	50.0	400	2000
2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl	*206*	0.200	1.00	5.00	50.0	400	2000
2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl	*208*	0.200	1.00	5.00	50.0	400	2000
Decachlorobiphenyl	*209*	0.200	1.00	5.00	50.0	400	2000
MASS-LABELLED TOXICS/LOC/ WINDOW-DEFINING STANDARDS							
2-Chloro($^{13}C_{12}$)biphenyl	*1L*	100	100	100	100	100	100
4-Chloro($^{13}C_{12}$)biphenyl	*3L*	100	100	100	100	100	100
2,2'-Dichloro($^{13}C_{12}$)biphenyl	*4L*	100	100	100	100	100	100
4,4'-Dichloro($^{13}C_{12}$)biphenyl	*15L*	100	100	100	100	100	100
2,2',6-Trichloro($^{13}C_{12}$)biphenyl	*19L*	100	100	100	100	100	100
3,4,4'-Trichloro($^{13}C_{12}$)biphenyl	*37L*	100	100	100	100	100	100
2,2',6,6'-Tetrachloro($^{13}C_{12}$)biphenyl	*54L*	100	100	100	100	100	100
3,3',4,4'-Tetrachloro($^{13}C_{12}$)biphenyl	*77L*	100	100	100	100	100	100
3,4,4',5-Tetrachloro($^{13}C_{12}$)biphenyl	*81L*	100	100	100	100	100	100
2,2',4,6,6'-Pentachloro($^{13}C_{12}$)biphenyl	*104L*	100	100	100	100	100	100
2,3,3',4,4'-Pentachloro($^{13}C_{12}$)biphenyl	*105L*	100	100	100	100	100	100
2,3,4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*114L*	100	100	100	100	100	100
2,3',4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*118L*	100	100	100	100	100	100
2',3,4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*123L*	100	100	100	100	100	100
3,3',4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*126L*	100	100	100	100	100	100
2,2',4,4',6,6'-Hexachloro($^{13}C_{12}$)biphenyl	*155L*	100	100	100	100	100	100
2,3,3',4,4',5-Hexachloro($^{13}C_{12}$)biphenyl	*156L*	100	100	100	100	100	100
2,3,3',4,4',5'-Hexachloro($^{13}C_{12}$)biphenyl	*157L*	100	100	100	100	100	100
2,3',4,4',5,5'-Hexachloro($^{13}C_{12}$)biphenyl	*167L*	100	100	100	100	100	100
3,3',4,4',5,5'-Hexachloro($^{13}C_{12}$)biphenyl	*169L*	100	100	100	100	100	100
2,2',3,4',5,6,6'-Heptachloro($^{13}C_{12}$)biphenyl	*188L*	100	100	100	100	100	100
2,3,3',4,4',5,5'-Heptachloro($^{13}C_{12}$)biphenyl	*189L*	100	100	100	100	100	100
2,2',3,3',5,5',6,6'-Octachloro($^{13}C_{12}$)biphenyl	*202L*	100	100	100	100	100	100
2,3,3',4,4',5,5',6-Octachloro($^{13}C_{12}$)biphenyl	*205L*	100	100	100	100	100	100
2,2',3,3',4,4',5,5',6-Nonachloro($^{13}C_{12}$)biphenyl	*206L*	100	100	100	100	100	100
2,2',3,3',4,5,5',6,6'-Nonachloro($^{13}C_{12}$)biphenyl	*208L*	100	100	100	100	100	100
Decachloro($^{13}C_{12}$)biphenyl	*209L*	100	100	100	100	100	100
MASS-LABELLED CLEANUP STANDARDS							
2,4,4'-Trichloro($^{13}C_{12}$)biphenyl	*28L*	100	100	100	100	100	100
2,3,3',5,5'-Pentachloro($^{13}C_{12}$)biphenyl	*111L*	100	100	100	100	100	100
2,2',3,3',5,5',6-Heptachloro($^{13}C_{12}$)biphenyl	*178L*	100	100	100	100	100	100
MASS-LABELLED INJECTION/ INTERNAL STANDARDS							
2,5-Dichloro($^{13}C_{12}$)biphenyl	*9L*	100	100	100	100	100	100
2,2',5,5'-Tetrachloro($^{13}C_{12}$)biphenyl	*52L*	100	100	100	100	100	100
2,2',4,5,5'-Pentachloro($^{13}C_{12}$)biphenyl	*101L*	100	100	100	100	100	100
2,2',3,4,4',5'-Hexachloro($^{13}C_{12}$)biphenyl	*138L*	100	100	100	100	100	100
2,2',3,3',4,4',5,5'-Octachloro($^{13}C_{12}$)biphenyl	*194L*	100	100	100	100	100	100

EPA METHOD 1668C STANDARD SOLUTIONS

Catalogue Number	Product (nonane solution)	Qty/Conc
68C-LCS	Mass-Labelled Toxics/LOC/Window Defining Stock Solution	1.2 mL
68C-CS	Mass-Labelled Cleanup Stock Solution	1.2 mL
68C-IS	Mass-Labelled Injection/Internal Standard Stock Solution	1.2 mL
68C-PAR	Native Toxics/LOC Stock Solution	1.2 mL

NOTE: The above product codes were updated to reflect the change of EPA Method 1668B to 1668C in April of 2010.

NATIVE TOXICS/LOC STANDARDS	*IUPAC*	68C-LCS (ng/mL)	68C-CS (ng/mL)	68C-IS (ng/mL)	68C-PAR (ng/mL)
2-Chlorobiphenyl	*1*	—	—	—	2000
4-Chlorobiphenyl	*3*	—	—	—	2000
2,2'-Dichlorobiphenyl	*4*	—	—	—	2000
4,4'-Dichlorobiphenyl	*15*	—	—	—	2000
2,2',6-Trichlorobiphenyl	*19*	—	—	—	2000
3,4,4'-Trichlorobiphenyl	*37*	—	—	—	2000
2,2',6,6'-Tetrachlorobiphenyl	*54*	—	—	—	2000
3,3',4,4'-Tetrachlorobiphenyl	*77*	—	—	—	2000
3,4,4',5-Tetrachlorobiphenyl	*81*	—	—	—	2000
2,2',4,6,6'-Pentachlorobiphenyl	*104*	—	—	—	2000
2,3,3',4,4'-Pentachlorobiphenyl	*105*	—	—	—	2000
2,3,4,4',5-Pentachlorobiphenyl	*114*	—	—	—	2000
2,3',4,4',5-Pentachlorobiphenyl	*118*	—	—	—	2000
2',3,4,4',5-Pentachlorobiphenyl	*123*	—	—	—	2000
3,3',4,4',5-Pentachlorobiphenyl	*126*	—	—	—	2000
2,2',4,4',6,6'-Hexachlorobiphenyl	*155*	—	—	—	2000
2,3,3',4,4',5-Hexachlorobiphenyl	*156*	—	—	—	2000
2,3,3',4,4',5'-Hexachlorobiphenyl	*157*	—	—	—	2000
2,3',4,4',5,5'-Hexachlorobiphenyl	*167*	—	—	—	2000
3,3',4,4',5,5'-Hexachlorobiphenyl	*169*	—	—	—	2000
2,2',3,4',5,6,6'-Heptachlorobiphenyl	*188*	—	—	—	2000
2,3,3',4,4',5,5'-Heptachlorobiphenyl	*189*	—	—	—	2000
2,2',3,3',5,5',6,6'-Octachlorobiphenyl	*202*	—	—	—	2000
2,3,3',4,4',5,5',6-Octachlorobiphenyl	*205*	—	—	—	2000
2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl	*206*	—	—	—	2000
2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl	*208*	—	—	—	2000
Decachlorobiphenyl	*209*	—	—	—	2000
MASS-LABELLED TOXICS/LOC/ WINDOW-DEFINING STANDARDS					
2-Chloro($^{13}C_{12}$)biphenyl	*1L*	1000	—	—	—
4-Chloro($^{13}C_{12}$)biphenyl	*3L*	1000	—	—	—
2,2'-Dichloro($^{13}C_{12}$)biphenyl	*4L*	1000	—	—	—
4,4'-Dichloro($^{13}C_{12}$)biphenyl	*15L*	1000	—	—	—
2,2',6-Trichloro($^{13}C_{12}$)biphenyl	*19L*	1000	—	—	—
3,4,4'-Trichloro($^{13}C_{12}$)biphenyl	*37L*	1000	—	—	—
2,2',6,6'-Tetrachloro($^{13}C_{12}$)biphenyl	*54L*	1000	—	—	—
3,3',4,4'-Tetrachloro($^{13}C_{12}$)biphenyl	*77L*	1000	—	—	—
3,4,4',5-Tetrachloro($^{13}C_{12}$)biphenyl	*81L*	1000	—	—	—
2,2',4,6,6'-Pentachloro($^{13}C_{12}$)biphenyl	*104L*	1000	—	—	—
2,3,3',4,4'-Pentachloro($^{13}C_{12}$)biphenyl	*105L*	1000	—	—	—
2,3,4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*114L*	1000	—	—	—
2,3',4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*118L*	1000	—	—	—
2',3,4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*123L*	1000	—	—	—
3,3',4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*126L*	1000	—	—	—
2,2',4,4',6,6'-Hexachloro($^{13}C_{12}$)biphenyl	*155L*	1000	—	—	—
2,3,3',4,4',5-Hexachloro($^{13}C_{12}$)biphenyl	*156L*	1000	—	—	—
2,3,3',4,4',5'-Hexachloro($^{13}C_{12}$)biphenyl	*157L*	1000	—	—	—
2,3',4,4',5,5'-Hexachloro($^{13}C_{12}$)biphenyl	*167L*	1000	—	—	—
3,3',4,4',5,5'-Hexachloro($^{13}C_{12}$)biphenyl	*169L*	1000	—	—	—
2,2',3,4',5,6,6'-Heptachloro($^{13}C_{12}$)biphenyl	*188L*	1000	—	—	—
2,3,3',4,4',5,5'-Heptachloro($^{13}C_{12}$)biphenyl	*189L*	1000	—	—	—
2,2',3,3',5,5',6,6'-Octachloro($^{13}C_{12}$)biphenyl	*202L*	1000	—	—	—
2,3,3',4,4',5,5',6-Octachloro($^{13}C_{12}$)biphenyl	*205L*	1000	—	—	—
2,2',3,3',4,4',5,5',6-Nonachloro($^{13}C_{12}$)biphenyl	*206L*	1000	—	—	—
2,2',3,3',4,5,5',6,6'-Nonachloro($^{13}C_{12}$)biphenyl	*208L*	1000	—	—	—
Decachloro($^{13}C_{12}$)biphenyl	*209L*	1000	—	—	—
MASS-LABELLED CLEANUP STANDARDS					
2,4,4'-Trichloro($^{13}C_{12}$)biphenyl	*28L*	—	1000	—	—
2,3,3',5,5'-Pentachloro($^{13}C_{12}$)biphenyl	*111L*	—	1000	—	—
2,2',3,3',5,5',6-Heptachloro($^{13}C_{12}$)biphenyl	*178L*	—	1000	—	—
MASS-LABELLED INJECTION/ INTERNAL STANDARDS					
2,5-Dichloro($^{13}C_{12}$)biphenyl	*9L*	—	—	5000	—
2,2',5,5'-Tetrachloro($^{13}C_{12}$)biphenyl	*52L*	—	—	5000	—
2,2',4,5,5'-Pentachloro($^{13}C_{12}$)biphenyl	*101L*	—	—	5000	—
2,2',3,4,4',5'-Hexachloro($^{13}C_{12}$)biphenyl	*138L*	—	—	5000	—
2,2',3,3',4,4',5,5'-Octachloro($^{13}C_{12}$)biphenyl	*194L*	—	—	5000	—



EPA METHOD 1668 STANDARD SOLUTIONS

Catalogue Number	Product (nonane solution)	Qty/Conc
EPA-1668CVS	EPA Method 1668 Calibration and Verification Solutions CS1-CS5	1 kit (5 ampoules)
EPA-1668CS1	CS1	200 µL
EPA-1668CS2	CS2	200 µL
EPA-1668CS3	CS3 Calibration Verification	500 µL
EPA-1668CS4	CS4	200 µL
EPA-1668CS5	CS5	200 µL

NATIVE PCBs	*IUPAC*	1668CS1 (ng/mL)	1668CS2 (ng/mL)	1668CS3 (ng/mL)	1668CS4 (ng/mL)	1668CS5 (ng/mL)
3,3',4,4'-Tetrachlorobiphenyl	*77*	0.500	2.00	10.0	40.0	200
2,3,3',4,4'-Pentachlorobiphenyl	*105*	2.50	10.0	50.0	200	1000
2,3,4,4',5-Pentachlorobiphenyl	*114*	2.50	10.0	50.0	200	1000
2,3',4,4',5-Pentachlorobiphenyl	*118*	2.50	10.0	50.0	200	1000
2',3,4,4',5-Pentachlorobiphenyl	*123*	2.50	10.0	50.0	200	1000
3,3',4,4',5-Pentachlorobiphenyl	*126*	2.50	10.0	50.0	200	1000
2,3,3',4,4',5-Hexachlorobiphenyl	*156*	5.00	20.0	100	400	2000
2,3,3',4,4',5'-Hexachlorobiphenyl	*157*	5.00	20.0	100	400	2000
2,3',4,4',5,5'-Hexachlorobiphenyl	*167*	5.00	20.0	100	400	2000
3,3',4,4',5,5'-Hexachlorobiphenyl	*169*	5.00	20.0	100	400	2000
2,2',3,3',4,4',5-Heptachlorobiphenyl	*170*	5.00	20.0	100	400	2000
2,2',3,4,4',5,5'-Heptachlorobiphenyl	*180*	5.00	20.0	100	400	2000
2,3,3',4,4',5,5'-Heptachlorobiphenyl	*189*	5.00	20.0	100	400	2000
MASS-LABELLED PCBs						
3,3',4,4'-Tetrachloro($^{13}C_{12}$)biphenyl	*77L*	100	100	100	100	100
2,3,3',4,4'-Pentachloro($^{13}C_{12}$)biphenyl	*105L*	100	100	100	100	100
2,3',4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*118L*	100	100	100	100	100
3,3',4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*126L*	100	100	100	100	100
2,3,3',4,4',5-Hexachloro($^{13}C_{12}$)biphenyl	*156L*	100	100	100	100	100
2,3,3',4,4',5'-Hexachloro($^{13}C_{12}$)biphenyl	*157L*	100	100	100	100	100
2,3',4,4',5,5'-Hexachloro($^{13}C_{12}$)biphenyl	*167L*	100	100	100	100	100
3,3',4,4',5,5'-Hexachloro($^{13}C_{12}$)biphenyl	*169L*	100	100	100	100	100
2,2',3,4,4',5,5'-Heptachloro($^{13}C_{12}$)biphenyl	*180L*	100	100	100	100	100
2,3,3',4,4',5,5'-Heptachloro($^{13}C_{12}$)biphenyl	*189L*	100	100	100	100	100
Decachloro($^{13}C_{12}$)biphenyl	*209L*	200	200	200	200	200
CLEANUP STANDARDS						
3,4,4',5-Tetrachloro($^{13}C_{12}$)biphenyl	*81L*	0.500	2.00	10.0	40.0	200
2,3,3',5,5'-Pentachloro($^{13}C_{12}$)biphenyl	*111L*	2.50	10.0	50.0	200	1000
INTERNAL STANDARDS						
2,2',5,5'-Tetrachloro($^{13}C_{12}$)biphenyl	*52L*	100	100	100	100	100
2,2',4,5,5'-Pentachloro($^{13}C_{12}$)biphenyl	*101L*	100	100	100	100	100
2,2',3,4,4',5'-Hexachloro($^{13}C_{12}$)biphenyl	*138L*	100	100	100	100	100
2,2',3,3',5,5',6-Heptachloro($^{13}C_{12}$)biphenyl	*178L*	100	100	100	100	100

EPA METHOD 1668 STANDARD SOLUTIONS

Catalogue Number	Product (nonane solution)	Qty/Conc
EPA-1668LCS	Labelled Compound Stock Solution	1.2 mL
EPA-1668CS	Cleanup Standard Solution	1.2 mL
EPA-1668IS	Internal Standard Stock Solution	1.2 mL
EPA-1668PAR	Precision and Recovery Solution	1.2 mL

NATIVE PCBs	*IUPAC*	1668LCS (ng/mL)	1668CS (ng/mL)	1668IS (ng/mL)	1668PAR (ng/mL)
3,3',4,4'-Tetrachlorobiphenyl	*77*	—	—	—	20.0
2,3,3',4,4'-Pentachlorobiphenyl	*105*	—	—	—	1000
2,3,4,4',5-Pentachlorobiphenyl	*114*	—	—	—	1000
2,3',4,4',5-Pentachlorobiphenyl	*118*	—	—	—	1000
2',3,4,4',5-Pentachlorobiphenyl	*123*	—	—	—	1000
3,3',4,4',5-Pentachlorobiphenyl	*126*	—	—	—	100
2,3,3',4,4',5-Hexachlorobiphenyl	*156*	—	—	—	1000
2,3,3',4,4',5'-Hexachlorobiphenyl	*157*	—	—	—	1000
2,3',4,4',5,5'-Hexachlorobiphenyl	*167*	—	—	—	1000
3,3',4,4',5,5'-Hexachlorobiphenyl	*169*	—	—	—	200
2,2',3,3',4,4',5-Heptachlorobiphenyl	*170*	—	—	—	200
2,2',3,4,4',5,5'-Heptachlorobiphenyl	*180*	—	—	—	1000
2,3,3',4,4',5,5'-Heptachlorobiphenyl	*189*	—	—	—	200
MASS-LABELLED PCBs					
3,3',4,4'-Tetrachloro($^{13}C_{12}$)biphenyl	*77L*	1000	—	—	—
2,3,3',4,4'-Pentachloro($^{13}C_{12}$)biphenyl	*105L*	1000	—	—	—
2,3',4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*118L*	1000	—	—	—
3,3',4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*126L*	1000	—	—	—
2,3,3',4,4',5-Hexachloro($^{13}C_{12}$)biphenyl	*156L*	1000	—	—	—
2,3,3',4,4',5'-Hexachloro($^{13}C_{12}$)biphenyl	*157L*	1000	—	—	—
2,3',4,4',5,5'-Hexachloro($^{13}C_{12}$)biphenyl	*167L*	1000	—	—	—
3,3',4,4',5,5'-Hexachloro($^{13}C_{12}$)biphenyl	*169L*	1000	—	—	—
2,2',3,4,4',5,5'-Heptachloro($^{13}C_{12}$)biphenyl	*180L*	1000	—	—	—
2,3,3',4,4',5,5'-Heptachloro($^{13}C_{12}$)biphenyl	*189L*	1000	—	—	—
Decachloro($^{13}C_{12}$)biphenyl	*209L*	2000	—	—	—
CLEANUP STANDARDS					
3,4,4',5-Tetrachloro($^{13}C_{12}$)biphenyl	*81L*	—	200	—	—
2,3,3',5,5'-Pentachloro($^{13}C_{12}$)biphenyl	*111L*	—	1000	—	—
INTERNAL STANDARDS					
2,2',5,5'-Tetrachloro($^{13}C_{12}$)biphenyl	*52L*	—	—	1000	—
2,2',4,5,5'-Pentachloro($^{13}C_{12}$)biphenyl	*101L*	—	—	1000	—
2,2',3,4,4',5'-Hexachloro($^{13}C_{12}$)biphenyl	*138L*	—	—	1000	—
2,2',3,3',5,5',6-Heptachloro($^{13}C_{12}$)biphenyl	*178L*	—	—	1000	—



ENVIRONMENT CANADA METHOD 1/RM/31 STANDARD SOLUTIONS

Catalogue Number	Product (isooctane solution)	Qty/Conc
EC9605-CVS	PCB Calibration Solutions for GC/MS Calibration and Verification Solutions CS1-CS5	1 kit (5 ampoules)
ECPCS1	CS1	500 µL
ECPCS2	CS2	500 µL
ECPCS3	CS3	500 µL
ECPCS4	CS4	500 µL
ECPCS5	CS5	500 µL

NATIVE PCBs*	*IUPAC*	ECPCS1 (ng/mL)	ECPCS2 (ng/mL)	ECPCS3 (ng/mL)	ECPCS4 (ng/mL)	ECPCS5 (ng/mL)
2,2',5-Trichlorobiphenyl	*18*	20.0	50.0	200	800	2000
2,4,4'-Trichlorobiphenyl	*28*	20.0	50.0	200	800	2000
2',3,4-Trichlorobiphenyl	*33*	20.0	50.0	200	800	2000
2,2',5,5'-Tetrachlorobiphenyl	*52*	20.0	50.0	200	800	2000
2,2',3,5'-Tetrachlorobiphenyl	*44*	20.0	50.0	200	800	2000
2,3',4',5-Tetrachlorobiphenyl	*70*	20.0	50.0	200	800	2000
2,2',4,5,5'-Pentachlorobiphenyl	*101*	20.0	50.0	200	800	2000
2,3',4,4',5-Pentachlorobiphenyl	*118*	20.0	50.0	200	800	2000
2,3,3',4,4'-Pentachlorobiphenyl	*105*	20.0	50.0	200	800	2000
2,2',4,4',5,5'-Hexachlorobiphenyl	*153*	20.0	50.0	200	800	2000
2,2',3,4,4',5'-Hexachlorobiphenyl	*138*	20.0	50.0	200	800	2000
2,2',3,3',4,4'-Hexachlorobiphenyl	*128*	20.0	50.0	200	800	2000
2,2',3,4',5,5',6-Heptachlorobiphenyl	*187*	20.0	50.0	200	800	2000
2,2',3,4,4',5,5'-Heptachlorobiphenyl	*180*	20.0	50.0	200	800	2000
2,2',3,3',4,4',5-Heptachlorobiphenyl	*170*	20.0	50.0	200	800	2000
2,2',3,3',4,5,5',6'-Octachlorobiphenyl	*199*	20.0	50.0	200	800	2000
2,2',3,3',4,4',5,6-Octachlorobiphenyl	*195*	20.0	50.0	200	800	2000
2,2',3,3',4,4',5,5'-Octachlorobiphenyl	*194*	20.0	50.0	200	800	2000
2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl	*206*	20.0	50.0	200	800	2000
Decachlorobiphenyl	*209*	20.0	50.0	200	800	2000
MASS-LABELLED PCBs*						
2,4,4'-Trichloro($^{13}C_{12}$)biphenyl	*28L*	400	400	400	400	400
2,2',5,5'-Tetrachloro($^{13}C_{12}$)biphenyl	*52L*	400	400	400	400	400
2,3',4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*118L*	400	400	400	400	400
2,2',4,4',5,5'-Hexachloro($^{13}C_{12}$)biphenyl	*153L*	400	400	400	400	400
2,2',3,4,4',5,5'-Heptachloro($^{13}C_{12}$)biphenyl	*180L*	400	400	400	400	400
2,2',3,3',5,5',6,6'-Octachloro($^{13}C_{12}$)biphenyl	*202L*	400	400	400	400	400
2,2',3,3',4,4',5,5',6-Nonachloro($^{13}C_{12}$)biphenyl	*206L*	400	400	400	400	400
Decachloro($^{13}C_{12}$)biphenyl	*209L*	400	400	400	400	400
MASS-LABELLED RECOVERY STANDARDS*						
2,2',4,5,5'-Pentachloro($^{13}C_{12}$)biphenyl	*101L*	400	400	400	400	400
2,2',3,3',4,4',5,5'-Octachloro($^{13}C_{12}$)biphenyl	*194L*	400	400	400	400	400

* In order of elution on a 60 m DB-5 column.

ENVIRONMENT CANADA METHOD 1/RM/31 STANDARD SOLUTIONS

Catalogue Number	Product (isooctane solution)	Qty/Conc
EC9605-RS	Recovery Standard Solution	1.2 mL
EC9605-SS	Surrogate Solution	1.2 mL
EC9605-PAR	Precision and Recovery Solution	1.2 mL

NATIVE PCBs	*IUPAC*	EC9605-RS (µg/mL)	EC9605-SS (µg/mL)	EC9605-PAR (ng/mL)
2,2',5-Trichlorobiphenyl	*18*	—	—	100
2,4,4'-Trichlorobiphenyl	*28*	—	—	100
2',3,4-Trichlorobiphenyl	*33*	—	—	100
2,2',5,5'-Tetrachlorobiphenyl	*52*	—	—	100
2,2',3,5'-Tetrachlorobiphenyl	*44*	—	—	100
2,3',4',5-Tetrachlorobiphenyl	*70*	—	—	100
2,2',4,5,5'-Pentachlorobiphenyl	*101*	—	—	100
2,3',4,4',5-Pentachlorobiphenyl	*118*	—	—	100
2,3,3',4,4'-Pentachlorobiphenyl	*105*	—	—	100
2,2',4,4',5,5'-Hexachlorobiphenyl	*153*	—	—	100
2,2',3,4,4',5'-Hexachlorobiphenyl	*138*	—	—	100
2,2',3,3',4,4'-Hexachlorobiphenyl	*128*	—	—	100
2,2',3,4',5,5',6-Heptachlorobiphenyl	*187*	—	—	100
2,2',3,4,4',5,5'-Heptachlorobiphenyl	*180*	—	—	100
2,2',3,3',4,4',5-Heptachlorobiphenyl	*170*	—	—	100
2,2',3,3',4,5,5',6'-Octachlorobiphenyl	*199*	—	—	100
2,2',3,3',4,4',5,6-Octachlorobiphenyl	*195*	—	—	100
2,2',3,3',4,4',5,5'-Octachlorobiphenyl	*194*	—	—	100
2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl	*206*	—	—	100
Decachlorobiphenyl	*209*	—	—	100
MASS-LABELLED PCBs				
2,4,4'-Trichloro($^{13}C_{12}$)biphenyl	*28L*	—	2.00	—
2,2',5,5'-Tetrachloro($^{13}C_{12}$)biphenyl	*52L*	—	2.00	—
2,3',4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*118L*	—	2.00	—
2,2',4,4',5,5'-Hexachloro($^{13}C_{12}$)biphenyl	*153L*	—	2.00	—
2,2',3,4,4',5,5'-Heptachloro($^{13}C_{12}$)biphenyl	*180L*	—	2.00	—
2,2',3,3',5,5',6,6'-Octachloro($^{13}C_{12}$)biphenyl	*202L*	—	2.00	—
2,2',3,3',4,4',5,5',6-Nonachloro($^{13}C_{12}$)biphenyl	*206L*	—	2.00	—
Decachloro($^{13}C_{12}$)biphenyl	*209L*	—	2.00	—
MASS-LABELLED RECOVERY STANDARDS				
2,2',4,5,5'-Pentachloro($^{13}C_{12}$)biphenyl	*101L*	2.00	—	—
2,2',3,3',4,4',5,5'-Octachloro($^{13}C_{12}$)biphenyl	*194L*	2.00	—	—



P48-W-CVS

Catalogue Number	Product (nonane solution)	Qty/Conc
P48-W-CVS	P48-W-CVS; EN 1948-4:2010 HRGC/HRMS Calibration Solutions for the Dioxin-like PCBs CS1-CS6	1 kit (6 ampoules)
P48-W-CS1	CS1	500 µL
P48-W-CS2	CS2	500 µL
P48-W-CS3	CS3	500 µL
P48-W-CS4	CS4	500 µL
P48-W-CS5	CS5	500 µL
P48-W-CS6	CS6	500 µL

NATIVE DIOXIN-LIKE PCBs	*IUPAC*	P48-W-CS1 (pg/µL)	P48-W-CS2 (pg/µL)	P48-W-CS3 (pg/µL)	P48-W-CS4 (pg/µL)	P48-W-CS5 (pg/µL)	P48-W-CS6 (pg/µL)
3,3',4,4'-Tetrachlorobiphenyl	*77*	0.100	1.00	10.0	50.0	200	800
3,4,4',5-Tetrachlorobiphenyl	*81*	0.100	1.00	10.0	50.0	200	800
2,3,3',4,4'-Pentachlorobiphenyl	*105*	0.100	1.00	10.0	50.0	200	800
2,3,4,4',5-Pentachlorobiphenyl	*114*	0.100	1.00	10.0	50.0	200	800
2,3',4,4',5-Pentachlorobiphenyl	*118*	0.600	6.00	60.0	300	1200	4800
2',3,4,4',5-Pentachlorobiphenyl	*123*	0.100	1.00	10.0	50.0	200	800
3,3',4,4',5-Pentachlorobiphenyl	*126*	0.100	1.00	10.0	50.0	200	800
2,3,3',4,4',5-Hexachlorobiphenyl	*156*	0.100	1.00	10.0	50.0	200	800
2,3,3',4,4',5'-Hexachlorobiphenyl	*157*	0.100	1.00	10.0	50.0	200	800
2,3',4,4',5,5'-Hexachlorobiphenyl	*167*	0.100	1.00	10.0	50.0	200	800
3,3',4,4',5,5'-Hexachlorobiphenyl	*169*	0.100	1.00	10.0	50.0	200	800
2,3,3',4,4',5,5'-Heptachlorobiphenyl	*189*	0.100	1.00	10.0	50.0	200	800
WHO PCB EXTRACTION STANDARDS							
3,3',4,4'-Tetrachloro($^{13}C_{12}$)biphenyl	*77L*	10.0	10.0	10.0	10.0	10.0	10.0
3,4,4',5-Tetrachloro($^{13}C_{12}$)biphenyl	*81L*	10.0	10.0	10.0	10.0	10.0	10.0
2,3,3',4,4'-Pentachloro($^{13}C_{12}$)biphenyl	*105L*	10.0	10.0	10.0	10.0	10.0	10.0
2,3,4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*114L*	10.0	10.0	10.0	10.0	10.0	10.0
2,3',4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*118L*	10.0	10.0	10.0	10.0	10.0	10.0
2',3,4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*123L*	10.0	10.0	10.0	10.0	10.0	10.0
3,3',4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*126L*	10.0	10.0	10.0	10.0	10.0	10.0
2,3,3',4,4',5-Hexachloro($^{13}C_{12}$)biphenyl	*156L*	10.0	10.0	10.0	10.0	10.0	10.0
2,3,3',4,4',5'-Hexachloro($^{13}C_{12}$)biphenyl	*157L*	10.0	10.0	10.0	10.0	10.0	10.0
2,3',4,4',5,5'-Hexachloro($^{13}C_{12}$)biphenyl	*167L*	10.0	10.0	10.0	10.0	10.0	10.0
3,3',4,4',5,5'-Hexachloro($^{13}C_{12}$)biphenyl	*169L*	10.0	10.0	10.0	10.0	10.0	10.0
2,3,3',4,4',5,5'-Heptachloro($^{13}C_{12}$)biphenyl	*189L*	10.0	10.0	10.0	10.0	10.0	10.0
SAMPLING STANDARDS							
2,3,4,4'-Tetrachloro($^{13}C_{12}$)biphenyl	*60L*	10.0	10.0	10.0	10.0	10.0	10.0
3,3',4,5,5'-Pentachloro($^{13}C_{12}$)biphenyl	*127L*	10.0	10.0	10.0	10.0	10.0	10.0
2,3,3',4,5,5'-Hexachloro($^{13}C_{12}$)biphenyl	*159L*	10.0	10.0	10.0	10.0	10.0	10.0
RECOVERY STANDARDS							
2,3',4',5-Tetrachloro($^{13}C_{12}$)biphenyl	*70L*	10.0	10.0	10.0	10.0	10.0	10.0
2,3,3',5,5'-Pentachloro($^{13}C_{12}$)biphenyl	*111L*	10.0	10.0	10.0	10.0	10.0	10.0
2,2',3,3',4,4',5-Heptachloro($^{13}C_{12}$)biphenyl	*170L*	10.0	10.0	10.0	10.0	10.0	10.0

Catalogue Number	Product (nonane solution)	Qty/Conc
P48-M-CVS	P48-M-CVS; EN 1948-4:2010 HRGC/HRMS Calibration Solutions for the Marker PCBs CS0.1-CS5	1 kit (6 ampoules)
P48-M-CS0.1	CS0.1	500 µL
P48-M-CS1	CS1	500 µL
P48-M-CS2	CS2	500 µL
P48-M-CS3	CS3	500 µL
P48-M-CS4	CS4	500 µL
P48-M-CS5	CS5	500 µL

NATIVE MARKER PCBs	*IUPAC*	P48-M-CS0.1 (pg/µL)	P48-M-CS1 (pg/µL)	P48-M-CS2 (pg/µL)	P48-M-CS3 (pg/µL)	P48-M-CS4 (pg/µL)	P48-M-CS5 (pg/µL)
2,4,4'-Trichlorobiphenyl	*28*	0.100	1.00	10.0	100	500	5000
2,2',5,5'-Tetrachlorobiphenyl	*52*	0.100	1.00	10.0	100	500	5000
2,2',4,5,5'-Pentachlorobiphenyl	*101*	0.100	1.00	10.0	100	500	5000
2,2',3,4,4',5'-Hexachlorobiphenyl	*138*	0.100	1.00	10.0	100	500	5000
2,2',4,4',5,5'-Hexachlorobiphenyl	*153*	0.100	1.00	10.0	100	500	5000
2,2',3,4,4',5,5'-Heptachlorobiphenyl	*180*	0.100	1.00	10.0	100	500	5000
MARKER PCB EXTRACTION STANDARDS							
2,4,4'-Trichloro($^{13}C_{12}$)biphenyl	*28L*	100	100	100	100	100	100
2,2',5,5'-Tetrachloro($^{13}C_{12}$)biphenyl	*52L*	100	100	100	100	100	100
2,2',4,5,5'-Pentachloro($^{13}C_{12}$)biphenyl	*101L*	100	100	100	100	100	100
2,2',3,4,4',5'-Hexachloro($^{13}C_{12}$)biphenyl	*138L*	100	100	100	100	100	100
2,2',4,4',5,5'-Hexachloro($^{13}C_{12}$)biphenyl	*153L*	100	100	100	100	100	100
2,2',3,4,4',5,5'-Heptachloro($^{13}C_{12}$)biphenyl	*180L*	100	100	100	100	100	100
SAMPLING STANDARDS							
2,3,4,4'-Tetrachloro($^{13}C_{12}$)biphenyl	*60L*	10.0	10.0	10.0	10.0	10.0	10.0
3,3',4,5,5'-Pentachloro($^{13}C_{12}$)biphenyl	*127L*	10.0	10.0	10.0	10.0	10.0	10.0
2,3,3',4,5,5'-Hexachloro($^{13}C_{12}$)biphenyl	*159L*	10.0	10.0	10.0	10.0	10.0	10.0
RECOVERY STANDARDS							
2,3',4',5-Tetrachloro($^{13}C_{12}$)biphenyl	*70L*	10.0	10.0	10.0	10.0	10.0	10.0
2,3,3',5,5'-Pentachloro($^{13}C_{12}$)biphenyl	*111L*	10.0	10.0	10.0	10.0	10.0	10.0
2,2',3,3',4,4',5-Heptachloro($^{13}C_{12}$)biphenyl	*170L*	10.0	10.0	10.0	10.0	10.0	10.0



WM48-CVS

Catalogue Number	Product (nonane solution)	Qty/Conc
WM48-CVS	WM48-CVS; EN 1948-4:2010 HRGC/HRMS Calibration Solutions for the Dioxin-like and Marker PCBs CS1-CS6	1 kit (6 ampoules)
WM48-CS1	CS1	500 µL
WM48-CS2	CS2	500 µL
WM48-CS3	CS3	500 µL
WM48-CS4	CS4	500 µL
WM48-CS5	CS5	500 µL
WM48-CS6	CS6	500 µL

NATIVE DIOXIN-LIKE PCBs	*IUPAC*	WM48-CS1 (pg/µL)	WM48-CS2 (pg/µL)	WM48-CS3 (pg/µL)	WM48-CS4 (pg/µL)	WM48-CS5 (pg/µL)	WM48-CS6 (pg/µL)
3,3',4,4'-Tetrachlorobiphenyl	*77*	0.100	0.500	2.00	10.0	40.0	200
3,4,4',5-Tetrachlorobiphenyl	*81*	0.100	0.500	2.00	10.0	40.0	200
2,3,3',4,4'-Pentachlorobiphenyl	*105*	0.100	0.500	2.00	10.0	40.0	200
2,3,4,4',5-Pentachlorobiphenyl	*114*	0.100	0.500	2.00	10.0	40.0	200
2,3',4,4',5-Pentachlorobiphenyl	*118*	0.500	2.50	10.0	50.0	200	1000
2',3,4,4',5-Pentachlorobiphenyl	*123*	0.100	0.500	2.00	10.0	40.0	200
3,3',4,4',5-Pentachlorobiphenyl	*126*	0.100	0.500	2.00	10.0	40.0	200
2,3,3',4,4',5-Hexachlorobiphenyl	*156*	0.100	0.500	2.00	10.0	40.0	200
2,3,3',4,4',5'-Hexachlorobiphenyl	*157*	0.100	0.500	2.00	10.0	40.0	200
2,3',4,4',5,5'-Hexachlorobiphenyl	*167*	0.100	0.500	2.00	10.0	40.0	200
3,3',4,4',5,5'-Hexachlorobiphenyl	*169*	0.100	0.500	2.00	10.0	40.0	200
2,3,3',4,4',5,5'-Heptachlorobiphenyl	*189*	0.100	0.500	2.00	10.0	40.0	200
NATIVE MARKER PCBs							
2,4,4'-Trichlorobiphenyl	*28*	0.500	2.50	10.0	50.0	200	1000
2,2',5,5'-Tetrachlorobiphenyl	*52*	0.500	2.50	10.0	50.0	200	1000
2,2',4,5,5'-Pentachlorobiphenyl	*101*	0.500	2.50	10.0	50.0	200	1000
2,2',3,4,4',5'-Hexachlorobiphenyl	*138*	0.500	2.50	10.0	50.0	200	1000
2,2',4,4',5,5'-Hexachlorobiphenyl	*153*	0.500	2.50	10.0	50.0	200	1000
2,2',3,4,4',5,5'-Heptachlorobiphenyl	*180*	0.500	2.50	10.0	50.0	200	1000
EXTRACTION STANDARDS							
3,3',4,4'-Tetrachloro($^{13}C_{12}$)biphenyl	*77L*	10.0	10.0	10.0	10.0	10.0	10.0
3,4,4',5-Tetrachloro($^{13}C_{12}$)biphenyl	*81L*	10.0	10.0	10.0	10.0	10.0	10.0
2,3,3',4,4'-Pentachloro($^{13}C_{12}$)biphenyl	*105L*	10.0	10.0	10.0	10.0	10.0	10.0
2,3,4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*114L*	10.0	10.0	10.0	10.0	10.0	10.0
2,3',4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*118L*	10.0	10.0	10.0	10.0	10.0	10.0
2',3,4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*123L*	10.0	10.0	10.0	10.0	10.0	10.0
3,3',4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*126L*	10.0	10.0	10.0	10.0	10.0	10.0
2,3,3',4,4',5-Hexachloro($^{13}C_{12}$)biphenyl	*156L*	10.0	10.0	10.0	10.0	10.0	10.0
2,3,3',4,4',5'-Hexachloro($^{13}C_{12}$)biphenyl	*157L*	10.0	10.0	10.0	10.0	10.0	10.0
2,3',4,4',5,5'-Hexachloro($^{13}C_{12}$)biphenyl	*167L*	10.0	10.0	10.0	10.0	10.0	10.0
3,3',4,4',5,5'-Hexachloro($^{13}C_{12}$)biphenyl	*169L*	10.0	10.0	10.0	10.0	10.0	10.0
2,3,3',4,4',5,5'-Heptachloro($^{13}C_{12}$)biphenyl	*189L*	10.0	10.0	10.0	10.0	10.0	10.0
2,4,4'-Trichloro($^{13}C_{12}$)biphenyl	*28L*	10.0	10.0	10.0	10.0	10.0	10.0
2,2',5,5'-Tetrachloro($^{13}C_{12}$)biphenyl	*52L*	10.0	10.0	10.0	10.0	10.0	10.0
2,2',4,5,5'-Pentachloro($^{13}C_{12}$)biphenyl	*101L*	10.0	10.0	10.0	10.0	10.0	10.0
2,2',3,4,4',5'-Hexachloro($^{13}C_{12}$)biphenyl	*138L*	10.0	10.0	10.0	10.0	10.0	10.0
2,2',4,4',5,5'-Hexachloro($^{13}C_{12}$)biphenyl	*153L*	10.0	10.0	10.0	10.0	10.0	10.0
2,2',3,4,4',5,5'-Heptachloro($^{13}C_{12}$)biphenyl	*180L*	10.0	10.0	10.0	10.0	10.0	10.0
SAMPLING STANDARDS							
2,3,4,4'-Tetrachloro($^{13}C_{12}$)biphenyl	*60L*	10.0	10.0	10.0	10.0	10.0	10.0
3,3',4,5,5'-Pentachloro($^{13}C_{12}$)biphenyl	*127L*	10.0	10.0	10.0	10.0	10.0	10.0
2,3,3',4,5,5'-Hexachloro($^{13}C_{12}$)biphenyl	*159L*	10.0	10.0	10.0	10.0	10.0	10.0
RECOVERY STANDARDS							
2,3',4',5-Tetrachloro($^{13}C_{12}$)biphenyl	*70L*	10.0	10.0	10.0	10.0	10.0	10.0
2,3,3',5,5'-Pentachloro($^{13}C_{12}$)biphenyl	*111L*	10.0	10.0	10.0	10.0	10.0	10.0
2,2',3,3',4,4',5-Heptachloro($^{13}C_{12}$)biphenyl	*170L*	10.0	10.0	10.0	10.0	10.0	10.0

P48-W-PAR: Native Dioxin-Like (WHO) PCB Solution

Catalogue Number	Product (nonane solution)	Qty/Conc
P48-W-PAR	P48-W-PAR; EN 1948-4:2010	1.2 mL

NATIVE DIOXIN-LIKE (WHO) PCBs	*IUPAC*	P48-W-PAR (pg/µL)
3,3',4,4'-Tetrachlorobiphenyl	*77*	250
3,4,4',5-Tetrachlorobiphenyl	*81*	250
2,3,3',4,4'-Pentachlorobiphenyl	*105*	250
2,3,4,4',5-Pentachlorobiphenyl	*114*	250
2,3',4,4',5-Pentachlorobiphenyl	*118*	1500
2',3,4,4',5-Pentachlorobiphenyl	*123*	250
3,3',4,4',5-Pentachlorobiphenyl	*126*	250
2,3,3',4,4',5-Hexachlorobiphenyl	*156*	250
2,3,3',4,4',5'-Hexachlorobiphenyl	*157*	250
2,3',4,4',5,5'-Hexachlorobiphenyl	*167*	250
3,3',4,4',5,5'-Hexachlorobiphenyl	*169*	250
2,3,3',4,4',5,5'-Heptachlorobiphenyl	*189*	250

P48-M-PAR: Native Marker PCB Solution

Catalogue Number	Product (nonane solution)	Qty/Conc
P48-M-PAR	P48-M-PAR; EN 1948-4:2010	1.2 mL

NATIVE MARKER PCBs	*IUPAC*	P48-M-PAR (pg/µL)
2,4,4'-Trichlorobiphenyl	*28*	250
2,2',5,5'-Tetrachlorobiphenyl	*52*	250
2,2',4,5,5'-Pentachlorobiphenyl	*101*	250
2,2',3,4,4',5'-Hexachlorobiphenyl	*138*	250
2,2',4,4',5,5'-Hexachlorobiphenyl	*153*	250
2,2',3,4,4',5,5'-Heptachlorobiphenyl	*180*	250



SUPPORT SOLUTIONS FOR EN 1948-4:2010

Catalogue Number	Product (nonane solution)	Qty/Conc
P48-W-ES	Dioxin-like (WHO) PCB Extraction Standard	1.2 mL
P48-M-ES	Marker PCB Extraction Standard	1.2 mL
P48-SS	Mass-Labelled PCB Sampling Standard	1.2 mL
P48-RS	Mass-Labelled PCB Recovery Standard	1.2 mL

DIOXIN-LIKE PCB EXTRACTION STANDARD	*IUPAC*	P48-W-ES (pg/µL)	P48-M-ES (pg/µL)	P48-SS (pg/µL)	P48-RS (pg/uL)
3,3',4,4'-Tetrachloro($^{13}C_{12}$)biphenyl	*77L*	100	—	—	—
3,4,4',5-Tetrachloro($^{13}C_{12}$)biphenyl	*81L*	100	—	—	—
2,3,3',4,4'-Pentachloro($^{13}C_{12}$)biphenyl	*105L*	100	—	—	—
2,3,4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*114L*	100	—	—	—
2,3',4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*118L*	100	—	—	—
2',3,4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*123L*	100	—	—	—
3,3',4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*126L*	100	—	—	—
2,3,3',4,4',5-Hexachloro($^{13}C_{12}$)biphenyl	*156L*	100	—	—	—
2,3,3',4,4',5'-Hexachloro($^{13}C_{12}$)biphenyl	*157L*	100	—	—	—
2,3',4,4',5,5'-Hexachloro($^{13}C_{12}$)biphenyl	*167L*	100	—	—	—
3,3',4,4',5,5'-Hexachloro($^{13}C_{12}$)biphenyl	*169L*	100	—	—	—
2,3,3',4,4',5,5'-Heptachloro($^{13}C_{12}$)biphenyl	*189L*	100	—	—	—
MARKER PCB EXTRACTION STANDARD					
2,4,4'-Trichloro($^{13}C_{12}$)biphenyl	*28L*	—	1000	—	—
2,2',5,5'-Tetrachloro($^{13}C_{12}$)biphenyl	*52L*	—	1000	—	—
2,2',4,5,5'-Pentachloro($^{13}C_{12}$)biphenyl	*101L*	—	1000	—	—
2,2',3,4,4',5'-Hexachloro($^{13}C_{12}$)biphenyl	*138L*	—	1000	—	—
2,2',4,4',5,5'-Hexachloro($^{13}C_{12}$)biphenyl	*153L*	—	1000	—	—
2,2',3,4,4',5,5'-Heptachloro($^{13}C_{12}$)biphenyl	*180L*	—	1000	—	—
MASS-LABELLED PCB SAMPLING STANDARD					
2,3,4,4'-Tetrachloro($^{13}C_{12}$)biphenyl	*60L*	—	—	100	—
3,3',4,5,5'-Pentachloro($^{13}C_{12}$)biphenyl	*127L*	—	—	100	—
2,3,3',4,5,5'-Hexachloro($^{13}C_{12}$)biphenyl	*159L*	—	—	100	—
MASS-LABELLED PCB RECOVERY STANDARD					
2,3',4',5-Tetrachloro($^{13}C_{12}$)biphenyl	*70L*	—	—	—	100
2,3,3',5,5'-Pentachloro($^{13}C_{12}$)biphenyl	*111L*	—	—	—	100
2,2',3,3',4,4',5-Heptachloro($^{13}C_{12}$)biphenyl	*170L*	—	—	—	100

PCBs: MASS-LABELLED CONGENERS

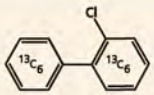
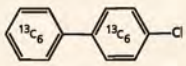
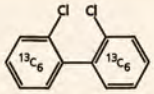
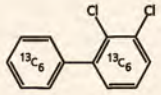
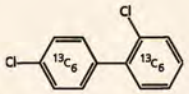
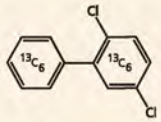
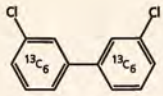
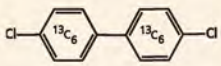
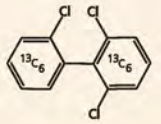
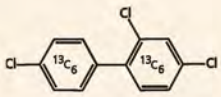
Wellington began the preparation of $^{13}C_{12}$-labelled PCBs in the early 1990s and now offers an extensive selection. This includes mass-labelled analogues of the 12 'dioxin-like' PCBs as well as those of the more prominent congeners found in industrial mixtures and the environment.

The ^{13}C-PCBs in the following pages were all prepared using one-product, unambiguous routes and purified using a variety of methods. Their structures, chemical and isotopic purities were confirmed using multiple instruments and this data is included in detailed Certificates of Analysis (CofAs).

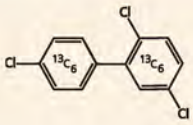
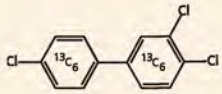
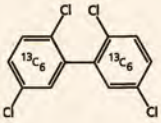
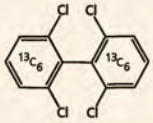
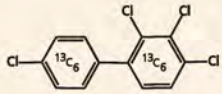
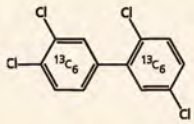
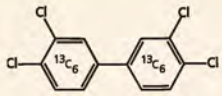
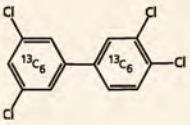
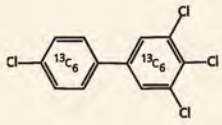
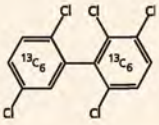
Additional ^{13}C-PCBs may be added in the future, so please continue to visit our website for updates or contact Wellington or your local distributor if you have any requests for additional congeners.



MASS-LABELLED POLYCHLORINATED BIPHENYLS

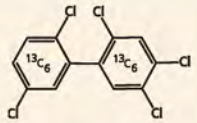
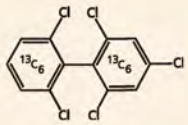
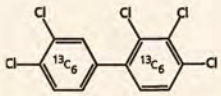
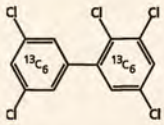
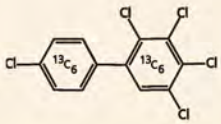
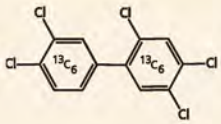
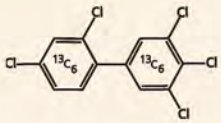
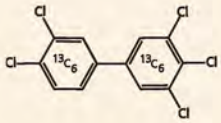
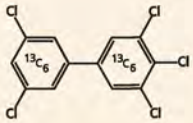
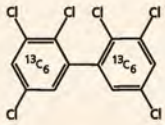
Catalogue Number		Product
MBP-1		2-Chloro($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBP-3		4-Chloro($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBP-4		2,2'-Dichloro($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBP-5		2,3-Dichloro($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBP-8		2,4'-Dichloro($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBP-9		2,5-Dichloro($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBP-11		3,3'-Dichloro($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBP-15		4,4'-Dichloro($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBP-19		2,2',6-Trichloro($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBP-28		2,4,4'-Trichloro($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane

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

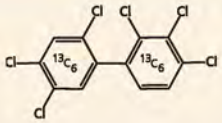
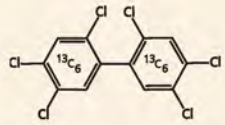
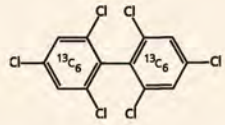
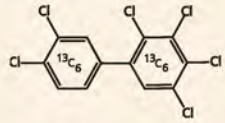
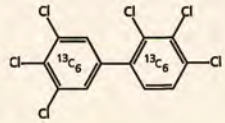
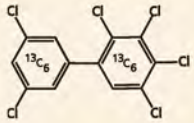
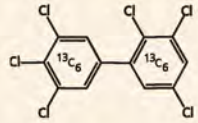
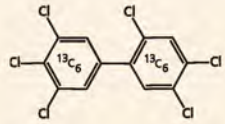
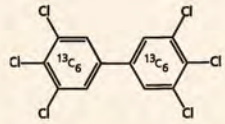
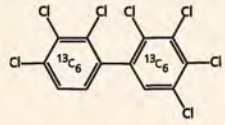
Catalogue Number		Product
MBP-31		2,4',5-Trichloro($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBP-37		3,4,4'-Trichloro($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBP-52		2,2',5,5'-Tetrachloro($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBP-54		2,2',6,6'-Tetrachloro($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBP-60		2,3,4,4'-Tetrachloro($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBP-70		2,3',4',5-Tetrachloro($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBP-77		3,3',4,4'-Tetrachloro($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBP-79		3,3',4,5'-Tetrachloro($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBP-81		3,4,4',5-Tetrachloro($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBP-95		2,2',3,5',6-Pentachloro($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane

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

MASS-LABELLED POLYCHLORINATED BIPHENYLS

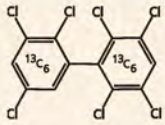
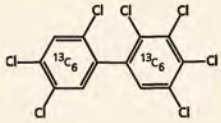
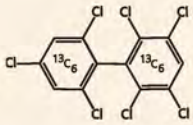
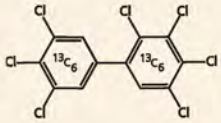
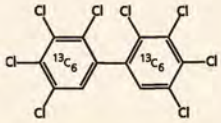
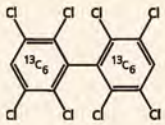
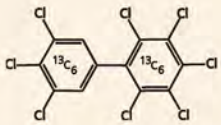
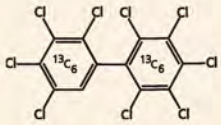
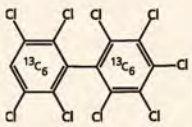
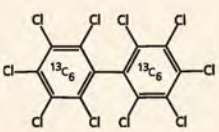
Catalogue Number		Product
MBP-101		2,2',4,5,5'-Pentachloro($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBP-104		2,2',4,6,6'-Pentachloro($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBP-105		2,3,3',4,4'-Pentachloro($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBP-111		2,3,3',5,5'-Pentachloro($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBP-114		2,3,4,4',5-Pentachloro($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBP-118		2,3',4,4',5-Pentachloro($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBP-123		2',3,4,4',5-Pentachloro($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBP-126		3,3',4,4',5-Pentachloro($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBP-127		3,3',4,5,5'-Pentachloro($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBP-133		2,2',3,3',5,5'-Hexachloro($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane

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

Catalogue Number		Product
MBP-138		2,2',3,4,4',5'-Hexachloro($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBP-153		2,2',4,4',5,5'-Hexachloro($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBP-155		2,2',4,4',6,6'-Hexachloro($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBP-156		2,3,3',4,4',5-Hexachloro($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBP-157		2,3,3',4,4',5'-Hexachloro($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBP-159		2,3,3',4,5,5'-Hexachloro($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBP-162		2,3,3',4',5,5'-Hexachloro($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBP-167		2,3',4,4',5,5'-Hexachloro($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBP-169		3,3',4,4',5,5'-Hexachloro($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBP-170		2,2',3,3',4,4',5-Heptachloro($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane

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

MASS-LABELLED POLYCHLORINATED BIPHENYLS

Catalogue Number		Product
MBP-178		2,2',3,3',5,5',6-Heptachloro($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBP-180		2,2',3,4,4',5,5'-Heptachloro($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBP-188		2,2',3,4',5,6,6'-Heptachloro($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBP-189		2,3,3',4,4',5,5'-Heptachloro($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBP-194		2,2',3,3',4,4',5,5'-Octachloro($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBP-202		2,2',3,3',5,5',6,6'-Octachloro($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBP-205		2,3,3',4,4',5,5',6-Octachloro($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBP-206		2,2',3,3',4,4',5,5',6-Nonachloro($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBP-208		2,2',3,3',4,5,5',6,6'-Nonachloro($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBP-209		Decachloro($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane

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

PCBs: SPECIALTY SOLUTION/MIXTURES

Additional PCB calibration sets, and other solutions/mixtures, have been prepared and are presented in this section.

PCB-CVS-A10 and **PCB-CVS-B10**, and their support solutions, were designed and prepared to be used to satisfy the requirements of the Japanese Industrial Standards **JIS K 0311:2005** and **JIS K 0312:2005**. Note that PCB congeners 170 and 180, and their ^{13}C analogues, have been added to the 12 'dioxin-like' PCBs. Some years back these two congeners were assigned 'provisional TEFs'.

Also offered is **PCB-CVS-H**, a calibration set with support solutions, and solution/mixtures containing a larger number of PCB congeners.

All of the solutions from this section are accompanied by detailed Certificates of Analysis (CofAs) that include HRGC/LRMS and/or HRGC/HRMS data as appropriate, along with RRF summaries for each calibration set.





PCB-CVS-H

Catalogue Number	Product (nonane solution)	Qty/Conc
PCB-CVS-H	Calibration Solutions for HRGC/HRMS Analysis of Polychlorinated Biphenyls (PCBs) CS1-CS6	1 kit (6 ampoules)
PCB-CS1-H	CS1	200 µL
PCB-CS2-H	CS2	200 µL
PCB-CS3-H	CS3	200 µL
PCB-CS4-H	CS4	200 µL
PCB-CS5-H	CS5	200 µL
PCB-CS6-H	CS6	200 µL

NATIVE PCBs (*IUPAC*)		PCB-CS1-H (ng/mL)	PCB-CS2-H (ng/mL)	PCB-CS3-H (ng/mL)	PCB-CS4-H (ng/mL)	PCB-CS5-H (ng/mL)	PCB-CS6-H (ng/mL)
CHLOROBIPHENYLS 1, 3		0.100	0.500	2.00	10.0	40.0	200
DICHLOROBIPHENYLS 4, 6, 8, 10, 15		0.100	0.500	2.00	10.0	40.0	200
TRICHLOROBIPHENYLS 16, 18, 19, 22, 28, 31, 33, 37		0.100	0.500	2.00	10.0	40.0	200
TETRACHLOROBIPHENYLS 40, 41, 44, 49, 52, 54, 60, 66, 70, 74, 77, 81		0.100	0.500	2.00	10.0	40.0	200
PENTACHLOROBIPHENYLS 84, 85, 87, 90, 95, 97, 99, 101, 104 105, 110, 114, 118, 119, 123, 126		0.100	0.500	2.00	10.0	40.0	200
HEXACHLOROBIPHENYLS 128, 129, 135, 137, 138, 141, 149, 151, 153, 155, 156, 157, 158, 167, 168, 169		0.100	0.500	2.00	10.0	40.0	200
HEPTACHLOROBIPHENYLS 170,171, 174, 177, 178, 180, 183, 187, 188, 189, 191, 193		0.100	0.500	2.00	10.0	40.0	200
OCTACHLOROBIPHENYLS 194, 199, 200, 201, 202, 203, 205		0.100	0.500	2.00	10.0	40.0	200
NONACHLOROBIPHENYLS 206, 207, 208		0.100	0.500	2.00	10.0	40.0	200
DECACHLOROBIPHENYL 209		0.100	0.500	2.00	10.0	40.0	200
MASS-LABELLED PCBs EXTRACTION STANDARDS	***IUPAC***						
2-Chloro($^{13}C_{12}$)biphenyl	***1L***	50.0	50.0	50.0	50.0	50.0	50.0
4-Chloro($^{13}C_{12}$)biphenyl	***3L***	50.0	50.0	50.0	50.0	50.0	50.0
2,2'-Dichloro($^{13}C_{12}$)biphenyl	***4L***	50.0	50.0	50.0	50.0	50.0	50.0
2,4'-Dichloro($^{13}C_{12}$)biphenyl	***8L***	50.0	50.0	50.0	50.0	50.0	50.0
4,4'-Dichloro($^{13}C_{12}$)biphenyl	***15L***	50.0	50.0	50.0	50.0	50.0	50.0
2,2',6-Trichloro($^{13}C_{12}$)biphenyl	***19L***	50.0	50.0	50.0	50.0	50.0	50.0
2,4,4'-Trichloro($^{13}C_{12}$)biphenyl	***28L***	50.0	50.0	50.0	50.0	50.0	50.0
2,2',5,5'-Tetrachloro($^{13}C_{12}$)biphenyl	***52L***	50.0	50.0	50.0	50.0	50.0	50.0
2,2',6,6'-Tetrachloro($^{13}C_{12}$)biphenyl	***54L***	50.0	50.0	50.0	50.0	50.0	50.0
2,3',4',5-Tetrachloro($^{13}C_{12}$)biphenyl	***70L***	50.0	50.0	50.0	50.0	50.0	50.0
3,3',4,4'-Tetrachloro($^{13}C_{12}$)biphenyl	***77L***	50.0	50.0	50.0	50.0	50.0	50.0
3,4,4',5-Tetrachloro($^{13}C_{12}$)biphenyl	***81L***	50.0	50.0	50.0	50.0	50.0	50.0
2,2',3,5',6-Pentachloro($^{13}C_{12}$)biphenyl	***95L***	50.0	50.0	50.0	50.0	50.0	50.0
2,2',4,5,5'-Pentachloro($^{13}C_{12}$)biphenyl	***101L***	50.0	50.0	50.0	50.0	50.0	50.0
2,2',4,6,6'-Pentachloro($^{13}C_{12}$)biphenyl	***104L***	50.0	50.0	50.0	50.0	50.0	50.0
2,3,3',4,4'-Pentachloro($^{13}C_{12}$)biphenyl	***105L***	50.0	50.0	50.0	50.0	50.0	50.0
2,3,4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	***114L***	50.0	50.0	50.0	50.0	50.0	50.0
2,3',4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	***118L***	50.0	50.0	50.0	50.0	50.0	50.0
2',3,4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	***123L***	50.0	50.0	50.0	50.0	50.0	50.0
3,3',4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	***126L***	50.0	50.0	50.0	50.0	50.0	50.0
2,2',3,4,4',5'-Hexachloro($^{13}C_{12}$)biphenyl	***138L***	50.0	50.0	50.0	50.0	50.0	50.0
2,2',4,4',5,5'-Hexachloro($^{13}C_{12}$)biphenyl	***153L***	50.0	50.0	50.0	50.0	50.0	50.0
2,2',4,4',6,6'-Hexachloro($^{13}C_{12}$)biphenyl	***155L***	50.0	50.0	50.0	50.0	50.0	50.0
2,3,3',4,4',5-Hexachloro($^{13}C_{12}$)biphenyl	***156L***	50.0	50.0	50.0	50.0	50.0	50.0
2,3,3',4,4',5'-Hexachloro($^{13}C_{12}$)biphenyl	***157L***	50.0	50.0	50.0	50.0	50.0	50.0
2,3',4,4',5,5'-Hexachloro($^{13}C_{12}$)biphenyl	***167L***	50.0	50.0	50.0	50.0	50.0	50.0
3,3',4,4',5,5'-Hexachloro($^{13}C_{12}$)biphenyl	***169L***	50.0	50.0	50.0	50.0	50.0	50.0
2,2',3,3',4,4',5-Heptachloro($^{13}C_{12}$)biphenyl	***170L***	50.0	50.0	50.0	50.0	50.0	50.0
2,2',3,4,4',5,5'-Heptachloro($^{13}C_{12}$)biphenyl	***180L***	50.0	50.0	50.0	50.0	50.0	50.0
2,2',3,4',5,6,6'-Heptachloro($^{13}C_{12}$)biphenyl	***188L***	50.0	50.0	50.0	50.0	50.0	50.0
2,3,3',4,4',5,5'-Heptachloro($^{13}C_{12}$)biphenyl	***189L***	50.0	50.0	50.0	50.0	50.0	50.0
2,2',3,3',5,5',6,6'-Octachloro($^{13}C_{12}$)biphenyl	***202L***	50.0	50.0	50.0	50.0	50.0	50.0
2,3,3',4,4',5,5',6-Octachloro($^{13}C_{12}$)biphenyl	***205L***	50.0	50.0	50.0	50.0	50.0	50.0
2,2',3,3',4,5,5',6,6'-Nonachloro($^{13}C_{12}$)biphenyl	***208L***	50.0	50.0	50.0	50.0	50.0	50.0
Decachloro($^{13}C_{12}$)biphenyl	***209L***	50.0	50.0	50.0	50.0	50.0	50.0
RECOVERY/INTERNAL STANDARDS							
2,5-Dichloro($^{13}C_{12}$)biphenyl	***9L***	50.0	50.0	50.0	50.0	50.0	50.0
3,4,4'-Trichloro($^{13}C_{12}$)biphenyl	***37L***	50.0	50.0	50.0	50.0	50.0	50.0
3,3',4,5'-Tetrachloro($^{13}C_{12}$)biphenyl	***79L***	50.0	50.0	50.0	50.0	50.0	50.0
2,3,3',5,5'-Pentachloro($^{13}C_{12}$)biphenyl	***111L***	50.0	50.0	50.0	50.0	50.0	50.0
2,3,3',4',5,5'-Hexachloro($^{13}C_{12}$)biphenyl	***162L***	50.0	50.0	50.0	50.0	50.0	50.0
2,2',3,3',4,4',5,5'-Octachloro($^{13}C_{12}$)biphenyl	***194L***	50.0	50.0	50.0	50.0	50.0	50.0
2,2',3,3',4,4',5,5',6-Nonachloro($^{13}C_{12}$)biphenyl	***206L***	50.0	50.0	50.0	50.0	50.0	50.0
SAMPLING/CLEANUP STANDARDS							
2,3,4,4'-Tetrachloro($^{13}C_{12}$)biphenyl	***60L***	50.0	50.0	50.0	50.0	50.0	50.0
2,3,3',4,5,5'-Hexachloro($^{13}C_{12}$)biphenyl	***159L***	50.0	50.0	50.0	50.0	50.0	50.0

Catalogue Number	Product (nonane solution)	Qty/Conc
PCB-LCS-H	Mass-Labelled PCB Extraction Standards	1.2 mL
PCB-ISS-H	Mass-Labelled PCB Recovery/Internal Standards	1.2 mL
PCB-SCS-H	Mass-Labelled PCB Sampling/Cleanup Standards	1.2 mL
PCB-PAR-H	Native PCB Solution	1.2 mL

NATIVE PCBs (*IUPAC*)		PCB-LCS-H (ng/mL)	PCB-ISS-H (ng/mL)	PCB-SCS-H (ng/mL)	PCB-PAR-H (ng/mL)
CHLOROBIPHENYLS 1, 3		—	—	—	500
DICHLOROBIPHENYLS 4, 6, 8, 10, 15		—	—	—	500
TRICHLOROBIPHENYLS 16, 18, 19, 22, 28, 31, 33, 37		—	—	—	500
TETRACHLOROBIPHENYLS 40, 41, 44, 49, 52, 54, 60, 66, 70, 74, 77, 81		—	—	—	500
PENTACHLOROBIPHENYLS 84, 85, 87, 90, 95, 97, 99, 101, 104 105, 110, 114, 118, 119, 123, 126		—	—	—	500
HEXACHLOROBIPHENYLS 128, 129, 135, 137, 138, 141, 149, 151, 153, 155, 156, 157, 158, 167, 168, 169		—	—	—	500
HEPTACHLOROBIPHENYLS 170,171, 174, 177, 178, 180, 183, 187, 188, 189, 191, 193		—	—	—	500
OCTACHLOROBIPHENYLS 194, 199, 200, 201, 202, 203, 205		—	—	—	500
NONACHLOROBIPHENYLS 206, 207, 208		—	—	—	500
DECACHLOROBIPHENYL 209		—	—	—	500
MASS-LABELLED PCBs	***IUPAC***				
EXTRACTION STANDARDS					
2-Chloro($^{13}C_{12}$)biphenyl	***1L***	1000	—	—	—
4-Chloro($^{13}C_{12}$)biphenyl	***3L***	1000	—	—	—
2,2'-Dichloro($^{13}C_{12}$)biphenyl	***4L***	1000	—	—	—
2,4'-Dichloro($^{13}C_{12}$)biphenyl	***8L***	1000	—	—	—
4,4'-Dichloro($^{13}C_{12}$)biphenyl	***15L***	1000	—	—	—
2,2',6-Trichloro($^{13}C_{12}$)biphenyl	***19L***	1000	—	—	—
2,4,4'-Trichloro($^{13}C_{12}$)biphenyl	***28L***	1000	—	—	—
2,2',5,5'-Tetrachloro($^{13}C_{12}$)biphenyl	***52L***	1000	—	—	—
2,2',6,6'-Tetrachloro($^{13}C_{12}$)biphenyl	***54L***	1000	—	—	—
2,3',4',5-Tetrachloro($^{13}C_{12}$)biphenyl	***70L***	1000	—	—	—
3,3',4,4'-Tetrachloro($^{13}C_{12}$)biphenyl	***77L***	1000	—	—	—
3,4,4',5-Tetrachloro($^{13}C_{12}$)biphenyl	***81L***	1000	—	—	—
2,2',3,5',6-Pentachloro($^{13}C_{12}$)biphenyl	***95L***	1000	—	—	—
2,2',4,5,5'-Pentachloro($^{13}C_{12}$)biphenyl	***101L***	1000	—	—	—
2,2',4,6,6'-Pentachloro($^{13}C_{12}$)biphenyl	***104L***	1000	—	—	—
2,3,3',4,4'-Pentachloro($^{13}C_{12}$)biphenyl	***105L***	1000	—	—	—
2,3,4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	***114L***	1000	—	—	—
2,3',4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	***118L***	1000	—	—	—
2',3,4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	***123L***	1000	—	—	—
3,3',4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	***126L***	1000	—	—	—
2,2',3,4,4',5'-Hexachloro($^{13}C_{12}$)biphenyl	***138L***	1000	—	—	—
2,2',4,4',5,5'-Hexachloro($^{13}C_{12}$)biphenyl	***153L***	1000	—	—	—
2,2',4,4',6,6'-Hexachloro($^{13}C_{12}$)biphenyl	***155L***	1000	—	—	—
2,3,3',4,4',5-Hexachloro($^{13}C_{12}$)biphenyl	***156L***	1000	—	—	—
2,3,3',4,4',5'-Hexachloro($^{13}C_{12}$)biphenyl	***157L***	1000	—	—	—
2,3',4,4',5,5'-Hexachloro($^{13}C_{12}$)biphenyl	***167L***	1000	—	—	—
3,3',4,4',5,5'-Hexachloro($^{13}C_{12}$)biphenyl	***169L***	1000	—	—	—
2,2',3,3',4,4',5-Heptachloro($^{13}C_{12}$)biphenyl	***170L***	1000	—	—	—
2,2',3,4,4',5,5'-Heptachloro($^{13}C_{12}$)biphenyl	***180L***	1000	—	—	—
2,2',3,4',5,6,6'-Heptachloro($^{13}C_{12}$)biphenyl	***188L***	1000	—	—	—
2,3,3',4,4',5,5'-Heptachloro($^{13}C_{12}$)biphenyl	***189L***	1000	—	—	—
2,2',3,3',5,5',6,6'-Octachloro($^{13}C_{12}$)biphenyl	***202L***	1000	—	—	—
2,3,3',4,4',5,5',6-Octachloro($^{13}C_{12}$)biphenyl	***205L***	1000	—	—	—
2,2',3,3',4,5,5',6,6'-Nonachloro($^{13}C_{12}$)biphenyl	***208L***	1000	—	—	—
Decachloro($^{13}C_{12}$)biphenyl	***209L***	1000	—	—	—
RECOVERY/INTERNAL STANDARDS					
2,5-Dichloro($^{13}C_{12}$)biphenyl	***9L***	—	1000	—	—
3,4,4'-Trichloro($^{13}C_{12}$)biphenyl	***37L***	—	1000	—	—
3,3',4,5'-Tetrachloro($^{13}C_{12}$)biphenyl	***79L***	—	1000	—	—
2,3,3',5,5'-Pentachloro($^{13}C_{12}$)biphenyl	***111L***	—	1000	—	—
2,3,3',4',5,5'-Hexachloro($^{13}C_{12}$)biphenyl	***162L***	—	1000	—	—
2,2',3,3',4,4',5,5'-Octachloro($^{13}C_{12}$)biphenyl	***194L***	—	1000	—	—
2,2',3,3',4,4',5,5',6-Nonachloro($^{13}C_{12}$)biphenyl	***206L***	—	1000	—	—
SAMPLING/CLEANUP STANDARDS					
2,3,4,4'-Tetrachloro($^{13}C_{12}$)biphenyl	***60L***	—	—	1000	—
2,3,3',4,5,5'-Hexachloro($^{13}C_{12}$)biphenyl	***159L***	—	—	1000	—



PCB-CVS-A10

Catalogue Number	Product (nonane solution)	Qty/Conc
PCB-CVS-A10-Set1	CS1/CS3/CS5/CS7/CS9	1 kit (5 ampoules)
PCB-CVS-A10-Set2	CS2/CS4/CS6/CS8/CS10	1 kit (5 ampoules)
PCB-CVS-A10-Set3	CS3/CS5/CS7/CS9/CS11	1 kit (5 ampoules)
PCB-A10-CSL	CSL Extended Calibration/Low Level	200 µL
PCB-A10-CS1	CS1	200 µL
PCB-A10-CS2	CS2	200 µL
PCB-A10-CS3	CS3	200 µL
PCB-A10-CS4	CS4	200 µL

NATIVE PCBs	*IUPAC*	PCB-A10-CSL (ng/mL)	PCB-A10-CS1 (ng/mL)	PCB-A10-CS2 (ng/mL)	PCB-A10-CS3 (ng/mL)	PCB-A10-CS4 (ng/mL)
3,3',4,4'-Tetrachlorobiphenyl	*77*	0.0500	0.100	0.200	0.500	1.00
3,4,4',5-Tetrachlorobiphenyl	*81*	0.0500	0.100	0.200	0.500	1.00
2,3,3',4,4'-Pentachlorobiphenyl	*105*	0.0500	0.100	0.200	0.500	1.00
2,3,4,4',5-Pentachlorobiphenyl	*114*	0.0500	0.100	0.200	0.500	1.00
2,3',4,4',5-Pentachlorobiphenyl	*118*	0.0500	0.100	0.200	0.500	1.00
2',3,4,4',5-Pentachlorobiphenyl	*123*	0.0500	0.100	0.200	0.500	1.00
3,3',4,4',5-Pentachlorobiphenyl	*126*	0.0500	0.100	0.200	0.500	1.00
2,3,3',4,4',5-Hexachlorobiphenyl	*156*	0.0500	0.100	0.200	0.500	1.00
2,3,3',4,4',5'-Hexachlorobiphenyl	*157*	0.0500	0.100	0.200	0.500	1.00
2,3',4,4',5,5'-Hexachlorobiphenyl	*167*	0.0500	0.100	0.200	0.500	1.00
3,3',4,4',5,5'-Hexachlorobiphenyl	*169*	0.0500	0.100	0.200	0.500	1.00
2,2',3,3',4,4',5-Heptachlorobiphenyl	*170*	0.0500	0.100	0.200	0.500	1.00
2,2',3,4,4',5,5'-Heptachlorobiphenyl	*180*	0.0500	0.100	0.200	0.500	1.00
2,3,3',4,4',5,5'-Heptachlorobiphenyl	*189*	0.0500	0.100	0.200	0.500	1.00
EXTRACTION SPIKE						
3,3',4,4'-Tetrachloro($^{13}C_{12}$)biphenyl	*77L*	10.0	10.0	10.0	10.0	10.0
3,4,4',5-Tetrachloro($^{13}C_{12}$)biphenyl	*81L*	10.0	10.0	10.0	10.0	10.0
2,3,3',4,4'-Pentachloro($^{13}C_{12}$)biphenyl	*105L*	10.0	10.0	10.0	10.0	10.0
2,3,4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*114L*	10.0	10.0	10.0	10.0	10.0
2,3',4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*118L*	10.0	10.0	10.0	10.0	10.0
2',3,4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*123L*	10.0	10.0	10.0	10.0	10.0
3,3',4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*126L*	10.0	10.0	10.0	10.0	10.0
2,3,3',4,4',5-Hexachloro($^{13}C_{12}$)biphenyl	*156L*	10.0	10.0	10.0	10.0	10.0
2,3,3',4,4',5'-Hexachloro($^{13}C_{12}$)biphenyl	*157L*	10.0	10.0	10.0	10.0	10.0
2,3',4,4',5,5'-Hexachloro($^{13}C_{12}$)biphenyl	*167L*	10.0	10.0	10.0	10.0	10.0
3,3',4,4',5,5'-Hexachloro($^{13}C_{12}$)biphenyl	*169L*	10.0	10.0	10.0	10.0	10.0
2,2',3,3',4,4',5-Heptachloro($^{13}C_{12}$)biphenyl	*170L*	10.0	10.0	10.0	10.0	10.0
2,2',3,4,4',5,5'-Heptachloro($^{13}C_{12}$)biphenyl	*180L*	10.0	10.0	10.0	10.0	10.0
2,3,3',4,4',5,5'-Heptachloro($^{13}C_{12}$)biphenyl	*189L*	10.0	10.0	10.0	10.0	10.0
SYRINGE SPIKE						
2,3',4',5-Tetrachloro($^{13}C_{12}$)biphenyl	*70L*	10.0	10.0	10.0	10.0	10.0
2,3,3',5,5'-Pentachloro($^{13}C_{12}$)biphenyl	*111L*	10.0	10.0	10.0	10.0	10.0
2,2',3,4,4',5'-Hexachloro($^{13}C_{12}$)biphenyl	*138L*	10.0	10.0	10.0	10.0	10.0
SAMPLING SPIKE						
3,3',4,5'-Tetrachloro($^{13}C_{12}$)biphenyl	*79L*	10.0	10.0	10.0	10.0	10.0

Catalogue Number	Product (nonane solution)		Qty/Conc
PCB-A10-CS5	CS5		200 µL
PCB-A10-CS6	CS6		200 µL
PCB-A10-CS7	CS7		200 µL
PCB-A10-CS8	CS8		200 µL
PCB-A10-CS9	CS9		200 µL
PCB-A10-CS10	CS10		200 µL
PCB-A10-CS11	CS11		200 µL
PCB-A10-CSH	CSH	Extended Calibration/High Level	200 µL

PCB-A10-CS5 (ng/mL)	PCB-A10-CS6 (ng/mL)	PCB-A10-CS7 (ng/mL)	PCB-A10-CS8 (ng/mL)	PCB-A10-CS9 (ng/mL)	PCB-A10-CS10 (ng/mL)	PCB-A10-CS11 (ng/mL)	PCB-A10-CSH (ng/mL)
2.00	5.00	10.0	20.0	50.0	100	250	1000
2.00	5.00	10.0	20.0	50.0	100	250	1000
2.00	5.00	10.0	20.0	50.0	100	250	1000
2.00	5.00	10.0	20.0	50.0	100	250	1000
2.00	5.00	10.0	20.0	50.0	100	250	1000
2.00	5.00	10.0	20.0	50.0	100	250	1000
2.00	5.00	10.0	20.0	50.0	100	250	1000
2.00	5.00	10.0	20.0	50.0	100	250	1000
2.00	5.00	10.0	20.0	50.0	100	250	1000
2.00	5.00	10.0	20.0	50.0	100	250	1000
2.00	5.00	10.0	20.0	50.0	100	250	1000
2.00	5.00	10.0	20.0	50.0	100	250	1000
2.00	5.00	10.0	20.0	50.0	100	250	1000
2.00	5.00	10.0	20.0	50.0	100	250	1000
2.00	5.00	10.0	20.0	50.0	100	250	1000
10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0



PCB-CVS-B10

Catalogue Number	Product (nonane solution)	Qty/Conc
PCB-CVS-B10-Set1	CS1/CS2/CS3/CS4/CS5	1 kit (5 ampoules)
PCB-CVS-B10-Set2	CS2/CS3/CS4/CS5/CS6	1 kit (5 ampoules)
PCB-B10-CS1	CS1	200 µL
PCB-B10-CS2	CS2	200 µL
PCB-B10-CS3	CS3	200 µL

NATIVE PCBs	*IUPAC*	PCB-B10-CS1 (ng/mL)	PCB-B10-CS2 (ng/mL)	PCB-B10-CS3 (ng/mL)
3,3',4,4'-Tetrachlorobiphenyl	*77*	0.200	1.00	4.00
3,4,4',5-Tetrachlorobiphenyl	*81*	0.200	1.00	4.00
2,3,3',4,4'-Pentachlorobiphenyl	*105*	0.200	1.00	4.00
2,3,4,4',5-Pentachlorobiphenyl	*114*	0.200	1.00	4.00
2,3',4,4',5-Pentachlorobiphenyl	*118*	0.200	1.00	4.00
2',3,4,4',5-Pentachlorobiphenyl	*123*	0.200	1.00	4.00
3,3',4,4',5-Pentachlorobiphenyl	*126*	0.200	1.00	4.00
2,3,3',4,4',5-Hexachlorobiphenyl	*156*	0.200	1.00	4.00
2,3,3',4,4',5'-Hexachlorobiphenyl	*157*	0.200	1.00	4.00
2,3',4,4',5,5'-Hexachlorobiphenyl	*167*	0.200	1.00	4.00
3,3',4,4',5,5'-Hexachlorobiphenyl	*169*	0.200	1.00	4.00
2,2',3,3',4,4',5-Heptachlorobiphenyl	*170*	0.200	1.00	4.00
2,2',3,4,4',5,5'-Heptachlorobiphenyl	*180*	0.200	1.00	4.00
2,3,3',4,4',5,5'-Heptachlorobiphenyl	*189*	0.200	1.00	4.00
EXTRACTION SPIKE				
3,3',4,4'-Tetrachloro($^{13}C_{12}$)biphenyl	*77L*	10.0	10.0	10.0
3,4,4',5-Tetrachloro($^{13}C_{12}$)biphenyl	*81L*	10.0	10.0	10.0
2,3,3',4,4'-Pentachloro($^{13}C_{12}$)biphenyl	*105L*	10.0	10.0	10.0
2,3,4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*114L*	10.0	10.0	10.0
2,3',4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*118L*	10.0	10.0	10.0
2',3,4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*123L*	10.0	10.0	10.0
3,3',4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*126L*	10.0	10.0	10.0
2,3,3',4,4',5-Hexachloro($^{13}C_{12}$)biphenyl	*156L*	10.0	10.0	10.0
2,3,3',4,4',5'-Hexachloro($^{13}C_{12}$)biphenyl	*157L*	10.0	10.0	10.0
2,3',4,4',5,5'-Hexachloro($^{13}C_{12}$)biphenyl	*167L*	10.0	10.0	10.0
3,3',4,4',5,5'-Hexachloro($^{13}C_{12}$)biphenyl	*169L*	10.0	10.0	10.0
2,2',3,3',4,4',5-Heptachloro($^{13}C_{12}$)biphenyl	*170L*	10.0	10.0	10.0
2,2',3,4,4',5,5'-Heptachloro($^{13}C_{12}$)biphenyl	*180L*	10.0	10.0	10.0
2,3,3',4,4',5,5'-Heptachloro($^{13}C_{12}$)biphenyl	*189L*	10.0	10.0	10.0
SYRINGE SPIKE				
2,3',4',5-Tetrachloro($^{13}C_{12}$)biphenyl	*70L*	10.0	10.0	10.0
2,3,3',5,5'-Pentachloro($^{13}C_{12}$)biphenyl	*111L*	10.0	10.0	10.0
2,2',3,4,4',5'-Hexachloro($^{13}C_{12}$)biphenyl	*138L*	10.0	10.0	10.0
2,2',3,3',5,5',6-Heptachloro($^{13}C_{12}$)biphenyl	*178L*	10.0	10.0	10.0
SAMPLING SPIKE				
3,3',4,5'-Tetrachloro($^{13}C_{12}$)biphenyl	*79L*	10.0	10.0	10.0

Catalogue Number	Product (nonane solution)	Qty/Conc
PCB-B10-CS4	CS4	200 µL
PCB-B10-CS5	CS5	200 µL
PCB-B10-CS6	CS6	200 µL
PCB-B10-CS7	CS7	200 µL

NATIVE PCBs	*IUPAC*	PCB-B10-CS4 (ng/mL)	PCB-B10-CS5 (ng/mL)	PCB-B10-CS6 (ng/mL)	PCB-B10-CS7 (ng/mL)
3,3',4,4'-Tetrachlorobiphenyl	*77*	20.0	100	400	1000
3,4,4',5-Tetrachlorobiphenyl	*81*	20.0	100	400	1000
2,3,3',4,4'-Pentachlorobiphenyl	*105*	20.0	100	400	1000
2,3,4,4',5-Pentachlorobiphenyl	*114*	20.0	100	400	1000
2,3',4,4',5-Pentachlorobiphenyl	*118*	20.0	100	400	1000
2',3,4,4',5-Pentachlorobiphenyl	*123*	20.0	100	400	1000
3,3',4,4',5-Pentachlorobiphenyl	*126*	20.0	100	400	1000
2,3,3',4,4',5-Hexachlorobiphenyl	*156*	20.0	100	400	1000
2,3,3',4,4',5'-Hexachlorobiphenyl	*157*	20.0	100	400	1000
2,3',4,4',5,5'-Hexachlorobiphenyl	*167*	20.0	100	400	1000
3,3',4,4',5,5'-Hexachlorobiphenyl	*169*	20.0	100	400	1000
2,2',3,3',4,4',5-Heptachlorobiphenyl	*170*	20.0	100	400	1000
2,2',3,4,4',5,5'-Heptachlorobiphenyl	*180*	20.0	100	400	1000
2,3,3',4,4',5,5'-Heptachlorobiphenyl	*189*	20.0	100	400	1000
EXTRACTION SPIKE					
3,3',4,4'-Tetrachloro($^{13}C_{12}$)biphenyl	77L	10.0	10.0	10.0	10.0
3,4,4',5-Tetrachloro($^{13}C_{12}$)biphenyl	81L	10.0	10.0	10.0	10.0
2,3,3',4,4'-Pentachloro($^{13}C_{12}$)biphenyl	105L	10.0	10.0	10.0	10.0
2,3,4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	114L	10.0	10.0	10.0	10.0
2,3',4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	118L	10.0	10.0	10.0	10.0
2',3,4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	123L	10.0	10.0	10.0	10.0
3,3',4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	126L	10.0	10.0	10.0	10.0
2,3,3',4,4',5-Hexachloro($^{13}C_{12}$)biphenyl	156L	10.0	10.0	10.0	10.0
2,3,3',4,4',5'-Hexachloro($^{13}C_{12}$)biphenyl	157L	10.0	10.0	10.0	10.0
2,3',4,4',5,5'-Hexachloro($^{13}C_{12}$)biphenyl	167L	10.0	10.0	10.0	10.0
3,3',4,4',5,5'-Hexachloro($^{13}C_{12}$)biphenyl	169L	10.0	10.0	10.0	10.0
2,2',3,3',4,4',5-Heptachloro($^{13}C_{12}$)biphenyl	170L	10.0	10.0	10.0	10.0
2,2',3,4,4',5,5'-Heptachloro($^{13}C_{12}$)biphenyl	180L	10.0	10.0	10.0	10.0
2,3,3',4,4',5,5'-Heptachloro($^{13}C_{12}$)biphenyl	189L	10.0	10.0	10.0	10.0
SYRINGE SPIKE					
2,3',4',5-Tetrachloro($^{13}C_{12}$)biphenyl	70L	10.0	10.0	10.0	10.0
2,3,3',5,5'-Pentachloro($^{13}C_{12}$)biphenyl	111L	10.0	10.0	10.0	10.0
2,2',3,4,4',5'-Hexachloro($^{13}C_{12}$)biphenyl	138L	10.0	10.0	10.0	10.0
2,2',3,3',5,5',6-Heptachloro($^{13}C_{12}$)biphenyl	178L	10.0	10.0	10.0	10.0
SAMPLING SPIKE					
3,3',4,5'-Tetrachloro($^{13}C_{12}$)biphenyl	79L	10.0	10.0	10.0	10.0



MASS-LABELLED PCBs: SOLUTION/MIXTURES

Support solutions for **PCB-CVS-A10**, **PCB-CVS-B10**, and **DFP-CVS-B10**

Catalogue Number	Product (nonane solution)	Qty/Conc
PCB-LCS-A1	Mass-Labelled PCB Solution/Mixture	1.2 mL
PCB-LCS-A100	Mass-Labelled PCB Solution/Mixture	1.2 mL
PCB-LCS-A20	Mass-Labelled PCB Solution/Mixture	1.2 mL

MASS-LABELLED PCBs	*IUPAC*	PCB-LCS-A1 (ng/mL)	PCB-LCS-A100 (ng/mL)	PCB-LCS-A20 (ng/mL)
3,3',4,4'-Tetrachloro($^{13}C_{12}$)biphenyl	*77L*	1000	100	20.0
3,4,4',5-Tetrachloro($^{13}C_{12}$)biphenyl	*81L*	1000	100	20.0
2,3,3',4,4'-Pentachloro($^{13}C_{12}$)biphenyl	*105L*	1000	100	20.0
2,3,4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*114L*	1000	100	20.0
2,3',4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*118L*	1000	100	20.0
2',3,4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*123L*	1000	100	20.0
3,3',4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*126L*	1000	100	20.0
2,3,3',4,4',5-Hexachloro($^{13}C_{12}$)biphenyl	*156L*	1000	100	20.0
2,3,3',4,4',5'-Hexachloro($^{13}C_{12}$)biphenyl	*157L*	1000	100	20.0
2,3',4,4',5,5'-Hexachloro($^{13}C_{12}$)biphenyl	*167L*	1000	100	20.0
3,3',4,4',5,5'-Hexachloro($^{13}C_{12}$)biphenyl	*169L*	1000	100	20.0
2,2',3,3',4,4',5-Heptachloro($^{13}C_{12}$)biphenyl	*170L*	1000	100	20.0
2,2',3,4,4',5,5'-Heptachloro($^{13}C_{12}$)biphenyl	*180L*	1000	100	20.0
2,3,3',4,4',5,5'-Heptachloro($^{13}C_{12}$)biphenyl	*189L*	1000	100	20.0

PCB-IS-A	Mass-Labelled PCB Solution	1.2 mL
PCB-IS-A100	Mass-Labelled PCB Solution	1.2 mL
PCB-IS-A20	Mass-Labelled PCB Solution	1.2 mL

MASS-LABELLED PCBs	*IUPAC*	PCB-IS-A (ng/mL)	PCB-IS-A100 (ng/mL)	PCB-IS-A20 (ng/mL)
2,3',4',5-Tetrachloro($^{13}C_{12}$)biphenyl	*70L*	1000	100	20.0

PCB-IS-B	Mass-Labelled PCB Solution/Mixture	1.2 mL
PCB-IS-B100	Mass-Labelled PCB Solution/Mixture	1.2 mL
PCB-IS-B20	Mass-Labelled PCB Solution/Mixture	1.2 mL

MASS-LABELLED PCBs	*IUPAC*	PCB-IS-B (ng/mL)	PCB-IS-B100 (ng/mL)	PCB-IS-B20 (ng/mL)
2,3',4',5-Tetrachloro($^{13}C_{12}$)biphenyl	*70L*	1000	100	20.0
2,3,3',5,5'-Pentachloro($^{13}C_{12}$)biphenyl	*111L*	1000	100	20.0
2,2',3,4,4',5'-Hexachloro($^{13}C_{12}$)biphenyl	*138L*	1000	100	20.0

PCB-IS-C	Mass-Labelled PCB Solution/Mixture	1.2 mL
PCB-IS-C100	Mass-Labelled PCB Solution/Mixture	1.2 mL
PCB-IS-C20	Mass-Labelled PCB Solution/Mixture	1.2 mL

MASS-LABELLED PCBs	*IUPAC*	PCB-IS-C (ng/mL)	PCB-IS-C100 (ng/mL)	PCB-IS-C20 (ng/mL)
2,3',4',5-Tetrachloro($^{13}C_{12}$)biphenyl	*70L*	1000	100	20.0
2,3,3',5,5'-Pentachloro($^{13}C_{12}$)biphenyl	*111L*	1000	100	20.0
2,2',3,4,4',5'-Hexachloro($^{13}C_{12}$)biphenyl	*138L*	1000	100	20.0
2,2',3,3',5,5',6-Heptachloro($^{13}C_{12}$)biphenyl	*178L*	1000	100	20.0

PCB-SS-A	Mass-Labelled PCB Solution	1.2 mL
PCB-SS-A100	Mass-Labelled PCB Solution	1.2 mL
PCB-SS-A20	Mass-Labelled PCB Solution	1.2 mL

MASS-LABELLED PCBs	*IUPAC*	PCB-SS-A (ng/mL)	PCB-SS-A100 (ng/mL)	PCB-SS-A20 (ng/mL)
3,3',4,5'-Tetrachloro($^{13}C_{12}$)biphenyl	*79L*	1000	100	20.0

Catalogue Number	Product (nonane solution)	Qty/Conc
MBP-CP	Mass-Labelled Coplanar PCB Solution/Mixture	1.2 mL
	IUPAC	
3,3',4,4'-Tetrachloro($^{13}C_{12}$)biphenyl	*77L*	10.0 µg/mL
3,4,4',5-Tetrachloro($^{13}C_{12}$)biphenyl	*81L*	10.0 µg/mL
3,3',4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*126L*	10.0 µg/mL
3,3',4,4',5,5'-Hexachloro($^{13}C_{12}$)biphenyl	*169L*	10.0 µg/mL
MBP-MO	Mass-Labelled Mono-ortho PCB Solution/Mixture	1.2 mL
	IUPAC	
2,3,3',4,4'-Pentachloro($^{13}C_{12}$)biphenyl	*105L*	5.00 µg/mL
2,3,4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*114L*	5.00 µg/mL
2,3',4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*118L*	5.00 µg/mL
2',3,4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*123L*	5.00 µg/mL
2,3,3',4,4',5-Hexachloro($^{13}C_{12}$)biphenyl	*156L*	5.00 µg/mL
2,3,3',4,4',5'-Hexachloro($^{13}C_{12}$)biphenyl	*157L*	5.00 µg/mL
2,3',4,4',5,5'-Hexachloro($^{13}C_{12}$)biphenyl	*167L*	5.00 µg/mL
2,3,3',4,4',5,5'-Heptachloro($^{13}C_{12}$)biphenyl	*189L*	5.00 µg/mL
MBP-CG	Mass-Labelled Mono to Decachloro PCB Solution/Mixture	1.2 mL
	IUPAC	
4-Chloro($^{13}C_{12}$)biphenyl	*3L*	5.00 µg/mL
4,4'-Dichloro($^{13}C_{12}$)biphenyl	*15L*	5.00 µg/mL
2,4',5-Trichloro($^{13}C_{12}$)biphenyl	*31L*	5.00 µg/mL
2,2',5,5'-Tetrachloro($^{13}C_{12}$)biphenyl	*52L*	5.00 µg/mL
2,3',4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*118L*	5.00 µg/mL
2,2',4,4',5,5'-Hexachloro($^{13}C_{12}$)biphenyl	*153L*	5.00 µg/mL
2,2',3,4,4',5,5'-Heptachloro($^{13}C_{12}$)biphenyl	*180L*	5.00 µg/mL
2,2',3,3',4,4',5,5'-Octachloro($^{13}C_{12}$)biphenyl	*194L*	5.00 µg/mL
2,2',3,3',4,4',5,5',6-Nonachloro($^{13}C_{12}$)biphenyl	*206L*	5.00 µg/mL
Decachloro($^{13}C_{12}$)biphenyl	*209L*	5.00 µg/mL
MBP-MXE	Mass-Labelled PCB Solution/Mixture	1.2 mL
	IUPAC	
2,4,4'-Trichloro($^{13}C_{12}$)biphenyl	*28L*	5.00 µg/mL
2,2',5,5'-Tetrachloro($^{13}C_{12}$)biphenyl	*52L*	5.00 µg/mL
2,2',4,5,5'-Pentachloro($^{13}C_{12}$)biphenyl	*101L*	5.00 µg/mL
2,2',3,4,4',5'-Hexachloro($^{13}C_{12}$)biphenyl	*138L*	5.00 µg/mL
2,2',4,4',5,5'-Hexachloro($^{13}C_{12}$)biphenyl	*153L*	5.00 µg/mL
2,2',3,4,4',5,5'-Heptachloro($^{13}C_{12}$)biphenyl	*180L*	5.00 µg/mL
Decachloro($^{13}C_{12}$)biphenyl	*209L*	5.00 µg/mL





NATIVE PCBs: SOLUTION/MIXTURES

(*) Support solutions for **PCB-CVS-A10**, **PCB-CVS-B10**, and **DFP-CVS-B10**

Catalogue Number	Product (nonane solution)	Qty/Conc
PCB-ST-A*	Native PCB Stock Solution/Mixture	1.2 mL
PCB-ST-A10*	Native PCB Stock Solution/Mixture	1.2 mL
PCB-ST-A2*	Native PCB Stock Solution/Mixture	1.2 mL

NATIVE PCBs	*IUPAC*	PCB-ST-A* (ng/mL)	PCB-ST-A10* (ng/mL)	PCB-ST-A2* (ng/mL)
3,3',4,4'-Tetrachlorobiphenyl	*77*	2000	10.0	2.00
3,4,4',5-Tetrachlorobiphenyl	*81*	2000	10.0	2.00
2,3,3',4,4'-Pentachlorobiphenyl	*105*	2000	10.0	2.00
2,3,4,4',5-Pentachlorobiphenyl	*114*	2000	10.0	2.00
2,3',4,4',5-Pentachlorobiphenyl	*118*	2000	10.0	2.00
2',3,4,4',5-Pentachlorobiphenyl	*123*	2000	10.0	2.00
3,3',4,4',5-Pentachlorobiphenyl	*126*	2000	10.0	2.00
2,3,3',4,4',5-Hexachlorobiphenyl	*156*	2000	10.0	2.00
2,3,3',4,4',5'-Hexachlorobiphenyl	*157*	2000	10.0	2.00
2,3',4,4',5,5'-Hexachlorobiphenyl	*167*	2000	10.0	2.00
3,3',4,4',5,5'-Hexachlorobiphenyl	*169*	2000	10.0	2.00
2,2',3,3',4,4',5-Heptachlorobiphenyl	*170*	2000	10.0	2.00
2,2',3,4,4',5,5'-Heptachlorobiphenyl	*180*	2000	10.0	2.00
2,3,3',4,4',5,5'-Heptachlorobiphenyl	*189*	2000	10.0	2.00

BP-CP81

Catalogue Number	Product (nonane solution)	Qty/Conc
BP-CP81	Native Coplanar PCB Solution/Mixture	1.2 mL

NATIVE PCBs	*IUPAC*	
3,3',4,4'-Tetrachlorobiphenyl	*77*	10.0 µg/mL
3,4,4',5-Tetrachlorobiphenyl	*81*	10.0 µg/mL
3,3',4,4',5-Pentachlorobiphenyl	*126*	10.0 µg/mL
3,3',4,4',5,5'-Hexachlorobiphenyl	*169*	10.0 µg/mL

BP-WD

Catalogue Number	Product (nonane solution)	Qty/Conc
BP-WD	Native PCB Window Defining Solution/Mixture for DB-5 or Equivalent Columns	1.2 mL
NATIVE PCBs	***IUPAC***	
Biphenyl	—	2.50 µg/mL
2-Chlorobiphenyl	*1*	2.50 µg/mL
4-Chlorobiphenyl	*3*	2.50 µg/mL
2,6-Dichlorobiphenyl	*10*	2.50 µg/mL
4,4'-Dichlorobiphenyl	*15*	2.50 µg/mL
2,2',6-Trichlorobiphenyl	*19*	2.50 µg/mL
3,4,4'-Trichlorobiphenyl	*37*	2.50 µg/mL
2,2',6,6'-Tetrachlorobiphenyl	*54*	2.50 µg/mL
3,3',4,4'-Tetrachlorobiphenyl	*77*	2.50 µg/mL
2,2',4,6,6'-Pentachlorobiphenyl	*104*	2.50 µg/mL
3,3',4,4',5-Pentachlorobiphenyl	*126*	2.50 µg/mL
2,2',4,4',6,6'-Hexachlorobiphenyl	*155*	2.50 µg/mL
3,3',4,4',5,5'-Hexachlorobiphenyl	*169*	2.50 µg/mL
2,2',3,4',5,6,6'-Heptachlorobiphenyl	*188*	2.50 µg/mL
2,3,3',4,4',5,5'-Heptachlorobiphenyl	*189*	2.50 µg/mL
2,2',3,3',5,5',6,6'-Octachlorobiphenyl	*202*	2.50 µg/mL
2,3,3',4,4',5,5',6-Octachlorobiphenyl	*205*	2.50 µg/mL
2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl	*206*	2.50 µg/mL
2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl	*208*	2.50 µg/mL
Decachlorobiphenyl	*209*	2.50 µg/mL

BP-MO

Catalogue Number	Product (nonane solution)	Qty/Conc
BP-MO	Native Mono-ortho PCB Solution/Mixture	1.2 mL
NATIVE PCBs	***IUPAC***	
2,3,3',4,4'-Pentachlorobiphenyl	*105*	10.0 µg/mL
2,3,4,4',5-Pentachlorobiphenyl	*114*	10.0 µg/mL
2,3',4,4',5-Pentachlorobiphenyl	*118*	10.0 µg/mL
2',3,4,4',5-Pentachlorobiphenyl	*123*	10.0 µg/mL
2,3,3',4,4',5-Hexachlorobiphenyl	*156*	10.0 µg/mL
2,3,3',4,4',5'-Hexachlorobiphenyl	*157*	10.0 µg/mL
2,3',4,4',5,5'-Hexachlorobiphenyl	*167*	10.0 µg/mL
2,3,3',4,4',5,5'-Heptachlorobiphenyl	*189*	10.0 µg/mL



BP-MS

BP-MS-PL1, **BP-MS-PL2**, and **BP-MS-PL3** were prepared to be used in the identification/confirmation of the PCB congeners in **BP-MS**. Although DB-5 data is provided with **BP-MS**, there can be changes in the elution order on "*equivalent capillary columns*".

Catalogue Number	Product (nonane solution)	Qty/Conc
BP-MS	Native PCB Solution/Mixture for MS Detection	1.2 mL
BP-MS2	Native PCB Solution/Mixture for MS Detection	1.2 mL
BP-MS-PL1	Native PCB Solution/Mixture for MS Detection	1.2 mL
BP-MS-PL2	Native PCB Solution/Mixture for MS Detection	1.2 mL
BP-MS-PL3	Native PCB Solution/Mixture for MS Detection	1.2 mL

PCB CONGENERS	*IUPAC*	BP-MS (µg/mL)	BP-MS2 (µg/mL)	BP-MS-PL1 (µg/mL)	BP-MS-PL2 (µg/mL)	BP-MS-PL3 (µg/mL)
2-Chlorobiphenyl	*1*	2.00	—	—	—	—
4-Chlorobiphenyl	*3*	2.00	—	—	—	—
2,2'-Dichlorobiphenyl	*4*	2.00	—	—	—	—
2,4'-Dichlorobiphenyl	*8*	2.00	—	—	—	—
2,6- Dichlorobiphenyl	*10*	2.00	—	—	—	—
*4,4'-Dichlorobiphenyl	*15*	2.00	—	—	—	—
*2,2',5-Trichlorobiphenyl	*18*	2.00	—	—	—	—
2,2',6-Trichlorobiphenyl	*19*	2.00	—	—	—	—
2,3,4'-Trichlorobiphenyl	*22*	2.00	—	—	—	—
2,4,4'-Trichlorobiphenyl	*28*	2.00	—	—	—	—
2',3,4-Trichlorobiphenyl	*33*	2.00	—	—	—	—
3,4,4'-Trichlorobiphenyl	*37*	2.00	—	—	—	—
2,2',3,3'-Tetrachlorobiphenyl	*40*	—	2.00	—	—	—
2,2',3,4-Tetrachlorobiphenyl	*41*	—	2.00	—	—	—
*2,2',3,5'-Tetrachlorobiphenyl	*44*	2.00	—	—	—	—
*2,2',4,5'-Tetrachlorobiphenyl	*49*	2.00	—	—	2.00	—
*2,2',5,5'-Tetrachlorobiphenyl	*52*	2.00	—	2.00	—	—
*2,2',6,6'-Tetrachlorobiphenyl	*54*	2.00	—	—	—	—
2,3,4,4'-Tetrachlorobiphenyl	*60*	—	2.00	—	—	—
2,3',4,4'-Tetrachlorobiphenyl	*66*	—	2.00	—	—	—
2,3',4',5-Tetrachlorobiphenyl	*70*	2.00	—	2.00	—	—
2,4,4',5-Tetrachlorobiphenyl	*74*	2.00	—	—	2.00	—
*3,3',4,4'-Tetrachlorobiphenyl	*77*	2.00	—	—	—	2.00
3,4,4',5-Tetrachlorobiphenyl	*81*	2.00	—	—	—	—
*2,2',3,4,5'-Pentachlorobiphenyl	*87*	2.00	—	2.00	—	—
2,2',3,4',5-Pentachlorobiphenyl	*90*	—	2.00	—	—	—
2,2',3,5',6-Pentachlorobiphenyl	*95*	2.00	—	—	2.00	—
2,2',4,4',5-Pentachlorobiphenyl	*99*	2.00	—	—	2.00	—
*2,2',4,5,5'-Pentachlorobiphenyl	*101*	2.00	—	2.00	—	—
2,2',4,6,6'-Pentachlorobiphenyl	*104*	2.00	—	—	—	—
*2,3,3',4,4'-Pentachlorobiphenyl	*105*	2.00	—	—	—	—
2,3,3',4',6-Pentachlorobiphenyl	*110*	2.00	—	2.00	—	—
*2,3,4,4',5-Pentachlorobiphenyl	*114*	2.00	—	—	—	—
*2,3',4,4',5-Pentachlorobiphenyl	*118*	2.00	—	—	—	—
2,3',4,4',6-Pentachlorobiphenyl	*119*	2.00	—	—	—	—
2',3,4,4',5-Pentachlorobiphenyl	*123*	2.00	—	—	—	—
3,3',4,4',5-Pentachlorobiphenyl	*126*	2.00	—	—	—	—
*2,2',3,3',4,4'-Hexachlorobiphenyl	*128*	2.00	—	—	—	2.00
2,2',3,3',4,5-Hexachlorobiphenyl	*129*	—	2.00	—	—	—
2,2',3,4,4',5-Hexachlorobiphenyl	*137*	—	2.00	—	—	—
*2,2',3,4,4',5'-Hexachlorobiphenyl	*138*	2.00	—	2.00	—	—
2,2',3,4,5,5'-Hexachlorobiphenyl	*141*	—	2.00	—	—	—
2,2',3,4',5,6-Hexachlorobiphenyl	*149*	2.00	—	—	2.00	—
*2,2',3,5,5',6-Hexachlorobiphenyl	*151*	2.00	—	—	2.00	—
*2,2',4,4',5,5'-Hexachlorobiphenyl	*153*	2.00	—	2.00	—	—
2,2',4,4',6,6'-Hexachlorobiphenyl	*155*	2.00	—	2.00	—	—
*2,3,3',4,4',5-Hexachlorobiphenyl	*156*	2.00	—	—	—	—
2,3,3',4,4',5'-Hexachlorobiphenyl	*157*	2.00	—	—	—	—
2,3,3',4,4',6-Hexachlorobiphenyl	*158*	2.00	—	—	2.00	—
2,3',4,4',5,5'-Hexachlorobiphenyl	*167*	2.00	—	—	—	—
2,3',4,4',5',6-Hexachlorobiphenyl	*168*	2.00	—	—	2.00	—
3,3',4,4',5,5'-Hexachlorobiphenyl	*169*	2.00	—	—	—	—
*2,2',3,3',4,4',5-Heptachlorobiphenyl	*170*	2.00	—	—	—	—
*2,2',3,3',4,4',6-Heptachlorobiphenyl	*171*	2.00	—	—	2.00	—
2,2',3,3',4',5,6-Heptachlorobiphenyl	*177*	2.00	—	2.00	—	—
2,2',3,3',5,5',6-Heptachlorobiphenyl	*178*	2.00	—	—	—	2.00
*2,2',3,4,4',5,5'-Heptachlorobiphenyl	*180*	2.00	—	2.00	—	—
*2,2',3,4,4',5',6-Heptachlorobiphenyl	*183*	2.00	—	—	—	—
*2,2',3,4',5,5',6-Heptachlorobiphenyl	*187*	2.00	—	—	—	—
2,2',3,4',5,6,6'-Heptachlorobiphenyl	*188*	2.00	—	2.00	—	—
*2,3,3',4,4',5,5'-Heptachlorobiphenyl	*189*	2.00	—	—	—	—
*2,3,3',4,4',5',6-Heptachlorobiphenyl	*191*	2.00	—	—	—	—
2,3,3',4',5,5',6-Heptachlorobiphenyl	*193*	—	2.00	—	—	—
*2,2',3,3',4,4',5,5'-Octachlorobiphenyl	*194*	2.00	—	—	—	—
*2,2',3,3',4,5,5',6'-Octachlorobiphenyl	*199*	2.00	—	—	—	—
*2,2',3,3',4,5',6,6'-Octachlorobiphenyl	*201*	2.00	—	2.00	—	—
*2,2',3,3',5,5',6,6'-Octachlorobiphenyl	*202*	2.00	—	—	—	2.00
2,2',3,4,4',5,5',6-Octachlorobiphenyl	*203*	—	2.00	—	—	—
*2,3,3',4,4',5,5',6-Octachlorobiphenyl	*205*	2.00	—	—	—	—
*2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl	*206*	2.00	—	—	—	—
*2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl	*208*	2.00	—	—	—	—
*Decachlorobiphenyl	*209*	2.00	—	—	—	—

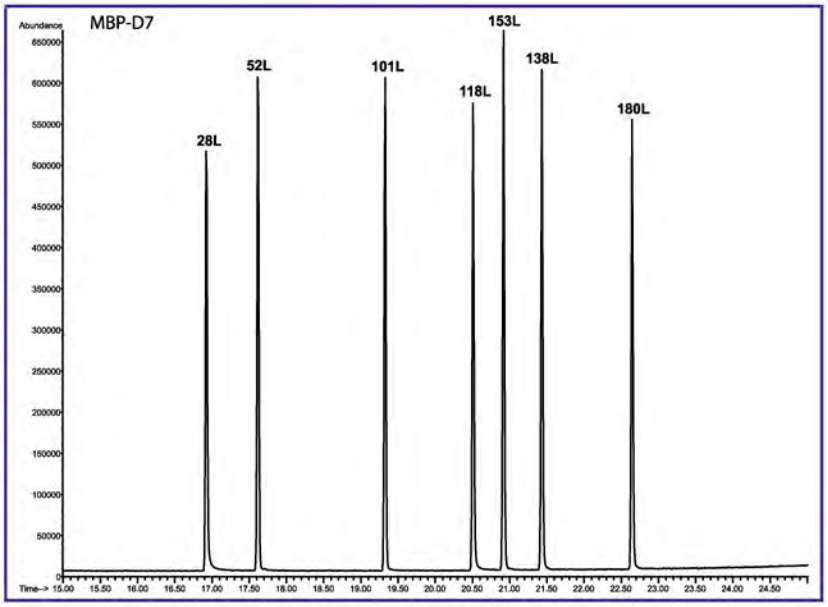
Congeners marked with an asterisk (*) are concentration-certified by direct comparison to the NRCC CLB-1 solutions.

Solution/Mixtures for the analysis of the Dutch 7 PCB Congeners.

Catalogue Number	Product (nonane solution)	Qty/Conc
BP-D7	Native PCB Congener Solution/Mixture	1.2 mL
MBP-D7	Mass-Labelled PCB Congener Solution/Mixture	1.2 mL

NATIVE PCB CONGENERS	*IUPAC*	BP-D7 (µg/mL)
2,4,4'-Trichlorobiphenyl	*28*	10.0
2,2',5,5'-Tetrachlorobiphenyl	*52*	10.0
2,2',4,5,5'-Pentachlorobiphenyl	*101*	10.0
2,3',4,4',5-Pentachlorobiphenyl	*118*	10.0
2,2',3,4,4',5'-Hexachlorobiphenyl	*138*	10.0
2,2',4,4',5,5'-Hexachlorobiphenyl	*153*	10.0
2,2',3,4,4',5,5'-Heptachlorobiphenyl	*180*	10.0

MASS-LABELLED PCB CONGENERS	*IUPAC*	MBP-D7 (µg/mL)
2,4,4'-Trichloro($^{13}C_{12}$)biphenyl	*28L*	5.00
2,2',5,5'-Tetrachloro($^{13}C_{12}$)biphenyl	*52L*	5.00
2,2',4,5,5'-Pentachloro($^{13}C_{12}$)biphenyl	*101L*	5.00
2,3',4,4',5-Pentachloro($^{13}C_{12}$)biphenyl	*118L*	5.00
2,2',3,4,4',5'-Hexachloro($^{13}C_{12}$)biphenyl	*138L*	5.00
2,2',4,4',5,5'-Hexachloro($^{13}C_{12}$)biphenyl	*153L*	5.00
2,2',3,4,4',5,5'-Heptachloro($^{13}C_{12}$)biphenyl	*180L*	5.00



HRGC/LRMS Data: MBP-D7 on a 30 m DB-5 column.

MASS-LABELLED PCDDs/PCDFs/PCBs: SOLUTION/MIXTURES

These three solutions were designed and prepared as support solutions to be used with the following calibration sets:

DF-CVS-A10 (see Page 44)

DF-CVS-B10 (see Page 46)

as well as:

PCB-CVS-A10

Catalogue Number	Product (nonane solution)		Qty/Conc
DFP-LCS-A	Mass-Labelled PCDD/PCDF/PCB Solution/Mixture		1.2 mL
MASS-LABELLED PCDDs			
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin			10.0 ng/mL
1,2,3,7,8-Pentachloro($^{13}C_{12}$)dibenzo-*p*-dioxin			10.0 ng/mL
1,2,3,4,7,8-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin			10.0 ng/mL
1,2,3,6,7,8-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin			10.0 ng/mL
1,2,3,7,8,9-Hexachloro($^{13}C_{12}$)dibenzo-*p*-dioxin			10.0 ng/mL
1,2,3,4,6,7,8-Heptachloro($^{13}C_{12}$)dibenzo-*p*-dioxin			10.0 ng/mL
Octachloro($^{13}C_{12}$)dibenzo-*p*-dioxin			20.0 ng/mL
MASS-LABELLED PCDFs			
2,3,7,8-Tetrachloro($^{13}C_{12}$)dibenzofuran			10.0 ng/mL
1,2,3,7,8-Pentachloro($^{13}C_{12}$)dibenzofuran			10.0 ng/mL
2,3,4,7,8-Pentachloro($^{13}C_{12}$)dibenzofuran			10.0 ng/mL
1,2,3,4,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran			10.0 ng/mL
1,2,3,6,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran			10.0 ng/mL
1,2,3,7,8,9-Hexachloro($^{13}C_{12}$)dibenzofuran			10.0 ng/mL
2,3,4,6,7,8-Hexachloro($^{13}C_{12}$)dibenzofuran			10.0 ng/mL
1,2,3,4,6,7,8-Heptachloro($^{13}C_{12}$)dibenzofuran			10.0 ng/mL
1,2,3,4,7,8,9-Heptachloro($^{13}C_{12}$)dibenzofuran			10.0 ng/mL
Octachloro($^{13}C_{12}$)dibenzofuran			20.0 ng/mL
MASS-LABELLED PCBs		***IUPAC***	
3,3',4,4'-Tetrachloro($^{13}C_{12}$)biphenyl		*77L*	10.0 ng/mL
3,4,4',5-Tetrachloro($^{13}C_{12}$)biphenyl		*81L*	10.0 ng/mL
2,3,3',4,4'-Pentachloro($^{13}C_{12}$)biphenyl		*105L*	10.0 ng/mL
2,3,4,4',5-Pentachloro($^{13}C_{12}$)biphenyl		*114L*	10.0 ng/mL
2,3',4,4',5-Pentachloro($^{13}C_{12}$)biphenyl		*118L*	10.0 ng/mL
2',3,4,4',5-Pentachloro($^{13}C_{12}$)biphenyl		*123L*	10.0 ng/mL
3,3',4,4',5-Pentachloro($^{13}C_{12}$)biphenyl		*126L*	10.0 ng/mL
2,3,3',4,4',5-Hexachloro($^{13}C_{12}$)biphenyl		*156L*	10.0 ng/mL
2,3,3',4,4',5'-Hexachloro($^{13}C_{12}$)biphenyl		*157L*	10.0 ng/mL
2,3',4,4',5,5'-Hexachloro($^{13}C_{12}$)biphenyl		*167L*	10.0 ng/mL
3,3',4,4',5,5'-Hexachloro($^{13}C_{12}$)biphenyl		*169L*	10.0 ng/mL
2,2',3,3',4,4',5-Heptachloro($^{13}C_{12}$)biphenyl		*170L*	10.0 ng/mL
2,2',3,4,4',5,5'-Heptachloro($^{13}C_{12}$)biphenyl		*180L*	10.0 ng/mL
2,3,3',4,4',5,5'-Heptachloro($^{13}C_{12}$)biphenyl		*189L*	10.0 ng/mL
DFP-IS-A	Mass-Labelled PCDF/PCB Syringe Spike		1.2 mL
		IUPAC	
2,3',4',5-Tetrachloro($^{13}C_{12}$)biphenyl		*70L*	10.0 ng/mL
1,2,3,4,6,9-Hexachloro($^{13}C_{12}$)dibenzofuran			10.0 ng/mL
1,2,3,4,6,8,9-Heptachloro($^{13}C_{12}$)dibenzofuran			10.0 ng/mL
DFP-SS-A	Mass-Labelled PCDD/PCB Sampling Spike		1.2 mL
		IUPAC	
3,3',4,5'-Tetrachloro($^{13}C_{12}$)biphenyl		*79L*	50.0 ng/mL
1,2,3,4-Tetrachloro($^{13}C_{12}$)dibenzo-*p*-dioxin			50.0 ng/mL

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

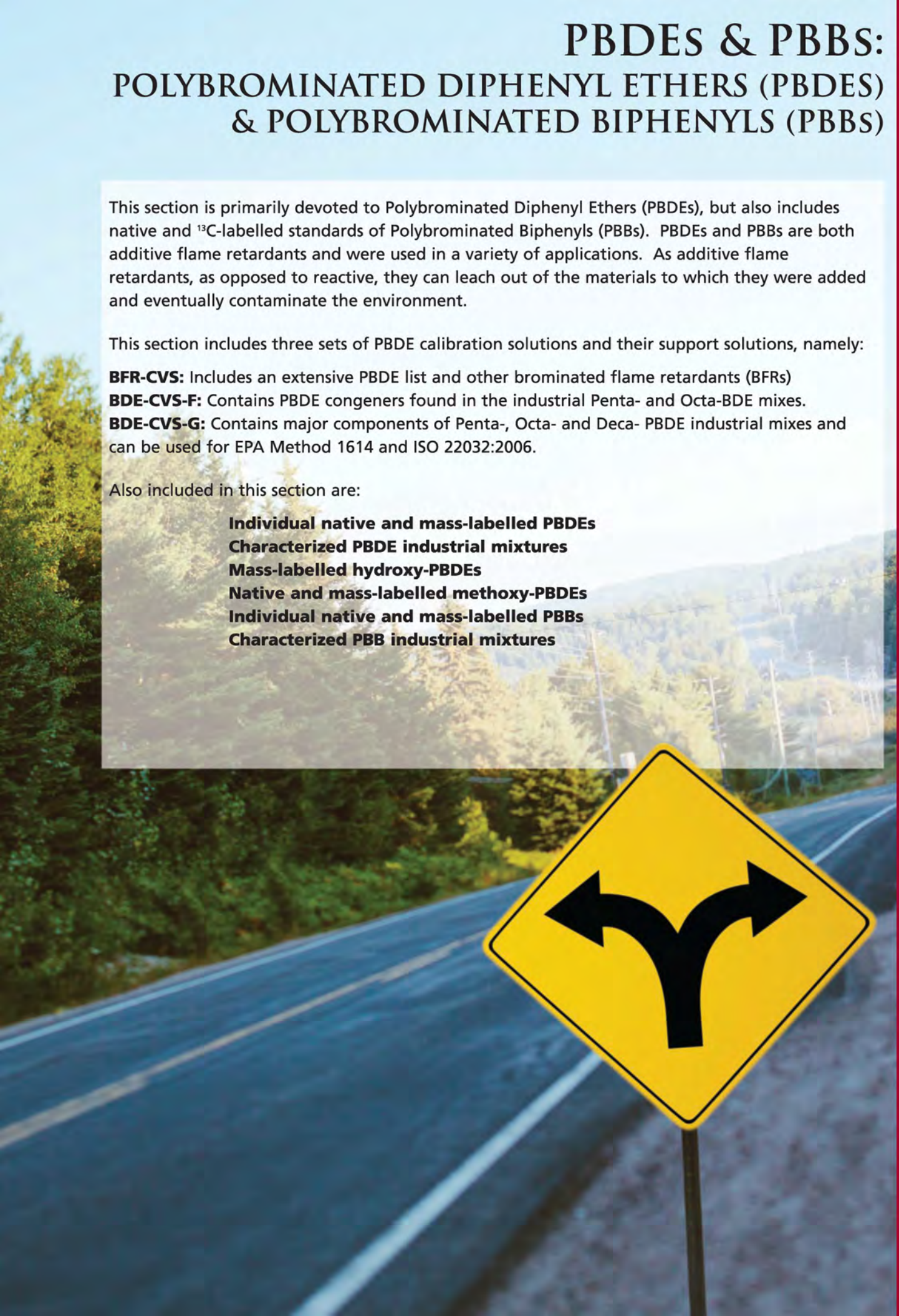
This section is primarily devoted to Polybrominated Diphenyl Ethers (PBDEs), but also includes native and ^{13}C-labelled standards of Polybrominated Biphenyls (PBBs). PBDEs and PBBs are both additive flame retardants and were used in a variety of applications. As additive flame retardants, as opposed to reactive, they can leach out of the materials to which they were added and eventually contaminate the environment.

This section includes three sets of PBDE calibration solutions and their support solutions, namely:

BFR-CVS: Includes an extensive PBDE list and other brominated flame retardants (BFRs)
BDE-CVS-F: Contains PBDE congeners found in the industrial Penta- and Octa-BDE mixes.
BDE-CVS-G: Contains major components of Penta-, Octa- and Deca- PBDE industrial mixes and can be used for EPA Method 1614 and ISO 22032:2006.

Also included in this section are:

Individual native and mass-labelled PBDEs
Characterized PBDE industrial mixtures
Mass-labelled hydroxy-PBDEs
Native and mass-labelled methoxy-PBDEs
Individual native and mass-labelled PBBs
Characterized PBB industrial mixtures





BFR-CVS

Catalogue Number	Product (toluene solution)	Qty/Conc
BFR-CVS	Polybrominated Diphenyl Ethers/Brominated Flame Retardants	1 kit
	Calibration Solutions CS1-CS5	(5 ampoules)
BFR-CS1, BFR-CS2, BFR-CS3, BFR-CS4, BFR-CS5	Individual Calibration Solutions	200 µL each

NATIVE PBDEs/BFRs		BFR-CS1 (ng/mL)	BFR-CS2 (ng/mL)	BFR-CS3 (ng/mL)	BFR-CS4 (ng/mL)	BFR-CS5 (ng/mL)
2-Bromodiphenyl ether	*BDE-1*	0.250	1.00	5.00	20.0	100
3-Bromodiphenyl ether	*BDE-2*	0.250	1.00	5.00	20.0	100
4-Bromodiphenyl ether	*BDE-3*	0.250	1.00	5.00	20.0	100
2,4-Dibromodiphenyl ether	*BDE-7*	0.250	1.00	5.00	20.0	100
2,6-Dibromodiphenyl ether	*BDE-10*	0.250	1.00	5.00	20.0	100
4,4'-Dibromodiphenyl ether	*BDE-15*	0.250	1.00	5.00	20.0	100
2,2',4-Tribromodiphenyl ether	*BDE-17 (>96%)*	0.240	0.960	4.80	19.0	96.0
2,4,4'-Tribromodiphenyl ether	*BDE-28*	0.250	1.00	5.00	20.0	100
2,4,6-Tribromodiphenyl ether	*BDE-30*	0.250	1.00	5.00	20.0	100
Pentabromoethylbenzene	*PBEB*	0.250	1.00	5.00	20.0	100
Hexabromobenzene	*HBBZ*	0.250	1.00	5.00	20.0	100
2,2',4,4'-Tetrabromodiphenyl ether	*BDE-47*	0.500	2.00	10.0	40.0	200
2,2',4,5'-Tetrabromodiphenyl ether	*BDE-49*	0.500	2.00	10.0	40.0	200
2,3',4,4'-Tetrabromodiphenyl ether	*BDE-66*	0.500	2.00	10.0	40.0	200
2,3',4',6-Tetrabromodiphenyl ether	*BDE-71*	0.500	2.00	10.0	40.0	200
3,3',4,4'-Tetrabromodiphenyl ether	*BDE-77*	0.500	2.00	10.0	40.0	200
2,2',3,4,4'-Pentabromodiphenyl ether	*BDE-85*	0.500	2.00	10.0	40.0	200
2,2',4,4',5-Pentabromodiphenyl ether	*BDE-99*	0.500	2.00	10.0	40.0	200
2,2',4,4',6-Pentabromodiphenyl ether	*BDE-100*	0.500	2.00	10.0	40.0	200
2,3',4,4',6-Pentabromodiphenyl ether	*BDE-119*	0.500	2.00	10.0	40.0	200
3,3',4,4',5-Pentabromodiphenyl ether	*BDE-126*	0.500	2.00	10.0	40.0	200
2,2',3,4,4',5'-Hexabromodiphenyl ether	*BDE-138*	0.500	2.00	10.0	40.0	200
2,2',3,4,4',6-Hexabromodiphenyl ether	*BDE-139*	0.500	2.00	10.0	40.0	200
2,2',3,4,4',6'-Hexabromodiphenyl ether	*BDE-140*	0.500	2.00	10.0	40.0	200
2,2',4,4',5,5'-Hexabromodiphenyl ether	*BDE-153*	0.500	2.00	10.0	40.0	200
2,2',4,4',5,6'-Hexabromodiphenyl ether	*BDE-154*	0.500	2.00	10.0	40.0	200
2,3,3',4,4',5-Hexabromodiphenyl ether	*BDE-156*	0.500	2.00	10.0	40.0	200
3,3',4,4',5,5'-Hexabromodiphenyl ether	*BDE-169*	0.500	2.00	10.0	40.0	200
2,2',4,4',5,5'-Hexabromobiphenyl	*BB-153*	0.500	2.00	10.0	40.0	200
1,2-Bis(2,4,6-tribromophenoxy)ethane	*BTBPE*	0.500	2.00	10.0	40.0	200
2,2',3,3',4,4',6-Heptabromodiphenyl ether	*BDE-171*	1.00	4.00	20.0	80.0	400
2,2',3,4,4',5,5'-Heptabromodiphenyl ether	*BDE-180*	1.00	4.00	20.0	80.0	400
2,2',3,4,4',5',6-Heptabromodiphenyl ether	*BDE-183*	1.00	4.00	20.0	80.0	400
2,2',3,4,4',6,6'-Heptabromodiphenyl ether	*BDE-184*	1.00	4.00	20.0	80.0	400
2,3,3',4,4',5',6-Heptabromodiphenyl ether	*BDE-191*	1.00	4.00	20.0	80.0	400
2,2',3,3',4,4',5,6'-Octabromodiphenyl ether	*BDE-196*	1.00	4.00	20.0	80.0	400
2,2',3,3',4,4',6,6'-Octabromodiphenyl ether	*BDE-197*	1.00	4.00	20.0	80.0	400
2,2',3,3',4,5',6,6'-Octabromodiphenyl ether	*BDE-201*	1.00	4.00	20.0	80.0	400
2,2',3,4,4',5,5',6-Octabromodiphenyl ether	*BDE-203*	1.00	4.00	20.0	80.0	400
2,2',3,4,4',5,6,6'-Octabromodiphenyl ether	*BDE-204*	1.00	4.00	20.0	80.0	400
2,3,3',4,4',5,5',6-Octabromodiphenyl ether	*BDE-205*	1.00	4.00	20.0	80.0	400
2,2',3,3',4,4',5,5',6-Nonabromodiphenyl ether	*BDE-206*	2.50	10.0	50.0	200	1000
2,2',3,3',4,4',5,6,6'-Nonabromodiphenyl ether	*BDE-207*	2.50	10.0	50.0	200	1000
2,2',3,3',4,5,5',6,6'-Nonabromodiphenyl ether	*BDE-208*	2.50	10.0	50.0	200	1000
Decabromodiphenyl ether	*BDE-209*	2.50	10.0	50.0	200	1000
Decabromodiphenylethane	*DBDPE*	5.00	20.0	100	400	2000
MASS-LABELLED PBDEs/BFRs						
4-Bromo($^{13}C_{12}$)diphenyl ether	*MBDE-3*	25.0	25.0	25.0	25.0	25.0
4,4'-Dibromo($^{13}C_{12}$)diphenyl ether	*MBDE-15*	25.0	25.0	25.0	25.0	25.0
2,4,4'-Tribromo($^{13}C_{12}$)diphenyl ether	*MBDE-28*	25.0	25.0	25.0	25.0	25.0
Hexabromo($^{13}C_6$)benzene	*MHBBZ*	25.0	25.0	25.0	25.0	25.0
2,2',4,4'-Tetrabromo($^{13}C_{12}$)diphenyl ether	*MBDE-47*	50.0	50.0	50.0	50.0	50.0
3,3',4,4'-Tetrabromo($^{13}C_{12}$)diphenyl ether	*MBDE-77*	50.0	50.0	50.0	50.0	50.0
2,2',4,4',5-Pentabromo($^{13}C_{12}$)diphenyl ether	*MBDE-99*	50.0	50.0	50.0	50.0	50.0
2,2',4,4',6-Pentabromo($^{13}C_{12}$)diphenyl ether	*MBDE-100*	50.0	50.0	50.0	50.0	50.0
3,3',4,4',5-Pentabromo($^{13}C_{12}$)diphenyl ether	*MBDE-126*	50.0	50.0	50.0	50.0	50.0
2,2',4,4',5,5'-Hexabromo($^{13}C_{12}$)diphenyl ether	*MBDE-153*	50.0	50.0	50.0	50.0	50.0
2,2',4,4',5,6'-Hexabromo($^{13}C_{12}$)diphenyl ether	*MBDE-154*	50.0	50.0	50.0	50.0	50.0
3,3',4,4',5,5'-Hexabromo($^{13}C_{12}$)diphenyl ether	*MBDE-169*	50.0	50.0	50.0	50.0	50.0
2,2',4,4',5,5'-Hexabromo($^{13}C_{12}$)biphenyl	*MBB-153*	50.0	50.0	50.0	50.0	50.0
1,2-Bis[2,4,6-tribromo($^{13}C_6$)phenoxy]ethane	*MBTBPE*	50.0	50.0	50.0	50.0	50.0
2,2',3,4,4',5',6-Heptabromo($^{13}C_{12}$)diphenyl ether	*MBDE-183*	100	100	100	100	100
2,2',3,3',4,4',6,6'-Octabromo($^{13}C_{12}$)diphenyl ether	*MBDE-197*	100	100	100	100	100
2,3,3',4,4',5,5',6-Octabromo($^{13}C_{12}$)diphenyl ether	*MBDE-205*	100	100	100	100	100
2,2',3,3',4,4',5,6,6'-Nonabromo($^{13}C_{12}$)diphenyl ether	*MBDE-207*	250	250	250	250	250
Decabromo($^{13}C_{12}$)diphenyl ether	*MBDE-209*	250	250	250	250	250
Decabromo($^{13}C_{12}$)diphenylethane	*MDBDPE*	500	500	500	500	500
INTERNAL/INJECTION STANDARDS						
3,3',4,5'-Tetrabromo($^{13}C_{12}$)diphenyl ether	*MBDE-79*	50.0	50.0	50.0	50.0	50.0
2,2',3,4,4',6-Hexabromo($^{13}C_{12}$)diphenyl ether	*MBDE-139*	50.0	50.0	50.0	50.0	50.0
2,2',3,4,4',5,5'-Heptabromo($^{13}C_{12}$)diphenyl ether	*MBDE-180*	100	100	100	100	100
2,2',3,3',4,4',5,5',6-Nonabromo($^{13}C_{12}$)diphenyl ether	*MBDE-206*	250	250	250	250	250
SAMPLING/CLEANUP STANDARD						
2,2',3,4,4',5'-Hexabromo($^{13}C_{12}$)diphenyl ether	*MBDE-138*	50.0	50.0	50.0	50.0	50.0

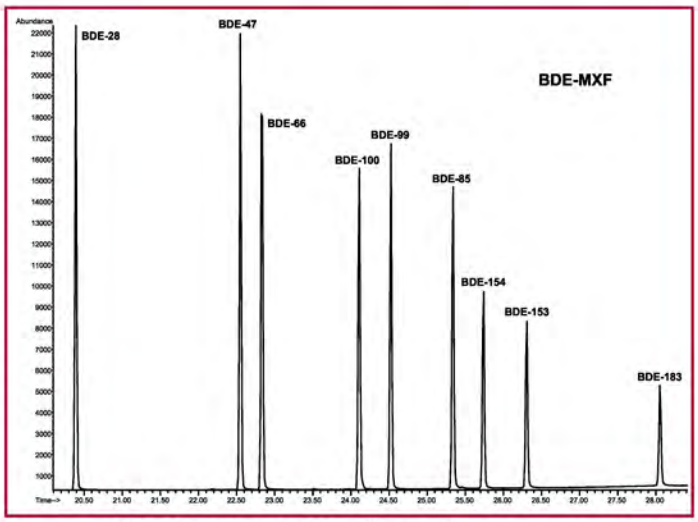
Catalogue Number	Product (toluene solution)	Qty/Conc
BFR-LCS	Labelled Compounds Solution	1.2 mL
BFR-ISS	Internal/Injection Standards	1.2 mL
BFR-SCS	Sampling/Cleanup Standard	1.2 mL
BFR-PAR	Native Compounds Stock Solution (nonane/toluene solution)	1.2 mL

NATIVE PBDEs/BFRs		BFR-LCS (ng/mL)	BFR-ISS (ng/mL)	BFR-SCS (ng/mL)	BFR-PAR (ng/mL)
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
MASS-LABELLED PBDEs/BFRs					
4-Bromo($^{13}C_{12}$)diphenyl ether	*MBDE-3*	100	—	—	—
4,4'-Dibromo($^{13}C_{12}$)diphenyl ether	*MBDE-15*	100	—	—	—
2,4,4'-Tribromo($^{13}C_{12}$)diphenyl ether	*MBDE-28*	100	—	—	—
Hexabromo($^{13}C_6$)benzene	*MHBBZ*	100	—	—	—
2,2',4,4'-Tetrabromo($^{13}C_{12}$)diphenyl ether	*MBDE-47*	200	—	—	—
3,3',4,4'-Tetrabromo($^{13}C_{12}$)diphenyl ether	*MBDE-77*	200	—	—	—
2,2',4,4',5-Pentabromo($^{13}C_{12}$)diphenyl ether	*MBDE-99*	200	—	—	—
2,2',4,4',6-Pentabromo($^{13}C_{12}$)diphenyl ether	*MBDE-100*	200	—	—	—
3,3',4,4',5-Pentabromo($^{13}C_{12}$)diphenyl ether	*MBDE-126*	200	—	—	—
2,2',4,4',5,5'-Hexabromo($^{13}C_{12}$)diphenyl ether	*MBDE-153*	200	—	—	—
2,2',4,4',5,6'-Hexabromo($^{13}C_{12}$)diphenyl ether	*MBDE-154*	200	—	—	—
3,3',4,4',5,5'-Hexabromo($^{13}C_{12}$)diphenyl ether	*MBDE-169*	200	—	—	—
2,2',4,4',5,5'-Hexabromo($^{13}C_{12}$)biphenyl	*MBB-153*	200	—	—	—
1,2-Bis[2,4,6-tribromo($^{13}C_6$)phenoxy]ethane	*MBTBPE*	200	—	—	—
2,2',3,4,4',5',6-Heptabromo($^{13}C_{12}$)diphenyl ether	*MBDE-183*	400	—	—	—
2,2',3,3',4,4',6,6'-Octabromo($^{13}C_{12}$)diphenyl ether	*MBDE-197*	400	—	—	—
2,3,3',4,4',5,5',6-Octabromo($^{13}C_{12}$)diphenyl ether	*MBDE-205*	400	—	—	—
2,2',3,3',4,4',5,6,6'-Nonabromo($^{13}C_{12}$)diphenyl ether	*MBDE-207*	1000	—	—	—
Decabromo($^{13}C_{12}$)diphenyl ether	*MBDE-209*	1000	—	—	—
Decabromo($^{13}C_{12}$)diphenylethane	*MDBDPE*	2000	—	—	—
INTERNAL/INJECTION STANDARDS					
3,3',4,5'-Tetrabromo($^{13}C_{12}$)diphenyl ether	*MBDE-79*	—	200	—	—
2,2',3,4,4',6-Hexabromo($^{13}C_{12}$)diphenyl ether	*MBDE-139*	—	200	—	—
2,2',3,4,4',5,5'-Heptabromo($^{13}C_{12}$)diphenyl ether	*MBDE-180*	—	400	—	—
2,2',3,3',4,4',5,5',6-Nonabromo($^{13}C_{12}$)diphenyl ether	*MBDE-206*	—	1000	—	—
SAMPLING/CLEANUP STANDARD					
2,2',3,4,4',5'-Hexabromo($^{13}C_{12}$)diphenyl ether	*MBDE-138*	—	—	400	—

BDE-CVS-F

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

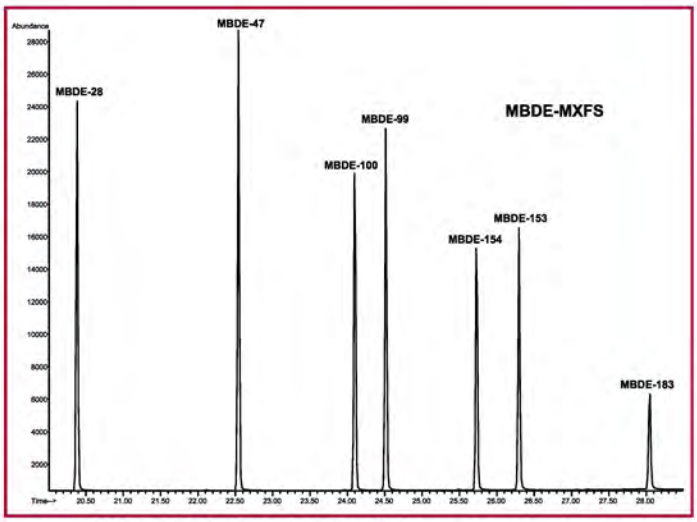
NATIVE PBDEs	*IUPAC*	BDE-CS1-F (ng/mL)	BDE-CS2-F (ng/mL)	BDE-CS3-F (ng/mL)	BDE-CS4-F (ng/mL)	BDE-CS5-F (ng/mL)
2,4,4'-Tribromodiphenyl ether	*28*	1.00	5.00	25.0	100	500
2,2',4,4'-Tetrabromodiphenyl ether	*47*	1.00	5.00	25.0	100	500
2,3',4,4'-Tetrabromodiphenyl ether	*66*	1.00	5.00	25.0	100	500
2,2',3,4,4'-Pentabromodiphenyl ether	*85*	1.00	5.00	25.0	100	500
2,2',4,4',5-Pentabromodiphenyl ether	*99*	1.00	5.00	25.0	100	500
2,2',4,4',6-Pentabromodiphenyl ether	*100*	1.00	5.00	25.0	100	500
2,2',4,4',5,5'-Hexabromodiphenyl ether	*153*	1.00	5.00	25.0	100	500
2,2',4,4',5,6'-Hexabromodiphenyl ether	*154*	1.00	5.00	25.0	100	500
2,2',3,4,4',5',6-Heptabromodiphenyl ether	*183*	1.00	5.00	25.0	100	500
SURROGATE STANDARDS						
2,4,4'-Tribromo($^{13}C_{12}$)diphenyl ether	*28L*	20.0	20.0	20.0	20.0	20.0
2,2',4,4'-Tetrabromo($^{13}C_{12}$)diphenyl ether	*47L*	20.0	20.0	20.0	20.0	20.0
2,2',4,4',5-Pentabromo($^{13}C_{12}$)diphenyl ether	*99L*	20.0	20.0	20.0	20.0	20.0
2,2',4,4',6-Pentabromo($^{13}C_{12}$)diphenyl ether	*100L*	20.0	20.0	20.0	20.0	20.0
2,2',4,4',5,5'-Hexabromo($^{13}C_{12}$)diphenyl ether	*153L*	20.0	20.0	20.0	20.0	20.0
2,2',4,4',5,6'-Hexabromo($^{13}C_{12}$)diphenyl ether	*154L*	20.0	20.0	20.0	20.0	20.0
2,2',3,4,4',5',6-Heptabromo($^{13}C_{12}$)diphenyl ether	*183L*	20.0	20.0	20.0	20.0	20.0
RECOVERY STANDARDS						
3,3',4,4'-Tetrabromo($^{13}C_{12}$)diphenyl ether	*77L*	20.0	20.0	20.0	20.0	20.0
2,2',3,4,4',5'-Hexabromo($^{13}C_{12}$)diphenyl ether	*138L*	20.0	20.0	20.0	20.0	20.0



BDE-MXF; HRGC/LRMS Full Scan Chromatogram

Catalogue Number	Product (toluene solution)	Qty/Conc
MBDE-MXFS	Mass-Labelled PBDE Surrogate Stock Solution	1.2 mL
MBDE-MXFR	Mass-Labelled PBDE Recovery Stock Solution	1.2 mL
BDE-MXF	Native PBDE Stock Solution/Mixture	1.2 mL

NATIVE PBDEs	*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
SURROGATE STANDARDS				
2,4,4'-Tribromo($^{13}C_{12}$)diphenyl ether	*28L*	2000	—	—
2,2',4,4'-Tetrabromo($^{13}C_{12}$)diphenyl ether	*47L*	2000	—	—
2,2',4,4',5-Pentabromo($^{13}C_{12}$)diphenyl ether	*99L*	2000	—	—
2,2',4,4',6-Pentabromo($^{13}C_{12}$)diphenyl ether	*100L*	2000	—	—
2,2',4,4',5,5'-Hexabromo($^{13}C_{12}$)diphenyl ether	*153L*	2000	—	—
2,2',4,4',5,6'-Hexabromo($^{13}C_{12}$)diphenyl ether	*154L*	2000	—	—
2,2',3,4,4',5',6-Heptabromo($^{13}C_{12}$)diphenyl ether	*183L*	2000	—	—
RECOVERY STANDARDS				
3,3',4,4'-Tetrabromo($^{13}C_{12}$)diphenyl ether	*77L*	—	2000	—
2,2',3,4,4',5'-Hexabromo($^{13}C_{12}$)diphenyl ether	*138L*	—	2000	—



MBDE-MXFS; HRGC/LRMS Full Scan Chromatogram.



BDE-CVS-G

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

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

NATIVE PBDEs	*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*	1.00	5.00	20.0	100	400
2,4-Dibromodiphenyl ether	*7*	1.00	5.00	20.0	100	400
4,4'-Dibromodiphenyl ether	*15*	1.00	5.00	20.0	100	400
2,2',4-Tribromodiphenyl ether	*17*	1.00	5.00	20.0	100	400
2,4,4'-Tribromodiphenyl ether	*28*	1.00	5.00	20.0	100	400
2,2',4,4'-Tetrabromodiphenyl ether	*47*	1.00	5.00	20.0	100	400
2,2',4,5'-Tetrabromodiphenyl ether	*49*	1.00	5.00	20.0	100	400
2,3',4,4'-Tetrabromodiphenyl ether	*66*	1.00	5.00	20.0	100	400
2,3',4',6-Tetrabromodiphenyl ether	*71*	1.00	5.00	20.0	100	400
3,3',4,4'-Tetrabromodiphenyl ether	*77*	1.00	5.00	20.0	100	400
2,2',3,4,4'-Pentabromodiphenyl ether	*85*	1.00	5.00	20.0	100	400
2,2',4,4',5-Pentabromodiphenyl ether	*99*	1.00	5.00	20.0	100	400
2,2',4,4',6-Pentabromodiphenyl ether	*100*	1.00	5.00	20.0	100	400
2,3',4,4',6-Pentabromodiphenyl ether	*119*	1.00	5.00	20.0	100	400
3,3',4,4',5-Pentabromodiphenyl ether	*126*	1.00	5.00	20.0	100	400
2,2',3,4,4',5'-Hexabromodiphenyl ether	*138*	2.00	10.0	40.0	200	800
2,2',4,4',5,5'-Hexabromodiphenyl ether	*153*	2.00	10.0	40.0	200	800
2,2',4,4',5,6'-Hexabromodiphenyl ether	*154*	2.00	10.0	40.0	200	800
2,3,3',4,4',5-Hexabromodiphenyl ether	*156*	2.00	10.0	40.0	200	800
2,2',3,4,4',5',6-Heptabromodiphenyl ether	*183*	2.00	10.0	40.0	200	800
2,2',3,4,4',6,6'-Heptabromodiphenyl ether	*184*	2.00	10.0	40.0	200	800
2,3,3',4,4',5',6-Heptabromodiphenyl ether	*191*	2.00	10.0	40.0	200	800
2,2',3,3',4,4',5,6'-Octabromodiphenyl ether	*196*	2.00	10.0	40.0	200	800
2,2',3,3',4,4',6,6'-Octabromodiphenyl ether	*197*	2.00	10.0	40.0	200	800
2,2',3,3',4,4',5,5',6-Nonabromodiphenyl ether	*206*	5.00	25.0	100	500	2000
2,2',3,3',4,4',5,6,6'-Nonabromodiphenyl ether	*207*	5.00	25.0	100	500	2000
Decabromodiphenyl ether	*209*	5.00	25.0	100	500	2000
MASS-LABELLED PBDEs						
4-Bromo($^{13}C_{12}$)diphenyl ether	*3L*	100	100	100	100	100
4,4'-Dibromo($^{13}C_{12}$)diphenyl ether	*15L*	100	100	100	100	100
2,4,4'-Tribromo($^{13}C_{12}$)diphenyl ether	*28L*	100	100	100	100	100
2,2',4,4'-Tetrabromo($^{13}C_{12}$)diphenyl ether	*47L*	100	100	100	100	100
2,2',4,4',5-Pentabromo($^{13}C_{12}$)diphenyl ether	*99L*	100	100	100	100	100
2,2',4,4',6-Pentabromo($^{13}C_{12}$)diphenyl ether	*100L*	100	100	100	100	100
3,3',4,4',5-Pentabromo($^{13}C_{12}$)diphenyl ether	*126L*	100	100	100	100	100
2,2',4,4',5,5'-Hexabromo($^{13}C_{12}$)diphenyl ether	*153L*	200	200	200	200	200
2,2',4,4',5,6'-Hexabromo($^{13}C_{12}$)diphenyl ether	*154L*	200	200	200	200	200
2,2',3,4,4',5',6-Heptabromo($^{13}C_{12}$)diphenyl ether	*183L*	200	200	200	200	200
2,2',3,3',4,4',6,6'-Octabromo($^{13}C_{12}$)diphenyl ether	*197L*	200	200	200	200	200
2,2',3,3',4,4',5,6,6'-Nonabromo($^{13}C_{12}$)diphenyl ether	*207L*	500	500	500	500	500
Decabromo($^{13}C_{12}$)diphenyl ether	*209L*	500	500	500	500	500
INTERNAL STANDARDS						
3,3',4,5'-Tetrabromo($^{13}C_{12}$)diphenyl ether	*79L*	100	100	100	100	100
2,2',3,4,4',5'-Hexabromo($^{13}C_{12}$)diphenyl ether	*138L*	200	200	200	200	200
2,2',3,3',4,4',5,5',6-Nonabromo($^{13}C_{12}$)diphenyl ether	*206L*	500	500	500	500	500

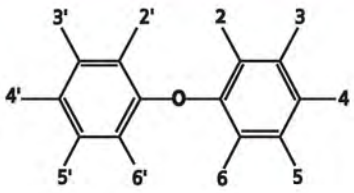
Catalogue Number	Product (nonane/toluene solution)	Qty/Conc
MBDE-MXG	Mass-Labelled PBDE Solution/Mixture	1.2 mL
MBDE-ISS-G	Mass-Labelled PBDE Internal Standard Solution/Mixture	1.2 mL
BDE-MXE	Native PBDE Solution/Mixture	1.2 mL

NATIVE PBDEs	*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 PBDEs				
4-Bromo($^{13}C_{12}$)diphenyl ether	*3L*	100	—	—
4,4'-Dibromo($^{13}C_{12}$)diphenyl ether	*15L*	100	—	—
2,4,4'-Tribromo($^{13}C_{12}$)diphenyl ether	*28L*	100	—	—
2,2',4,4'-Tetrabromo($^{13}C_{12}$)diphenyl ether	*47L*	100	—	—
2,2',4,4',5-Pentabromo($^{13}C_{12}$)diphenyl ether	*99L*	100	—	—
2,2',4,4',6-Pentabromo($^{13}C_{12}$)diphenyl ether	*100L*	100	—	—
3,3',4,4',5-Pentabromo($^{13}C_{12}$)diphenyl ether	*126L*	100	—	—
2,2',4,4',5,5'-Hexabromo($^{13}C_{12}$)diphenyl ether	*153L*	200	—	—
2,2',4,4',5,6'-Hexabromo($^{13}C_{12}$)diphenyl ether	*154L*	200	—	—
2,2',3,4,4',5',6-Heptabromo($^{13}C_{12}$)diphenyl ether	*183L*	200	—	—
2,2',3,3',4,4',6,6'-Octabromo($^{13}C_{12}$)diphenyl ether	*197L*	200	—	—
2,2',3,3',4,4',5,6,6'-Nonabromo($^{13}C_{12}$)diphenyl ether	*207L*	500	—	—
Decabromo($^{13}C_{12}$)diphenyl ether	*209L*	500	—	—
INTERNAL STANDARDS				
3,3',4,5'-Tetrabromo($^{13}C_{12}$)diphenyl ether	*79L*	—	100	—
2,2',3,4,4',5'-Hexabromo($^{13}C_{12}$)diphenyl ether	*138L*	—	200	—
2,2',3,3',4,4',5,5',6-Nonabromo($^{13}C_{12}$)diphenyl ether	*206L*	—	500	—



NATIVE POLYBROMINATED DIPHENYL ETHERS (PBDEs)

Catalogue Number	Product (nonane solution)	Qty/Conc	
BDE-1	2-Bromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-2	3-Bromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-3	4-Bromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-7	2,4-Dibromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-10	2,6-Dibromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-15	4,4'-Dibromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-17	2,2',4-Tribromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-21	2,3,4-Tribromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-28	2,4,4'-Tribromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-30	2,4,6-Tribromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-37	3,4,4'-Tribromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-47	2,2',4,4'-Tetrabromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-49	2,2',4,5'-Tetrabromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-54	2,2',6,6'-Tetrabromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-60	2,3,4,4'-Tetrabromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-66	2,3',4,4'-Tetrabromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-71	2,3',4',6-Tetrabromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-77	3,3',4,4'-Tetrabromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-82	2,2',3,3',4-Pentabromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-85	2,2',3,4,4'-Pentabromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-99	2,2',4,4',5-Pentabromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-100	2,2',4,4',6-Pentabromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-104	2,2',4,6,6'-Pentabromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-105	2,3,3',4,4'-Pentabromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-119	2,3',4,4',6-Pentabromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-126	3,3',4,4',5-Pentabromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-128	2,2',3,3',4,4'-Hexabromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-138	2,2',3,4,4',5'-Hexabromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-139	2,2',3,4,4',6-Hexabromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-140	2,2',3,4,4',6'-Hexabromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-149	2,2',3,4',5',6-Hexabromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-153	2,2',4,4',5,5'-Hexabromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-154	2,2',4,4',5,6'-Hexabromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-155	2,2',4,4',6,6'-Hexabromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-156	2,3,3',4,4',5-Hexabromodiphenyl ether	1.2 mL	50.0 µg/mL

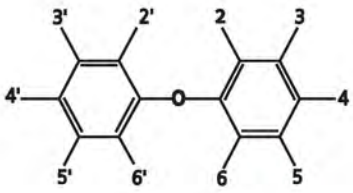


NATIVE POLYBROMINATED DIPHENYL ETHERS (PBDEs)

Catalogue Number	Product (nonane solution)	Qty/Conc	
BDE-169	3,3',4,4',5,5'-Hexabromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-170	2,2',3,3',4,4',5-Heptabromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-171	2,2',3,3',4,4',6-Heptabromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-175	2,2',3,3',4,5',6-Heptabromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-176	2,2',3,3',4,6,6'-Heptabromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-177	2,2',3,3',4',5,6-Heptabromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-179	2,2',3,3',5,6,6'-Heptabromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-180	2,2',3,4,4',5,5'-Heptabromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-181	2,2',3,4,4',5,6-Heptabromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-182	2,2',3,4,4',5,6'-Heptabromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-183	2,2',3,4,4',5',6-Heptabromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-184	2,2',3,4,4',6,6'-Heptabromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-188	2,2',3,4',5,6,6'-Heptabromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-189	2,3,3',4,4',5,5'-Heptabromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-191*	2,3,3',4,4',5',6-Heptabromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-194*	2,2',3,3',4,4',5,5'-Octabromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-195*	2,2',3,3',4,4',5,6-Octabromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-196*	2,2',3,3',4,4',5,6'-Octabromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-197*	2,2',3,3',4,4',6,6'-Octabromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-198*	2,2',3,3',4,5,5',6,-Octabromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-199*	2,2',3,3',4,5,5',6'-Octabromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-200*	2,2',3,3',4,5,6,6'-Octabromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-201*	2,2',3,3',4,5',6,6'-Octabromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-202*	2,2',3,3',5,5',6,6'-Octabromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-203*	2,2',3,4,4',5,5',6-Octabromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-204*	2,2',3,4,4',5,6,6'-Octabromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-205*	2,3,3',4,4',5,5',6-Octabromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-206*	2,2',3,3',4,4',5,5',6-Nonabromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-207*	2,2',3,3',4,4',5,6,6'-Nonabromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-208*	2,2',3,3',4,5,5',6,6'-Nonabromodiphenyl ether	1.2 mL	50.0 µg/mL
BDE-209*	Decabromodiphenyl ether	1.2 mL	50.0 µg/mL
4PC-BDE-208*	2,2',3,3',4,5,5',6,6'-Nonabromo-4'-chlorodiphenyl ether	1.2 mL	50.0 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
BDE-WD	PBDE Window Defining Solution/Mixture for use with a J&W DB-5HT column	1.2 mL

	FIRST ELUTER (IUPAC)	LAST ELUTER (IUPAC)	CONCENTRATION (µg/mL each)
Bromodiphenyl ethers	1	3	1.00
Dibromodiphenyl ethers	10	15	1.00
Tribromodiphenyl ethers	30	37	1.00
Tetrabromodiphenyl ethers	54	60	1.00
Pentabromodiphenyl ethers	104	82	1.00
Hexabromodiphenyl ethers	155	128	2.00
Heptabromodiphenyl ethers	188	170	2.00
Octabromodiphenyl ethers	202	195	2.00
Nonabromodiphenyl ethers	208	206	5.00
Decabromodiphenyl ether	209		5.00

NATIVE PBDEs: SOLUTION/MIXTURES

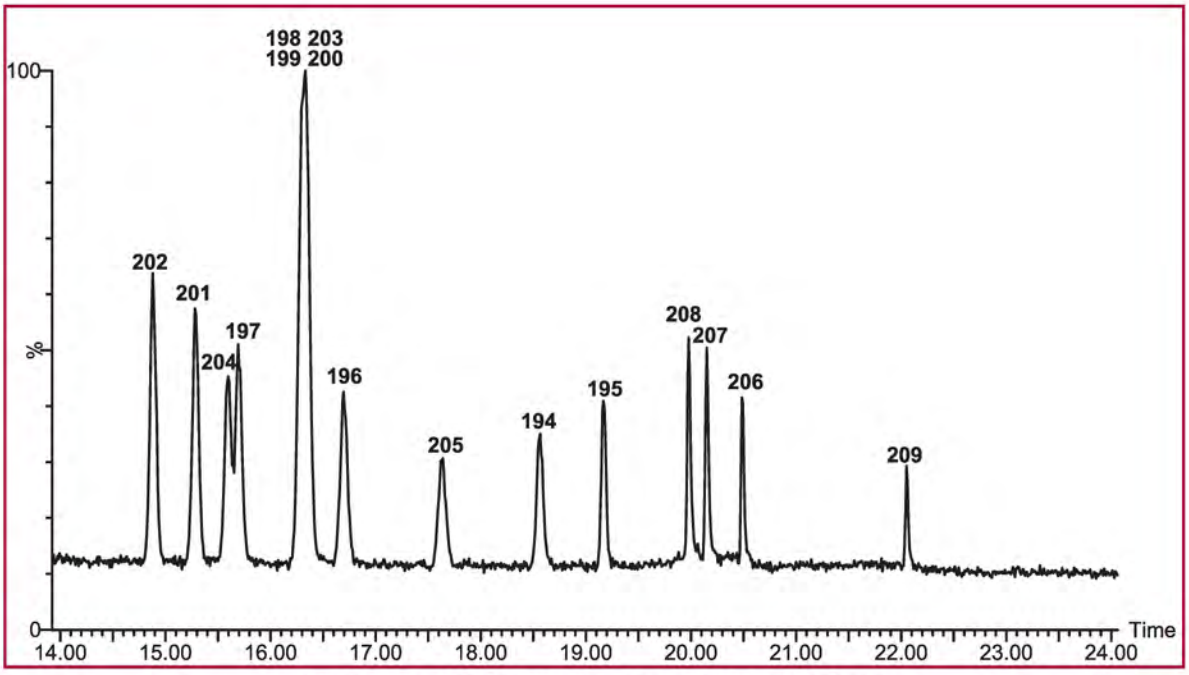
Catalogue Number	Product (nonane solution)	Qty/Conc
BDE-MXA	Native PBDE Solution/Mixture	1.2 mL

	IUPAC	
2,2',4,4'-Tetrabromodiphenyl ether	*47*	5.00 µg/mL
2,2',4,4',5-Pentabromodiphenyl ether	*99*	5.00 µg/mL
2,2',4,4',5,5'-Hexabromodiphenyl ether	*153*	5.00 µg/mL

BDE-MXB	Native PBDE Solution/Mixture	1.2 mL
	IUPAC	
2,4,4'-Tribromodiphenyl ether	*28*	5.00 µg/mL
2,2',4,4',5,6'-Hexabromodiphenyl ether	*154*	5.00 µg/mL
2,2',3,4,4',5',6-Heptabromodiphenyl ether	*183*	5.00 µg/mL

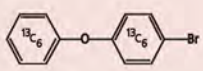
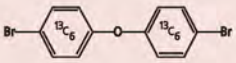
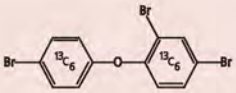
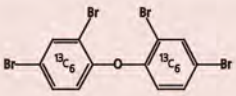
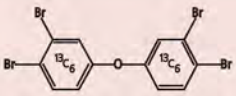
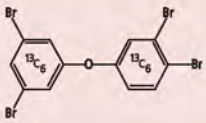
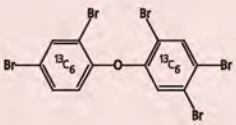
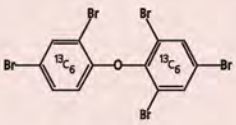
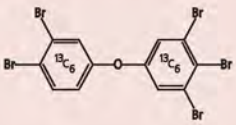
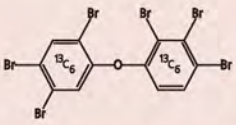
BDE-MXD	Native PBDE Solution/Mixture	1.2 mL
	IUPAC	
2,2',4-Tribromodiphenyl ether	*17*	5.00 µg/mL
2,2',4,4'-Tetrabromodiphenyl ether	*47*	5.00 µg/mL
2,3',4,4'-Tetrabromodiphenyl ether	*66*	5.00 µg/mL
2,2',4,4',6-Pentabromodiphenyl ether	*100*	5.00 µg/mL
2,2',4,4',5,5'-Hexabromodiphenyl ether	*153*	5.00 µg/mL
2,2',3,4,4',5',6-Heptabromodiphenyl ether	*183*	5.00 µg/mL
Decabromodiphenyl ether	*209*	10.0 µg/mL

Catalogue Number	Product (nonane/toluene solution)	Qty/Conc
BDE-OND	Solution/Mixture of Octa-, Nona-, and Deca-BDEs	1.2 mL
	IUPAC	
2,2',3,3',4,4',5,5'-Octabromodiphenyl ether	*194*	1.00 µg/mL
2,2',3,3',4,4',5,6-Octabromodiphenyl ether	*195*	1.00 µg/mL
2,2',3,3',4,4',5,6'-Octabromodiphenyl ether	*196*	1.00 µg/mL
2,2',3,3',4,4',6,6'-Octabromodiphenyl ether	*197*	1.00 µg/mL
2,2',3,3',4,5,5',6-Octabromodiphenyl ether	*198*	1.00 µg/mL
2,2',3,3',4,5,5',6'-Octabromodiphenyl ether	*199*	1.00 µg/mL
2,2',3,3',4,5,6,6'-Octabromodiphenyl ether	*200*	1.00 µg/mL
2,2',3,3',4,5',6,6'-Octabromodiphenyl ether	*201*	1.00 µg/mL
2,2',3,3',5,5',6,6'-Octabromodiphenyl ether	*202*	1.00 µg/mL
2,2',3,4,4',5,5',6-Octabromodiphenyl ether	*203*	1.00 µg/mL
2,2',3,4,4',5,6,6'-Octabromodiphenyl ether	*204*	1.00 µg/mL
2,3,3',4,4',5,5',6-Octabromodiphenyl ether	*205*	1.00 µg/mL
2,2',3,3',4,4',5,5',6-Nonabromodiphenyl ether	*206*	2.50 µg/mL
2,2',3,3',4,4',5,6,6'-Nonabromodiphenyl ether	*207*	2.50 µg/mL
2,2',3,3',4,5,5',6,6'-Nonabromodiphenyl ether	*208*	2.50 µg/mL
Decabromodiphenyl ether	*209*	2.50 µg/mL



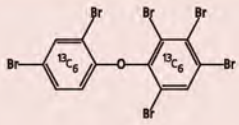
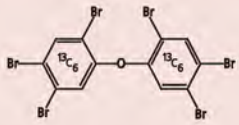
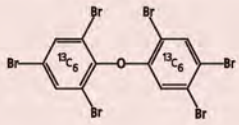
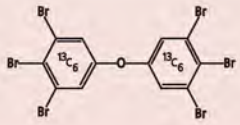
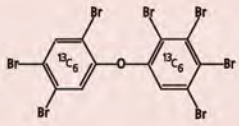
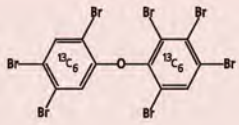
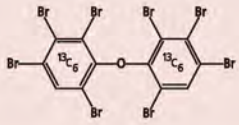
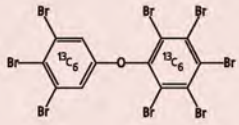
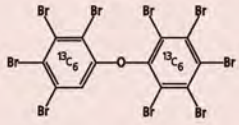
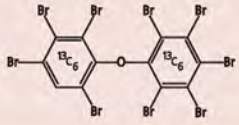
HRGC/HRMS Data for BDE-OND on a 15 m DB-5HT column.

MASS-LABELLED POLYBROMINATED DIPHENYL ETHERS (PBDEs)

Catalogue Number		Product
MBDE-3		4-Bromo($^{13}C_{12}$)diphenyl ether 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBDE-15		4,4'-Dibromo($^{13}C_{12}$)diphenyl ether 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBDE-28		2,4,4'-Tribromo($^{13}C_{12}$)diphenyl ether 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBDE-47		2,2',4,4'-Tetrabromo($^{13}C_{12}$)diphenyl ether 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBDE-77		3,3',4,4'-Tetrabromo($^{13}C_{12}$)diphenyl ether 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBDE-79		3,3',4,5'-Tetrabromo($^{13}C_{12}$)diphenyl ether 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBDE-99		2,2',4,4',5-Pentabromo($^{13}C_{12}$)diphenyl ether 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBDE-100		2,2',4,4',6-Pentabromo($^{13}C_{12}$)diphenyl ether 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBDE-126		3,3',4,4',5-Pentabromo($^{13}C_{12}$)diphenyl ether 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBDE-138		2,2',3,4,4',5'-Hexabromo($^{13}C_{12}$)diphenyl ether 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane

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

MASS-LABELLED POLYBROMINATED DIPHENYL ETHERS (PBDEs)

Catalogue Number		Product
MBDE-139		2,2',3,4,4',6-Hexabromo($^{13}C_{12}$)diphenyl ether 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBDE-153		2,2',4,4',5,5'-Hexabromo($^{13}C_{12}$)diphenyl ether 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBDE-154		2,2',4,4',5,6'-Hexabromo($^{13}C_{12}$)diphenyl ether 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBDE-169		3,3',4,4',5,5'-Hexabromo($^{13}C_{12}$)diphenyl ether 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBDE-180		2,2',3,4,4',5,5'-Heptabromo($^{13}C_{12}$)diphenyl ether 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBDE-183		2,2',3,4,4',5',6-Heptabromo($^{13}C_{12}$)diphenyl ether 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MBDE-197		2,2',3,3',4,4',6,6'-Octabromo($^{13}C_{12}$)diphenyl ether 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
MBDE-205		2,3,3',4,4',5,5',6-Octabromo($^{13}C_{12}$)diphenyl ether 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
MBDE-206		2,2',3,3',4,4',5,5',6-Nonabromo($^{13}C_{12}$)diphenyl ether 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
MBDE-207		2,2',3,3',4,4',5,6,6'-Nonabromo($^{13}C_{12}$)diphenyl ether 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene

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

MASS-LABELLED POLYBROMINATED DIPHENYL ETHERS (PBDEs)

Catalogue Number		Product
MBDE-209		Decabromo($^{13}C_{12}$)diphenyl ether 1.2 mL; 25.0 µg/mL (±1.2 µg/mL); in toluene

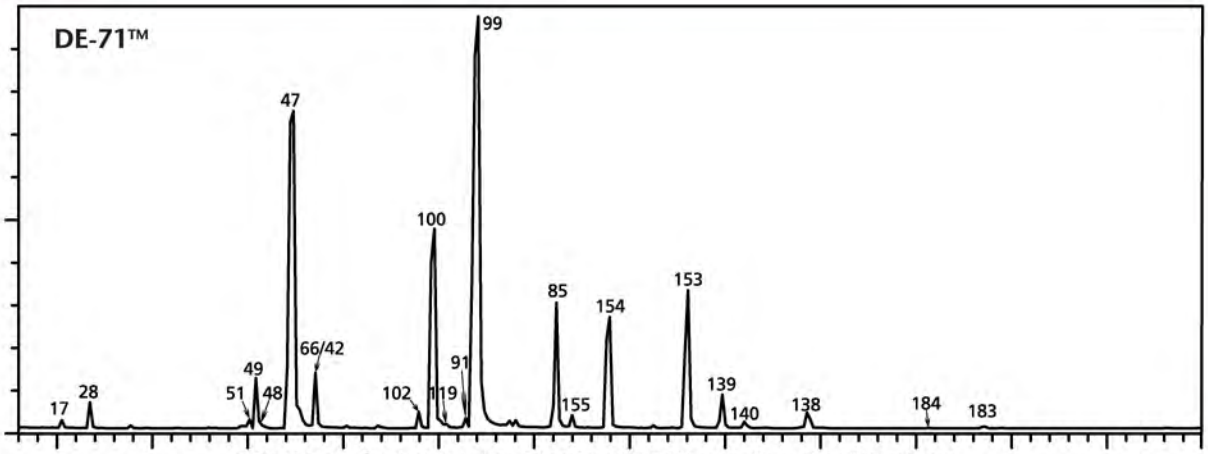
* Unless stated otherwise, isotopic purities of these compounds are 99% or greater.

MASS-LABELLED PBDEs: SOLUTION/MIXTURES

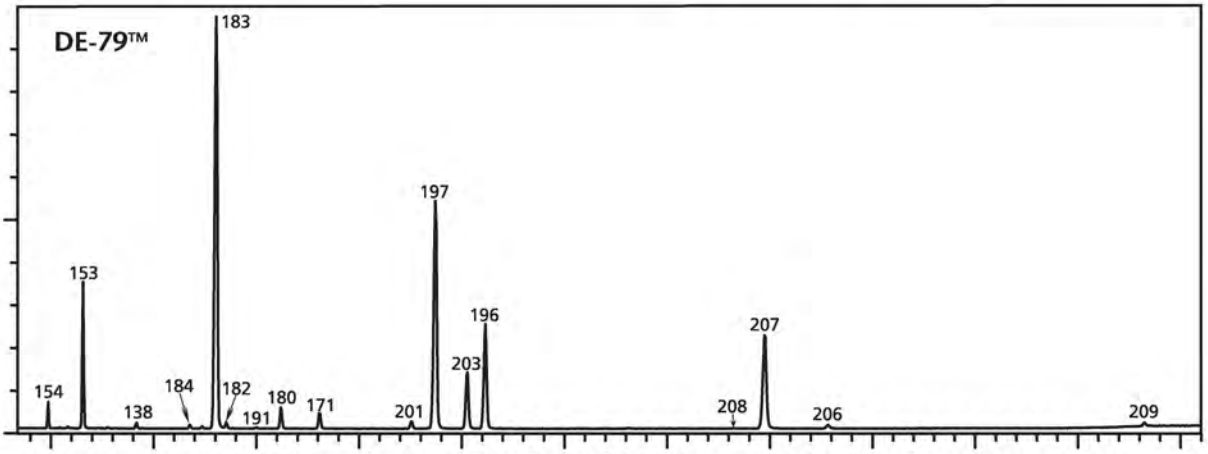
Catalogue Number	Product (nonane solution)		Qty/Conc
MBDE-MXA	Mass-Labelled PBDE Solution/Mixture		1.2 mL
		IUPAC	
	2,2',4,4'-Tetrabromo($^{13}C_{12}$)diphenyl ether	*47L*	5.00 µg/mL
	2,2',4,4',5-Pentabromo($^{13}C_{12}$)diphenyl ether	*99L*	5.00 µg/mL
	2,2',4,4',5,5'-Hexabromo($^{13}C_{12}$)diphenyl ether	*153L*	5.00 µg/mL
MBDE-MXB	Mass-Labelled PBDE Solution/Mixture		1.2 mL
		IUPAC	
	2,4,4'-Tribromo($^{13}C_{12}$)diphenyl ether	*28L*	5.00 µg/mL
	2,2',4,4',5,6'-Hexabromo($^{13}C_{12}$)diphenyl ether	*154L*	5.00 µg/mL
	2,2',3,4,4',5',6-Heptabromo($^{13}C_{12}$)diphenyl ether	*183L*	5.00 µg/mL
MBDE-MXC	Mass-Labelled PBDE Solution/Mixture		1.2 mL
		IUPAC	
	4-Bromo($^{13}C_{12}$)diphenyl ether	*3L*	5.00 µg/mL
	4,4'-Dibromo($^{13}C_{12}$)diphenyl ether	*15L*	5.00 µg/mL
	2,4,4'-Tribromo($^{13}C_{12}$)diphenyl ether	*28L*	5.00 µg/mL
	2,2',4,4'-Tetrabromo($^{13}C_{12}$)diphenyl ether	*47L*	5.00 µg/mL
	2,2',4,4',5-Pentabromo($^{13}C_{12}$)diphenyl ether	*99L*	5.00 µg/mL
	2,2',4,4',5,5'-Hexabromo($^{13}C_{12}$)diphenyl ether	*153L*	5.00 µg/mL
	2,2',4,4',5,6'-Hexabromo($^{13}C_{12}$)diphenyl ether	*154L*	5.00 µg/mL
	2,2',3,4,4',5',6-Heptabromo($^{13}C_{12}$)diphenyl ether	*183L*	5.00 µg/mL

POLYBROMINATED DIPHENYL ETHER TECHNICAL MIXTURES

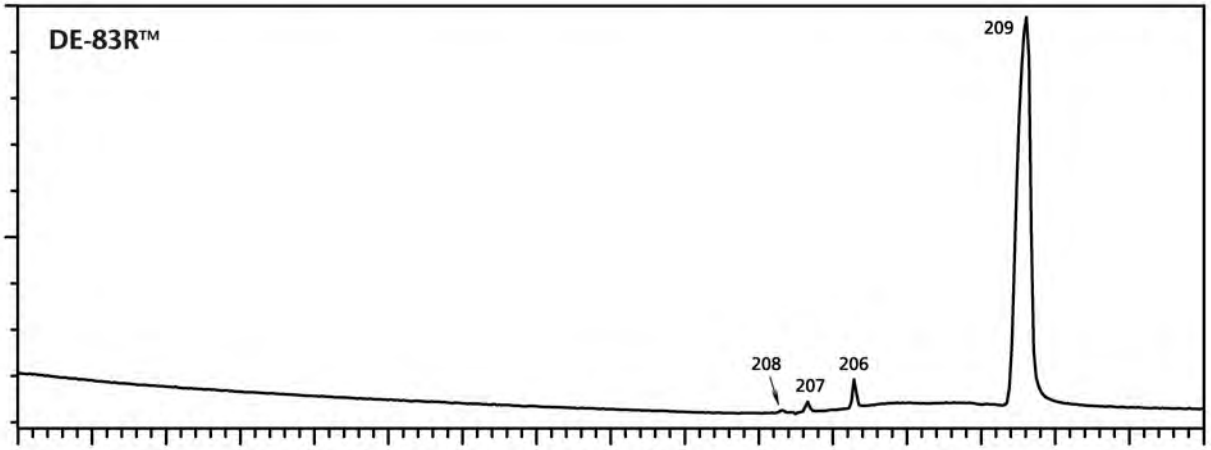
Catalogue Number	Product (toluene solution)	Qty/Conc	
TBDE-71	Great Lakes Chemical DE-71™ Pentabromodiphenyl Oxide	1.2 mL	100 µg/mL
TBDE-79	Great Lakes Chemical DE-79™ Octabromodiphenyl Oxide	1.2 mL	100 µg/mL
TBDE-83R	Great Lakes Chemical DE-83R™ Decabromodiphenyl Oxide	1.2 mL	100 µg/mL



GC/MS Data for Great Lakes Chemical DE-71™ on a 30 m DB-5HT column.

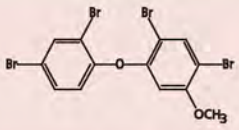
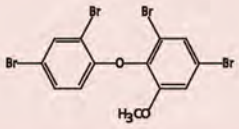
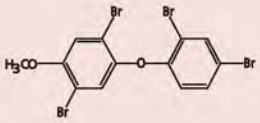
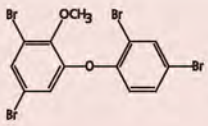
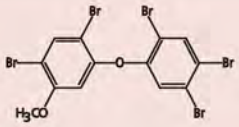
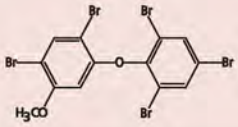
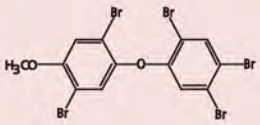
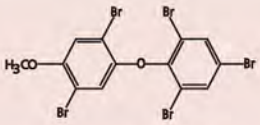


GC/MS Data for Great Lakes Chemical DE-79™ on a 30 m DB-5HT column.



GC/MS Data for Great Lakes Chemical DE-83R™ on a 15 m DB-5HT column.

NATIVE METHOXY-BROMODIPHENYL ETHERS (MeO-BDEs)

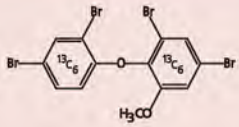
Catalogue Number		Product
5MBDE47		2,2',4,4'-Tetrabromo-5-methoxydiphenyl ether 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
6MBDE47		2,2',4,4'-Tetrabromo-6-methoxydiphenyl ether 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
4PMBDE49		2,2',4',5-Tetrabromo-4-methoxydiphenyl ether 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
2PMBDE68		2',3,4',5-Tetrabromo-2-methoxydiphenyl ether 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
5PMBDE99		2,2',4,4',5-Pentabromo-5'-methoxydiphenyl ether 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
5PMBDE100		2,2',4,4',6'-Pentabromo-5-methoxydiphenyl ether 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
4PMBDE101		2,2',4,5,5'-Pentabromo-4'-methoxydiphenyl ether 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
4PMBDE103		2,2',4',5,6'-Pentabromo-4-methoxydiphenyl ether 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane

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

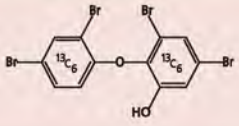
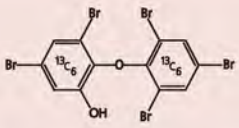
Catalogue Number	Product (nonane solution)	Qty/Conc
MeOBDES	Methoxy-Bromodiphenyl Ethers Solution/Mixture	1.2 mL
	2,2',4,4'-Tetrabromo-5-methoxydiphenyl ether	5.00 µg/mL
	2,2',4,4'-Tetrabromo-6-methoxydiphenyl ether	5.00 µg/mL
	2,2',4',5-Tetrabromo-4-methoxydiphenyl ether	5.00 µg/mL
	2',3,4',5-Tetrabromo-2-methoxydiphenyl ether	5.00 µg/mL
	2,2',4,4',5-Pentabromo-5'-methoxydiphenyl ether	5.00 µg/mL
	2,2',4,4',6'-Pentabromo-5-methoxydiphenyl ether	5.00 µg/mL
	2,2',4,5,5'-Pentabromo-4'-methoxydiphenyl ether	5.00 µg/mL
	2,2',4',5,6'-Pentabromo-4-methoxydiphenyl ether	5.00 µg/mL

MASS-LABELLED METHOXY-BROMODIPHENYL ETHERS

Catalogue Number		Product
M6MBDE47		2,2',4,4'-Tetrabromo-6-methoxy($^{13}C_{12}$)diphenyl ether 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
M6PMBDE100		2,2',4,4',6-Pentabromo-6'-methoxy($^{13}C_{12}$)diphenyl ether 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane

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

MASS-LABELLED HYDROXY-BROMODIPHENYL ETHERS

Catalogue Number		Product
M6HBDE47		2,2',4,4'-Tetrabromo-6-hydroxy($^{13}C_{12}$)diphenyl ether 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
M6PHBDE100		2,2',4,4',6-Pentabromo-6'-hydroxy($^{13}C_{12}$)diphenyl ether 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene

* 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 POLYBROMINATED BIPHENYLS (PBBs)

Catalogue Number	Product (nonane solution)	Qty/Conc	
BB-1	2-Bromobiphenyl	1.2 mL	50.0 µg/mL
BB-2	3-Bromobiphenyl	1.2 mL	50.0 µg/mL
BB-3	4-Bromobiphenyl	1.2 mL	50.0 µg/mL
BB-4	2,2'-Dibromobiphenyl	1.2 mL	50.0 µg/mL
BB-7	2,4-Dibromobiphenyl	1.2 mL	50.0 µg/mL
BB-9	2,5-Dibromobiphenyl	1.2 mL	50.0 µg/mL
BB-10	2,6-Dibromobiphenyl	1.2 mL	50.0 µg/mL
BB-15	4,4'-Dibromobiphenyl	1.2 mL	50.0 µg/mL
BB-18	2,2',5-Tribromobiphenyl	1.2 mL	50.0 µg/mL
BB-22	2,3,4'-Tribromobiphenyl	1.2 mL	50.0 µg/mL
BB-26	2,3',5-Tribromobiphenyl	1.2 mL	50.0 µg/mL
BB-29	2,4,5-Tribromobiphenyl	1.2 mL	50.0 µg/mL
BB-30	2,4,6-Tribromobiphenyl	1.2 mL	50.0 µg/mL
BB-31	2,4',5-Tribromobiphenyl	1.2 mL	50.0 µg/mL
BB-37	3,4,4'-Tribromobiphenyl	1.2 mL	50.0 µg/mL
BB-38	3,4,5-Tribromobiphenyl	1.2 mL	50.0 µg/mL
BB-49	2,2',4,5'-Tetrabromobiphenyl	1.2 mL	50.0 µg/mL
BB-52	2,2',5,5'-Tetrabromobiphenyl	1.2 mL	50.0 µg/mL
BB-53	2,2',5,6'-Tetrabromobiphenyl	1.2 mL	50.0 µg/mL
BB-56	2,3,3',4'-Tetrabromobiphenyl	1.2 mL	50.0 µg/mL
BB-75	2,4,4',6-Tetrabromobiphenyl	1.2 mL	50.0 µg/mL
BB-77	3,3',4,4'-Tetrabromobiphenyl	1.2 mL	50.0 µg/mL
BB-80	3,3',5,5'-Tetrabromobiphenyl	1.2 mL	50.0 µg/mL
BB-101	2,2',4,5,5'-Pentabromobiphenyl	1.2 mL	50.0 µg/mL
BB-103	2,2',4,5',6-Pentabromobiphenyl	1.2 mL	50.0 µg/mL
BB-153	2,2',4,4',5,5'-Hexabromobiphenyl	1.2 mL	50.0 µg/mL
BB-154	2,2',4,4',5,6'-Hexabromobiphenyl	1.2 mL	50.0 µg/mL
BB-155	2,2',4,4',6,6'-Hexabromobiphenyl	1.2 mL	50.0 µg/mL
BB-156	2,3,3',4,4',5-Hexabromobiphenyl	1.2 mL	50.0 µg/mL
BB-169	3,3',4,4',5,5'-Hexabromobiphenyl	1.2 mL	50.0 µg/mL
BB-180	2,2',3,4,4',5,5'-Heptabromobiphenyl	1.2 mL	50.0 µg/mL
BB-194	2,2',3,3',4,4',5,5'-Octabromobiphenyl	1.2 mL	50.0 µg/mL
BB-205	2,3,3',4,4',5,5',6-Octabromobiphenyl	1.2 mL	50.0 µg/mL
BB-206*	2,2',3,3',4,4',5,5',6-Nonabromobiphenyl	1.2 mL	50.0 µg/mL
BB-209*	Decabromobiphenyl	1.2 mL	50.0 µg/mL

* 50% Nonane/50% Toluene Solution

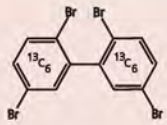
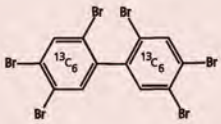
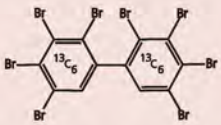
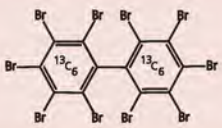
NATIVE PBBs: SOLUTION/MIXTURE

Catalogue Number	Product (nonane solution)		Qty/Conc
PBB-MXA	Native PBB Solution/Mixture		1.2 mL
		IUPAC	
	4-Bromobiphenyl	*3*	1.00 µg/mL
	4,4'-Dibromobiphenyl	*15*	1.00 µg/mL
	2,2',5-Tribromobiphenyl	*18*	1.00 µg/mL
	2,2',5,5'-Tetrabromobiphenyl	*52*	1.00 µg/mL
	2,2',4,5,5'-Pentabromobiphenyl	*101*	2.00 µg/mL
	2,2',4,4',5,5'-Hexabromobiphenyl	*153*	2.00 µg/mL
	2,2',3,4,4',5,5'-Heptabromobiphenyl	*180*	2.00 µg/mL
	2,2',3,3',4,4',5,5'-Octabromobiphenyl	*194*	2.00 µg/mL
	2,2',3,3',4,4',5,5',6-Nonabromobiphenyl	*206*	5.00 µg/mL
	Decabromobiphenyl	*209*	5.00 µg/mL

POLYBROMINATED BIPHENYL TECHNICAL MIXTURES

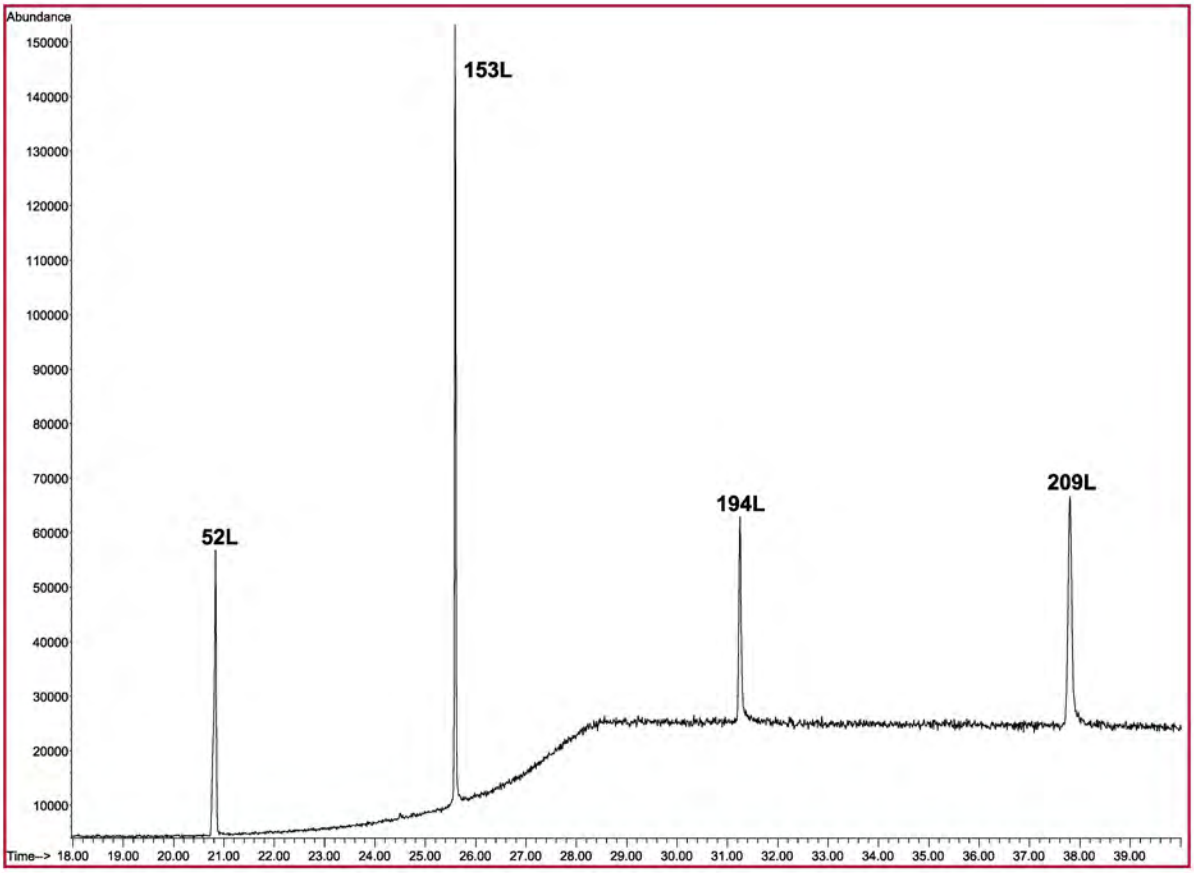
Catalogue Number	Product (nonane solution)	Qty/Conc	
TBB-BP6	Great Lakes Chemical Firemaster BP-6™ Hexabromobiphenyl	1.2 mL	100 µg/mL
TBB-809D	Chemische Fabrik Kalk Bromkal80-9D™ Nonabromobiphenyl	1.2 mL	100 µg/mL

MASS-LABELLED POLYBROMINATED BIPHENYLS

Catalogue Number		Product
MBB-52		2,2',5,5'-Tetrabromo($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane; isotopic purity 99% or greater
MBB-153		2,2',4,4',5,5'-Hexabromo($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane; isotopic purity 99% or greater
MBB-194		2,2',3,3',4,4',5,5'-Octabromo($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane; isotopic purity 99% or greater
MBB-209		Decabromo($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane; isotopic purity 99% or greater

MASS-LABELLED PBBs: SOLUTION/MIXTURE

Catalogue Number	Product (nonane solution)	Qty/Conc
MBB-MXA	Mass-Labelled PBB Solution/Mixture	1.2 mL
	IUPAC	
2,2',5,5'-Tetrabromo($^{13}C_{12}$)biphenyl	*52L*	1.00 µg/mL
2,2',4,4',5,5'-Hexabromo($^{13}C_{12}$)biphenyl	*153L*	2.00 µg/mL
2,2',3,3',4,4',5,5'-Octabromo($^{13}C_{12}$)biphenyl	*194L*	2.00 µg/mL
Decabromo($^{13}C_{12}$)biphenyl	*209L*	5.00 µg/mL



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

In order to keep up-to-date on new releases from Wellington Laboratories Inc., please visit our website at www.well-labs.com.

New Products are announced in the Wellington Reporter.



Country Farmland
Waterloo, Ontario

HALOGENATED FLAME RETARDANTS & RELATED COMPOUNDS

While PBDEs and PBBs have garnered the most attention, many other halogenated flame retartants (HFRs) were industrially produced in large quantities. In this section, we offer a wide selection of HFRs that have found varying levels of usage in certain applications. Mass-labelled analogues of most of them are also available.

- Hexabromocyclododecane (HBCD or HBCDD) is an HFR added in percent levels to polystyrene used in the construction industry.
- Tetrabromobisphenol-A (TBBPA) is a reactive HFR used in printed circuit boards and is also added to various types of polymers.
- Dechlorane Plus® is a high production volume, chlorinated flame retardant that is used to replace PBDEs.

As these HFRs are being phased out or stringently regulated, organophosphate flame retardants (OPFRs) are being produced in larger quantities and have found increased usage. OPFRs are also used as plasticizers and additives in lubricants. In this section, a large selection of OPFRs is offered along with some selected mass-labelled OPFRs.

Finally, this section also contains standards of compounds related to the use of HFRs, namely:

Native and Mass-labelled Brominated Dibenzo-*p*-dioxins (PBDDs)
Native Brominated Dibenzofurans (PBDFs)
Mixed Br/Cl Dibenzo-*p*-dioxins and Dibenzofurans



NATIVE HEXABROMOCYCLODODECANE ISOMERS (HBCDDs)

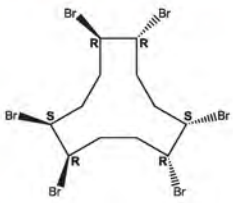
Catalogue Number	Product (toluene solution)	Qty/Conc
aHBCD	*rac*-α-1,2,5,6,9,10-Hexabromocyclododecane	1.2 mL 50.0 µg/mL
bHBCD	*rac*-β-1,2,5,6,9,10-Hexabromocyclododecane	1.2 mL 50.0 µg/mL
gHBCD	*rac*-γ-1,2,5,6,9,10-Hexabromocyclododecane	1.2 mL 50.0 µg/mL
dHBCD	δ-1,2,5,6,9,10-Hexabromocyclododecane	1.2 mL 50.0 µg/mL
eHBCD	ε-1,2,5,6,9,10-Hexabromocyclododecane	1.2 mL 50.0 µg/mL
zHBCD	ζ-1,2,5,6,9,10-Hexabromocyclododecane	1.2 mL 50.0 µg/mL
etaHBCD	*rac*-η-1,2,5,6,9,10-Hexabromocyclododecane	1.2 mL 50.0 µg/mL
tHBCD	θ-1,2,5,6,9,10-Hexabromocyclododecane	1.2 mL 50.0 µg/mL
iHBCD	*rac*-ι-1,2,5,6,9,10-Hexabromocyclododecane	1.2 mL 50.0 µg/mL
kHBCD	*rac*-κ-1,2,5,6,9,10-Hexabromocyclododecane	1.2 mL 50.0 µg/mL

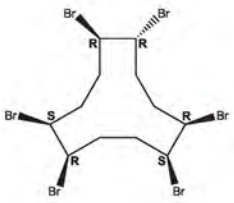
NATIVE HBCDD ISOMERS: SOLUTION/MIXTURE

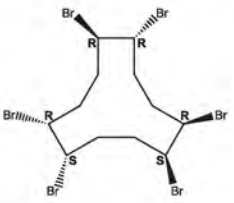
Catalogue Number	Product (toluene solution)	Qty/Conc
HBCD-MXA	Native HBCDD Isomer Solution/Mixture	1.2 mL
	rac-α-1,2,5,6,9,10-Hexabromocyclododecane	10.0 µg/mL
	rac-β-1,2,5,6,9,10-Hexabromocyclododecane	10.0 µg/mL
	rac-γ-1,2,5,6,9,10-Hexabromocyclododecane	10.0 µg/mL

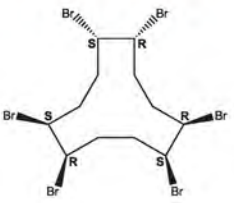
NATIVE HBCDD ENANTIOMERS

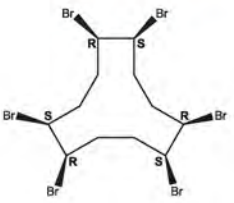
Catalogue Number	Product (toluene solution)	Qty/Conc
(+)aHBCD	(+)-α-1*S*,2*S*,5*R*,6*S*,9*S*,10*R*-Hexabromocyclododecane	1.2 mL 50.0 µg/mL
(-)aHBCD	(-)-α-1*R*,2*R*,5*S*,6*R*,9*R*,10*S*-Hexabromocyclododecane	1.2 mL 50.0 µg/mL
(+)gHBCD	(+)-γ-1*R*,2*R*,5*R*,6*S*,9*S*,10*R*-Hexabromocyclododecane	1.2 mL 50.0 µg/mL
(-)gHBCD	(-)-γ-1*S*,2*S*,5*S*,6*R*,9*R*,10*S*-Hexabromocyclododecane	1.2 mL 50.0 µg/mL

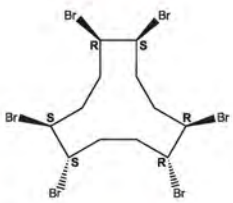

alpha (α)

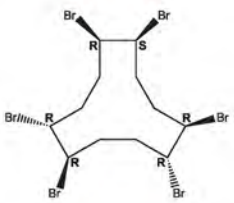

beta (β)

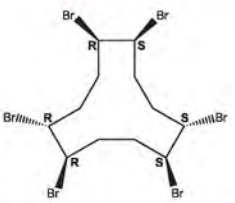

gamma (γ)

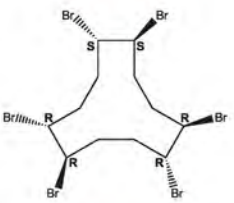

delta (δ)

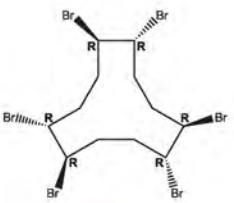

epsilon (ε)


zeta (ζ)


eta (η)


theta (θ)


iota (ι)


kappa (κ)

^{13}C-LABELLED HEXABROMOCYCLODODECANE ISOMERS

Catalogue Number	Product (toluene solution)	Qty/Conc	
MaHBCD	*rac*-α-1,2,5,6,9,10-Hexabromo($^{13}C_{12}$)cyclododecane	1.2 mL	50.0 µg/mL
MbHBCD	*rac*-β-1,2,5,6,9,10-Hexabromo($^{13}C_{12}$)cyclododecane	1.2 mL	50.0 µg/mL
MgHBCD	*rac*-γ-1,2,5,6,9,10-Hexabromo($^{13}C_{12}$)cyclododecane	1.2 mL	50.0 µg/mL

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

DEUTERATED HEXABROMOCYCLODODECANE ISOMERS

Catalogue Number	Product (toluene solution)	Qty/Conc	
DaHBCD	d_{18}-*rac*-α-1,2,5,6,9,10-Hexabromocyclododecane	1.2 mL	50.0 µg/mL
DbHBCD	d_{18}-*rac*-β-1,2,5,6,9,10-Hexabromocyclododecane	1.2 mL	50.0 µg/mL
DgHBCD	d_{18}-*rac*-γ-1,2,5,6,9,10-Hexabromocyclododecane	1.2 mL	50.0 µg/mL

* Unless stated otherwise, isotopic purities of these compounds are 98%.

^{13}C-LABELLED HBCDD ISOMERS: SOLUTION/MIXTURE

Catalogue Number	Product (toluene solution)	Qty/Conc
MHBCD-MXA	Mass-Labelled HBCDD Isomer Solution/Mixture	1.2 mL
	rac-α-1,2,5,6,9,10-Hexabromocyclo($^{13}C_{12}$)dodecane	10.0 µg/mL
	rac-β-1,2,5,6,9,10-Hexabromocyclo($^{13}C_{12}$)dodecane	10.0 µg/mL
	rac-γ-1,2,5,6,9,10-Hexabromocyclo($^{13}C_{12}$)dodecane	10.0 µg/mL

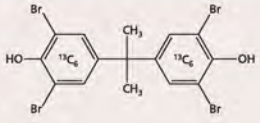
PENTABROMOCYCLODODECENE (PBCD)

Catalogue Number	Product (toluene solution)	Qty/Conc	
PBCD	*rac*-(1,5*R*,6*S*,9*S*,10*R*)-pentabromocyclododecene	1.2 mL	50.0 µg/mL

TETRABROMOBISPHENOL-A (TBBPA)

Catalogue Number	Product (methanol solution)	Qty/Conc	
TBBPA	3,3',5,5'-Tetrabromobisphenol-A	1.2 mL	50.0 µg/mL

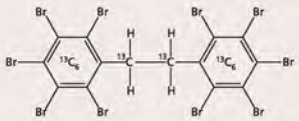
MASS-LABELLED TETRABROMOBISPHENOL-A (MTBBPA)

Catalogue Number		Product
MTBBPA		3,3',5,5'-Tetrabromobisphenol-A (rings: $^{13}C_{12}$) 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol; isotopic purity 99% or greater

DECABROMODIPHENYLETHANE (DBDPE)

Catalogue Number	Product (toluene solution)	Qty/Conc
DBDPE	1,2-Bis(pentabromophenyl)ethane	1.2 mL 25.0 µg/mL

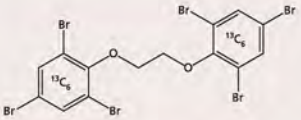
MASS-LABELLED DECABROMODIPHENYLETHANE (MDBDPE)

Catalogue Number		Product
MDBDPE		$^{13}C_{14}$-1,2-Bis(pentabromophenyl)ethane 1.2 mL; 25.0 µg/mL (±1.2 µg/mL); in toluene; isotopic purity 99% or greater

1,2-BIS(2,4,6-TRIBROMOPHENOXY)ETHANE (BTBPE)

Catalogue Number	Product (toluene solution)	Qty/Conc
BTBPE	1,2-Bis(2,4,6-tribromophenoxy)ethane	1.2 mL 50.0 µg/mL

MASS-LABELLED 1,2-BIS(2,4,6-TRIBROMOPHENOXY)ETHANE (MBTBPE)

Catalogue Number		Product
MBTBPE		1,2-Bis[2,4,6-tribromo($^{13}C_6$)phenoxy]ethane 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene; isotopic purity 99% or greater

HEXABROMOBENZENE (HBBZ)

Catalogue Number	Product (toluene solution)	Qty/Conc
HBBZ	Hexabromobenzene	1.2 mL 50.0 µg/mL

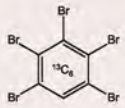
MASS-LABELLED HEXABROMOBENZENE (MHBBZ)

Catalogue Number		Product
MHBBZ		Hexabromo($^{13}C_6$)benzene 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene; isotopic purity 99% or greater

PENTABROMOBENZENE (PBBZ)

Catalogue Number	Product (toluene solution)	Qty/Conc
PBBZ	Pentabromobenzene	1.2 mL 50.0 µg/mL

MASS-LABELLED PENTABROMOBENZENE (MPBBZ)

Catalogue Number		Product
MPBBZ		Pentabromo($^{13}C_6$)benzene 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene; isotopic purity 99% or greater

PENTABROMOETHYLBENZENE (PBEB)

Catalogue Number	Product (toluene solution)	Qty/Conc
PBEB	Pentabromoethylbenzene	1.2 mL 50.0 µg/mL

PENTABROMOTOLUENE (PBT)

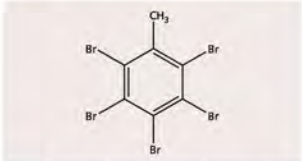
Catalogue Number	Product (toluene solution)	Qty/Conc
PBT	Pentabromotoluene	1.2 mL 50.0 µg/mL

TETRABROMO-*p*-XYLENE (pTBX)

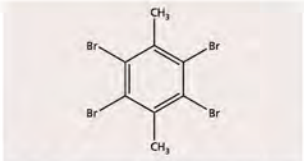
Catalogue Number	Product (toluene solution)	Qty/Conc
pTBX	2,3,5,6-Tetrabromo-*p*-xylene	1.2 mL 50.0 µg/mL



Pentabromoethylbenzene



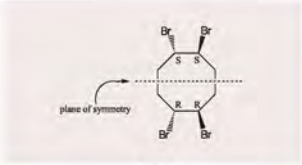
Pentabromotoluene



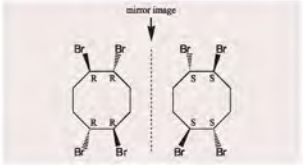
2,3,5,6-Tetrabromo-*p*-xylene

1,2,5,6-TETRABROMOCYCLOOCTANE (TBCO)

Catalogue Number	Product (toluene solution)	Qty/Conc
aTBCO	(1*R*,2*R*,5*S*,6*S*)-1,2,5,6-tetrabromocyclooctane	1.2 mL 50.0 µg/mL
bTBCO	*rac*-(1*R*,2*R*,5*R*,6*R*)-1,2,5,6-tetrabromocyclooctane	1.2 mL 50.0 µg/mL



aTBCO



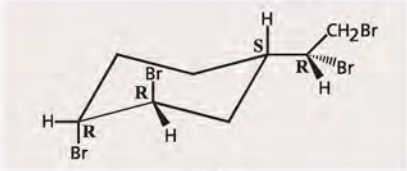
bTBCO

TETRABROMOETHYLCYCLOHEXANE (TBECH)

Catalogue Number	Product (toluene solution)	Qty/Conc
bTBECH	*rac*-(1*R*,2*R*)-1,2-dibromo-(4*S*)-4-[(1*S*)-1,2-dibromoethyl]cyclohexane	1.2 mL 50.0 µg/mL
gTBECH	*rac*-(1*R*,2*R*)-1,2-dibromo-(4*R*)-4-[(1*R*)-1,2-dibromoethyl]cyclohexane	1.2 mL 50.0 µg/mL

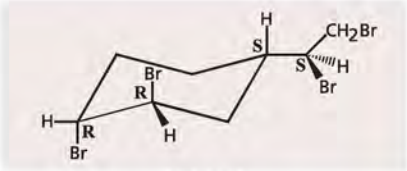
TETRABROMOETHYLCYCLOHEXANE ISOMERIC SOLUTION/MIXTURES

Catalogue Number	Product (toluene solution)	Qty/Conc
abTBECH	TBECH Isomeric Solution/Mixture	1.2 mL
aTBECH	*rac*-(1*R*,2*R*)-1,2-dibromo-(4*S*)-4-[(1*R*)-1,2-dibromoethyl]cyclohexane	50.0 µg/mL
bTBECH	*rac*-(1*R*,2*R*)-1,2-dibromo-(4*S*)-4-[(1*S*)-1,2-dibromoethyl]cyclohexane	50.0 µg/mL
gdTBECH	TBECH Isomeric Solution/Mixture	1.2 mL
gTBECH	*rac*-(1*R*,2*R*)-1,2-dibromo-(4*R*)-4-[(1*R*)-1,2-dibromoethyl]cyclohexane	50.0 µg/mL
dTBECH	*rac*-(1*R*,2*R*)-1,2-dibromo-(4*R*)-4-[(1*S*)-1,2-dibromoethyl]cyclohexane	50.0 µg/mL



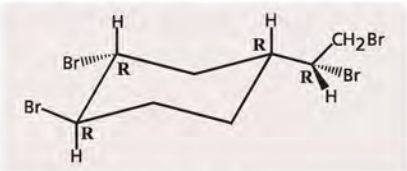
aTBECH

rac-(1*R*,2*R*)-1,2-dibromo-(4*S*)-4-[(1*R*)-1,2-dibromoethyl]cyclohexane



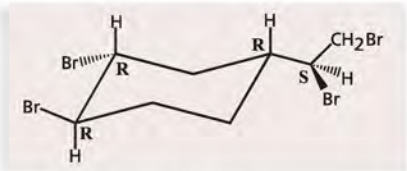
bTBECH

rac-(1*R*,2*R*)-1,2-dibromo-(4*S*)-4-[(1*S*)-1,2-dibromoethyl]cyclohexane



gTBECH

rac-(1*R*,2*R*)-1,2-dibromo-(4*R*)-4-[(1*R*)-1,2-dibromoethyl]cyclohexane

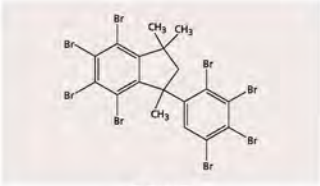


dTBECH

rac-(1*R*,2*R*)-1,2-dibromo-(4*R*)-4-[(1*S*)-1,2-dibromoethyl]cyclohexane

OCTABROMOTRIMETHYLPHENYLINDANE (OBIND)

Catalogue Number	Product (toluene solution)	Qty/Conc
OBIND	4,5,6,7-Tetrabromo-1,1,3-trimethyl-3-(2,3,4,5-tetrabromophenyl)indane	1.2 mL 50.0 µg/mL

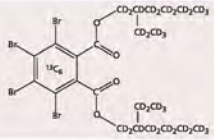


OBIND

BIS(2-ETHYLHEXYL) TETRABROMOPHTHALATE (BEHTBP)

Catalogue Number	Product (toluene solution)	Qty/Conc
BEHTBP	Bis(2-ethylhexyl) tetrabromophthalate	1.2 mL 50.0 µg/mL

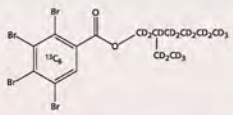
BIS(2-ETHYLHEXYL-d_{17}) TETRABROMO($^{13}C_6$)PHTHALATE (MBEHTBP)

Catalogue Number		Product
MBEHTBP		Bis(2-ethylhexyl-d_{17}) tetrabromo($^{13}C_6$)phthalate 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene; isotopic purity 99% or greater ($^{13}C_6$), 98% or greater ($^{2}H_{34}$)

2-ETHYLHEXYL 2,3,4,5-TETRABROMOBENZOATE (EHTBB)

Catalogue Number	Product (toluene solution)	Qty/Conc
EHTBB	2-Ethylhexyl 2,3,4,5-tetrabromobenzoate	1.2 mL 50.0 µg/mL

2-ETHYLHEXYL-d_{17} 2,3,4,5-TETRABROMO($^{13}C_6$)BENZOATE (MEHTBB)

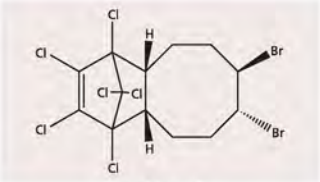
Catalogue Number		Product
MEHTBB		2-Ethylhexyl-d_{17} 2,3,4,5-tetrabromo($^{13}C_6$)benzoate 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene; isotopic purity 99% or greater ($^{13}C_6$), 98% or greater ($^{2}H_{17}$)

HEXACHLOROCYCLOPENTENYL-DIBROMOCYCLOOCTANE (HCDBCO)

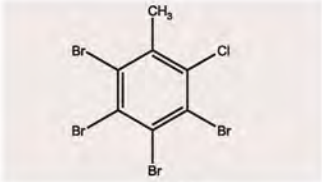
Catalogue Number	Product (toluene solution)	Qty/Conc
HCDBCO	*rac*-(1*R*,2*R*,5*R*,6*R*,9*S*,10*S*)-5,6-dibromo-1,10,11,12,13,13-hexachlorotricyclo[8.2.1.$0^{2,9}$]tridec-11-ene	1.2 mL 50.0 µg/mL

TETRABROMO-*O*-CHLOROTOLUENE (TBCT)

Catalogue Number	Product (toluene solution)	Qty/Conc
TBCT	Tetrabromo-*o*-chlorotoluene	1.2 mL 50.0 µg/mL

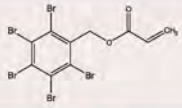


HCDBCO



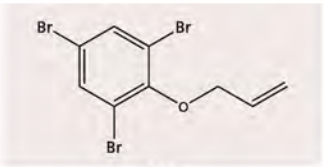
TBCT

PENTABROMOBENZYL ACRYLATE (PBBA)

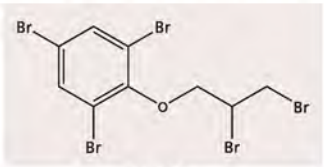
Catalogue Number		Product
PBBA		Pentabromobenzyl acrylate 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene

2,4,6-TRIBROMOPHENYL ETHERS

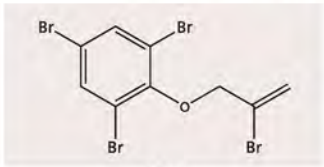
Catalogue Number	Product (toluene solution)	Qty/Conc	
ATE	Allyl 2,4,6-tribromophenyl ether	1.2 mL	50.0 µg/mL
DPTE	2,3-Dibromopropyl 2,4,6-tribromophenyl ether	1.2 mL	50.0 µg/mL
BATE	2-Bromoallyl 2,4,6-tribromophenyl ether	1.2 mL	50.0 µg/mL



ATE



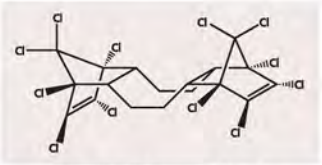
DPTE



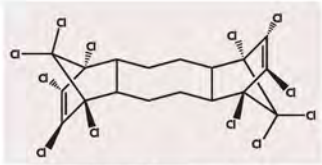
BATE

DECHLORANE PLUS®

Catalogue Number	Product (toluene solution)	Qty/Conc	
s-DP	*syn*-Dechlorane Plus®	1.2 mL	50.0 µg/mL
a-DP	*anti*-Dechlorane Plus®	1.2 mL	50.0 µg/mL

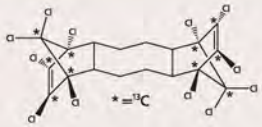


syn-Dechlorane Plus®



anti-Dechlorane Plus®

MASS-LABELLED DECHLORANE PLUS®

Catalogue Number		Product
Ma-DP		*anti*-($^{13}C_{10}$)Dechlorane Plus® 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene; isotopic purity 99% or greater

DECHLORINATED DECHLORANE PLUS®

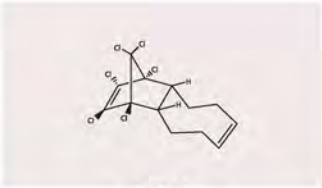
Catalogue Number	Product (toluene solution)	Qty/Conc	
aCl10DP	*anti*-Cl10-Dechlorane Plus®	1.2 mL	50.0 µg/mL
axxCl10DP	*exo-exo-anti*-Cl10-Dechlorane Plus®	1.2 mL	50.0 µg/mL
aCl11DP	*anti*-Cl11-Dechlorane Plus®	1.2 mL	50.0 µg/mL
axCl11DP	*exo-anti*-Cl11-Dechlorane Plus®	1.2 mL	50.0 µg/mL

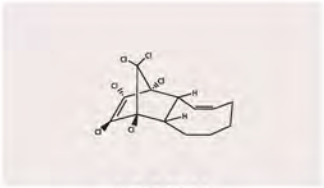
DECHLORANE PLUS® MONO ADDUCTS

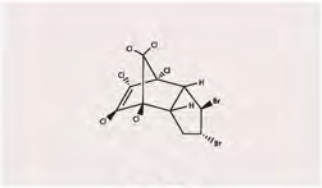
Catalogue Number	Product (toluene solution)	Qty/Conc
DPMA	Dechlorane Plus® Mono adduct	1.2 mL 50.0 µg/mL
1,3-DPMA	1,3-Dechlorane Plus® Mono adduct	1.2 mL 50.0 µg/mL

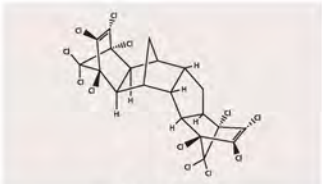
EXPERIMENTAL FLAME RETARDANTS (EFRs)

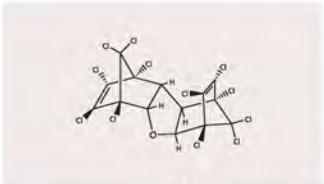
Catalogue Number	Product (toluene solution)	Qty/Conc
DBCD	Dibromochlordene	1.2 mL 50.0 µg/mL
Dec-601	Dechlorane 601	1.2 mL 50.0 µg/mL
Dec-602	Dechlorane 602	1.2 mL 50.0 µg/mL
Dec-603	Dechlorane 603	1.2 mL 50.0 µg/mL
Dec-604	Dechlorane 604	1.2 mL 50.0 µg/mL
Dec-604CB	Dechlorane 604 Component B	1.2 mL 50.0 µg/mL
CPlus	Chlordene Plus	1.2 mL 50.0 µg/mL
DBALD	Dibromoaldrin	1.2 mL 50.0 µg/mL
HCPN	Hexachloro(phenyl)norbornene	1.2 mL 50.0 µg/mL

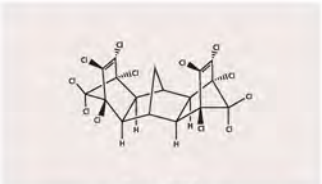

DPMA

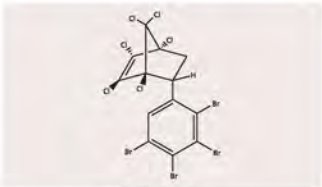

1,3-DPMA

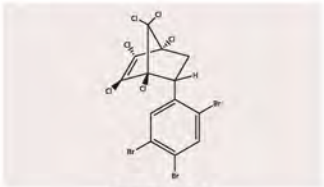

DBCD

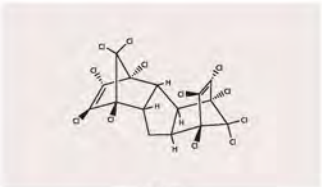

Dec-601

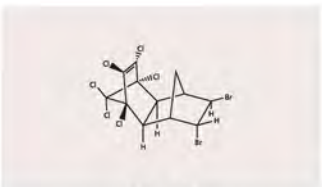

Dec-602

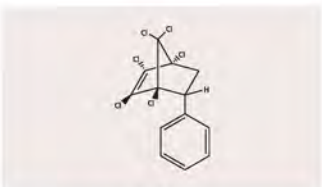

Dec-603


Dec-604

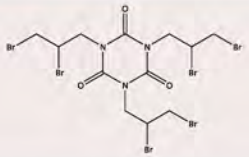

Dec-604CB


CPlus


DBALD


HCPN

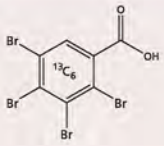
TRIS(2,3-DIBROMOPROPYL)ISOCYANURATE (T23BPIC)

Catalogue Number	Product
T23BPIC	 Tris(2,3-dibromopropyl)isocyanurate 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene

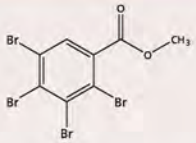
2,3,4,5-TETRABROMOBENZOIC ACID (TBBA)

Catalogue Number	Product (methanol solution)	Qty/Conc
TBBA	2,3,4,5-Tetrabromobenzoic acid	1.2 mL 50.0 µg/mL

MASS-LABELLED 2,3,4,5-TETRABROMOBENZOIC ACID (MTBBA)

Catalogue Number	Product
MTBBA	 2,3,4,5-Tetrabromobenzoic acid ($^{13}C_6$-ring) 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol; isotopic purity 99% or greater

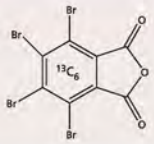
METHYL-2,3,4,5-TETRABROMOBENZOATE (MeTBBA)

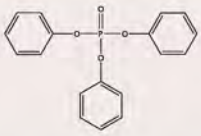
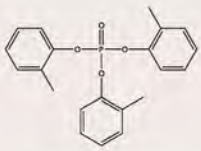
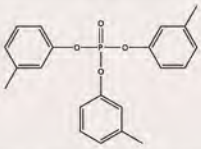
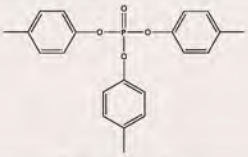
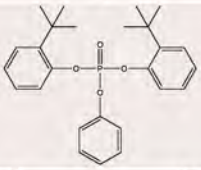
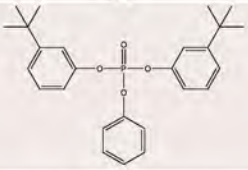
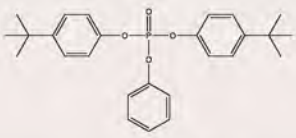
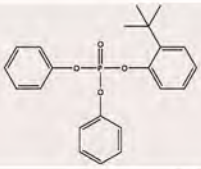
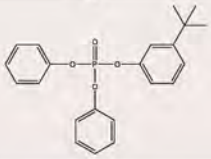
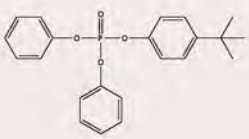
Catalogue Number	Product
MeTBBA	 Methyl-2,3,4,5-tetrabromobenzoate 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene

TETRABROMOPHTHALIC ANHYDRIDE (TBPAn)

Catalogue Number	Product (toluene solution)	Qty/Conc
TBPAn	Tetrabromophthalic anhydride	1.2 mL 50.0 µg/mL

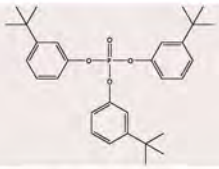
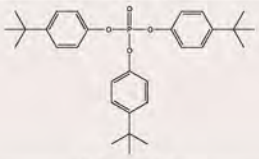
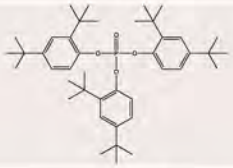
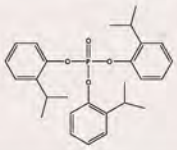
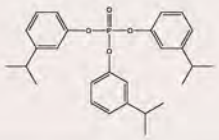
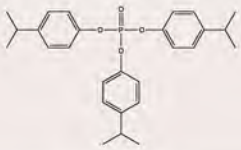
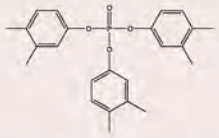
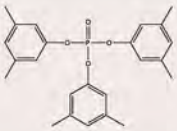
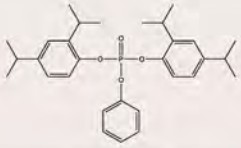
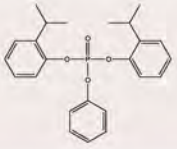
MASS-LABELLED TETRABROMOPHTHALIC ANHYDRIDE (MTBPAn)

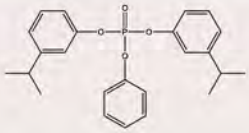
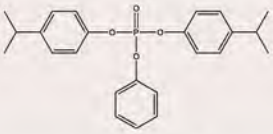
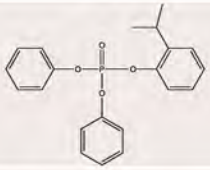
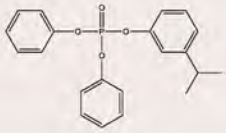
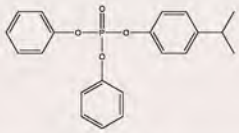
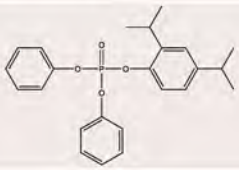
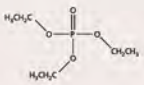
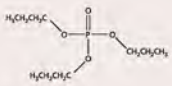
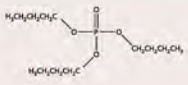
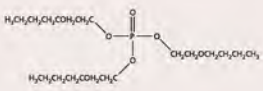
Catalogue Number	Product
MTBPAn	 Tetrabromo($^{13}C_6$)phthalic anhydride 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene; isotopic purity 99% or greater

Catalogue Number		Product
TPP		Triphenyl phosphate 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
TOTP		Tri-o-tolyl phosphate 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
TMTP		Tri-m-tolyl phosphate 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
TPTP		Tri-p-tolyl phosphate 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
B2tBPPP		Bis(2-*tert*-butylphenyl) phenyl phosphate 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
B3tBPPP		Bis(3-*tert*-butylphenyl) phenyl phosphate 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
B4tBPPP		Bis(4-*tert*-butylphenyl) phenyl phosphate 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
2tBPDPP		2-*tert*-Butylphenyl diphenyl phosphate 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
3tBPDPP		3-*tert*-Butylphenyl diphenyl phosphate 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
4tBPDPP		4-*tert*-Butylphenyl diphenyl phosphate 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene

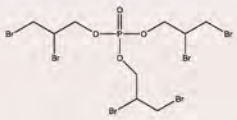
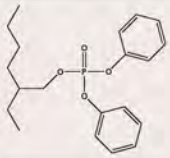
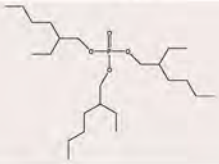
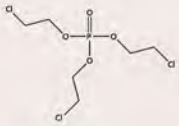
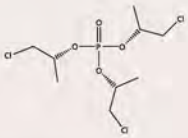
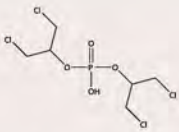
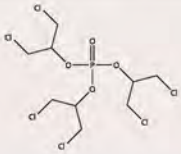


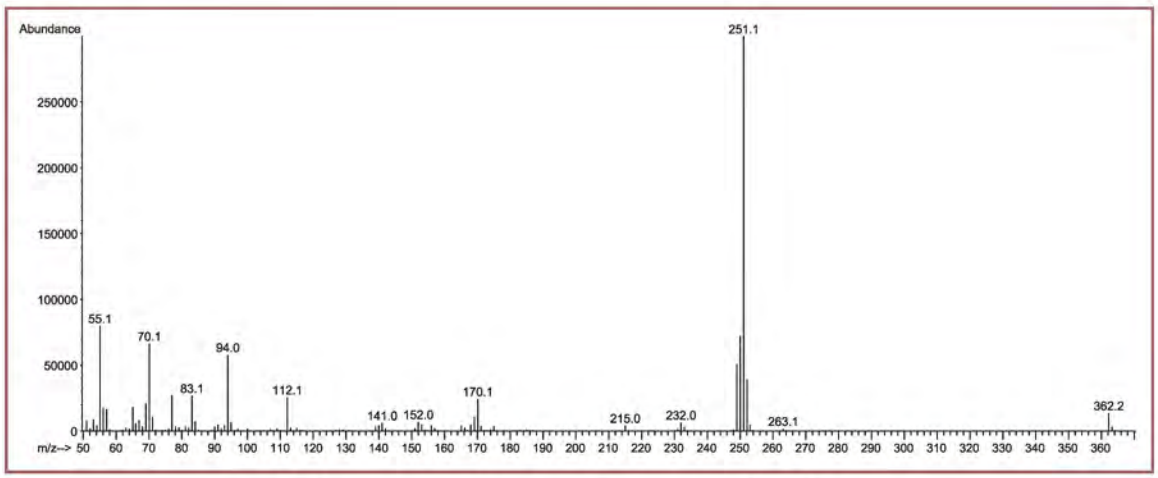
NATIVE ORGANOPHOSPHORUS COMPOUNDS

Catalogue Number		Product
T3tBPP		Tris(3-*tert*-butylphenyl) phosphate 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
T4tBPP		Tris(4-*tert*-butylphenyl) phosphate 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
T24DtBPP		Tris(2,4-di-*tert*-butylphenyl) phosphate 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
T2IPPP		Tris(2-isopropylphenyl) phosphate 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
T3IPPP		Tris(3-isopropylphenyl) phosphate 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
T4IPPP		Tris(4-isopropylphenyl) phosphate 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
T34DMPP		Tris(3,4-dimethylphenyl) phosphate 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
T35DMPP		Tris(3,5-dimethylphenyl) phosphate 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
B24DIPPPP		Bis(2,4-diisopropylphenyl) phenyl phosphate 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
B2IPPPP		Bis(4-isopropylphenyl) phenyl phosphate 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene

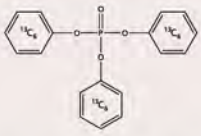
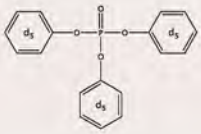
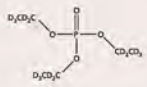
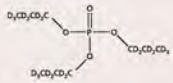
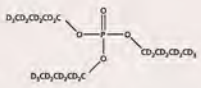
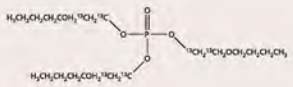
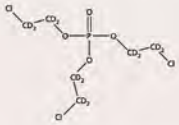
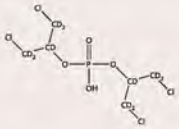
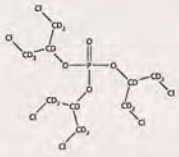
Catalogue Number		Product
B3IPPPP		Bis(3-isopropylphenyl) phenyl phosphate 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
B4IPPPP		Bis(4-isopropylphenyl) phenyl phosphate 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
2IPPDPP		2-Isopropylphenyl diphenyl phosphate 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
3IPPDPP		3-Isopropylphenyl diphenyl phosphate 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
4IPPDPP		4-Isopropylphenyl diphenyl phosphate 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
24DIPPDPP		2,4-Diisopropylphenyl diphenyl phosphate 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
TEP		Triethyl phosphate 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
TPrP		Tri-n-propyl phosphate 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
TBP		Tri-n-butyl phosphate 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
TBEP		Tris(2-butoxyethyl) phosphate 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene

NATIVE ORGANOPHOSPHORUS COMPOUNDS

Catalogue Number		Product
TDBPP		Tris(2,3-dibromopropyl) phosphate 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
EHDP		2-Ethylhexyl diphenyl phosphate 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
TEHP		Tris(2-ethylhexyl) phosphate 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
TCEP		Tris(2-chloroethyl) phosphate 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
TCPP		Tris[(2*R*)-1-chloro-2-propyl] phosphate 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
BDCP		Bis(1,3-dichloro-2-propyl) phosphate 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in **acetonitrile**
TDCPP		Tris(1,3-dichloro-2-propyl) phosphate 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene



HRGC/LRMS EI+ Spectra Data for EHDP on a 15 m DB-5HT column.

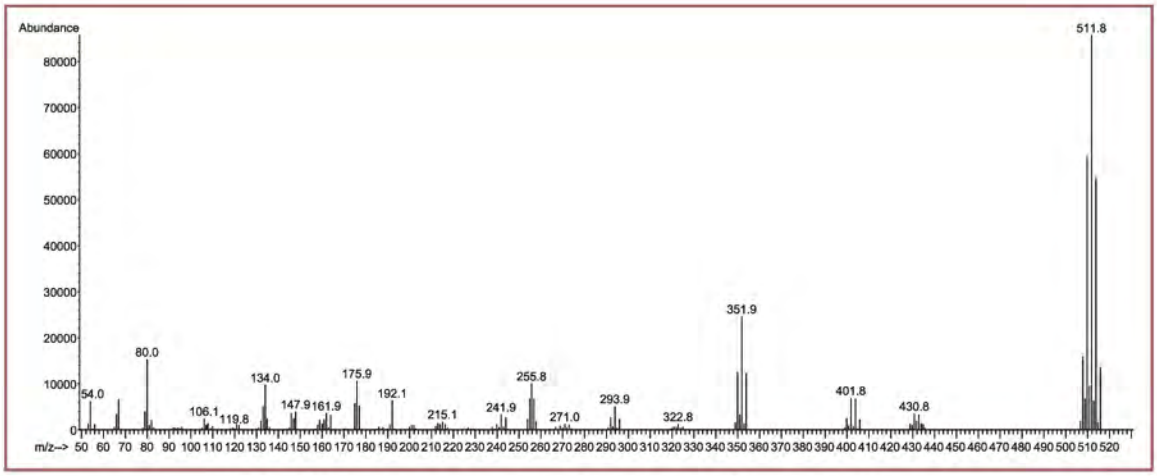
Catalogue Number		Product
MTPP		($^{13}C_{18}$)Triphenyl phosphate 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene; isotopic purity 99% or greater ($^{13}C_{18}$)
dTPP		Triphenyl phosphate-d_{15} 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene; isotopic purity 98% or greater ($^{2}H_{15}$)
dTEP		Triethyl phosphate-d_{15} 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene; isotopic purity 98% or greater ($^{2}H_{15}$)
dTPrP		Tri-n-propyl phosphate-d_{21} 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene; isotopic purity 98% or greater ($^{2}H_{21}$)
dTBP		Tri-n-butyl phosphate-d_{27} 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene; isotopic purity 98% or greater ($^{2}H_{27}$)
M6TBEP		Tris[2-butoxy($^{13}C_{2}$)ethyl] phosphate 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene; isotopic purity 99% or greater ($^{13}C_{6}$)
dTCEP		Tris(2-chloroethyl) phosphate-d_{12} 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene; isotopic purity 98% or greater ($^{2}H_{12}$)
dBDCP		Bis(1,3-dichloro-2-propyl) phosphate-d_{10} 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in **acetonitrile**; isotopic purity 98% or greater ($^{2}H_{10}$)
dTDCPP		Tris(1,3-dichloro-2-propyl) phosphate-d_{15} 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene; isotopic purity 98% or greater ($^{2}H_{15}$)

NATIVE BROMINATED DIBENZO-*p*-DIOXINS (PBDDs)

Catalogue Number	Product (toluene solution)	Qty/Conc
BDD-1	1-Bromodibenzo-*p*-dioxin	1.2 mL 50.0 µg/mL
BDD-27/28	2,7/2,8-Dibromodibenzo-*p*-dioxin mix	1.2 mL 50.0 µg/mL
BDD-237	2,3,7-Tribromodibenzo-*p*-dioxin	1.2 mL 50.0 µg/mL
BDD-1234	1,2,3,4-Tetrabromodibenzo-*p*-dioxin	1.2 mL 50.0 µg/mL
BDD-1378	1,3,7,8-Tetrabromodibenzo-*p*-dioxin	1.2 mL 50.0 µg/mL
BDD-2378	2,3,7,8-Tetrabromodibenzo-*p*-dioxin	1.2 mL 50.0 µg/mL
BDD-12378	1,2,3,7,8-Pentabromodibenzo-*p*-dioxin	1.2 mL 50.0 µg/mL
BDD-12478	1,2,4,7,8-Pentabromodibenzo-*p*-dioxin	1.2 mL 50.0 µg/mL
BDD-1234678	1,2,3,4,6,7,8-Heptabromodibenzo-*p*-dioxin	1.2 mL 25.0 µg/mL
BDD-12346789	Octabromodibenzo-*p*-dioxin	1.2 mL 10.0 µg/mL

MASS-LABELLED BROMINATED DIBENZO-*p*-DIOXIN

Catalogue Number	Product
MBDD-2378	2,3,7,8-Tetrabromo($^{13}C_{12}$)dibenzo-*p*-dioxin 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene; isotopic purity 99% or greater



HRGC/LRMS EI+ Spectra Data for MBDD-2378 on a 15 m DB-5HT column.

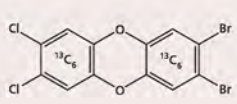
NATIVE BROMINATED DIBENZOFURANS (PBDFs)

Catalogue Number	Product (toluene solution)	Qty/Conc	
BDF-4	4-Bromodibenzofuran	1.2 mL	50.0 µg/mL
BDF-24	2,4-Dibromodibenzofuran	1.2 mL	50.0 µg/mL
BDF-28	2,8-Dibromodibenzofuran	1.2 mL	50.0 µg/mL
BDF-138	1,3,8-Tribromodibenzofuran	1.2 mL	50.0 µg/mL
BDF-234	2,3,4-Tribromodibenzofuran	1.2 mL	50.0 µg/mL
BDF-238	2,3,8-Tribromodibenzofuran	1.2 mL	50.0 µg/mL
BDF-247	2,4,7-Tribromodibenzofuran	1.2 mL	50.0 µg/mL
BDF-1278	1,2,7,8-Tetrabromodibenzofuran	1.2 mL	50.0 µg/mL
BDF-2378	2,3,7,8-Tetrabromodibenzofuran	1.2 mL	50.0 µg/mL
BDF-12378	1,2,3,7,8-Pentabromodibenzofuran	1.2 mL	50.0 µg/mL
BDF-23478	2,3,4,7,8-Pentabromodibenzofuran	1.2 mL	50.0 µg/mL
BDF-1234678	1,2,3,4,6,7,8-Heptabromodibenzofuran	1.2 mL	25.0 µg/mL
BDF-12346789	Octabromodibenzofuran	1.2 mL	25.0 µg/mL

NATIVE BROMO/CHLORO DIBENZO-*p*-DIOXINS

Catalogue Number	Product (toluene solution)	Qty/Conc	
7-B-23-CDD	7-Bromo-2,3-dichlorodibenzo-*p*-dioxin (97%)	1.2 mL	48.5 µg/mL
2-B-378-CDD	2-Bromo-3,7,8-trichlorodibenzo-*p*-dioxin (95%)	1.2 mL	47.5 µg/mL
2-B-1378-CDD	2-Bromo-1,3,7,8-tetrachlorodibenzo-*p*-dioxin (95%)	1.2 mL	47.5 µg/mL
23-B-78-CDD	2,3-Dibromo-7,8-dichlorodibenzo-*p*-dioxin	1.2 mL	50.0 µg/mL

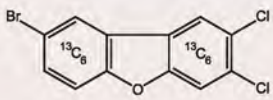
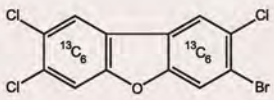
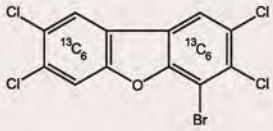
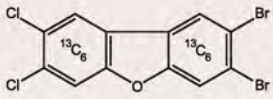
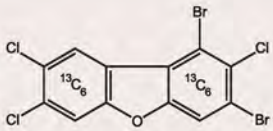
MASS-LABELLED BROMO/CHLORO DIBENZO-*p*-DIOXIN

Catalogue Number		Product
M23-B-78-CDD		2,3-Dibromo-7,8-dichloro($^{13}C_{12}$)dibenzo-*p*-dioxin 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene; isotopic purity 99% or greater

NATIVE BROMO/CHLORO DIBENZOFURANS

Catalogue Number	Product (toluene solution)	Qty/Conc	
8-B-23-CDF	8-Bromo-2,3-dichlorodibenzofuran	1.2 mL	50.0 µg/mL
3-B-278-CDF	3-Bromo-2,7,8-trichlorodibenzofuran	1.2 mL	50.0 µg/mL
8-B-234-CDF	8-Bromo-2,3,4-trichlorodibenzofuran	1.2 mL	50.0 µg/mL
4-B-2378-CDF	4-Bromo-2,3,7,8-tetrachlorodibenzofuran	1.2 mL	50.0 µg/mL
12-B-78-CDF	1,2-Dibromo-7,8-dichlorodibenzofuran	1.2 mL	50.0 µg/mL
23-B-78-CDF	2,3-Dibromo-7,8-dichlorodibenzofuran	1.2 mL	50.0 µg/mL
13-B-278-CDF	1,3-Dibromo-2,7,8-trichlorodibenzofuran	1.2 mL	50.0 µg/mL

MASS-LABELLED BROMO/CHLORO DIBENZOFURANS

Catalogue Number		Product
M8-B-23-CDF		8-Bromo-2,3-dichloro($^{13}C_{12}$)dibenzofuran 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene; isotopic purity 99% or greater
M3-B-278-CDF		3-Bromo-2,7,8-trichloro($^{13}C_{12}$)dibenzofuran 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene; isotopic purity 99% or greater
M4-B-2378-CDF		4-Bromo-2,3,7,8-tetrachloro($^{13}C_{12}$)dibenzofuran 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene; isotopic purity 99% or greater
M23-B-78-CDF		2,3-Dibromo-7,8-dichloro($^{13}C_{12}$)dibenzofuran 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene; isotopic purity 99% or greater
M13-B-278-CDF		1,3-Dibromo-2,7,8-trichloro($^{13}C_{12}$)dibenzofuran 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene; isotopic purity 99% or greater

PER- & POLYFLUOROALKYL SUBSTANCES (PFAS)

Wellington started the synthesis of PFAS reference standards in 2004. Since then, primarily due to reports in the literature and client requests, we have regularly added new native and mass-labelled standards to our inventory. Included in our inventory, which is continually expanding, are the following:

Perfluoroalkanesulfonates (PFSA)
Perfluoroethylcyclohexanesulfonate (PFECHS)
Perfluoroalkylcarboxylic acids (PFCA)
Perfluoroalkanesulfonamides (FASA)
Perfluoroalkanesulfonamidoethanols (N-MeFASE and N-EtFASE)
Perfluorooctanesulfonamidoacetic Acids (FOSAA)
Fluorotelomer Alcohols (X:2FTOH)
Fluorotelomer Carboxylic Acids and Sulfonates (FTCA and X:2FTS)
Fluorotelomer Unsaturated Carboxylic Acids (FTUCA)
Chloroperfluoroalkyl Ether Sulfonates (Cl-PFESA)
Per- and Polyfluoroalkyl Ether Carboxylic Acids (PFECA)
Perfluoroalkyl Ether Sulfonate (PFESA)
Perfluoroalkylphosphonic Acids (PFAPA)
Perfluoroalkylphosphinic Acids (X:XPFPi)
Polyfluoroalkyl Phosphate Esters (PAP, diPAP, and SAmPAP)
Fluorotelomer Acrylates and Acetates (X:2FTAcr and X:2FTOAc)

We have also continued to add new PFAS standards as they are confirmed to be present in AFFF mixtures, introduced as replacements for PFOS or PFOA (e.g. GenX), or produced for other applications. We also offer several solution/mixtures of native and mass-labelled PFAS to be used according to prescribed methods such as EPA Methods 533 and 537. However, it is highly possible that new methods will be developed with expanded lists of target analytes. Thus, our inventory of PFAS will continue to grow and we urge you to visit our website for announcements of new products.





PFC-CVS-C

Catalogue Number	Product (methanol solution)	Qty/Conc
PFC-CVS-C	PFC-CVS-C Calibration Solutions CS1-CS5	1 kit (5 ampoules)
PFC-C-CS1	CS1	200 µL
PFC-C-CS2	CS2	200 µL
PFC-C-CS3	CS3	200 µL
PFC-C-CS4	CS4	200 µL
PFC-C-CS5	CS5	200 µL

NATIVE PFCs		PFC-C-CS1 (ng/mL)	PFC-C-CS2 (ng/mL)	PFC-C-CS3 (ng/mL)	PFC-C-CS4 (ng/mL)	PFC-C-CS5 (ng/mL)
Perfluoro-n-butanoic acid	PFBA	2.00	10.0	50.0	200	1000
Perfluoro-n-pentanoic acid	PFPeA	2.00	10.0	50.0	200	1000
Perfluoro-n-hexanoic acid	PFHxA	2.00	10.0	50.0	200	1000
Perfluoro-n-heptanoic acid	PFHpA	2.00	10.0	50.0	200	1000
Perfluoro-n-octanoic acid	PFOA	2.00	10.0	50.0	200	1000
Perfluoro-n-nonanoic acid	PFNA	2.00	10.0	50.0	200	1000
Perfluoro-n-decanoic acid	PFDA	2.00	10.0	50.0	200	1000
Perfluoro-n-undecanoic acid	PFUdA	2.00	10.0	50.0	200	1000
Perfluoro-n-dodecanoic acid	PFDoA	2.00	10.0	50.0	200	1000
Perfluoro-n-tridecanoic acid	PFTrDA	2.00	10.0	50.0	200	1000
Perfluoro-n-tetradecanoic acid	PFTeDA	2.00	10.0	50.0	200	1000
Perfluoro-n-hexadecanoic acid	PFHxDA	2.00	10.0	50.0	200	1000
Perfluoro-n-octadecanoic acid	PFODA	2.00	10.0	50.0	200	1000
Potassium perfluoro-1-butanesulfonate	L-PFBS	2.00	10.0	50.0	200	1000
Sodium perfluoro-1-pentanesulfonate	L-PFPeS	2.00	10.0	50.0	200	1000
Sodium perfluoro-1-hexanesulfonate	L-PFHxS	2.00	10.0	50.0	200	1000
Sodium perfluoro-1-heptanesulfonate	L-PFHpS	2.00	10.0	50.0	200	1000
Sodium perfluoro-1-octanesulfonate	L-PFOS	2.00	10.0	50.0	200	1000
Sodium perfluoro-1-nonanesulfonate	L-PFNS	2.00	10.0	50.0	200	1000
Sodium perfluoro-1-decanesulfonate	L-PFDS	2.00	10.0	50.0	200	1000
Sodium perfluoro-1-dodecanesulfonate	L-PFDoS	2.00	10.0	50.0	200	1000
MASS-LABELLED PFC EXTRACTION STANDARDS						
Perfluoro-n-($^{13}C_4$)butanoic acid	MPFBA	50.0	50.0	50.0	50.0	50.0
Perfluoro-n-($^{13}C_5$)pentanoic acid	M5PFPeA	50.0	50.0	50.0	50.0	50.0
Perfluoro-n-(1,2,3,4,6-$^{13}C_5$)hexanoic acid	M5PFHxA	50.0	50.0	50.0	50.0	50.0
Perfluoro-n-(1,2,3,4-$^{13}C_4$)heptanoic acid	M4PFHpA	50.0	50.0	50.0	50.0	50.0
Perfluoro-n-($^{13}C_8$)octanoic acid	M8PFOA	50.0	50.0	50.0	50.0	50.0
Perfluoro-n-($^{13}C_9$)nonanoic acid	M9PFNA	50.0	50.0	50.0	50.0	50.0
Perfluoro-n-(1,2,3,4,5,6-$^{13}C_6$)decanoic acid	M6PFDA	50.0	50.0	50.0	50.0	50.0
Perfluoro-n-(1,2,3,4,5,6,7-$^{13}C_7$)undecanoic acid	M7PFUdA	50.0	50.0	50.0	50.0	50.0
Perfluoro-n-(1,2-$^{13}C_2$)dodecanoic acid	MPFDoA	50.0	50.0	50.0	50.0	50.0
Perfluoro-n-(1,2-$^{13}C_2$)tetradecanoic acid	M2PFTeDA	50.0	50.0	50.0	50.0	50.0
Sodium perfluoro-1-(2,3,4-$^{13}C_3$)butanesulfonate	M3PFBS	50.0	50.0	50.0	50.0	50.0
Sodium perfluoro-1-(1,2,3-$^{13}C_3$)hexanesulfonate	M3PFHxS	50.0	50.0	50.0	50.0	50.0
Sodium perfluoro-1-($^{13}C_8$)octanesulfonate	M8PFOS	50.0	50.0	50.0	50.0	50.0
MASS-LABELLED PFC INJECTION STANDARDS						
Perfluoro-n-(2,3,4-$^{13}C_3$)butanoic acid	M3PFBA	50.0	50.0	50.0	50.0	50.0
Perfluoro-n-(1,2-$^{13}C_2$)octanoic acid	M2PFOA	50.0	50.0	50.0	50.0	50.0
Perfluoro-n-(1,2-$^{13}C_2$)decanoic acid	MPFDA	50.0	50.0	50.0	50.0	50.0
Sodium perfluoro-1-(1,2,3,4-$^{13}C_4$)octanesulfonate	MPFOS	50.0	50.0	50.0	50.0	50.0

NOTE: Listed concentrations for the perfluoroalkanesulfonates are reported as the salt.

Catalogue Number	Product (methanol solution)	Qty/Conc
MPFAC-C-ES	Mass-Labelled PFAS Extraction Standards Solution	1.2 mL
MPFAC-C-IS	Mass-Labelled PFAS Injection Standards Solution	1.2 mL
PFAC-MXC	Native PFAS Stock Solution	1.2 mL

		MPFAC-C-ES (ng/mL)	MPFAC-C-IS (ng/mL)	PFAC-MXC (ng/mL)
NATIVE PFCs				
Perfluoro-n-butanoic acid	PFBA	—	—	2000
Perfluoro-n-pentanoic acid	PFPeA	—	—	2000
Perfluoro-n-hexanoic acid	PFHxA	—	—	2000
Perfluoro-n-heptanoic acid	PFHpA	—	—	2000
Perfluoro-n-octanoic acid	PFOA	—	—	2000
Perfluoro-n-nonanoic acid	PFNA	—	—	2000
Perfluoro-n-decanoic acid	PFDA	—	—	2000
Perfluoro-n-undecanoic acid	PFUdA	—	—	2000
Perfluoro-n-dodecanoic acid	PFDoA	—	—	2000
Perfluoro-n-tridecanoic acid	PFTrDA	—	—	2000
Perfluoro-n-tetradecanoic acid	PFTeDA	—	—	2000
Perfluoro-n-hexadecanoic acid	PFHxDA	—	—	2000
Perfluoro-n-octadecanoic acid	PFODA	—	—	2000
Potassium perfluoro-1-butanesulfonate	L-PFBS	—	—	2000
Sodium perfluoro-1-pentanesulfonate	L-PFPeS	—	—	2000
Sodium perfluoro-1-hexanesulfonate	L-PFHxS	—	—	2000
Sodium perfluoro-1-heptanesulfonate	L-PFHpS	—	—	2000
Sodium perfluoro-1-octanesulfonate	L-PFOS	—	—	2000
Sodium perfluoro-1-nonanesulfonate	L-PFNS	—	—	2000
Sodium perfluoro-1-decanesulfonate	L-PFDS	—	—	2000
Sodium perfluoro-1-dodecanesulfonate	L-PFDoS	—	—	2000
MASS-LABELLED PFC EXTRACTION STANDARDS				
Perfluoro-n-($^{13}C_4$)butanoic acid	MPFBA	2000	—	—
Perfluoro-n-($^{13}C_5$)pentanoic acid	M5PFPeA	2000	—	—
Perfluoro-n-(1,2,3,4,6-$^{13}C_5$)hexanoic acid	M5PFHxA	2000	—	—
Perfluoro-n-(1,2,3,4-$^{13}C_4$)heptanoic acid	M4PFHpA	2000	—	—
Perfluoro-n-($^{13}C_8$)octanoic acid	M8PFOA	2000	—	—
Perfluoro-n-($^{13}C_9$)nonanoic acid	M9PFNA	2000	—	—
Perfluoro-n-(1,2,3,4,5,6-$^{13}C_6$)decanoic acid	M6PFDA	2000	—	—
Perfluoro-n-(1,2,3,4,5,6,7-$^{13}C_7$)undecanoic acid	M7PFUdA	2000	—	—
Perfluoro-n-(1,2-$^{13}C_2$)dodecanoic acid	MPFDoA	2000	—	—
Perfluoro-n-(1,2-$^{13}C_2$)tetradecanoic acid	M2PFTeDA	2000	—	—
Sodium perfluoro-1-(2,3,4-$^{13}C_3$)butanesulfonate	M3PFBS	2000	—	—
Sodium perfluoro-1-(1,2,3-$^{13}C_3$)hexanesulfonate	M3PFHxS	2000	—	—
Sodium perfluoro-1-($^{13}C_8$)octanesulfonate	M8PFOS	2000	—	—
MASS-LABELLED PFC INJECTION STANDARDS				
Perfluoro-n-(2,3,4-$^{13}C_3$)butanoic acid	M3PFBA	—	2000	—
Perfluoro-n-(1,2-$^{13}C_2$)octanoic acid	M2PFOA	—	2000	—
Perfluoro-n-(1,2-$^{13}C_2$)decanoic acid	MPFDA	—	2000	—
Sodium perfluoro-1-(1,2,3,4-$^{13}C_4$)octanesulfonate	MPFOS	—	2000	—

NOTE: Listed concentrations for the perfluoroalkanesulfonates are reported as the salt.

NATIVE LINEAR PERFLUOROALKANESULFONATES (PFSA)

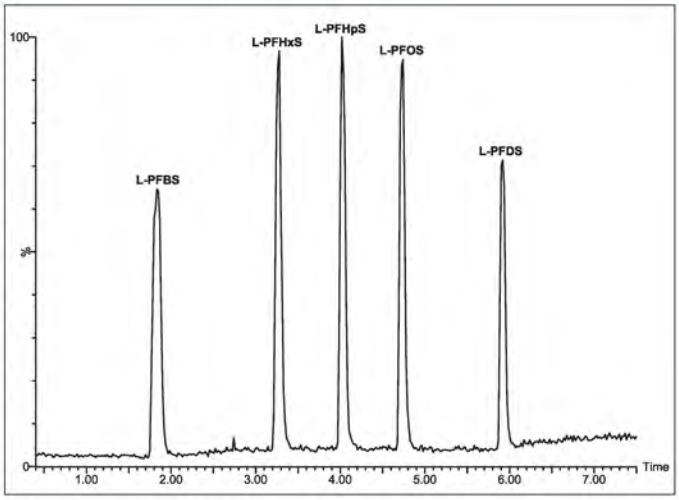
Catalogue Number	Product (methanol solution)	Qty/Conc	
L-PFPrS	Sodium perfluoro-1-propanesulfonate	1.2 mL	50.0 µg/mL
L-PFBS	Potassium perfluoro-1-butanesulfonate	1.2 mL	50.0 µg/mL
L-PFPeS	Sodium perfluoro-1-pentanesulfonate	1.2 mL	50.0 µg/mL
L-PFHxS	Sodium perfluoro-1-hexanesulfonate	1.2 mL	50.0 µg/mL
L-PFHpS	Sodium perfluoro-1-heptanesulfonate	1.2 mL	50.0 µg/mL
L-PFOS	Sodium perfluoro-1-octanesulfonate	1.2 mL	50.0 µg/mL
L-PFOSK	Potassium perfluoro-1-octanesulfonate	1.2 mL	50.0 µg/mL
L-PFNS	Sodium perfluoro-1-nonanesulfonate	1.2 mL	50.0 µg/mL
L-PFDS	Sodium perfluoro-1-decanesulfonate	1.2 mL	50.0 µg/mL
L-PFUdS	Sodium perfluoro-1-undecanesulfonate	1.2 mL	50.0 µg/mL
L-PFDoS	Sodium perfluoro-1-dodecanesulfonate	1.2 mL	50.0 µg/mL
L-PFTrDS	Sodium perfluoro-1-tridecanesulfonate	1.2 mL	50.0 µg/mL

NATIVE PERFLUOROALKANESULFONATES: SOLUTION/MIXTURE

Catalogue Number	Product (methanol solution)		Qty/Conc
PFS-MXA	Native PFAS Solution/Mixture		1.2 mL
Potassium perfluoro-1-butanesulfonate		L-PFBS	2.00 µg/mL
Sodium perfluoro-1-hexanesulfonate		L-PFHxS	2.00 µg/mL
Sodium perfluoro-1-heptanesulfonate		L-PFHpS	2.00 µg/mL
Sodium perfluoro-1-octanesulfonate		L-PFOS	2.00 µg/mL
Sodium perfluoro-1-decanesulfonate		L-PFDS	2.00 µg/mL

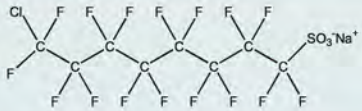
NATIVE PERFLUOROETHYLCYCLOHEXANESULFONATE (PFECHS)

Catalogue Number	Product (methanol solution)	Qty/Conc	
PFECHS	Perfluoro-4-ethylcyclohexanesulfonate (isomeric mixture)	1.2 mL	50.0 µg/mL



LC/MS Data for PFS-MXA on an Acquity UPLC BEH Shield RP_{18} column.

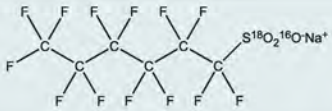
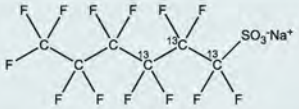
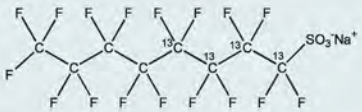
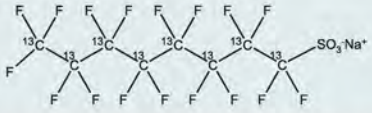
NATIVE CHLORO-PERFLUOROALKANESULFONATE

Catalogue Number		Product
8Cl-PFOS		Sodium 8-chloroperfluoro-1-octanesulfonate 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol

NATIVE BRANCHED PERFLUOROALKANESULFONATES

Catalogue Number	Product (methanol solution)	Qty/Conc	
br-PFHxSK	L-PFHxS with branched isomers (Potassium Salt)	1.2 mL	50.0 µg/mL
br-PFOSK	L-PFOSK with branched isomers (Potassium Salt)	1.2 mL	50.0 µg/mL
T-PFOS	Potassium perfluorooctanesulfonate (Technical Grade)	1.2 mL	50.0 µg/mL
NaP3MHpS	Sodium perfluoro-3-methylheptanesulfonate	1.2 mL	50.0 µg/mL
NaP6MHpS	Sodium perfluoro-6-methylheptanesulfonate	1.2 mL	50.0 µg/mL
ipPFNS	Sodium perfluoro-7-methyloctanesulfonate	1.2 mL	50.0 µg/mL

MASS-LABELLED PERFLUOROALKANESULFONATES

Catalogue Number		Product
M3PFBS		Sodium perfluoro-1-(2,3,4-$^{13}C_3$)butanesulfonate 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol; >99% linear; >99% 2,3,4-$^{13}C_3$
MPFHxS		Sodium perfluoro-1-hexane($^{18}O_2$)sulfonate 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol; >99% linear; 94% $^{18}O_2$
M3PFHxS		Sodium perfluoro-1-(1,2,3-$^{13}C_3$)hexanesulfonate 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol; >99% linear; >99% 1,2,3-$^{13}C_3$
MPFOS		Sodium perfluoro-1-(1,2,3,4-$^{13}C_4$)octanesulfonate 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol; >99% linear; >99% 1,2,3,4-$^{13}C_4$
M8PFOS		Sodium perfluoro-1-($^{13}C_8$)octanesulfonate 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol; >99% linear; >99% $^{13}C_8$

NOTE: Listed concentrations for the perfluoroalkanesulfonates are reported as the salt.



NATIVE LINEAR PERFLUOROALKYLCARBOXYLIC ACIDS (PFCA)

Catalogue Number	Product (methanol solution)	Qty/Conc	
PFBA	Perfluoro-n-butanoic acid	1.2 mL	50.0 µg/mL
PFPeA	Perfluoro-n-pentanoic acid	1.2 mL	50.0 µg/mL
PFHxA	Perfluoro-n-hexanoic acid	1.2 mL	50.0 µg/mL
PFHpA	Perfluoro-n-heptanoic acid	1.2 mL	50.0 µg/mL
PFOA	Perfluoro-n-octanoic acid	1.2 mL	50.0 µg/mL
PFNA	Perfluoro-n-nonanoic acid	1.2 mL	50.0 µg/mL
PFDA	Perfluoro-n-decanoic acid	1.2 mL	50.0 µg/mL
PFUdA	Perfluoro-n-undecanoic acid	1.2 mL	50.0 µg/mL
PFDoA	Perfluoro-n-dodecanoic acid	1.2 mL	50.0 µg/mL
PFTrDA	Perfluoro-n-tridecanoic acid	1.2 mL	50.0 µg/mL
PFTeDA	Perfluoro-n-tetradecanoic acid	1.2 mL	50.0 µg/mL
PFHxDA	Perfluoro-n-hexadecanoic acid	1.2 mL	50.0 µg/mL
PFODA	Perfluoro-n-octadecanoic acid	1.2 mL	50.0 µg/mL

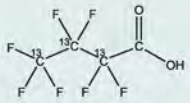
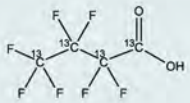
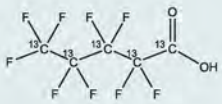
NATIVE PERFLUOROALKYLCARBOXYLIC ACIDS: SOLUTION/MIXTURE

Catalogue Number	Product (methanol solution)		Qty/Conc
PFC-MXA	Native PFCA Solution/Mixture		1.2 mL
Perfluoro-n-butanoic acid		PFBA	2.00 µg/mL
Perfluoro-n-pentanoic acid		PFPeA	2.00 µg/mL
Perfluoro-n-hexanoic acid		PFHxA	2.00 µg/mL
Perfluoro-n-heptanoic acid		PFHpA	2.00 µg/mL
Perfluoro-n-octanoic acid		PFOA	2.00 µg/mL
Perfluoro-n-nonanoic acid		PFNA	2.00 µg/mL
Perfluoro-n-decanoic acid		PFDA	2.00 µg/mL
Perfluoro-n-undecanoic acid		PFUdA	2.00 µg/mL
Perfluoro-n-dodecanoic acid		PFDoA	2.00 µg/mL
Perfluoro-n-tridecanoic acid		PFTrDA	2.00 µg/mL
Perfluoro-n-tetradecanoic acid		PFTeDA	2.00 µg/mL

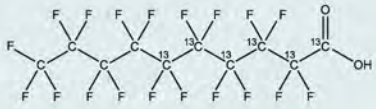
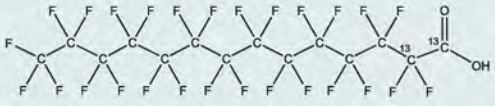
NATIVE BRANCHED PERFLUOROALKYLCARBOXYLIC ACIDS

Catalogue Number	Product (methanol solution)	Qty/Conc	
T-PFOA	Ammonium perfluorooctanoate (Technical Grade)	1.2 mL	50.0 µg/mL
P3MHpA	Perfluoro-3-methylheptanoic acid	1.2 mL	50.0 µg/mL
P4MOA	Perfluoro-4-methyloctanoic acid	1.2 mL	50.0 µg/mL
ipPFNA	Perfluoro-7-methyloctanoic acid	1.2 mL	50.0 µg/mL
P355TMHxA	Perfluoro-3,5,5-trimethylhexanoic acid	1.2 mL	50.0 µg/mL
P37DMOA	Perfluoro-3,7-dimethyloctanoic acid	1.2 mL	50.0 µg/mL

MASS-LABELLED PERFLUOROALKYLCARBOXYLIC ACIDS

Catalogue Number		Product
M3PFBA		Perfluoro-n-(2,3,4-$^{13}C_3$)butanoic acid 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol; >99% linear; >99% 2,3,4-$^{13}C_3$
MPFBA		Perfluoro-n-($^{13}C_4$)butanoic acid 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol; >99% linear; >99% $^{13}C_4$
M3PFPeA		Perfluoro-n-(3,4,5-$^{13}C_3$)pentanoic acid 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol; >99% linear; >99% 3,4,5-$^{13}C_3$
M5PFPeA		Perfluoro-n-($^{13}C_5$)pentanoic acid 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol; >99% linear; >99% $^{13}C_5$
MPFHxA		Perfluoro-n-(1,2-$^{13}C_2$)hexanoic acid 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol; >99% linear; >99% 1,2-$^{13}C_2$
M5PFHxA		Perfluoro-n-(1,2,3,4,6-$^{13}C_5$)hexanoic acid 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol; >99% linear; >99% 1,2,3,4,6-$^{13}C_5$
M4PFHpA		Perfluoro-n-(1,2,3,4-$^{13}C_4$)heptanoic acid 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol; >99% linear; >99% 1,2,3,4-$^{13}C_4$
M2PFOA		Perfluoro-n-(1,2-$^{13}C_2$)octanoic acid 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol; >99% linear; >99% 1,2-$^{13}C_2$
MPFOA		Perfluoro-n-(1,2,3,4-$^{13}C_4$)octanoic acid 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol; >99% linear; >99% 1,2,3,4-$^{13}C_4$
M8PFOA		Perfluoro-n-($^{13}C_8$)octanoic acid 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol; >99% linear; >98% $^{13}C_8$ and 1.0% $^{13}C_4$
MPFNA		Perfluoro-n-(1,2,3,4,5-$^{13}C_5$)nonanoic acid 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol; >99% linear; >99% 1,2,3,4,5-$^{13}C_5$

MASS-LABELLED PERFLUOROALKYLCARBOXYLIC ACIDS

Catalogue Number		Product
M9PFNA		Perfluoro-n-($^{13}C_9$)nonanoic acid 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol; >99% linear; >99% $^{13}C_9$
MPFDA		Perfluoro-n-(1,2-$^{13}C_2$)decanoic acid 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol; >99% linear; >99% 1,2-$^{13}C_2$
M6PFDA		Perfluoro-n-(1,2,3,4,5,6-$^{13}C_6$)decanoic acid 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol; >99% linear; >99% 1,2,3,4,5,6-$^{13}C_6$
MPFUdA		Perfluoro-n-(1,2-$^{13}C_2$)undecanoic acid 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol; >99% linear; >99% 1,2-$^{13}C_2$
M7PFUdA		Perfluoro-n-(1,2,3,4,5,6,7-$^{13}C_7$)undecanoic acid 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol; >99% linear; >99% 1,2,3,4,5,6,7-$^{13}C_7$
MPFDoA		Perfluoro-n-(1,2-$^{13}C_2$)dodecanoic acid 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol; >99% linear; >99% 1,2-$^{13}C_2$
M2PFTeDA		Perfluoro-n-(1,2-$^{13}C_2$)tetradecanoic acid 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol; >99% linear; >99% 1,2-$^{13}C_2$
M2PFHxDA		Perfluoro-n-(1,2-$^{13}C_2$)hexadecanoic acid 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol; >99% linear; >99% 1,2-$^{13}C_2$

Catalogue Number	Product (methanol solution)		Qty/Conc
PFAC-MXA	Native PFCA and PFSA Solution/Mixture		1.2 mL
Perfluoro-n-butanoic acid		PFBA	5.00 µg/mL
Perfluoro-n-pentanoic acid		PFPeA	5.00 µg/mL
Perfluoro-n-hexanoic acid		PFHxA	5.00 µg/mL
Perfluoro-n-heptanoic acid		PFHpA	5.00 µg/mL
Perfluoro-n-octanoic acid		PFOA	5.00 µg/mL
Perfluoro-n-nonanoic acid		PFNA	5.00 µg/mL
Perfluoro-n-decanoic acid		PFDA	5.00 µg/mL
Potassium perfluoro-1-butanesulfonate		L-PFBS	5.00 µg/mL
Sodium perfluoro-1-hexanesulfonate		L-PFHxS	5.00 µg/mL
Sodium perfluoro-1-octanesulfonate		L-PFOS	5.00 µg/mL
PFAC-MXB	Native PFCA and PFSA Solution/Mixture		1.2 mL
Perfluoro-n-butanoic acid		PFBA	2000 ng/mL
Perfluoro-n-pentanoic acid		PFPeA	2000 ng/mL
Perfluoro-n-hexanoic acid		PFHxA	2000 ng/mL
Perfluoro-n-heptanoic acid		PFHpA	2000 ng/mL
Perfluoro-n-octanoic acid		PFOA	2000 ng/mL
Perfluoro-n-nonanoic acid		PFNA	2000 ng/mL
Perfluoro-n-decanoic acid		PFDA	2000 ng/mL
Perfluoro-n-undecanoic acid		PFUdA	2000 ng/mL
Perfluoro-n-dodecanoic acid		PFDoA	2000 ng/mL
Perfluoro-n-tridecanoic acid		PFTrDA	2000 ng/mL
Perfluoro-n-tetradecanoic acid		PFTeDA	2000 ng/mL
Perfluoro-n-hexadecanoic acid		PFHxDA	2000 ng/mL
Perfluoro-n-octadecanoic acid		PFODA	2000 ng/mL
Potassium perfluoro-1-butanesulfonate		L-PFBS	2000 ng/mL
Sodium perfluoro-1-hexanesulfonate		L-PFHxS	2000 ng/mL
Sodium perfluoro-1-octanesulfonate		L-PFOS	2000 ng/mL
Sodium perfluoro-1-decanesulfonate		L-PFDS	2000 ng/mL
PFAC-MXF	Native Replacement PFAS Solution/Mixture		1.2 mL
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)propanoic acid		HFPO-DA	2000 ng/mL
Sodium dodecafluoro-3H-4,8-dioxanonanoate		NaDONA	2000 ng/mL
Potassium 9-chlorohexadecafluoro-3-oxanonane-1-sulfonate		9Cl-PF3ONS	2000 ng/mL
Potassium 11-chloroeicosafluoro-3-oxaundecane-1-sulfonate		11Cl-PF3OUdS	2000 ng/mL
PFAC-MXG	Native Perfluoroalkyl Ether Carboxylic Acids and Sulfonate Solution/Mixture		1.2 mL
Perfluoro-4-oxapentanoic acid		PF4OPeA	2000 ng/mL
Perfluoro-5-oxahexanoic acid		PF5OHxA	2000 ng/mL
Perfluoro-3,6-dioxaheptanoic acid		3,6-OPFHpA	2000 ng/mL
Potassium perfluoro(2-ethoxyethane)sulfonate		PFEESA	2000 ng/mL

NOTE: Listed concentrations for the perfluoroalkanesulfonates are reported as the salt.



MIXED NATIVE PFAS: SOLUTION/MIXTURES

Catalogue Number	Product (methanol solution)		Qty/Conc
PFAC-MXH	Native PFAS Solution/Mixture		1.2 mL
Perfluoro-n-butanoic acid		PFBA	4000 ng/mL
Perfluoro-n-pentanoic acid		PFPeA	2000 ng/mL
Perfluoro-n-hexanoic acid		PFHxA	1000 ng/mL
Perfluoro-n-heptanoic acid		PFHpA	1000 ng/mL
Perfluoro-n-octanoic acid		PFOA	1000 ng/mL
Perfluoro-n-nonanoic acid		PFNA	1000 ng/mL
Perfluoro-n-decanoic acid		PFDA	1000 ng/mL
Perfluoro-n-undecanoic acid		PFUdA	1000 ng/mL
Perfluoro-n-dodecanoic acid		PFDoA	1000 ng/mL
Perfluoro-n-tridecanoic acid		PFTrDA	1000 ng/mL
Perfluoro-n-tetradecanoic acid		PFTeDA	1000 ng/mL
Perfluoro-1-octanesulfonamide		FOSA	1000 ng/mL
N-methylperfluorooctanesulfonamidoacetic acid (linear and branched isomers)		br-NMeFOSAA	1000 ng/mL
N-ethylperfluorooctanesulfonamidoacetic acid (linear and branched isomers)		br-NEtFOSAA	1000 ng/mL
Potassium perfluoro-1-butanesulfonate		L-PFBS	1000 ng/mL
Sodium perfluoro-1-pentanesulfonate		L-PFPeS	1000 ng/mL
Potassium perfluorohexanesulfonate (linear and branched isomers)		br-PFHxSK	1000 ng/mL
Sodium perfluoro-1-heptanesulfonate		L-PFHpS	1000 ng/mL
Potassium perfluorooctanesulfonate (linear and branched isomers)		br-PFOSK	1000 ng/mL
Sodium perfluoro-1-nonanesulfonate		L-PFNS	1000 ng/mL
Sodium perfluoro-1-decanesulfonate		L-PFDS	1000 ng/mL
Sodium perfluoro-1-dodecanesulfonate		L-PFDoS	1000 ng/mL
Sodium 1H,1H,2H,2H-perfluorohexanesulfonate		4:2FTS	4000 ng/mL
Sodium 1H,1H,2H,2H-perfluorooctanesulfonate		6:2FTS	4000 ng/mL
Sodium 1H,1H,2H,2H-perfluorodecanesulfonate		8:2FTS	4000 ng/mL
PFAC-MXI	Native N-Me/EtFOSA & N-Me/EtFOSE Solution/Mixture		1.2 mL
N-methylperfluoro-1-octanesulfonamide		N-MeFOSA	1.00 µg/mL
N-ethylperfluoro-1-octanesulfonamide		N-EtFOSA	1.00 µg/mL
2-(N-methylperfluoro-1-octanesulfonamido)ethanol		N-MeFOSE	10.0 µg/mL
2-(N-ethylperfluoro-1-octanesulfonamido)ethanol		N-EtFOSE	10.0 µg/mL
PFAC-MXJ	Native X:3 Fluorotelomer Carboxylic Acid Solution/Mixture		1.2 mL
3-Perfluoropropyl propanoic acid		FPrPA	4.00 µg/mL
3-Perfluoropentyl propanoic acid		FPePA	20.0 µg/mL
3-Perfluoroheptyl propanoic acid		FHpPA	20.0 µg/mL

NOTE: Listed concentrations for the perfluoroalkanesulfonates are reported as the salt.

Catalogue Number	Product (methanol solution)		Qty/Conc
MPFAC-HIF-ES	Mass-Labelled PFAS Extraction Standard Solution/Mixture		1.2 mL
Perfluoro-n-($^{13}C_4$)butanoic acid		MPFBA	2000 ng/mL
Perfluoro-n-($^{13}C_5$)pentanoic acid		M5PFPeA	1000 ng/mL
Perfluoro-n-(1,2,3,4,6-$^{13}C_5$)hexanoic acid		M5PFHxA	500 ng/mL
Perfluoro-n-(1,2,3,4-$^{13}C_4$)heptanoic acid		M4PFHpA	500 ng/mL
Perfluoro-n-($^{13}C_8$)octanoic acid		M8PFOA	500 ng/mL
Perfluoro-n-($^{13}C_9$)nonanoic acid		M9PFNA	250 ng/mL
Perfluoro-n-(1,2,3,4,5,6-$^{13}C_6$)decanoic acid		M6PFDA	250 ng/mL
Perfluoro-n-(1,2,3,4,5,6,7-$^{13}C_7$)undecanoic acid		M7PFUdA	250 ng/mL
Perfluoro-n-(1,2-$^{13}C_2$)dodecanoic acid		MPFDoA	250 ng/mL
Perfluoro-n-(1,2-$^{13}C_2$)tetradecanoic acid		M2PFTeDA	250 ng/mL
Perfluoro-1-($^{13}C_8$)octanesulfonamide		M8FOSA	500 ng/mL
N-methyl-d_3-perfluoro-1-octanesulfonamide		d-N-MeFOSA	500 ng/mL
N-ethyl-d_5-perfluoro-1-octanesulfonamide		d-N-EtFOSA	500 ng/mL
N-methyl-d_3-perfluoro-1-octanesulfonamidoacetic acid		d3-N-MeFOSAA	1000 ng/mL
N-ethyl-d_5-perfluoro-1-octanesulfonamidoacetic acid		d5-N-EtFOSAA	1000 ng/mL
2-(N-methyl-d_3-perfluoro-1-octanesulfonamido)ethan-d_4-ol		d7-N-MeFOSE	5000 ng/mL
2-(N-ethyl-d_5-perfluoro-1-octanesulfonamido)ethan-d_4-ol		d9-N-EtFOSE	5000 ng/mL
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)($^{13}C_3$)propanoic acid		M3HFPO-DA	2000 ng/mL
Sodium perfluoro-1-(2,3,4-$^{13}C_3$)butanesulfonate		M3PFBS	500 ng/mL
Sodium perfluoro-1-(1,2,3-$^{13}C_3$)hexanesulfonate		M3PFHxS	500 ng/mL
Sodium perfluoro-1-($^{13}C_8$)octanesulfonate		M8PFOS	500 ng/mL
Sodium 1H,1H,2H,2H-perfluoro(1,2-$^{13}C_2$)hexanesulfonate		M2-4:2FTS	1000 ng/mL
Sodium 1H,1H,2H,2H-perfluoro(1,2-$^{13}C_2$)octanesulfonate		M2-6:2FTS	1000 ng/mL
Sodium 1H,1H,2H,2H-perfluoro(1,2-$^{13}C_2$)decanesulfonate		M2-8:2FTS	1000 ng/mL

Catalogue Number	Product (methanol solution)		Qty/Conc
MPFAC-HIF-IS	Mass-Labelled PFAS Injection Standard Solution/Mixture		1.2 mL
Perfluoro-n-(2,3,4-$^{13}C_3$)butanoic acid		M3PFBA	1000 ng/mL
Perfluoro-n-(1,2-$^{13}C_2$)hexanoic acid		MPFHxA	500 ng/mL
Perfluoro-n-(1,2,3,4-$^{13}C_4$)octanoic acid		MPFOA	500 ng/mL
Perfluoro-n-(1,2,3,4,5-$^{13}C_5$)nonanoic acid		MPFNA	250 ng/mL
Perfluoro-n-(1,2-$^{13}C_2$)decanoic acid		MPFDA	250 ng/mL
Sodium perfluoro-1-hexane($^{18}O_2$)sulfonate		MPFHxS	500 ng/mL
Sodium perfluoro-1-(1,2,3,4-$^{13}C_4$)octanesulfonate		MPFOS	500 ng/mL

NOTE: Listed concentrations for the perfluoroalkanesulfonates are reported as the salt.



MIXED NATIVE PFAS: SOLUTION/MIXTURE

Catalogue Number	Product (methanol solution)		Qty/Conc
EU-5813-NSS	5813/20 PFAS Native Solution/Mixture		1.2 mL
	Perfluoro-n-butanoic acid	PFBA	2000 ng/mL
	Perfluoro-n-pentanoic acid	PFPeA	2000 ng/mL
	Perfluoro-n-hexanoic acid	PFHxA	2000 ng/mL
	Perfluoro-n-heptanoic acid	PFHpA	2000 ng/mL
	Perfluoro-n-octanoic acid	PFOA	2000 ng/mL
	Perfluoro-n-nonanoic acid	PFNA	2000 ng/mL
	Perfluoro-n-decanoic acid	PFDA	2000 ng/mL
	Perfluoro-n-undecanoic acid	PFUdA	2000 ng/mL
	Perfluoro-n-dodecanoic acid	PFDoA	2000 ng/mL
	Perfluoro-n-tridecanoic acid	PFTrDA	2000 ng/mL
	Potassium perfluoro-1-butanesulfonate	L-PFBS	2000 ng/mL
	Sodium perfluoro-1-pentanesulfonate	L-PFPeS	2000 ng/mL
	Sodium perfluoro-1-hexanesulfonate	L-PFHxS	2000 ng/mL
	Sodium perfluoro-1-heptanesulfonate	L-PFHpS	2000 ng/mL
	Sodium perfluoro-1-octanesulfonate	L-PFOS	2000 ng/mL
	Sodium perfluoro-1-nonanesulfonate	L-PFNS	2000 ng/mL
	Sodium perfluoro-1-decanesulfonate	L-PFDS	2000 ng/mL
	Sodium perfluoro-1-undecanesulfonate	L-PFUdS	2000 ng/mL
	Sodium perfluoro-1-dodecanesulfonate	L-PFDoS	2000 ng/mL
	Sodium perfluoro-1-tridecanesulfonate	L-PFTrDS	2000 ng/mL

MIXED MASS-LABELLED PFAS: SOLUTION/MIXTURE

Catalogue Number	Product (methanol solution)		Qty/Conc
MPFAC-MXA	Mass-Labelled PFCA and PFSA Solution/Mixture		1.2 mL
	Perfluoro-n-($^{13}C_4$)butanoic acid	MPFBA	2000 ng/mL
	Perfluoro-n-(1,2-$^{13}C_2$)hexanoic acid	MPFHxA	2000 ng/mL
	Perfluoro-n-(1,2,3,4-$^{13}C_4$)octanoic acid	MPFOA	2000 ng/mL
	Perfluoro-n-(1,2,3,4,5-$^{13}C_5$)nonanoic acid	MPFNA	2000 ng/mL
	Perfluoro-n-(1,2-$^{13}C_2$)decanoic acid	MPFDA	2000 ng/mL
	Perfluoro-n-(1,2-$^{13}C_2$)undecanoic acid	MPFUdA	2000 ng/mL
	Perfluoro-n-(1,2-$^{13}C_2$)dodecanoic acid	MPFDoA	2000 ng/mL
	Sodium perfluoro-1-hexane($^{18}O_2$)sulfonate	MPFHxS	2000 ng/mL
	Sodium perfluoro-1-(1,2,3,4-$^{13}C_4$)octanesulfonate	MPFOS	2000 ng/mL

NOTE: Listed concentrations for the perfluoroalkanesulfonates are reported as the salt.

MIXED NATIVE PFAS: SOLUTION/MIXTURE

Catalogue Number	Product (methanol solution)		Qty/Conc
PFAC-24PAR	Native PFAS Precision and Recovery Standard Solution		1.2 mL
	Perfluoro-n-butanoic acid	PFBA	2000 ng/mL
	Perfluoro-n-pentanoic acid	PFPeA	2000 ng/mL
	Perfluoro-n-hexanoic acid	PFHxA	2000 ng/mL
	Perfluoro-n-heptanoic acid	PFHpA	2000 ng/mL
	Perfluoro-n-octanoic acid	PFOA	2000 ng/mL
	Perfluoro-n-nonanoic acid	PFNA	2000 ng/mL
	Perfluoro-n-decanoic acid	PFDA	2000 ng/mL
	Perfluoro-n-undecanoic acid	PFUdA	2000 ng/mL
	Perfluoro-n-dodecanoic acid	PFDoA	2000 ng/mL
	Perfluoro-n-tridecanoic acid	PFTrDA	2000 ng/mL
	Perfluoro-n-tetradecanoic acid	PFTeDA	2000 ng/mL
	Perfluoro-1-octanesulfonamide	FOSA	2000 ng/mL
	N-methylperfluoro-1-octanesulfonamidoacetic acid	N-MeFOSAA	2000 ng/mL
	N-ethylperfluoro-1-octanesulfonamidoacetic acid	N-EtFOSAA	2000 ng/mL
	Potassium perfluoro-1-butanesulfonate	L-PFBS	2000 ng/mL
	Sodium perfluoro-1-pentanesulfonate	L-PFPeS	2000 ng/mL
	Potassium perfluorohexanesulfonate (linear and branched isomers)	br-PFHxSK	2000 ng/mL
	Sodium perfluoro-1-heptanesulfonate	L-PFHpS	2000 ng/mL
	Potassium perfluorooctanesulfonate (linear and branched isomers)	br-PFOSK	2000 ng/mL
	Sodium perfluoro-1-nonanesulfonate	L-PFNS	2000 ng/mL
	Sodium perfluoro-1-decanesulfonate	L-PFDS	2000 ng/mL
	Sodium 1H,1H,2H,2H-perfluorohexanesulfonate	4:2FTS	2000 ng/mL
	Sodium 1H,1H,2H,2H-perfluorooctanesulfonate	6:2FTS	2000 ng/mL
	Sodium 1H,1H,2H,2H-perfluorodecanesulfonate	8:2FTS	2000 ng/mL

MIXED MASS-LABELLED PFAS: SOLUTION/MIXTURE

Catalogue Number	Product (methanol solution)		Qty/Conc
MPFAC-24ES	Mass-Labelled PFAS Extraction Standard Solution		1.2 mL
	Perfluoro-n-($^{13}C_4$)butanoic acid	MPFBA	1000 ng/mL
	Perfluoro-n-($^{13}C_5$)pentanoic acid	M5PFPeA	1000 ng/mL
	Perfluoro-n-(1,2,3,4,6-$^{13}C_5$)hexanoic acid	M5PFHxA	1000 ng/mL
	Perfluoro-n-(1,2,3,4-$^{13}C_4$)heptanoic acid	M4PFHpA	1000 ng/mL
	Perfluoro-n-($^{13}C_8$)octanoic acid	M8PFOA	1000 ng/mL
	Perfluoro-n-($^{13}C_9$)nonanoic acid	M9PFNA	1000 ng/mL
	Perfluoro-n-(1,2,3,4,5,6-$^{13}C_6$)decanoic acid	M6PFDA	1000 ng/mL
	Perfluoro-n-(1,2,3,4,5,6,7-$^{13}C_7$)undecanoic acid	M7PFUdA	1000 ng/mL
	Perfluoro-n-(1,2-$^{13}C_2$)dodecanoic acid	MPFDoA	1000 ng/mL
	Perfluoro-n-(1,2-$^{13}C_2$)tetradecanoic acid	M2PFTeDA	1000 ng/mL
	Perfluoro-1-($^{13}C_8$)octanesulfonamide	M8FOSA	1000 ng/mL
	N-methyl-d_3-perfluoro-1-octanesulfonamidoacetic acid	d3-N-MeFOSAA	1000 ng/mL
	N-ethyl-d_5-perfluoro-1-octanesulfonamidoacetic acid	d5-N-EtFOSAA	1000 ng/mL
	Sodium perfluoro-1-(2,3,4-$^{13}C_3$)butanesulfonate	M3PFBS	1000 ng/mL
	Sodium perfluoro-1-(1,2,3-$^{13}C_3$)hexanesulfonate	M3PFHxS	1000 ng/mL
	Sodium perfluoro-1-($^{13}C_8$)octanesulfonate	M8PFOS	1000 ng/mL
	Sodium 1H,1H,2H,2H-perfluoro(1,2-$^{13}C_2$)hexanesulfonate	M2-4:2FTS	1000 ng/mL
	Sodium 1H,1H,2H,2H-perfluoro(1,2-$^{13}C_2$)octanesulfonate	M2-6:2FTS	1000 ng/mL
	Sodium 1H,1H,2H,2H-perfluoro(1,2-$^{13}C_2$)decanesulfonate	M2-8:2FTS	1000 ng/mL

NOTE: Listed concentrations for the perfluoroalkanesulfonates are reported as the salt.



MIXED NATIVE PFAS: SOLUTION/MIXTURE

Catalogue Number	Product (methanol solution)		Qty/Conc
PFAC30PAR	Native PFAS Precision and Recovery Standard Solution		1.2 mL
	Perfluoro-n-butanoic acid	PFBA	1000 ng/mL
	Perfluoro-n-pentanoic acid	PFPeA	1000 ng/mL
	Perfluoro-n-hexanoic acid	PFHxA	1000 ng/mL
	Perfluoro-n-heptanoic acid	PFHpA	1000 ng/mL
	Perfluoro-n-octanoic acid	PFOA	1000 ng/mL
	Perfluoro-n-nonanoic acid	PFNA	1000 ng/mL
	Perfluoro-n-decanoic acid	PFDA	1000 ng/mL
	Perfluoro-n-undecanoic acid	PFUdA	1000 ng/mL
	Perfluoro-n-dodecanoic acid	PFDoA	1000 ng/mL
	Perfluoro-n-tridecanoic acid	PFTrDA	1000 ng/mL
	Perfluoro-n-tetradecanoic acid	PFTeDA	1000 ng/mL
	Perfluoro-1-butanesulfonamide	FBSA	1000 ng/mL
	Perfluoro-1-hexanesulfonamide	FHxSA	1000 ng/mL
	Perfluoro-1-octanesulfonamide	FOSA	1000 ng/mL
	2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoroproproxy)propanoic acid	HFPO-DA	1000 ng/mL
	N-methylperfluorooctanesulfonamidoacetic acid (linear and branched isomers)	br-NMeFOSAA	1000 ng/mL
	N-ethylperfluorooctanesulfonamidoacetic acid (linear and branched isomers)	br-NEtFOSAA	1000 ng/mL
	Potassium perfluoro-1-butanesulfonate	L-PFBS	1000 ng/mL
	Sodium perfluoro-1-pentanesulfonate	L-PFPeS	1000 ng/mL
	Potassium perfluorohexanesulfonate (linear and branched isomers)	br-PFHxSK	1000 ng/mL
	Sodium perfluoro-1-heptanesulfonate	L-PFHpS	1000 ng/mL
	Potassium perfluorooctanesulfonate (linear and branched isomers)	br-PFOSK	1000 ng/mL
	Sodium perfluoro-1-nonanesulfonate	L-PFNS	1000 ng/mL
	Sodium perfluoro-1-decanesulfonate	L-PFDS	1000 ng/mL
	Sodium 1H,1H,2H,2H-perfluorohexanesulfonate	4:2FTS	1000 ng/mL
	Sodium 1H,1H,2H,2H-perfluorooctanesulfonate	6:2FTS	1000 ng/mL
	Sodium 1H,1H,2H,2H-perfluorodecanesulfonate	8:2FTS	1000 ng/mL
	Sodium dodecafluoro-3H-4,8-dioxanonanoate	NaDONA	1000 ng/mL
	Potassium 9-chlorohexadecafluoro-3-oxanonane-1-sulfonate	9Cl-PF3ONS	1000 ng/mL
	Potassium 11-chloroeicosafluoro-3-oxaundecane-1-sulfonate	11Cl-PF3OUdS	1000 ng/mL

EPA METHOD 537.1 SOLUTION/MIXTURES

Catalogue Number	Product (methanol solution)		Qty/Conc
EPA-537SS-R1	EPA Method 537.1 Surrogate Primary Dilution Standard (SUR PDS)		1.2 mL
	Perfluoro-n-(1,2-$^{13}C_2$)hexanoic acid	MPFHxA	1000 ng/mL
	Perfluoro-n-(1,2-$^{13}C_2$)decanoic acid	MPFDA	1000 ng/mL
	2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoroproproxy)($^{13}C_3$)propanoic acid	M3HFPO-DA	1000 ng/mL
	N-ethyl-d_5-perfluoro-1-octanesulfonamidoacetic acid	d5-N-EtFOSAA	4000 ng/mL
EPA-537IS	EPA Method 537.1 Internal Standard Primary Dilution Standard (IS PDS)		1.2 mL
	Perfluoro-n-(1,2-$^{13}C_2$)octanoic acid	M2PFOA	1000 ng/mL
	N-methyl-d_3-perfluoro-1-octanesulfonamidoacetic acid	d3-N-MeFOSAA	4000 ng/mL
	Sodium perfluoro-1-(1,2,3,4-$^{13}C_4$)octanesulfonate	MPFOS	3000 ng/mL

NOTE: Listed concentrations for the perfluoroalkanesulfonates are reported as the salt.

Catalogue Number	Product (methanol solution)		Qty/Conc
EPA-537PDS-R1	EPA Method 537.1 Analyte Primary Dilution Standard (branched/linear mix)		1.2 mL
Perfluoro-n-hexanoic acid		PFHxA	2000 ng/mL
Perfluoro-n-heptanoic acid		PFHpA	2000 ng/mL
Perfluoro-n-octanoic acid		PFOA	2000 ng/mL
Perfluoro-n-nonanoic acid		PFNA	2000 ng/mL
Perfluoro-n-decanoic acid		PFDA	2000 ng/mL
Perfluoro-n-undecanoic acid		PFUdA	2000 ng/mL
Perfluoro-n-dodecanoic acid		PFDoA	2000 ng/mL
Perfluoro-n-tridecanoic acid		PFTrDA	2000 ng/mL
Perfluoro-n-tetradecanoic acid		PFTeDA	2000 ng/mL
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoroproproxy)propanoic acid		HFPO-DA	2000 ng/mL
N-methylperfluorooctanesulfonamidoacetic acid (linear and branched isomers)		br-NMeFOSAA	2000 ng/mL
N-ethylperfluorooctanesulfonamidoacetic acid (linear and branched isomers)		br-NEtFOSAA	2000 ng/mL
Potassium perfluoro-1-butanesulfonate		L-PFBS	2000 ng/mL
Potassium perfluorohexanesulfonate (linear and branched isomers)		br-PFHxSK	2000 ng/mL
Potassium perfluorooctanesulfonate (linear and branched isomers)		br-PFOSK	2000 ng/mL
Sodium dodecafluoro-3H-4,8-dioxanonanoate		NaDONA	2000 ng/mL
Potassium 9-chlorohexadecafluoro-3-oxanonane-1-sulfonate		9Cl-PF3ONS	2000 ng/mL
Potassium 11-chloroeicosafluoro-3-oxaundecane-1-sulfonate		11Cl-PF3OUdS	2000 ng/mL
EPA-537PDSL-R1	EPA Method 537.1 Analyte Primary Dilution Standard (linear isomers only)		1.2 mL
Perfluoro-n-hexanoic acid		PFHxA	2000 ng/mL
Perfluoro-n-heptanoic acid		PFHpA	2000 ng/mL
Perfluoro-n-octanoic acid		PFOA	2000 ng/mL
Perfluoro-n-nonanoic acid		PFNA	2000 ng/mL
Perfluoro-n-decanoic acid		PFDA	2000 ng/mL
Perfluoro-n-undecanoic acid		PFUdA	2000 ng/mL
Perfluoro-n-dodecanoic acid		PFDoA	2000 ng/mL
Perfluoro-n-tridecanoic acid		PFTrDA	2000 ng/mL
Perfluoro-n-tetradecanoic acid		PFTeDA	2000 ng/mL
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoroproproxy)propanoic acid		HFPO-DA	2000 ng/mL
N-methylperfluoro-1-octanesulfonamidoacetic acid		N-MeFOSAA	2000 ng/mL
N-ethylperfluoro-1-octanesulfonamidoacetic acid		N-EtFOSAA	2000 ng/mL
Potassium perfluoro-1-butanesulfonate		L-PFBS	2000 ng/mL
Sodium perfluoro-1-hexanesulfonate		L-PFHxS	2000 ng/mL
Sodium perfluoro-1-octanesulfonate		L-PFOS	2000 ng/mL
Sodium dodecafluoro-3H-4,8-dioxanonanoate		NaDONA	2000 ng/mL
Potassium 9-chlorohexadecafluoro-3-oxanonane-1-sulfonate		9Cl-PF3ONS	2000 ng/mL
Potassium 11-chloroeicosafluoro-3-oxaundecane-1-sulfonate		11Cl-PF3OUdS	2000 ng/mL

NOTE: Listed concentrations for the perfluoroalkanesulfonates are reported as the salt.



ISO 21675:2019 SOLUTION/MIXTURES

Catalogue Number	Product (methanol solution)		Qty/Conc
ISO 21675-NSS	ISO 21675:2019 Native Stock Solution		1.2 mL
Perfluoro-n-butanoic acid		PFBA	100 ng/mL
Perfluoro-n-pentanoic acid		PFPeA	100 ng/mL
Perfluoro-n-hexanoic acid		PFHxA	100 ng/mL
Perfluoro-n-heptanoic acid		PFHpA	100 ng/mL
Perfluoro-n-octanoic acid		PFOA	100 ng/mL
Perfluoro-n-nonanoic acid		PFNA	100 ng/mL
Perfluoro-n-decanoic acid		PFDA	100 ng/mL
Perfluoro-n-undecanoic acid		PFUdA	100 ng/mL
Perfluoro-n-dodecanoic acid		PFDoA	100 ng/mL
Perfluoro-n-tridecanoic acid		PFTrDA	100 ng/mL
Perfluoro-n-tetradecanoic acid		PFTeDA	100 ng/mL
Perfluoro-n-hexadecanoic acid		PFHxDA	100 ng/mL
Perfluoro-n-octadecanoic acid		PFODA	100 ng/mL
Perfluoro-1-octanesulfonamide		FOSA	100 ng/mL
N-methylperfluoro-1-octanesulfonamide		N-MeFOSA	100 ng/mL
N-ethylperfluoro-1-octanesulfonamide		N-EtFOSA	100 ng/mL
N-methylperfluoro-1-octanesulfonamidoacetic acid		N-MeFOSAA	100 ng/mL
N-ethylperfluoro-1-octanesulfonamidoacetic acid		N-EtFOSAA	100 ng/mL
2H-Perfluoro-2-decenoic acid		FOUEA	100 ng/mL
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoroproproxy)propanoic acid		HFPO-DA	100 ng/mL
Potassium perfluoro-1-butanesulfonate		L-PFBS	100 ng/mL
Sodium perfluoro-1-hexanesulfonate		L-PFHxS	100 ng/mL
Sodium perfluoro-1-heptanesulfonate		L-PFHpS	100 ng/mL
Sodium perfluoro-1-octanesulfonate		L-PFOS	100 ng/mL
Sodium perfluoro-1-decanesulfonate		L-PFDS	100 ng/mL
Sodium 1H,1H,2H,2H-perfluorooctanesulfonate		6:2FTS	100 ng/mL
Sodium 1H,1H,2H,2H-perfluorodecanesulfonate		8:2FTS	100 ng/mL
Sodium dodecafluoro-3H-4,8-dioxanonanoate		NaDONA	100 ng/mL
Potassium 9-chlorohexadecafluoro-3-oxanonane-1-sulfonate		9Cl-PF3ONS	100 ng/mL
Sodium bis(1H,1H,2H,2H-perfluorodecyl) phosphate		8:2diPAP	100 ng/mL

NOTE: Listed concentrations for the perfluoroalkanesulfonates are reported as the salt.

Catalogue Number	Product (methanol solution)		Qty/Conc
ISO 21675-LSS	ISO 21675:2019 Labelled Stock Solution		1.2 mL
Perfluoro-n-($^{13}C_4$)butanoic acid		MPFBA	100 ng/mL
Perfluoro-n-($^{13}C_5$)pentanoic acid		M5PFPeA	100 ng/mL
Perfluoro-n-(1,2,3,4,6-$^{13}C_5$)hexanoic acid		M5PFHxA	100 ng/mL
Perfluoro-n-(1,2,3,4-$^{13}C_4$)heptanoic acid		M4PFHpA	100 ng/mL
Perfluoro-n-($^{13}C_8$)octanoic acid		M8PFOA	100 ng/mL
Perfluoro-n-($^{13}C_9$)nonanoic acid		M9PFNA	100 ng/mL
Perfluoro-n-(1,2,3,4,5,6-$^{13}C_6$)decanoic acid		M6PFDA	100 ng/mL
Perfluoro-n-(1,2,3,4,5,6,7-$^{13}C_7$)undecanoic acid		M7PFUdA	100 ng/mL
Perfluoro-n-(1,2-$^{13}C_2$)dodecanoic acid		MPFDoA	100 ng/mL
Perfluoro-n-(1,2-$^{13}C_2$)tetradecanoic acid		M2PFTeDA	100 ng/mL
Perfluoro-n-(1,2-$^{13}C_2$)hexadecanoic acid		M2PFHxDA	100 ng/mL
Perfluoro-1-($^{13}C_8$)octanesulfonamide		M8FOSA	100 ng/mL
N-methyl-d_3-perfluoro-1-octanesulfonamide		d-N-MeFOSA	100 ng/mL
N-ethyl-d_5-perfluoro-1-octanesulfonamide		d-N-EtFOSA	100 ng/mL
N-methyl-d_3-perfluoro-1-octanesulfonamidoacetic acid		d3-N-MeFOSAA	100 ng/mL
N-ethyl-d_5-perfluoro-1-octanesulfonamidoacetic acid		d5-N-EtFOSAA	100 ng/mL
2H-Perfluoro-(1,2-$^{13}C_2$)-2-decenoic acid		MFOUEA	100 ng/mL
2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoroproproxy)($^{13}C_3$)propanoic acid		M3HFPO-DA	100 ng/mL
Sodium perfluoro-1-(2,3,4-$^{13}C_3$)butanesulfonate		M3PFBS	100 ng/mL
Sodium perfluoro-1-(1,2,3-$^{13}C_3$)hexanesulfonate		M3PFHxS	100 ng/mL
Sodium perfluoro-1-($^{13}C_8$)octanesulfonate		M8PFOS	100 ng/mL
Sodium 1H,1H,2H,2H-perfluoro(1,2-$^{13}C_2$)octanesulfonate		M2-6:2FTS	100 ng/mL
Sodium 1H,1H,2H,2H-perfluoro(1,2-$^{13}C_2$)decanesulfonate		M2-8:2FTS	100 ng/mL
Sodium bis[1H,1H,2H,2H-(1,2-$^{13}C_2$)perfluorodecyl] phosphate		M4-8:2diPAP	100 ng/mL

NOTE: Listed concentrations for the perfluoroalkanesulfonates are reported as the salt.

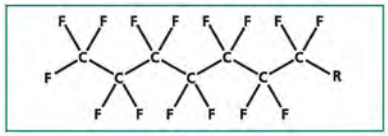


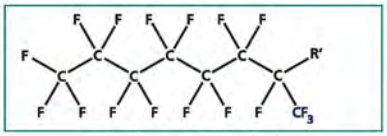
EPA METHOD 533 SOLUTION/MIXTURES

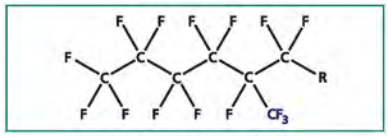
Catalogue Number	Product (methanol solution)		Qty/Conc
EPA-533ES	EPA Method 533 Isotope Dilution Standard PDS		1.2 mL
	Perfluoro-n-($^{13}C_4$)butanoic acid	MPFBA	500 ng/mL
	Perfluoro-n-($^{13}C_5$)pentanoic acid	M5PFPeA	500 ng/mL
	Perfluoro-n-(1,2,3,4,6-$^{13}C_5$)hexanoic acid	M5PFHxA	500 ng/mL
	Perfluoro-n-(1,2,3,4-$^{13}C_4$)heptanoic acid	M4PFHpA	500 ng/mL
	Perfluoro-n-($^{13}C_8$)octanoic acid	M8PFOA	500 ng/mL
	Perfluoro-n-($^{13}C_9$)nonanoic acid	M9PFNA	500 ng/mL
	Perfluoro-n-(1,2,3,4,5,6-$^{13}C_6$)decanoic acid	M6PFDA	500 ng/mL
	Perfluoro-n-(1,2,3,4,5,6,7-$^{13}C_7$)undecanoic acid	M7PFUdA	500 ng/mL
	Perfluoro-n-(1,2-$^{13}C_2$)dodecanoic acid	MPFDoA	500 ng/mL
	2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoroproproxy)($^{13}C_3$)propanoic acid	M3HFPO-DA	500 ng/mL
	Sodium perfluoro-1-(2,3,4-$^{13}C_3$)butanesulfonate	M3PFBS	500 ng/mL
	Sodium perfluoro-1-(1,2,3-$^{13}C_3$)hexanesulfonate	M3PFHxS	500 ng/mL
	Sodium perfluoro-1-($^{13}C_8$)octanesulfonate	M8PFOS	500 ng/mL
	Sodium 1H,1H,2H,2H-perfluoro(1,2-$^{13}C_2$)hexanesulfonate	M2-4:2FTS	2000 ng/mL
	Sodium 1H,1H,2H,2H-perfluoro(1,2-$^{13}C_2$)octanesulfonate	M2-6:2FTS	2000 ng/mL
	Sodium 1H,1H,2H,2H-perfluoro(1,2-$^{13}C_2$)decanesulfonate	M2-8:2FTS	2000 ng/mL
EPA-533IS	EPA Method 533 Isotope Performance Standard (IS PDS)		1.2 mL
	Perfluoro-n-(2,3,4-$^{13}C_3$)butanoic acid	M3PFBA	1000 ng/mL
	Perfluoro-n-(1,2-$^{13}C_2$)octanoic acid	M2PFOA	1000 ng/mL
	Sodium perfluoro-1-(1,2,3,4-$^{13}C_4$)octanesulfonate	MPFOS	3000 ng/mL
EPA-533PAR	EPA Method 533 Native Analyte Primary Dilution Standard (br/linear mix)		1.2 mL
	Perfluoro-n-butanoic acid	PFBA	500 ng/mL
	Perfluoro-n-pentanoic acid	PFPeA	500 ng/mL
	Perfluoro-n-hexanoic acid	PFHxA	500 ng/mL
	Perfluoro-n-heptanoic acid	PFHpA	500 ng/mL
	Perfluoro-n-octanoic acid	PFOA	500 ng/mL
	Perfluoro-n-nonanoic acid	PFNA	500 ng/mL
	Perfluoro-n-decanoic acid	PFDA	500 ng/mL
	Perfluoro-n-undecanoic acid	PFUdA	500 ng/mL
	Perfluoro-n-dodecanoic acid	PFDoA	500 ng/mL
	2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoroproproxy)propanoic acid	HFPO-DA	500 ng/mL
	Perfluoro-4-oxapentanoic acid	PF4OPeA	500 ng/mL
	Perfluoro-5-oxahexanoic acid	PF5OHxA	500 ng/mL
	Perfluoro-3,6-dioxaheptanoic acid	3,6-OPFHpA	500 ng/mL
	Potassium perfluoro-1-butanesulfonate	L-PFBS	500 ng/mL
	Sodium perfluoro-1-pentanesulfonate	L-PFPeS	500 ng/mL
	Potassium perfluorohexanesulfonate (linear and branched isomers)	br-PFHxSK	500 ng/mL
	Sodium perfluoro-1-heptanesulfonate	L-PFHpS	500 ng/mL
	Potassium perfluorooctanesulfonate (linear and branched isomers)	br-PFOSK	500 ng/mL
	Sodium 1H,1H,2H,2H-perfluorohexanesulfonate	4:2FTS	500 ng/mL
	Sodium 1H,1H,2H,2H-perfluorooctanesulfonate	6:2FTS	500 ng/mL
	Sodium 1H,1H,2H,2H-perfluorodecanesulfonate	8:2FTS	500 ng/mL
	Sodium dodecafluoro-3H-4,8-dioxanonanoate	NaDONA	500 ng/mL
	Potassium 9-chlorohexadecafluoro-3-oxanonane-1-sulfonate	9Cl-PF3ONS	500 ng/mL
	Potassium 11-chloroeicosafluoro-3-oxaundecane-1-sulfonate	11Cl-PF3OUdS	500 ng/mL
	Potassium perfluoro(2-ethoxyethane)sulfonate	PFEESA	500 ng/mL

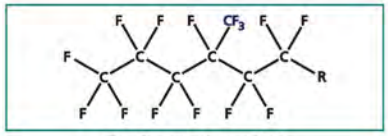
NOTE: Listed concentrations for the perfluoroalkanesulfonates are reported as the salt.

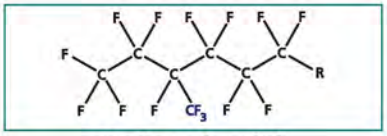
Catalogue Number	Product (methanol solution)	Qty/Anion Conc	
P1MHpS	Sodium Perfluoro-1-methylheptanesulfonate	200 µL	1.00 µg/mL
P3MHpS	Sodium Perfluoro-3-methylheptanesulfonate	200 µL	1.00 µg/mL
	Perfluoro-3-methylheptanoic acid		1.90 µg/mL
P4MHpS	Sodium Perfluoro-4-methylheptanesulfonate	200 µL	1.00 µg/mL
	Perfluoro-4-methylheptanoic acid		2.20 µg/mL
P5MHpS	Sodium Perfluoro-5-methylheptanesulfonate	200 µL	1.00 µg/mL
	Perfluoro-5-methylheptanoic acid		1.96 µg/mL
P6MHpS	Sodium Perfluoro-6-methylheptanesulfonate	200 µL	1.00 µg/mL
	Perfluoro-6-methylheptanoic acid		3.10 µg/mL
P55DMHxS	Sodium Perfluoro-5,5-dimethylhexanesulfonate	200 µL	1.00 µg/mL
	Perfluoro-5,5-dimethylhexanoic acid		1.95 µg/mL
P45DMHxS	Sodium Perfluoro-4,5-dimethylhexanesulfonate	200 µL	1.00 µg/mL
	Perfluoro-4,5-dimethylhexanoic acid		1.22 µg/mL
	Sodium Perfluoro-3,5-dimethylhexanesulfonate		0.50 µg/mL
	Perfluoro-3,5-dimethylhexanoic acid		0.60 µg/mL

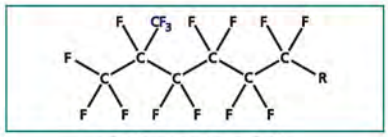

Linear

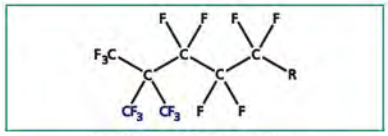

Perfluoro-1-methyl-

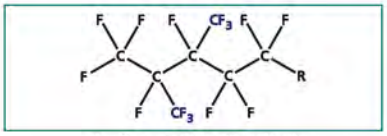

Perfluoro-3-methyl-

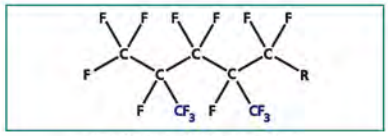

Perfluoro-4-methyl-


Perfluoro-5-methyl-


Perfluoro-6-methyl-


Perfluoro-5,5-dimethyl-


Perfluoro-4,5-dimethyl-

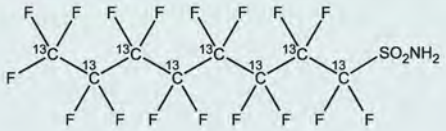
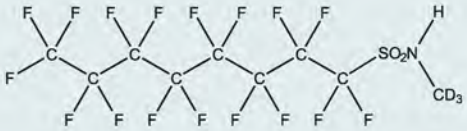
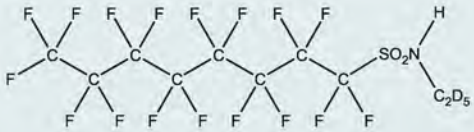

Perfluoro-3,5-dimethyl-

NOTE: R= CO_2^- and $CF_2SO_3^-$
R'= SO_3^- only

NATIVE PERFLUOROALKANESULFONAMIDES (FASA)

Catalogue Number	Product (methanol solution)	Qty/Conc	
FBSA-I	Perfluoro-1-butanesulfonamide (in isopropanol)	1.2 mL	50.0 µg/mL
FHxSA-I	Perfluoro-1-hexanesulfonamide (in isopropanol)	1.2 mL	50.0 µg/mL
FHpSA-I	Perfluoro-1-heptanesulfonamide (in isopropanol)	1.2 mL	50.0 µg/mL
FOSA-I	Perfluoro-1-octanesulfonamide (in isopropanol)	1.2 mL	50.0 µg/mL
FDSA-I	Perfluoro-1-decanesulfonamide (in isopropanol)	1.2 mL	50.0 µg/mL
N-MeFBSA-M	N-methylperfluoro-1-butanesulfonamide	1.2 mL	50.0 µg/mL
N-MeFOSA-M	N-methylperfluoro-1-octanesulfonamide	1.2 mL	50.0 µg/mL
N,N-Me2FOSA-M	N,N-dimethylperfluoro-1-octanesulfonamide	1.2 mL	50.0 µg/mL
N-EtFOSA-M	N-ethylperfluoro-1-octanesulfonamide	1.2 mL	50.0 µg/mL

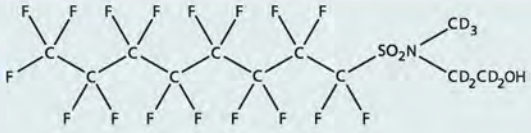
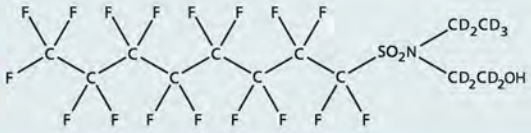
MASS-LABELLED PERFLUOROALKANESULFONAMIDES

Catalogue Number		Product
M8FOSA-I		Perfluoro-1-($^{13}C_8$)octanesulfonamide 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in isopropanol; >99% linear; >99% $^{13}C_8$
d-N-MeFOSA-M		N-methyl-d_3-perfluoro-1-octanesulfonamide 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol; >99% linear; 98% $^2H_3$
d-N-EtFOSA-M		N-ethyl-d_5-perfluoro-1-octanesulfonamide 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol; >99% linear; 98% $^2H_5$

NATIVE PERFLUOROALKANESULFONAMIDOETHANOLS (N-MeFASE and N-EtFASE)

Catalogue Number	Product (methanol solution)	Qty/Conc	
N-MeFBSE-M	2-(N-methylperfluoro-1-butanesulfonamido)ethanol	1.2 mL	50.0 µg/mL
N-MeFOSE-M	2-(N-methylperfluoro-1-octanesulfonamido)ethanol	1.2 mL	50.0 µg/mL
N-EtFOSE-M	2-(N-ethylperfluoro-1-octanesulfonamido)ethanol	1.2 mL	50.0 µg/mL

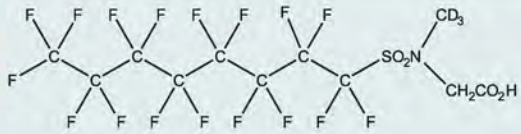
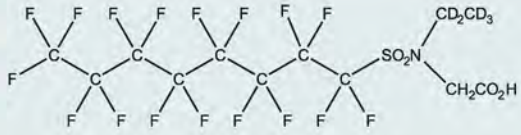
MASS-LABELLED PERFLUOROALKANESULFONAMIDOETHANOLS

Catalogue Number		Product
d7-N-MeFOSE-M		2-(N-methyl-d_3-perfluoro-1-octane-sulfonamido)ethan-d_4-ol 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol; >99% linear; 98% $^2H_7$
d9-N-EtFOSE-M		2-(N-ethyl-d_5-perfluoro-1-octane-sulfonamido)ethan-d_4-ol 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol; >99% linear; 98% $^2H_9$

NATIVE PERFLUOROOCTANESULFONAMIDOACETIC ACIDS (FOSAA)

Catalogue Number	Product (methanol solution)	Qty/Conc	
FOSAA	Perfluoro-1-octanesulfonamidoacetic acid	1.2 mL	50.0 µg/mL
N-MeFOSAA	N-methylperfluoro-1-octanesulfonamidoacetic acid	1.2 mL	50.0 µg/mL
N-EtFOSAA	N-ethylperfluoro-1-octanesulfonamidoacetic acid	1.2 mL	50.0 µg/mL
br-NMeFOSAA	N-methylperfluorooctanesulfonamidoacetic acid isomeric mix	1.2 mL	50.0 µg/mL
br-NEtFOSAA	N-ethylperfluorooctanesulfonamidoacetic acid isomeric mix	1.2 mL	50.0 µg/mL

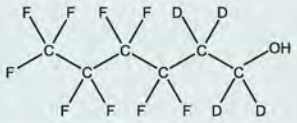
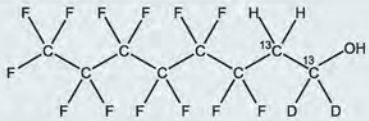
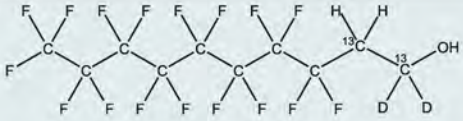
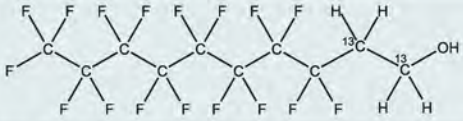
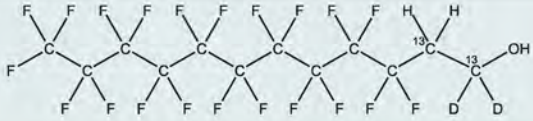
MASS-LABELLED PERFLUOROOCTANESULFONAMIDOACETIC ACIDS

Catalogue Number		Product
d3-N-MeFOSAA		N-methyl-d_3-perfluoro-1-octane-sulfonamidoacetic acid 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol; >99% linear; 98% $^2H_3$
d5-N-EtFOSAA		N-ethyl-d_5-perfluoro-1-octane-sulfonamidoacetic acid 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol; >99% linear; 98% $^2H_5$

NATIVE FLUOROTELOMER ALCOHOLS (X:2FTOH)

Catalogue Number	Product (methanol solution)	Qty/Conc	
FBET	2-Perfluorobutyl ethanol ***(4:2)***	1.2 mL	50.0 µg/mL
5:2sFTOH	1-Perfluoropentyl ethanol ***(5:2 secondary)***	1.2 mL	50.0 µg/mL
FHET	2-Perfluorohexyl ethanol ***(6:2)***	1.2 mL	50.0 µg/mL
7:2sFTOH	1-Perfluoroheptyl ethanol ***(7:2 secondary)***	1.2 mL	50.0 µg/mL
FOET	2-Perfluorooctyl ethanol ***(8:2)***	1.2 mL	50.0 µg/mL
FDET	2-Perfluorodecyl ethanol ***(10:2)***	1.2 mL	50.0 µg/mL

MASS-LABELLED FLUOROTELOMER ALCOHOLS

Catalogue Number		Product
MFBET		2-Perfluorobutyl (1,1,2,2-$^{2}H_{4}$)ethanol (>97%) 1.2 mL; 48.5 µg/mL (±2.4 µg/mL); in methanol; 98% 1,1,2,2-$^{2}H_{4}$
MFHET		2-Perfluorohexyl (1,1-$^{2}H_{2}$,1,2-$^{13}C_{2}$)ethanol 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol; 98% 1,1-$^{2}H_{2}$, >99% 1,2-$^{13}C_{2}$
M2FHET		2-Perfluorohexyl (1,2-$^{13}C_{2}$)ethanol 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol; >99% 1,2-$^{13}C_{2}$
MFOET		2-Perfluorooctyl (1,1-$^{2}H_{2}$,1,2-$^{13}C_{2}$)ethanol 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol; 98% 1,1-$^{2}H_{2}$, >99% 1,2-$^{13}C_{2}$
M2FOET		2-Perfluorooctyl (1,2-$^{13}C_{2}$)ethanol 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol; >99% 1,2-$^{13}C_{2}$
MFDET		2-Perfluorodecyl (1,1-$^{2}H_{2}$,1,2-$^{13}C_{2}$)ethanol 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol; 98% 1,1-$^{2}H_{2}$, >99% 1,2-$^{13}C_{2}$

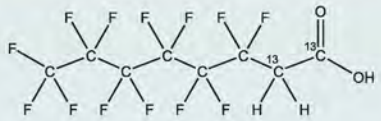
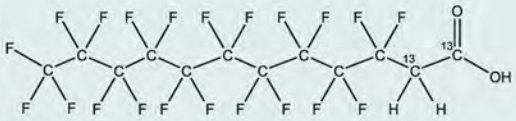
NATIVE FLUOROTELOMER CARBOXYLIC ACIDS (FTCA)

Catalogue Number	Product (isopropanol solution)	Qty/Conc	
FHEA	2-Perfluorohexyl ethanoic acid ***(6:2)***	1.2 mL	50.0 µg/mL
FOEA	2-Perfluorooctyl ethanoic acid ***(8:2)***	1.2 mL	50.0 µg/mL
FDEA	2-Perfluorodecyl ethanoic acid ***(10:2)***	1.2 mL	50.0 µg/mL
FPrPA	3-Perfluoropropyl propanoic acid ***(3:3)***	1.2 mL	50.0 µg/mL
FPePA	3-Perfluoropentyl propanoic acid ***(5:3)***	1.2 mL	50.0 µg/mL
FHpPA	3-Perfluoroheptyl propanoic acid ***(7:3)***	1.2 mL	50.0 µg/mL

NATIVE FLUOROTELOMER CARBOXYLIC ACIDS: SOLUTION/MIXTURE

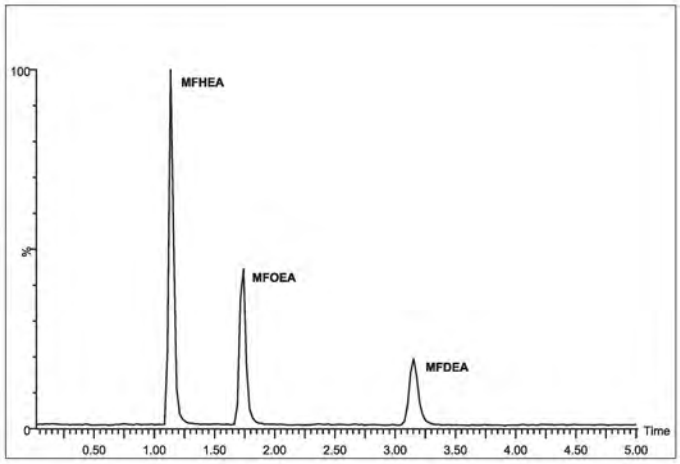
Catalogue Number	Product (isopropanol solution)		Qty/Conc
FTA-MXA	Native FTA Solution/Mixture		1.2 mL
2-Perfluorohexyl ethanoic acid ***(6:2)***		FHEA	2.00 µg/mL
2-Perfluorooctyl ethanoic acid ***(8:2)***		FOEA	2.00 µg/mL
2-Perfluorodecyl ethanoic acid ***(10:2)***		FDEA	2.00 µg/mL

MASS-LABELLED FLUOROTELOMER CARBOXYLIC ACIDS

Catalogue Number		Product
MFHEA		2-Perfluorohexyl (1,2-$^{13}C_2$)ethanoic acid 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in isopropanol; >99% $^{13}C_2$
MFOEA		2-Perfluorooctyl (1,2-$^{13}C_2$)ethanoic acid 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in isopropanol; >99% $^{13}C_2$
MFDEA		2-Perfluorodecyl (1,2-$^{13}C_2$)ethanoic acid 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in isopropanol; >99% $^{13}C_2$

MASS-LABELLED FLUOROTELOMER CARBOXYLIC ACIDS: SOLUTION/MIXTURE

Catalogue Number	Product (isopropanol solution)		Qty/Conc
MFTA-MXA	Mass-Labelled FTA Solution/Mixture		1.2 mL
2-Perfluorohexyl (1,2-$^{13}C_2$)ethanoic acid ***(6:2)***		MFHEA	2.00 µg/mL
2-Perfluorooctyl (1,2-$^{13}C_2$)ethanoic acid ***(8:2)***		MFOEA	2.00 µg/mL
2-Perfluorodecyl (1,2-$^{13}C_2$)ethanoic acid ***(10:2)***		MFDEA	2.00 µg/mL

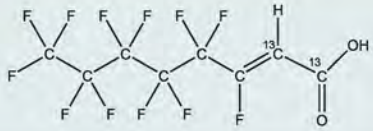


LC/MS Data for MFTA-MXA on an Acquity UPLC BEH Shield RP_{18} column.

NATIVE FLUOROTELOMER UNSATURATED CARBOXYLIC ACIDS (FTUCA)

Catalogue Number	Product (isopropanol solution)	Qty/Conc
FHUEA	2H-Perfluoro-2-octenoic acid ***(6:2)***	1.2 mL 50.0 µg/mL
FOUEA	2H-Perfluoro-2-decenoic acid ***(8:2)***	1.2 mL 50.0 µg/mL
FDUEA	2H-Perfluoro-2-dodecenoic acid ***(10:2)***	1.2 mL 50.0 µg/mL

MASS-LABELLED FLUOROTELOMER UNSATURATED CARBOXYLIC ACIDS

Catalogue Number		Product
MFHUEA		2H-Perfluoro-(1,2-$^{13}C_2$)-2-octenoic acid 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in isopropanol; >99% $^{13}C_2$
MFOUEA		2H-Perfluoro-(1,2-$^{13}C_2$)-2-decenoic acid 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in isopropanol; >99% $^{13}C_2$
MFDUEA		2H-Perfluoro-(1,2-$^{13}C_2$)-2-dodecenoic acid 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in isopropanol; >99% $^{13}C_2$

NATIVE CHLOROPERFLUOROALKYL ETHER SULFONATES (Cl-PFESA)

Catalogue Number	Product (methanol solution)	Qty/Conc
9Cl-PF3ONS	Potassium 9-chlorohexadecafluoro-3-oxanonane-1-sulfonate	1.2 mL 50.0 µg/mL
11Cl-PF3OUdS	Potassium 11-chloroeicosafluoro-3-oxaundecane-1-sulfonate	1.2 mL 50.0 µg/mL

NOTE: Listed concentrations are reported as the salt.

NATIVE PER- AND POLYFLUOROALKYL ETHER CARBOXYLIC ACIDS (PFECA)

Catalogue Number	Product (methanol solution)	Qty/Conc
NaDONA *	Sodium dodecafluoro-3H-4,8-dioxanonanoate	1.2 mL 50.0 µg/mL
PF4OPeA	Perfluoro-4-oxapentanoic acid (PFMPA)	1.2 mL 50.0 µg/mL
PF5OHxA	Perfluoro-5-oxahexanoic acid (PFMBA)	1.2 mL 50.0 µg/mL
3,6-OPFHpA	Perfluoro-3,6-dioxaheptanoic acid (NFDHA)	1.2 mL 50.0 µg/mL

***NOTE:** Listed concentration is reported as the salt.

NATIVE PERFLUOROALKYL ETHER SULFONATES (PFESA)

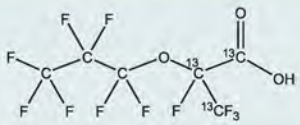
Catalogue Number	Product (methanol solution)	Qty/Conc
PFEESA	Potassium perfluoro(2-ethoxyethane)sulfonate	1.2 mL 50.0 µg/mL

NOTE: Listed concentration is reported as the salt.

NATIVE HEXAFLUOROPROPYLENE OXIDE DIMER ACID (HFPO-DA)

Catalogue Number	Product (methanol solution)	Qty/Conc
HFPO-DA	2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)-propanoic acid (GenX)	1.2 mL 50.0 µg/mL

MASS-LABELLED HEXAFLUOROPROPYLENE OXIDE DIMER ACID

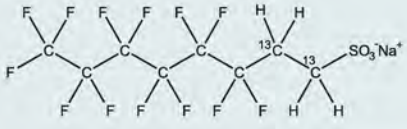
Catalogue Number	Product
M3HFPO-DA	 2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)($^{13}C_3$)propanoic acid 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol; > 99% $^{13}C_3$

NATIVE FLUOROTELOMER SULFONATES (X:2FTS)

Catalogue Number	Product (methanol solution)	Qty/Conc
4:2FTS	Sodium 1H,1H,2H,2H-perfluorohexanesulfonate ***(4:2)***	1.2 mL 50.0 µg/mL
6:2FTS	Sodium 1H,1H,2H,2H-perfluorooctanesulfonate ***(6:2)***	1.2 mL 50.0 µg/mL
8:2FTS	Sodium 1H,1H,2H,2H-perfluorodecanesulfonate ***(8:2)***	1.2 mL 50.0 µg/mL
10:2FTS	Sodium 1H,1H,2H,2H-perfluorododecanesulfonate ***(10:2)***	1.2 mL 50.0 µg/mL

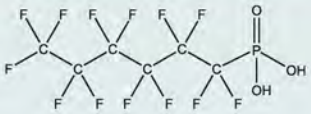
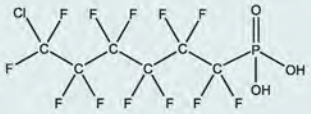
NOTE: Listed concentrations are reported as the salt.

MASS-LABELLED FLUOROTELOMER SULFONATES

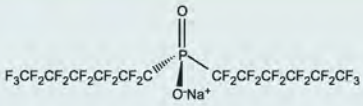
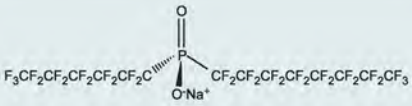
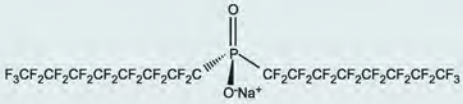
Catalogue Number	Product
M2-4:2FTS	 Sodium 1H,1H,2H,2H-perfluoro(1,2-$^{13}C_2$)hexanesulfonate ***(4:2)*** 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol; >99% $^{13}C_2$
M2-6:2FTS	 Sodium 1H,1H,2H,2H-perfluoro(1,2-$^{13}C_2$)octanesulfonate ***(6:2)*** 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol; >99% $^{13}C_2$
M2-8:2FTS	 Sodium 1H,1H,2H,2H-perfluoro(1,2-$^{13}C_2$)decanesulfonate ***(8:2)*** 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol; >99% $^{13}C_2$

NOTE: Listed concentrations are reported as the salt.

NATIVE PERFLUOROALKYLPHOSPHONIC ACIDS (PFAPA)

Catalogue Number		Product
PFHxPA		Perfluorohexylphosphonic acid 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol
PFOPA		Perfluorooctylphosphonic acid 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol
PFDPA		Perfluorodecylphosphonic acid 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol
Cl-PFHxPA		6-Chloroperfluorohexylphosphonic acid 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol
Cl-PFOPA		8-Chloroperfluorooctylphosphonic acid 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol

NATIVE SODIUM PERFLUOROALKYL PHOSPHINATES (X:XPFPi)

Catalogue Number		Product
6:6PFPi		Sodium bis(perfluorohexyl)phosphinate 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol
6:8PFPi		Sodium perfluorohexylperfluorooctylphosphinate 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol
8:8PFPi		Sodium bis(perfluorooctyl)phosphinate 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol

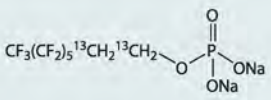
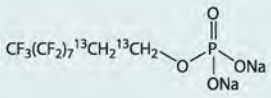
NATIVE POLYFLUOROALKYL PHOSPHATE MONO-ESTERS (PAP)

Catalogue Number	Product (methanol solution)	Qty/Conc	
6:2PAP	Sodium 1H,1H,2H,2H-perfluorooctyl phosphate	1.2 mL	50.0 µg/mL
8:2PAP	Sodium 1H,1H,2H,2H-perfluorodecyl phosphate	1.2 mL	50.0 µg/mL

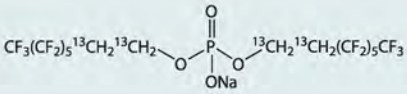
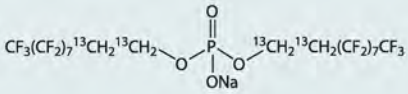
NATIVE POLYFLUOROALKYL PHOSPHATE DI-ESTERS (diPAP)

Catalogue Number	Product (methanol solution)	Qty/Conc	
6:2diPAP	Sodium bis(1H,1H,2H,2H-perfluorooctyl) phosphate	1.2 mL	50.0 µg/mL
6:2/8:2diPAP	Sodium (1H,1H,2H,2H-perfluorooctyl-1H,1H,2H,2H-perfluorodecyl) phosphate	1.2 mL	50.0 µg/mL
8:2diPAP	Sodium bis(1H,1H,2H,2H-perfluorodecyl) phosphate	1.2 mL	50.0 µg/mL

MASS-LABELLED POLYFLUOROALKYL PHOSPHATE MONO-ESTERS

Catalogue Number		Product
M2-6:2PAP		Sodium 1H,1H,2H,2H-(1,2-$^{13}C_2$)perfluorooctyl phosphate 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol; >99% $^{13}C_2$
M2-8:2PAP		Sodium 1H,1H,2H,2H-(1,2-$^{13}C_2$)perfluorodecyl phosphate 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol; >99% $^{13}C_2$

MASS-LABELLED POLYFLUOROALKYL PHOSPHATE DI-ESTERS

Catalogue Number		Product
M4-6:2diPAP		Sodium bis[1H,1H,2H,2H-(1,2-$^{13}C_2$)perfluorooctyl] phosphate 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol; >99% $^{13}C_4$
M4-8:2diPAP		Sodium bis[1H,1H,2H,2H-(1,2-$^{13}C_2$)perfluorodecyl] phosphate 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol; >99% $^{13}C_4$

NATIVE POLYFLUOROALKYL PHOSPHATE ESTERS (SAmPAP)

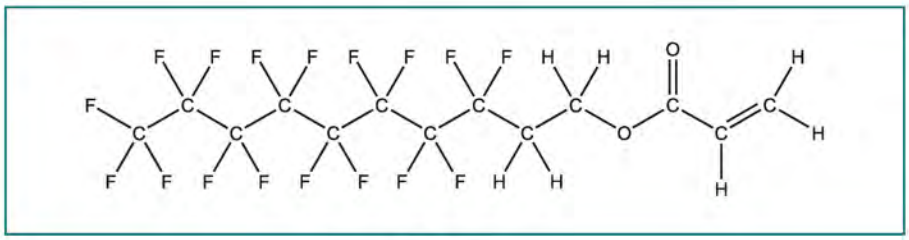
Catalogue Number	Product (methanol solution)	Qty/Conc	
SAmPAP	Sodium 2-(N-ethylperfluorooctane-1-sulfonamido)ethyl phosphate	1.2 mL	50.0 µg/mL
diSAmPAP	Sodium bis[2-(N-ethylperfluorooctane-1-sulfonamido)ethyl] phosphate	1.2 mL	50.0 µg/mL

NATIVE FLUOROTELOMER ACRYLATES (X:2FTAcr)

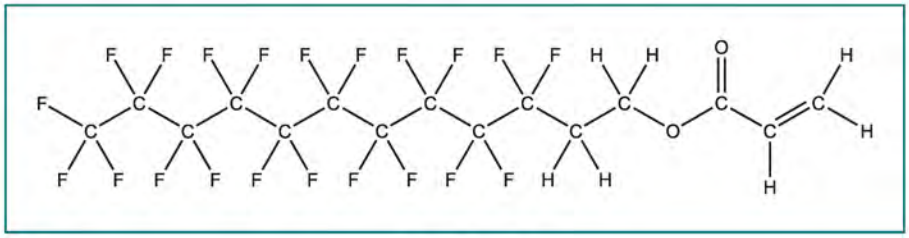
Catalogue Number	Product (isooctane solution)	Qty/Conc
8:2FTAcr	1H,1H,2H,2H-Perfluorodecyl acrylate	1.2 mL 50.0 µg/mL
10:2FTAcr	1H,1H,2H,2H-Perfluorododecyl acrylate (>95%)	1.2 mL 47.9 µg/mL

NATIVE FLUOROTELOMER ACETATES (X:2FTOAc)

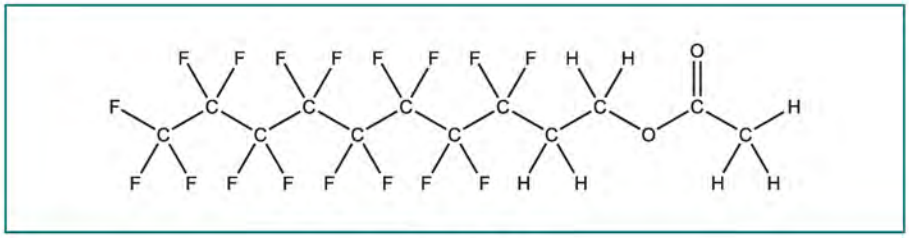
Catalogue Number	Product (isooctane solution)	Qty/Conc
8:2FTOAc	1H,1H,2H,2H-Perfluorodecyl acetate (>97%)	1.2 mL 48.5 µg/mL
10:2FTOAc	1H,1H,2H,2H-Perfluorododecyl acetate	1.2 mL 50.0 µg/mL



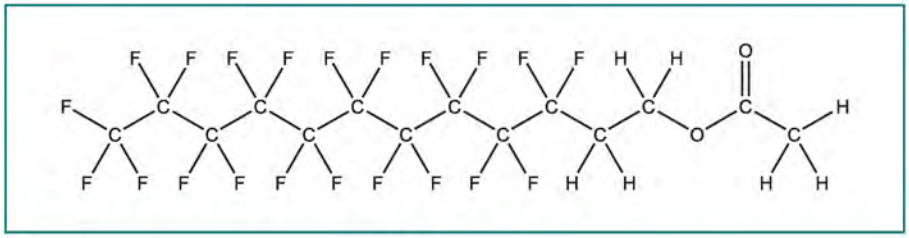
8:2FTAcr



10:2FTAcr



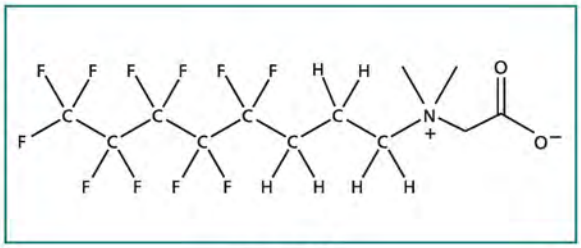
8:2FTOAc



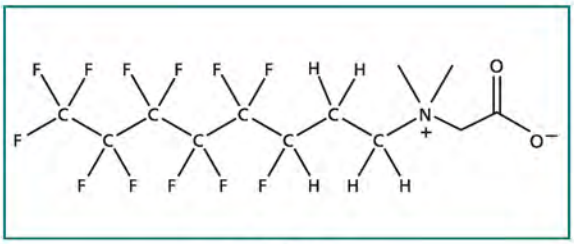
10:2FTOAc

Catalogue Number	Product (methanol solution)	Qty/Conc	
N-AP-FHxSA	N-(3-dimethylaminopropan-1-yl)perfluoro-1-hexanesulfonamide	1.2 mL	50.0 µg/mL
N-TAmP-FHxSA	N-[3-(perfluoro-1-hexanesulfonamido)propan-1-yl]-N,N,N-trimethylammonium	1.2 mL	50.0 µg/mL
N-CMAmP-6:2FOSA	N-(carboxymethyl)-N,N-dimethyl-N-[3-(1H,1H,2H,2H-perfluoro-1-octanesulfonamido)propan-1-yl]ammonium (6:2FTAB)	1.2 mL	50.0 µg/mL
5:3FTB	2-[(4,4,5,5,6,6,7,7,8,8,8-Undecafluorooctyl)dimethylammonio] acetate	1.2 mL	50.0 µg/mL
5:1:2FTB	2-[(3,4,4,5,5,6,6,7,7,8,8,8-Dodecafluorooctyl)dimethylammonio] acetate	1.2 mL	50.0 µg/mL

NOTE: The charge of these compounds will depend on pH.



5:3FTB



5:1:2FTB



Basilica of Our Lady
Guelph, Ontario

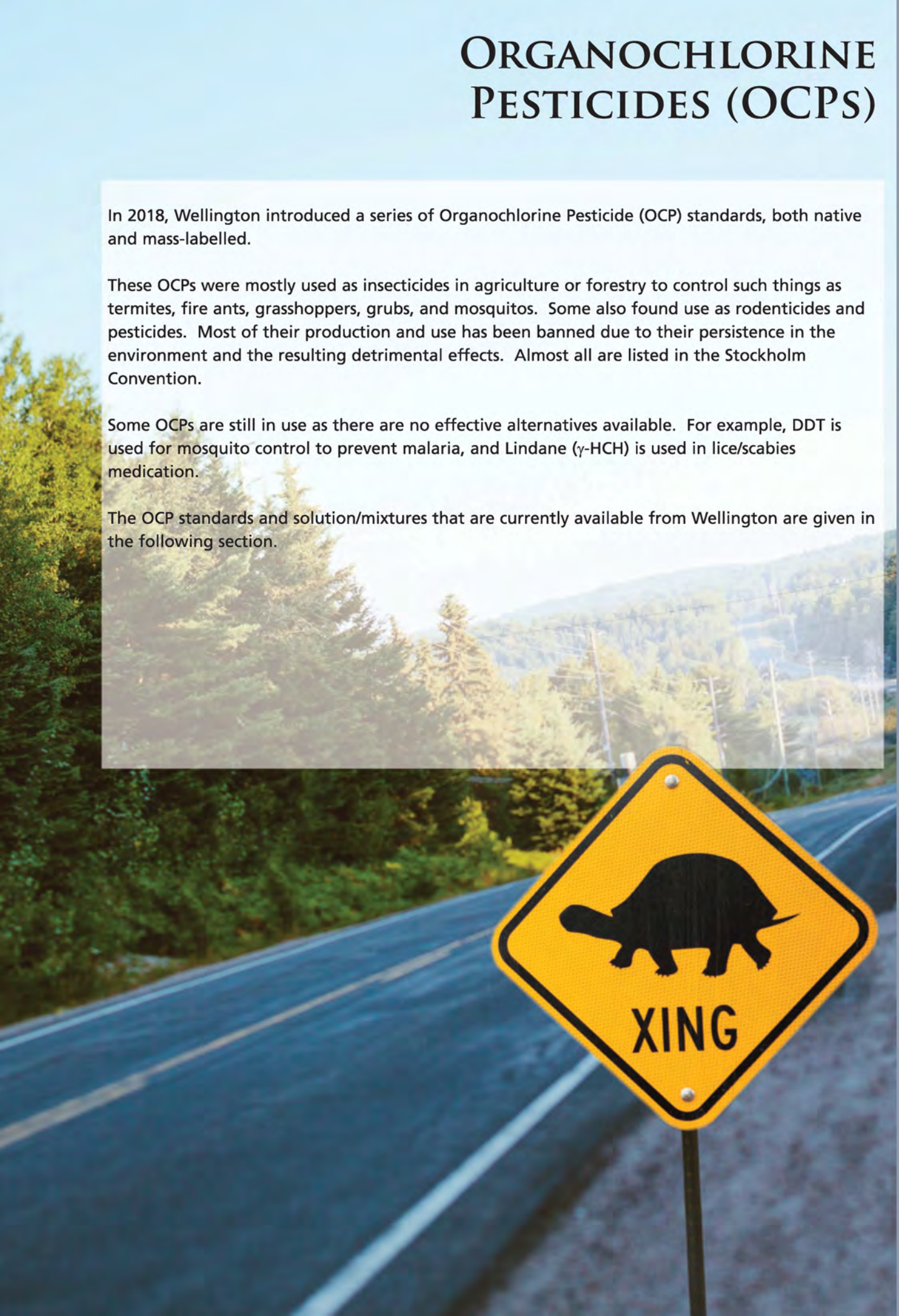
Organochlorine Pesticides (OCPs)

In 2018, Wellington introduced a series of Organochlorine Pesticide (OCP) standards, both native and mass-labelled.

These OCPs were mostly used as insecticides in agriculture or forestry to control such things as termites, fire ants, grasshoppers, grubs, and mosquitos. Some also found use as rodenticides and pesticides. Most of their production and use has been banned due to their persistence in the environment and the resulting detrimental effects. Almost all are listed in the Stockholm Convention.

Some OCPs are still in use as there are no effective alternatives available. For example, DDT is used for mosquito control to prevent malaria, and Lindane (γ-HCH) is used in lice/scabies medication.

The OCP standards and solution/mixtures that are currently available from Wellington are given in the following section.





NATIVE ORGANOCHLORINE PESTICIDES (OCPs)

Catalogue Number	Product (nonane solution)	Qty/Conc	
PeCB	Pentachlorobenzene	1.2 mL	100 µg/mL
HxCB	Hexachlorobenzene	1.2 mL	100 µg/mL
aHCH	α-1,2,3,4,5,6-Hexachlorocyclohexane	1.2 mL	100 µg/mL
bHCH	β-1,2,3,4,5,6-Hexachlorocyclohexane	1.2 mL	100 µg/mL
gHCH	γ-1,2,3,4,5,6-Hexachlorocyclohexane	1.2 mL	100 µg/mL
dHCH	δ-1,2,3,4,5,6-Hexachlorocyclohexane	1.2 mL	100 µg/mL
24P-DMDT	*o,p'*-Methoxychlor	1.2 mL	100 µg/mL
44P-DMDT	*p,p'*-Methoxychlor	1.2 mL	100 µg/mL
24P-DDD	1,1-Dichloro-2-(2-chlorophenyl)-2-(4-chlorophenyl)ethane	1.2 mL	100 µg/mL
44P-DDD	1,1-Dichloro-2,2-bis(4-chlorophenyl)ethane	1.2 mL	100 µg/mL
24P-DDE	1,1-Dichloro-2-(2-chlorophenyl)-2-(4-chlorophenyl)ethene	1.2 mL	100 µg/mL
44P-DDE	1,1-Dichloro-2,2-bis(4-chlorophenyl)ethene	1.2 mL	100 µg/mL
24P-DDT	1,1,1-Trichloro-2-(2-chlorophenyl)-2-(4-chlorophenyl)ethane	1.2 mL	100 µg/mL
44P-DDT	1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane	1.2 mL	100 µg/mL
HxChlor	Chlordene	1.2 mL	100 µg/mL
1H-HxChlor	1-Hydroxychlordene	1.2 mL	100 µg/mL
HpChlor	Heptachlor	1.2 mL	100 µg/mL
HpChlor-nEp	Heptachlor-*endo*-epoxide (isomer A)	1.2 mL	100 µg/mL
HpChlor-xEp	Heptachlor-*exo*-epoxide (isomer B)	1.2 mL	100 µg/mL
cChlorD	*cis*-Chlordane (α)	1.2 mL	100 µg/mL
tChlorD	*trans*-Chlordane (γ)	1.2 mL	100 µg/mL
OxyChlorD	Oxychlordane	1.2 mL	100 µg/mL
cNChlor	*cis*-Nonachlor	1.2 mL	100 µg/mL
tNChlor	*trans*-Nonachlor	1.2 mL	100 µg/mL
ALD	Aldrin	1.2 mL	100 µg/mL
ISOD	Isodrin	1.2 mL	100 µg/mL
DELD	Dieldrin	1.2 mL	100 µg/mL
END	Endrin	1.2 mL	100 µg/mL
END-Ald	Endrin Aldehyde	1.2 mL	100 µg/mL
END-Ket	Endrin Ketone	1.2 mL	100 µg/mL
KEP	Kepone	1.2 mL	100 µg/mL
MRX	Mirex	1.2 mL	100 µg/mL
aENDOS	Endosulfan I (α)	1.2 mL	100 µg/mL
bENDOS	Endosulfan II (β)	1.2 mL	100 µg/mL
ENDOS-S	Endosulfan Sulfate	1.2 mL	100 µg/mL

NATIVE ORGANOCHLORINE PESTICIDE SOLUTION/MIXTURE

Catalogue Number	Product (nonane solution)		Qty/Conc
OCP-MXA	Native OCP Solution/Mixture		1.2 mL
Pentachlorobenzene		PeCB	2.00 µg/mL
Hexachlorobenzene		HxCB	2.00 µg/mL
o,p'-Methoxychlor		24P-DMDT	2.00 µg/mL
p,p'-Methoxychlor		44P-DMDT	2.00 µg/mL
Chlordene		HxChlor	2.00 µg/mL
1-Hydroxychlordene		1H-HxChlor	2.00 µg/mL
Heptachlor		HpChlor	2.00 µg/mL
cis-Chlordane (α)		cChlorD	2.00 µg/mL
trans-Chlordane (γ)		tChlorD	2.00 µg/mL
Aldrin		ALD	2.00 µg/mL
Isodrin		ISOD	2.00 µg/mL
Dieldrin		DELD	2.00 µg/mL
Endrin		END	2.00 µg/mL
Endrin Aldehyde		END-Ald	2.00 µg/mL
Endrin Ketone		END-Ket	2.00 µg/mL
Kepone		KEP	2.00 µg/mL
Mirex		MRX	2.00 µg/mL

NATIVE DDT & RELATED COMPOUNDS SOLUTION/MIXTURE

Catalogue Number	Product (nonane solution)		Qty/Conc
DET-MXA	Native DDT & Related Compound Solution/Mixture		1.2 mL
1,1-Dichloro-2-(2-chlorophenyl)-2-(4-chlorophenyl)ethane		24P-DDD	2.00 µg/mL
1,1-Dichloro-2,2-bis(4-chlorophenyl)ethane		44P-DDD	2.00 µg/mL
1,1-Dichloro-2-(2-chlorophenyl)-2-(4-chlorophenyl)ethene		24P-DDE	2.00 µg/mL
1,1-Dichloro-2,2-bis(4-chlorophenyl)ethene		44P-DDE	2.00 µg/mL
1,1,1-Trichloro-2-(2-chlorophenyl)-2-(4-chlorophenyl)ethane		24P-DDT	2.00 µg/mL
1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane		44P-DDT	2.00 µg/mL

NATIVE HCH SOLUTION/MIXTURE

Catalogue Number	Product (nonane solution)		Qty/Conc
HCH-MXA	Native HCH Solution/Mixture		1.2 mL
α-1,2,3,4,5,6-Hexachlorocyclohexane		aHCH	2.00 µg/mL
β-1,2,3,4,5,6-Hexachlorocyclohexane		bHCH	2.00 µg/mL
γ-1,2,3,4,5,6-Hexachlorocyclohexane		gHCH	2.00 µg/mL
δ-1,2,3,4,5,6-Hexachlorocyclohexane		dHCH	2.00 µg/mL



MASS-LABELLED ORGANOCHLORINE PESTICIDES

Catalogue Number	Product (nonane solution)	Qty/Conc	
MPeCB	Pentachloro($^{13}C_6$)benzene	1.2 mL	100 µg/mL
MHxCB	Hexachloro($^{13}C_6$)benzene	1.2 mL	100 µg/mL
MaHCH	α-1,2,3,4,5,6-Hexachloro($^{13}C_6$)cyclohexane	1.2 mL	100 µg/mL
MbHCH	β-1,2,3,4,5,6-Hexachloro($^{13}C_6$)cyclohexane	1.2 mL	100 µg/mL
MgHCH	γ-1,2,3,4,5,6-Hexachloro($^{13}C_6$)cyclohexane	1.2 mL	100 µg/mL
MdHCH	δ-1,2,3,4,5,6-Hexachloro($^{13}C_6$)cyclohexane	1.2 mL	100 µg/mL
M44P-DMDT	*p,p'*-($^{13}C_{12}$)Methoxychlor	1.2 mL	100 µg/mL
M24P-DDD	1,1-Dichloro-2-[2-chloro($^{13}C_6$)phenyl]-2-[4-chloro($^{13}C_6$)phenyl]ethane	1.2 mL	100 µg/mL
M44P-DDD	1,1-Dichloro-2,2-bis[4-chloro($^{13}C_6$)phenyl]ethane	1.2 mL	100 µg/mL
M24P-DDE	1,1-Dichloro-2-[2-chloro($^{13}C_6$)phenyl]-2-[4-chloro($^{13}C_6$)phenyl]ethene	1.2 mL	100 µg/mL
M44P-DDE	1,1-Dichloro-2,2-bis[4-chloro($^{13}C_6$)phenyl]ethene	1.2 mL	100 µg/mL
M24P-DDT	1,1,1-Trichloro-2-[2-chloro($^{13}C_6$)phenyl]-2-[4-chloro($^{13}C_6$)phenyl]ethane	1.2 mL	100 µg/mL
M44P-DDT	1,1,1-Trichloro-2,2-bis[4-chloro($^{13}C_6$)phenyl]ethane	1.2 mL	100 µg/mL
MHxChlor	($^{13}C_{10}$)Chlordene	1.2 mL	100 µg/mL
MHpChlor	($^{13}C_{10}$)Heptachlor	1.2 mL	100 µg/mL
McChlorD	*cis*-($^{13}C_{10}$)Chlordane (α)	1.2 mL	100 µg/mL
MtChlorD	*trans*-($^{13}C_{10}$)Chlordane (γ)	1.2 mL	100 µg/mL
McNChlor	*cis*-($^{13}C_{10}$)Nonachlor	1.2 mL	100 µg/mL
MALD	($^{13}C_{12}$)Aldrin	1.2 mL	100 µg/mL
MISOD	($^{13}C_{12}$)Isodrin	1.2 mL	100 µg/mL
MDELD	($^{13}C_{12}$)Dieldrin	1.2 mL	100 µg/mL
MEND	($^{13}C_{12}$)Endrin	1.2 mL	100 µg/mL
MKEP	($^{13}C_{10}$)Kepone	1.2 mL	100 µg/mL
MMRX	($^{13}C_{10}$)Mirex	1.2 mL	100 µg/mL

MASS-LABELLED ORGANOCHLORINE PESTICIDE SOLUTION/MIXTURE

Catalogue Number	Product (nonane solution)		Qty/Conc
MOCP-MXA	Mass-Labelled OCP Solution/Mixture		1.2 mL
Pentachloro($^{13}C_6$)benzene		MPeCB	2.00 µg/mL
Hexachloro($^{13}C_6$)benzene		MHxCB	2.00 µg/mL
p,p'-($^{13}C_{12}$)Methoxychlor		M44P-DMDT	2.00 µg/mL
($^{13}C_{10}$)Chlordene		MHxChlor	2.00 µg/mL
($^{13}C_{10}$)Heptachlor		MHpChlor	2.00 µg/mL
cis-($^{13}C_{10}$)Chlordane (α)		McChlorD	2.00 µg/mL
trans-($^{13}C_{10}$)Chlordane (γ)		MtChlorD	2.00 µg/mL
($^{13}C_{12}$)Aldrin		MALD	2.00 µg/mL
($^{13}C_{12}$)Isodrin		MISOD	2.00 µg/mL
($^{13}C_{12}$)Dieldrin		MDELD	2.00 µg/mL
($^{13}C_{12}$)Endrin		MEND	2.00 µg/mL
($^{13}C_{10}$)Kepone		MKEP	2.00 µg/mL
($^{13}C_{10}$)Mirex		MMRX	2.00 µg/mL

MASS-LABELLED DDT & RELATED COMPOUNDS SOLUTION/MIXTURE

Catalogue Number	Product (nonane solution)		Qty/Conc
MDET-MXA	Mass-Labelled DDT & Related Compound Solution/Mixture		1.2 mL
1,1-Dichloro-2-[2-chloro($^{13}C_6$)phenyl]-2-[4-chloro($^{13}C_6$)phenyl]ethane		M24P-DDD	2.00 µg/mL
1,1-Dichloro-2,2-bis[4-chloro($^{13}C_6$)phenyl]ethane		M44P-DDD	2.00 µg/mL
1,1-Dichloro-2,2-bis[4-chloro($^{13}C_6$)phenyl]ethene		M44P-DDE	2.00 µg/mL
1,1,1-Trichloro-2-[2-chloro($^{13}C_6$)phenyl]-2-[4-chloro($^{13}C_6$)phenyl]ethane		M24P-DDT	2.00 µg/mL
1,1,1-Trichloro-2,2-bis[4-chloro($^{13}C_6$)phenyl]ethane		M44P-DDT	2.00 µg/mL

MASS-LABELLED HCH SOLUTION/MIXTURE

Catalogue Number	Product (nonane solution)		Qty/Conc
MHCH-MXA	Mass-Labelled HCH Solution/Mixture		1.2 mL
α-1,2,3,4,5,6-Hexachloro($^{13}C_6$)cyclohexane		MaHCH	2.00 µg/mL
β-1,2,3,4,5,6-Hexachloro($^{13}C_6$)cyclohexane		MbHCH	2.00 µg/mL
γ-1,2,3,4,5,6-Hexachloro($^{13}C_6$)cyclohexane		MgHCH	2.00 µg/mL
δ-1,2,3,4,5,6-Hexachloro($^{13}C_6$)cyclohexane		MdHCH	2.00 µg/mL



University of Guelph
Guelph, Ontario

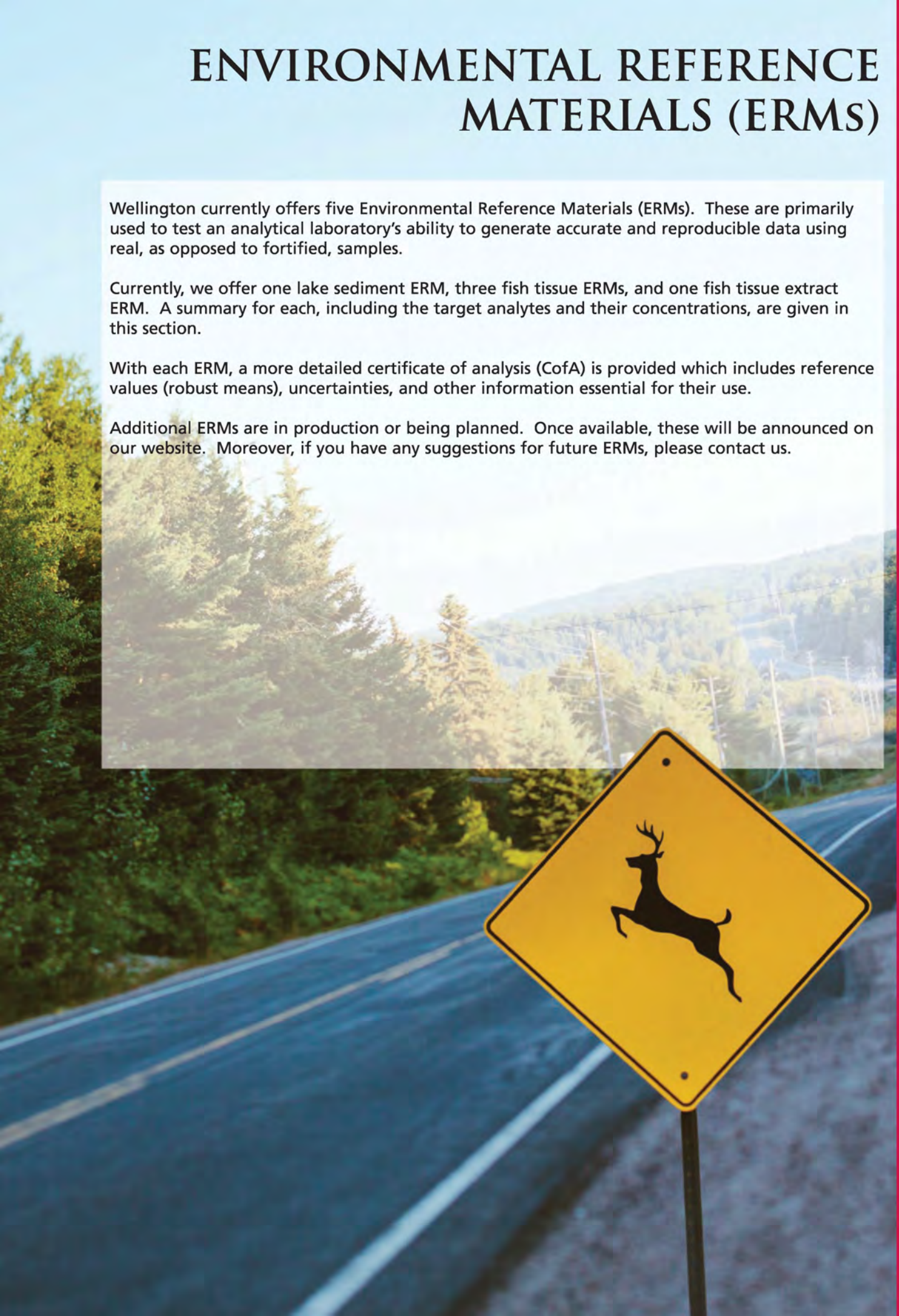
ENVIRONMENTAL REFERENCE MATERIALS (ERMs)

Wellington currently offers five Environmental Reference Materials (ERMs). These are primarily used to test an analytical laboratory's ability to generate accurate and reproducible data using real, as opposed to fortified, samples.

Currently, we offer one lake sediment ERM, three fish tissue ERMs, and one fish tissue extract ERM. A summary for each, including the target analytes and their concentrations, are given in this section.

With each ERM, a more detailed certificate of analysis (CofA) is provided which includes reference values (robust means), uncertainties, and other information essential for their use.

Additional ERMs are in production or being planned. Once available, these will be announced on our website. Moreover, if you have any suggestions for future ERMs, please contact us.





WMF-02: REFERENCE FISH TISSUE for ORGANIC CONTAMINANT ANALYSIS

Catalogue Number	Product	Qty/Conc
WMF-02	Reference "*Freeze-Dried*" Fish Tissue (Naturally Fortified Salmon)	1 x 10 g

Polychlorinated Dibenzo-*p*-dioxins (PCDDs)	Certified Reference value (pg/g)	Reference Value (pg/g)
2,3,7,8-Tetrachlorodibenzo-*p*-dioxin	0.865±0.047	0.826±0.067
1,2,3,7,8-Pentachlorodibenzo-*p*-dioxin	2.27±0.08	2.28±0.06
1,2,3,4,7,8-Hexachlorodibenzo-*p*-dioxin	0.910±0.039	0.916±0.041
1,2,3,6,7,8-Hexachlorodibenzo-*p*-dioxin	1.85±0.07	1.88±0.09
1,2,3,7,8,9-Hexachlorodibenzo-*p*-dioxin	1.10±0.08	1.10±0.07
1,2,3,4,6,7,8-Heptachlorodibenzo-*p*-dioxin	2.27±0.10	2.27±0.08
Octachlorodibenzo-*p*-dioxin	2.97±0.11	3.34±0.23
Polychlorinated Dibenzofurans (PCDFs)		
2,3,7,8-Tetrachlorodibenzofuran	13.0±0.4	13.2±0.5
1,2,3,7,8-Pentachlorodibenzofuran	2.94±0.16	2.97±0.12
2,3,4,7,8-Pentachlorodibenzofuran	4.08±0.19	4.14±0.20
1,2,3,4,7,8-Hexachlorodibenzofuran	1.55±0.07	1.59±0.06
1,2,3,6,7,8-Hexachlorodibenzofuran	1.27±0.09	1.32±0.10
1,2,3,7,8,9-Hexachlorodibenzofuran	0.810±0.074	0.850±0.070
2,3,4,6,7,8-Hexachlorodibenzofuran	1.23±0.06	1.23±0.06
1,2,3,4,6,7,8-Heptachlorodibenzofuran	1.10±0.07	1.12±0.07
1,2,3,4,7,8,9-Heptachlorodibenzofuran	0.759±0.055	0.797±0.050
Octachlorodibenzofuran	1.37±0.09	1.50±0.13
Polychlorinated Biphenyls (PCBs-IUPAC)		
2,2',6-Trichlorobiphenyl (19)	-	123±14
2,4,4'-Trichlorobiphenyl (28)	-	3730±380
2',3,4-Trichlorobiphenyl (33)	-	1550±190
3,4,4'-Trichlorobiphenyl (37)	-	913±68
2,2',3,5'-Tetrachlorobiphenyl (44)	-	1420±250
2,2',5,5'-Tetrachlorobiphenyl (52)	2340±190	2470±200
2,3',4',5-Tetrachlorobiphenyl (70)	-	4370±430
3,3',4,4'-Tetrachlorobiphenyl (77)	132±5	135±5
3,4,4',5-Tetrachlorobiphenyl (81)	9.44±0.57	9.47±0.64
2,2',4,5,5'-Pentachlorobiphenyl (101)	-	6650±590
2,3,3',4,4'-Pentachlorobiphenyl (105)	8560±250	8520±210
2,3,4,4',5-Pentachlorobiphenyl (114)	548±16	551±16
2,3',4,4',5-Pentachlorobiphenyl (118)	22500±900	22600±800
2',3,4,4',5-Pentachlorobiphenyl (123)	431±25	432±37
3,3',4,4',5-Pentachlorobiphenyl (126)	146±6	147±5
2,2',3,3',4,4'-Hexachlorobiphenyl (128)	-	7830±710
2,2',3,4,4',5'-Hexachlorobiphenyl (138)	-	47500±2900
2,2',4,4',5,5'-Hexachlorobiphenyl (153)	-	69500±3300
2,3,3',4,4',5-Hexachlorobiphenyl (156)	3460±140	3450±120
2,3,3',4,4',5'-Hexachlorobiphenyl (157)	953±65	953±50
2,3',4,4',5,5'-Hexachlorobiphenyl (167)	1810±70	1830±60
3,3',4,4',5,5'-Hexachlorobiphenyl (169)	47.2±2.8	46.6±2.5
2,2',3,3',4,4',5-Heptachlorobiphenyl (170)	-	7580±610
2,2',3,4,4',5,5'-Heptachlorobiphenyl (180)	-	23900±1200
2,2',3,4',5,5',6-Heptachlorobiphenyl (187)	-	13600±1200
2,3,3',4,4',5,5'-Heptachlorobiphenyl (189)	497±12	502±14
2,2',3,3',4,4',5,5'-Octachlorobiphenyl (194)	-	3220±280
2,2',3,3',4,4',5,6-Octachlorobiphenyl (195)	-	1090±170
2,2',3,3',4,5,5',6'-Octachlorobiphenyl (199)	-	2690±320
2,2',3,3',5,5',6,6'-Octachlorobiphenyl (202)	-	1340±150
2,3,3',4,4',5,5',6-Octachlorobiphenyl (205)	-	209±19
2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (206)	-	1220±120
2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl (208)	-	401±23
Decachlorobiphenyl (209)	-	463±27

Polybrominated Diphenyl Ethers (PBDEs-IUPAC)	Reference value (pg/g)
2,4,4'-Tribromodiphenyl ether (28)	330±33
2,2',4,4'-Tetrabromodiphenyl ether (47)	13200±800
2,2',4,5'-Tetrabromodiphenyl ether (49)	625±69
2,3',4,4'-Tetrabromodiphenyl ether (66)	607±93
2,2',4,4',5-Pentabromodiphenyl ether (99)	6420±340
2,2',4,4',6-Pentabromodiphenyl ether (100)	2980±130
2,2',4,4',5,5'-Hexabromodiphenyl ether (153)	834±54
2,2',4,4',5,6'-Hexabromodiphenyl ether (154)	1700±110
2,2',3,4,4',5',6-Heptabromodiphenyl ether (183)	46.8±5.3
2,2',3,3',4,4',5,5',6-Nonabromodiphenyl ether (206)	301±24
2,2',3,3',4,4',5,6,6'-Nonabromodiphenyl ether (207)	255±34
Decabromodiphenyl ether (209)	2020±140
Organochlorine Pesticides (OCPs)	**Reference value (ng/g)**
α-1,2,3,4,5,6-Hexachlorocyclohexane (aHCH)	5.96±0.54
β-1,2,3,4,5,6-Hexachlorocyclohexane (bHCH)	5.11±0.35
γ-1,2,3,4,5,6-Hexachlorocyclohexane (gHCH)	3.94±0.59
cis-Chlordane (α) (cChlorD)	15.5±1.3
trans-Chlordane (γ) (tChlorD)	5.58±0.54
1,1-Dichloro-2-(2-chlorophenyl)-2-(4-chlorophenyl)ethene (24P-DDE)	1.13±0.06
1,1,1-Trichloro-2-(2-chlorophenyl)-2-(4-chlorophenyl)ethane (24P-DDT)	7.00±0.44
1,1-Dichloro-2,2-bis(4-chlorophenyl)ethane (44P-DDD)	6.56±0.41
1,1-Dichloro-2,2-bis(4-chlorophenyl)ethene (44P-DDE)	133±6
1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane (44P-DDT)	13.0±0.9
Dieldrin (DELD)	19.2±3.2
Heptachlor-*exo*-epoxide (HpChlor-xEp)	6.48±0.47
Hexachlorobenzene (HxCB)	6.94±0.48
Mirex (MRX)	5.67±0.28
cis-Nonachlor (cNchlor)	27.9±1.1
trans-Nonachlor (tNchlor)	43.7±2.3
Oxychlordane (OxyChlorD)	13.4±0.9



WMF-03: REFERENCE FISH TISSUE for ORGANIC CONTAMINANT ANALYSIS

Catalogue Number	Product	Qty/Conc
WMF-03	Reference "*Freeze-Dried*" Fish Tissue (Low Level Salmon)	1 x 10 g

Polychlorinated Dibenzo-*p*-dioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs)	**Certified Reference value (pg/g)**	**Reference Value (pg/g)**
Octachlorodibenzo-*p*-dioxin	-	0.914±0.29
2,3,7,8-Tetrachlorodibenzofuran	0.822±0.057	0.828±0.050
Polychlorinated Biphenyls (PCBs-IUPAC)		
2,4,4'-Trichlorobiphenyl (28)	-	981±150
2,2',3,5'-Tetrachlorobiphenyl (44)	-	555±81
2,2',5,5'-Tetrachlorobiphenyl (52)	1160±100	1120±90
3,3',4,4'-Tetrachlorobiphenyl (77)	13.1±0.9	14.0±0.9
3,4,4',5-Tetrachlorobiphenyl (81)	-	0.863±0.20
2,2',4,5,5'-Pentachlorobiphenyl (101)	-	1090±120
2,3,3',4,4'-Pentachlorobiphenyl (105)	296±17	303±15
2,3,4,4',5-Pentachlorobiphenyl (114)	21.9±1.4	23.2±1.2
2,3',4,4',5-Pentachlorobiphenyl (118)	855±44	855±40
2',3,4,4',5-Pentachlorobiphenyl (123)	16.2±2.4	16.4±2.4
3,3',4,4',5-Pentachlorobiphenyl (126)	3.80±0.27	3.91±0.28
2,2',3,4,4',5'-Hexachlorobiphenyl (138)	-	1190±110
2,2',4,4',5,5'-Hexachlorobiphenyl (153)	-	1690±130
2,3,3',4,4',5-Hexachlorobiphenyl (156)	90.9±4.8	92.2±3.8
2,3,3',4,4',5'-Hexachlorobiphenyl (157)	25.3±1.6	25.7±1.2
2,3',4,4',5,5'-Hexachlorobiphenyl (167)	42.1±2.1	43.4±1.9
3,3',4,4',5,5'-Hexachlorobiphenyl (169)	-	1.11±0.12
2,2',3,3',4,4',5-Heptachlorobiphenyl (170)	-	142±18
2,2',3,4,4',5,5'-Heptachlorobiphenyl (180)	-	374±28
2,2',3,4',5,5',6-Heptachlorobiphenyl (187)	-	376±33
2,3,3',4,4',5,5'-Heptachlorobiphenyl (189)	6.50±0.30	6.64±0.34
2,2',3,3',4,4',5,5'-Octachlorobiphenyl (194)	-	30.1±3.5

Polybrominated Diphenyl Ethers (PBDEs-IUPAC)	Reference value (pg/g)
2,2',4,4'-Tetrabromodiphenyl ether (47)	2500±130
2,3',4,4'-Tetrabromodiphenyl ether (66)	35.9±3.4
2,2',3,4,4'-Pentabromodiphenyl ether (85)	26.0±2.6
2,2',4,4',5-Pentabromodiphenyl ether (99)	417±23
2,2',4,4',6-Pentabromodiphenyl ether (100)	153±16
2,2',4,4',5,5'-Hexabromodiphenyl ether (153)	32.7±3.5
2,2',4,4',5,6'-Hexabromodiphenyl ether (154)	39.5±4.1
2,2',3,4,4',5',6-Heptabromodiphenyl ether (183)	56.7±5.4
Decabromodiphenyl ether (209)	299±58
Organochlorine Pesticides (OCPs)	**Reference value (ng/g)**
α-1,2,3,4,5,6-Hexachlorocyclohexane (aHCH)	4.79±0.39
β-1,2,3,4,5,6-Hexachlorocyclohexane (bHCH)	3.91±0.32
γ-1,2,3,4,5,6-Hexachlorocyclohexane (gHCH)	1.32±0.32
cis-Chlordane (α) (cChlorD)	2.62±0.09
trans-Chlordane (γ) (tChlorD)	0.693±0.083
1,1-Dichloro-2,2-bis(4-chlorophenyl)ethane (44P-DDD)	2.12±0.22
1,1-Dichloro-2,2-bis(4-chlorophenyl)ethene (44P-DDE)	9.19±0.60
Hexachlorobenzene (HxCB)	7.24±0.44
trans-Nonachlor (tNChlor)	3.33±0.15





WMF-EX: REFERENCE FISH TISSUE for ORGANIC CONTAMINANT ANALYSIS

Catalogue Number	Product	Qty/Conc
WMF-EX	Reference Fish Tissue Extract (Isooctane/20% Salmon Oil)	1 x 3 g

Polychlorinated Dibenzo-*p*-dioxins (PCDDs)	Certified Reference value (pg/g)	Reference Value (pg/g)
2,3,7,8-Tetrachlorodibenzo-*p*-dioxin	1.91±0.16	1.84±0.16
1,2,3,7,8-Pentachlorodibenzo-*p*-dioxin	5.91±0.42	5.79±0.34
1,2,3,4,7,8-Hexachlorodibenzo-*p*-dioxin	-	0.613±0.11
1,2,3,6,7,8-Hexachlorodibenzo-*p*-dioxin	3.56±0.16	3.55±0.15
1,2,3,7,8,9-Hexachlorodibenzo-*p*-dioxin	-	0.806±0.089
1,2,3,4,6,7,8-Heptachlorodibenzo-*p*-dioxin	-	1.25±0.14
Polychlorinated Dibenzofurans (PCDFs)		
2,3,7,8-Tetrachlorodibenzofuran	48.2±1.9	48.4±1.9
1,2,3,7,8-Pentachlorodibenzofuran	7.38±0.35	7.57±0.36
2,3,4,7,8-Pentachlorodibenzofuran	11.3±0.9	11.5±0.8
1,2,3,4,7,8-Hexachlorodibenzofuran	2.45±0.22	2.44±0.18
1,2,3,6,7,8-Hexachlorodibenzofuran	1.53±0.25	1.65±0.22
2,3,4,6,7,8-Hexachlorodibenzofuran	1.45±0.18	1.44±0.17
Polychlorinated Biphenyls (PCBs-IUPAC)		
2,4,4'-Trichlorobiphenyl (28)	-	5130±420
2',3,4-Trichlorobiphenyl (33)	-	2190±160
2,2',3,5'-Tetrachlorobiphenyl (44)	-	3640±450
2,2',5,5'-Tetrachlorobiphenyl (52)	-	6160±340
3,3',4,4'-Tetrachlorobiphenyl (77)	274±17	277±11
3,4,4',5-Tetrachlorobiphenyl (81)	21.1±2.4	21.7±2.8
2,2',4,5,5'-Pentachlorobiphenyl (101)	-	20300±1200
2,3,3',4,4'-Pentachlorobiphenyl (105)	31500±1100	31200±1000
2,3,4,4',5-Pentachlorobiphenyl (114)	2020±80	2050±50
2,3',4,4',5-Pentachlorobiphenyl (118)	81500±4400	81100±3400
2',3,4,4',5-Pentachlorobiphenyl (123)	1490±120	1510±120
3,3',4,4',5-Pentachlorobiphenyl (126)	542±27	535±32
2,2',3,3',4,4'-Hexachlorobiphenyl (128)	-	29800±2300
2,2',3,4,4',5'-Hexachlorobiphenyl (138)	-	177000±8000
2,2',4,4',5,5'-Hexachlorobiphenyl (153)	-	252000±13000
2,3,3',4,4',5-Hexachlorobiphenyl (156)	13200±800	13000±600
2,3,3',4,4',5'-Hexachlorobiphenyl (157)	3720±300	3650±200
2,3',4,4',5,5'-Hexachlorobiphenyl (167)	6830±310	6830±260
3,3',4,4',5,5'-Hexachlorobiphenyl (169)	192±12	191±11
2,2',3,3',4,4',5-Heptachlorobiphenyl (170)	-	28700±1800
2,2',3,4,4',5,5'-Heptachlorobiphenyl (180)	-	91300±5400
2,2',3,4',5,5',6-Heptachlorobiphenyl (187)	-	51900±3200
2,3,3',4,4',5,5'-Heptachlorobiphenyl (189)	1880±100	1870±80
2,2',3,3',4,4',5,5'-Octachlorobiphenyl (194)	-	12800±900
2,2',3,3',4,4',5,6-Octachlorobiphenyl (195)	-	4430±400
2,2',3,3',4,5,5',6'-Octachlorobiphenyl (199)	-	10900±500
2,2',3,3',5,5',6,6'-Octachlorobiphenyl (202)	-	4910±360
2,3,3',4,4',5,5',6-Octachlorobiphenyl (205)	-	795±52
2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl (206)	-	4880±330
2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl (208)	-	1480±90
Decachlorobiphenyl (209)	-	1830±70

Polybrominated Diphenyl Ethers (PBDEs-IUPAC)	Reference value (ng/g)
2,4,4'-Tribromodiphenyl ether (28)	0.898±0.054
2,2',4,4'-Tetrabromodiphenyl ether (47)	40.8±2.8
2,2',4,5'-Tetrabromodiphenyl ether (49)	1.53±0.23
2,3',4,4'-Tetrabromodiphenyl ether (66)	1.98±0.25
2,2',4,4',5-Pentabromodiphenyl ether (99)	23.8±1.3
2,2',4,4',6-Pentabromodiphenyl ether (100)	10.6±0.6
2,2',4,4',5,5'-Hexabromodiphenyl ether (153)	3.45±0.19
2,2',4,4',5,6'-Hexabromodiphenyl ether (154)	6.90±0.22
2,2',3,4,4',5',6-Heptabromodiphenyl ether (183)	0.165±0.004
Decabromodiphenyl ether (209)	2.74±0.17
Organochlorine Pesticides (OCPs)	
α-1,2,3,4,5,6-Hexachlorocyclohexane (aHCH)	9.68±0.87
cis-Chlordane (α) (cChlorD)	48.4±4.2
trans-Chlordane (γ) (tChlorD)	8.72±0.79
1,1-Dichloro-2-(2-chlorophenyl)-2-(4-chlorophenyl)ethene (24P-DDE)	1.51±0.07
1,1,1-Trichloro-2-(2-chlorophenyl)-2-(4-chlorophenyl)ethane (24P-DDT)	15.4±1.6
1,1-Dichloro-2,2-bis(4-chlorophenyl)ethane (44P-DDD)	5.35±0.76
1,1-Dichloro-2,2-bis(4-chlorophenyl)ethene (44P-DDE)	451±35
1,1,1-Trichloro-2,2-bis(4-chlorophenyl)ethane (44P-DDT)	40.0±1.8
Dieldrin (DELD)	54.3±5.4
Heptachlor-*exo*-epoxide (HpChlor-xEp)	13.1±0.5
Hexachlorobenzene (HxCB)	10.3±0.5
Mirex (MRX)	11.9±0.7
cis-Nonachlor (cNChlor)	116±6
trans-Nonachlor (tNChlor)	183±12
Oxychlordane (OxyChlorD)	47.7±2.4



WMS-01: REFERENCE LAKE SEDIMENT for ORGANIC CONTAMINANT ANALYSIS

Catalogue Number	Product	Qty/Conc
WMS-01	Reference Lake Sediment	1 x 10 g

Polychlorinated Dibenzo-*p*-dioxins (PCDDs)	Certified Reference value (pg/g)	Reference Value (pg/g)
2,3,7,8-Tetrachlorodibenzo-*p*-dioxin	16.7±0.4	17.7±5.6
Total Tetrachlorodibenzo-*p*-dioxins	**52.2±1.1**	**60.1±25**
1,2,3,7,8-Pentachlorodibenzo-*p*-dioxin	7.84±0.26	7.96±2.8
Total Pentachlorodibenzo-*p*-dioxins	**49.8±1.3**	**69.5±23**
1,2,3,4,7,8-Hexachlorodibenzo-*p*-dioxin	7.99±0.32	8.66±2.7
1,2,3,6,7,8-Hexachlorodibenzo-*p*-dioxin	19.8±0.7	20.8±4.8
1,2,3,7,8,9-Hexachlorodibenzo-*p*-dioxin	19.0±0.5	17.3±8.0
Total Hexachlorodibenzo-*p*-dioxins	**217±8**	**238±86**
1,2,3,4,6,7,8-Heptachlorodibenzo-*p*-dioxin	296±5	293±63
Total Heptachlorodibenzo-*p*-dioxins	**630±9**	**608±152**
Octachlorodibenzo-*p*-dioxin	1990±40	1899±456
Polychlorinated Dibenzofurans (PCDFs)		
2,3,7,8-Tetrachlorodibenzofuran	65.2±1.1	52.5±16
Total Tetrachlorodibenzofurans	**372±8**	**374±162**
1,2,3,7,8-Pentachlorodibenzofuran	13.5±0.5	12.6±5
2,3,4,7,8-Pentachlorodibenzofuran	19.3±0.4	18.5±6
Total Pentachlorodibenzofurans	**224±13**	**225±113**
1,2,3,4,7,8-Hexachlorodibenzofuran	74.0±1.3	67.3±24
1,2,3,6,7,8-Hexachlorodibenzofuran	22.1±0.7	20.3±8.7
1,2,3,7,8,9-Hexachlorodibenzofuran	2.68*±4.0	2.68*±4.0
2,3,4,6,7,8-Hexachlorodibenzofuran	21.4±0.5	16±8
Total Hexachlorodibenzofurans	**251±8**	**262±95**
1,2,3,4,6,7,8-Heptachlorodibenzofuran	283±6	299±73
1,2,3,4,7,8,9-Heptachlorodibenzofuran	15.1±0.5	15.1±4.6
Total Heptachlorodibenzofurans	**393±9**	**411±100**
Octachlorodibenzofuran	491±14	509±157
Polychlorinated Biphenyls (PCBs-IUPAC)		
3,3',4,4'-Tetrachlorobiphenyl (77)	-	1717±520
3,4,4',5-Tetrachlorobiphenyl (81)	-	75*±79
2,3,3',4,4'-Pentachlorobiphenyl (105)	-	3998±951
2,3,4,4',5-Pentachlorobiphenyl (114)	-	207±128
2,3',4,4',5-Pentachlorobiphenyl (118)	-	8115±1663
2',3,4,4',5-Pentachlorobiphenyl (123)	-	209±191
3,3',4,4',5-Pentachlorobiphenyl (126)	-	84.9±35
2,3,3',4,4',5-Hexachlorobiphenyl (156)	-	715±248
2,3,3',4,4',5'-Hexachlorobiphenyl (157)	-	186±81
2,3',4,4',5,5'-Hexachlorobiphenyl (167)	-	330±85
3,3',4,4',5,5'-Hexachlorobiphenyl (169)	-	7.97±5.3
2,3,3',4,4',5,5'-Heptachlorobiphenyl (189)	-	85.2±17.8

* Provisional value for information purposes only. Any negative deviation is inadmissable.
The concentrations of these analytes may be certified at a later date as more data becomes available.

CARP-2: REFERENCE FISH TISSUE for ORGANIC CONTAMINANT ANALYSIS

Catalogue Number	Product	Qty/Conc
CARP-2	Reference Fish Tissue	6 x 9 g

Polychlorinated Biphenyls (PCBs) Congener (IUPAC)	**Certified Concentration µg/kg (wet weight basis)**
18	27.3±4.0
28	34.0±7.2
44	86.6±25.9
52	138±43
118	148±33
128	20.4±4.4
153	105±22
180	53.3±13.0
194	10.9±3.1
206	4.4±1.1
Polychlorinated Biphenyls (PCBs) Congener (IUPAC)	**Reference Concentration* µg/kg (wet weight basis)**
8	4.8±1.8
66/95	174±52
101/90	145±48
105	53.2±15.6
138/163/164	103±30
170/190	20.6±2.9
187/182	37.1±6.3
209	4.6±2.0
Polychlorinated Dibenzo-*p*-dioxins (PCDDs)	**ng/kg (wet weight basis)***
2,3,7,8-Tetrachlorodibenzo-*p*-dioxin	7.4±0.7
1,2,3,7,8-Pentachlorodibenzo-*p*-dioxin	5.3±1.3
1,2,3,4,7,8-Hexachlorodibenzo-*p*-dioxin	1.6±0.3
1,2,3,6,7,8-Hexachlorodibenzo-*p*-dioxin	5.8±0.8
1,2,3,7,8,9-Hexachlorodibenzo-*p*-dioxin	0.78±0.12
1,2,3,4,6,7,8-Heptachlorodibenzo-*p*-dioxin	6.4±0.9
Octachlorodibenzo-*p*-dioxin	9.4±1.7
Polychlorinated Dibenzofurans (PCDFs)	**ng/kg (wet weight basis)***
2,3,7,8-Tetrachlorodibenzofuran	18.2±1.6
1,2,3,7,8-Pentachlorodibenzofuran	5.6±0.3
Pesticides	**µg/kg (wet weight basis)***
gamma-chlordane	4.5±0.7
2,4'-DDE	2.9±0.5
trans-nonachlor	11.0±0.9
dieldrin	8.3±0.8
4,4'-DDE	158±14
2,4'-DDD	21.8±0.7
4,4'-DDD	90.9±8.5

* Not Certified

CARP-2 was prepared and certified by the National Research Council of Canada (NRCC), Institute for Environmental Research and Technology.



Rockwood Conservation Area
Rockwood, Ontario

ADDITIONAL PRODUCTS

Chlorinated Naphthalenes (PCNs): Native and Mass-Labelled Individuals and Solution/Mixtures

PAH Calibration Sets: Native and Mass-Labelled Support Solutions

Chlorinated Biphenylols (HO-PCBs): Native and Mass-Labelled Individuals; Mass-Labelled Solution/Mixture

Methoxy Chlorobiphenyls (MeO-PCBs): Native and Mass-Labelled Individuals and Solution/Mixtures

Chlorinated Biphenylenes (PCBPs): Native and Mass-Labelled

Triclocarban: Native and Mass-Labelled

Triclosan and Methyl Triclosan: Native, Mass-Labelled, and Chlorinated Derivatives

Tris(4-chlorophenyl) Methane and Methanol: Native and Mass-Labelled

Chlorinated Diphenyl Ethers (PCDEs): Native and Mass-Labelled

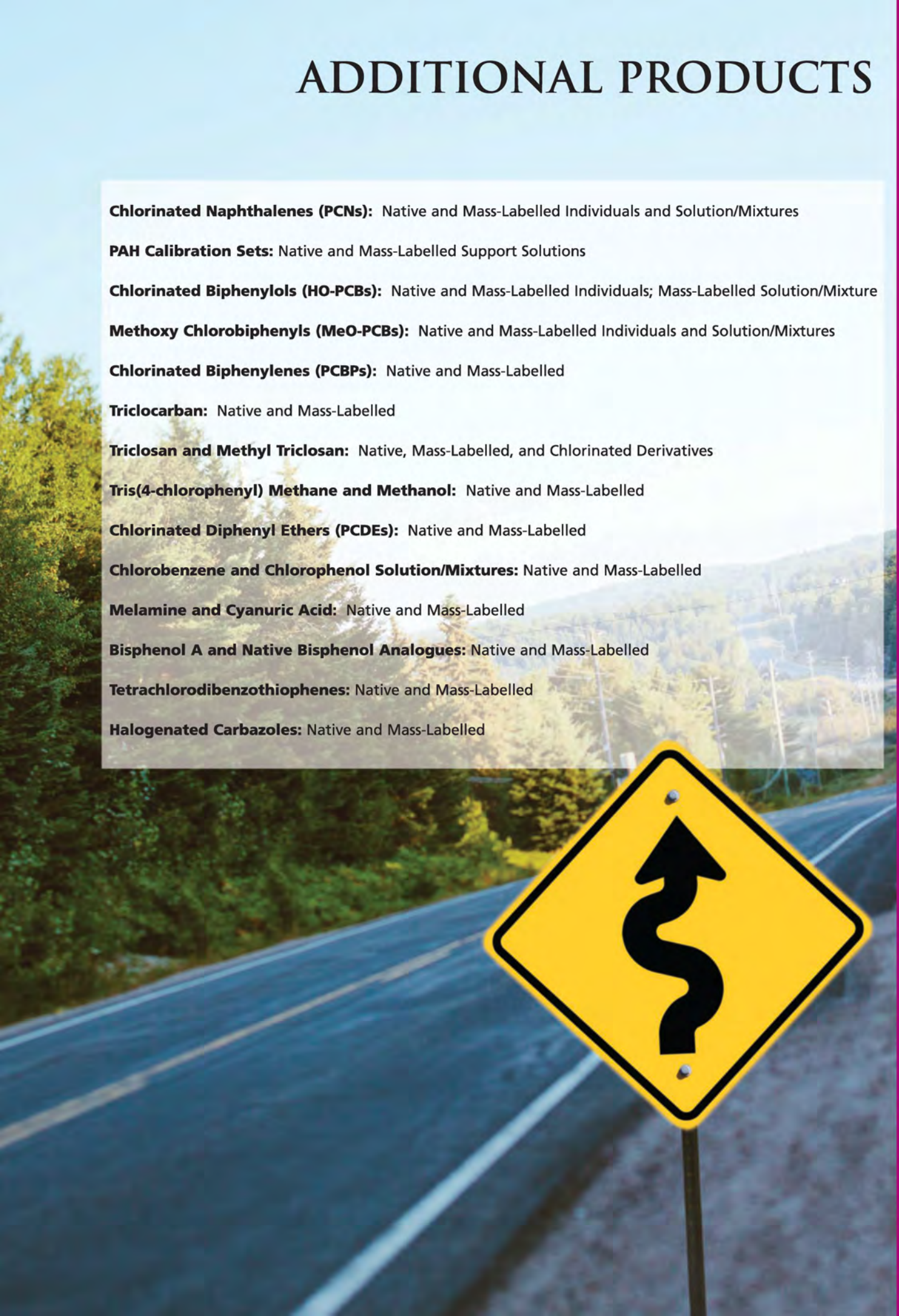
Chlorobenzene and Chlorophenol Solution/Mixtures: Native and Mass-Labelled

Melamine and Cyanuric Acid: Native and Mass-Labelled

Bisphenol A and Native Bisphenol Analogues: Native and Mass-Labelled

Tetrachlorodibenzothiophenes: Native and Mass-Labelled

Halogenated Carbazoles: Native and Mass-Labelled





PAH-CVS-B

Catalogue Number	Product (isooctane/toluene solution)	Qty/Conc
PAH-CVS-B	PAH-CVS-B Calibration Solutions CS1-CS5	1 kit (5 ampoules)
PAH-B-CS1	CS1	1.0 mL
PAH-B-CS2	CS2	1.0 mL
PAH-B-CS3	CS3	1.0 mL
PAH-B-CS4	CS4	1.0 mL
PAH-B-CS5	CS5	1.0 mL

	PAH-B-CS1 (ng/mL)	PAH-B-CS2 (ng/mL)	PAH-B-CS3 (ng/mL)	PAH-B-CS4 (ng/mL)	PAH-B-CS5 (ng/mL)
NATIVE PAHs					
Naphthalene	2.00	10.0	50.0	250	1000
2-Methylnaphthalene	2.00	10.0	50.0	250	1000
Acenaphthylene	2.00	10.0	50.0	250	1000
Acenaphthene	2.00	10.0	50.0	250	1000
Fluorene	2.00	10.0	50.0	250	1000
Phenanthrene	2.00	10.0	50.0	250	1000
Anthracene	2.00	10.0	50.0	250	1000
Fluoranthene	2.00	10.0	50.0	250	1000
Pyrene	2.00	10.0	50.0	250	1000
Benzo[*c*]fluorene	2.00	10.0	50.0	250	1000
Benzo[*a*]anthracene	2.00	10.0	50.0	250	1000
Cyclopenta[*cd*]pyrene	2.00	10.0	50.0	250	1000
Chrysene	2.00	10.0	50.0	250	1000
5-Methylchrysene	2.00	10.0	50.0	250	1000
Benzo[*b*]fluoranthene	2.00	10.0	50.0	250	1000
Benzo[*k*]fluoranthene	2.00	10.0	50.0	250	1000
Benzo[*j*]fluoranthene	2.00	10.0	50.0	250	1000
Benzo[*e*]pyrene	2.00	10.0	50.0	250	1000
Benzo[*a*]pyrene	2.00	10.0	50.0	250	1000
Perylene	2.00	10.0	50.0	250	1000
Indeno[1,2,3-*cd*]pyrene	2.00	10.0	50.0	250	1000
Dibenzo[*a,h*]anthracene	2.00	10.0	50.0	250	1000
Benzo[*ghi*]perylene	2.00	10.0	50.0	250	1000
Dibenzo[*a,l*]pyrene	2.00	10.0	50.0	250	1000
Dibenzo[*a,e*]pyrene	2.00	10.0	50.0	250	1000
Dibenzo[*a,i*]pyrene	2.00	10.0	50.0	250	1000
Dibenzo[*a,h*]pyrene	2.00	10.0	50.0	250	1000
DEUTERATED PAHs					
Naphthalene-d_8	100	100	100	100	100
2-Methylnaphthalene-d_{10}	100	100	100	100	100
Acenaphthylene-d_8	100	100	100	100	100
Phenanthrene-d_{10}	100	100	100	100	100
Anthracene-d_{10}	100	100	100	100	100
Fluoranthene-d_{10}	100	100	100	100	100
Benzo[*a*]anthracene-d_{12}	100	100	100	100	100
Chrysene-d_{12}	100	100	100	100	100
Benzo[*b*]fluoranthene-d_{12}	100	100	100	100	100
Benzo[*k*]fluoranthene-d_{12}	100	100	100	100	100
Benzo[*a*]pyrene-d_{12}	100	100	100	100	100
Perylene-d_{12}	100	100	100	100	100
Indeno[1,2,3-*cd*]pyrene-d_{12}	100	100	100	100	100
Dibenzo[*a,h*]anthracene-d_{14}	100	100	100	100	100
Benzo[*ghi*]perylene-d_{12}	100	100	100	100	100
Dibenzo[*a,i*]pyrene-d_{14}	100	100	100	100	100
INTERNAL STANDARDS					
Acenaphthene-d_{10}	100	100	100	100	100
Pyrene-d_{10}	100	100	100	100	100
Benzo[*e*]pyrene-d_{12}	100	100	100	100	100
SAMPLING STANDARDS					
Fluorene-d_{10}	100	100	100	100	100
p-Terphenyl-d_{14}	100	100	100	100	100

Catalogue Number	Product (isooctane/toluene solution)	Qty/Conc
PAH-LCS-B	PAH Labelled Compound Solution	1.2 mL
PAH-ISS-B	PAH Internal Standard Spiking Solution	1.2 mL
PAH-SS-B	PAH Sampling Standard Solution	1.2 mL
PAH-STK-B	PAH Native Stock Solution	1.2 mL

	PAH-LCS-B (ng/mL)	PAH-ISS-B (ng/mL)	PAH-SS-B (ng/mL)	PAH-STK-B (ng/mL)
NATIVE PAHs				
Naphthalene	—	—	—	2500
2-Methylnaphthalene	—	—	—	2500
Acenaphthylene	—	—	—	2500
Acenaphthene	—	—	—	2500
Fluorene	—	—	—	2500
Phenanthrene	—	—	—	2500
Anthracene	—	—	—	2500
Fluoranthene	—	—	—	2500
Pyrene	—	—	—	2500
Benzo[*c*]fluorene	—	—	—	2500
Benzo[*a*]anthracene	—	—	—	2500
Cyclopenta[*cd*]pyrene	—	—	—	2500
Chrysene	—	—	—	2500
5-Methylchrysene	—	—	—	2500
Benzo[*b*]fluoranthene	—	—	—	2500
Benzo[*k*]fluoranthene	—	—	—	2500
Benzo[*j*]fluoranthene	—	—	—	2500
Benzo[*e*]pyrene	—	—	—	2500
Benzo[*a*]pyrene	—	—	—	2500
Perylene	—	—	—	2500
Indeno[1,2,3-*cd*]pyrene	—	—	—	2500
Dibenzo[*a,h*]anthracene	—	—	—	2500
Benzo[*ghi*]perylene	—	—	—	2500
Dibenzo[*a,l*]pyrene	—	—	—	2500
Dibenzo[*a,e*]pyrene	—	—	—	2500
Dibenzo[*a,i*]pyrene	—	—	—	2500
Dibenzo[*a,h*]pyrene	—	—	—	2500
DEUTERATED PAHs				
Naphthalene-d_8	5000	—	—	—
2-Methylnaphthalene-d_{10}	5000	—	—	—
Acenaphthylene-d_8	5000	—	—	—
Phenanthrene-d_{10}	5000	—	—	—
Anthracene-d_{10}	5000	—	—	—
Fluoranthene-d_{10}	5000	—	—	—
Benzo[*a*]anthracene-d_{12}	5000	—	—	—
Chrysene-d_{12}	5000	—	—	—
Benzo[*b*]fluoranthene-d_{12}	5000	—	—	—
Benzo[*k*]fluoranthene-d_{12}	5000	—	—	—
Benzo[*a*]pyrene-d_{12}	5000	—	—	—
Perylene-d_{12}	5000	—	—	—
Indeno[1,2,3-*cd*]pyrene-d_{12}	5000	—	—	—
Dibenzo[*a,h*]anthracene-d_{14}	5000	—	—	—
Benzo[*ghi*]perylene-d_{12}	5000	—	—	—
Dibenzo[*a,i*]pyrene-d_{14}	5000	—	—	—
INTERNAL STANDARDS				
Acenaphthene-d_{10}	—	5000	—	—
Pyrene-d_{10}	—	5000	—	—
Benzo[e]pyrene-d_{12}	—	5000	—	—
SAMPLING STANDARDS				
Fluorene-d_{10}	—	—	5000	—
p-Terphenyl-d_{14}	—	—	5000	—



METHOD 429: HRGC/LRMS CALIBRATION SOLUTIONS FOR PAHs

Catalogue Number	Product (isooctane/toluene solution)	Qty/Conc
L429-CVS	L429-CVS Calibration Solutions CS1-CS5	1 kit (5 ampoules)
L429-CS1	CS1	1.0 mL
L429-CS2	CS2	1.0 mL
L429-CS3	CS3	1.0 mL
L429-CS4	CS4	1.0 mL
L429-CS5	CS5	1.0 mL

NATIVE PAHs	L429-CS1 (ng/µL)	L429-CS2 (ng/µL)	L429-CS3 (ng/µL)	L429-CS4 (ng/µL)	L429-CS5 (ng/µL)
Naphthalene	0.250	0.500	1.00	2.50	5.00
2-Methylnaphthalene	0.250	0.500	1.00	2.50	5.00
Acenaphthylene	0.250	0.500	1.00	2.50	5.00
Acenaphthene	0.250	0.500	1.00	2.50	5.00
Fluorene	0.250	0.500	1.00	2.50	5.00
Phenanthrene	0.250	0.500	1.00	2.50	5.00
Anthracene	0.250	0.500	1.00	2.50	5.00
Fluoranthene	0.250	0.500	1.00	2.50	5.00
Pyrene	0.250	0.500	1.00	2.50	5.00
Benzo[*a*]anthracene	0.250	0.500	1.00	2.50	5.00
Chrysene	0.250	0.500	1.00	2.50	5.00
Benzo[*b*]fluoranthene	0.250	0.500	1.00	2.50	5.00
Benzo[*k*]fluoranthene	0.250	0.500	1.00	2.50	5.00
Benzo[*e*]pyrene	0.250	0.500	1.00	2.50	5.00
Benzo[*a*]pyrene	0.250	0.500	1.00	2.50	5.00
Perylene	0.250	0.500	1.00	2.50	5.00
Indeno[1,2,3-*cd*]pyrene	0.250	0.500	1.00	2.50	5.00
Dibenzo[*a*,*h*]anthracene	0.250	0.500	1.00	2.50	5.00
Benzo[*ghi*]perylene	0.250	0.500	1.00	2.50	5.00
SURROGATE STANDARDS					
Fluorene-d_{10}	1.00	1.00	1.00	1.00	1.00
p-Terphenyl-d_{14}	1.00	1.00	1.00	1.00	1.00
INTERNAL STANDARDS					
Naphthalene-d_8	1.00	1.00	1.00	1.00	1.00
2-Methylnaphthalene-d_{10}	1.00	1.00	1.00	1.00	1.00
Acenaphthylene-d_8	1.00	1.00	1.00	1.00	1.00
Phenanthrene-d_{10}	1.00	1.00	1.00	1.00	1.00
Fluoranthene-d_{10}	1.00	1.00	1.00	1.00	1.00
Benzo[*a*]anthracene-d_{12}	1.00	1.00	1.00	1.00	1.00
Chrysene-d_{12}	1.00	1.00	1.00	1.00	1.00
Benzo[*b*]fluoranthene-d_{12}	1.00	1.00	1.00	1.00	1.00
Benzo[*k*]fluoranthene-d_{12}	1.00	1.00	1.00	1.00	1.00
Benzo[*a*]pyrene-d_{12}	1.00	1.00	1.00	1.00	1.00
Perylene-d_{12}	1.00	1.00	1.00	1.00	1.00
Indeno[1,2,3-*cd*]pyrene-d_{12}	1.00	1.00	1.00	1.00	1.00
Dibenzo[*a*,*h*]anthracene-d_{14}	1.00	1.00	1.00	1.00	1.00
Benzo[*ghi*]perylene-d_{12}	1.00	1.00	1.00	1.00	1.00
ALTERNATE STANDARD					
Anthracene-d_{10}	1.00	1.00	1.00	1.00	1.00
RECOVERY STANDARDS					
Acenaphthene-d_{10}	1.00	1.00	1.00	1.00	1.00
Pyrene-d_{10}	1.00	1.00	1.00	1.00	1.00
Benzo[*e*]pyrene-d_{12}	1.00	1.00	1.00	1.00	1.00

METHOD 429: HRGC/LRMS CALIBRATION SOLUTIONS FOR PAHs

Catalogue Number	Product (isooctane/toluene solution)	Qty/Conc
L429-SS	Method 429 Surrogate Standard Stock Solution	1.2 mL
L429-IS	Method 429 Internal Standard Stock Solution	1.2 mL
L429-AS	Method 429 Alternate Standard Stock Solution	1.2 mL
L429-RS	Method 429 Recovery Standard Stock Solution	1.2 mL
L429-PAR	Method 429 Native PAH Stock Solution	1.2 mL

NATIVE PAHs	L429-SS (µg/mL)	L429-IS (µg/mL)	L429-AS (µg/mL)	L429-RS (µg/mL)	L429-PAR (µg/mL)
Naphthalene	—	—	—	—	2.00
2-Methylnaphthalene	—	—	—	—	2.00
Acenaphthylene	—	—	—	—	2.00
Acenaphthene	—	—	—	—	2.00
Fluorene	—	—	—	—	2.00
Phenanthrene	—	—	—	—	2.00
Anthracene	—	—	—	—	2.00
Fluoranthene	—	—	—	—	2.00
Pyrene	—	—	—	—	2.00
Benzo[*a*]anthracene	—	—	—	—	2.00
Chrysene	—	—	—	—	2.00
Benzo[*b*]fluoranthene	—	—	—	—	2.00
Benzo[*k*]fluoranthene	—	—	—	—	2.00
Benzo[*e*]pyrene	—	—	—	—	2.00
Benzo[*a*]pyrene	—	—	—	—	2.00
Perylene	—	—	—	—	2.00
Indeno[1,2,3-*cd*]pyrene	—	—	—	—	2.00
Dibenzo[*a*,*h*]anthracene	—	—	—	—	2.00
Benzo[*ghi*]perylene	—	—	—	—	2.00
SURROGATE STANDARDS					
Fluorene-d_{10}	100	—	—	—	—
p-Terphenyl-d_{14}	100	—	—	—	—
INTERNAL STANDARDS					
Naphthalene-d_8	—	100	—	—	—
2-Methylnaphthalene-d_{10}	—	100	—	—	—
Acenaphthylene-d_8	—	100	—	—	—
Phenanthrene-d_{10}	—	100	—	—	—
Fluoranthene-d_{10}	—	100	—	—	—
Benzo[*a*]anthracene-d_{12}	—	100	—	—	—
Chrysene-d_{12}	—	100	—	—	—
Benzo[*b*]fluoranthene-d_{12}	—	100	—	—	—
Benzo[*k*]fluoranthene-d_{12}	—	100	—	—	—
Benzo[*a*]pyrene-d_{12}	—	100	—	—	—
Perylene-d_{12}	—	100	—	—	—
Indeno[1,2,3-*cd*]pyrene-d_{12}	—	100	—	—	—
Dibenzo[*a*,*h*]anthracene-d_{14}	—	100	—	—	—
Benzo[*ghi*]perylene-d_{12}	—	100	—	—	—
ALTERNATE STANDARD					
Anthracene-d_{10}	—	—	100	—	—
RECOVERY STANDARDS					
Acenaphthene-d_{10}	—	—	—	100	—
Pyrene-d_{10}	—	—	—	100	—
Benzo[e]pyrene-d_{12}	—	—	—	100	—



EPA PAH SOLUTION/MIXTURES

Catalogue Number	Product (toluene solution)	Qty/Conc
EPA-PAH-STK	Native PAH Solution/Mixture	1.2 mL
Naphthalene		5.00 µg/mL
Acenaphthylene		5.00 µg/mL
Acenaphthene		5.00 µg/mL
Fluorene		5.00 µg/mL
Phenanthrene		5.00 µg/mL
Anthracene		5.00 µg/mL
Fluoranthene		5.00 µg/mL
Pyrene		5.00 µg/mL
Benzo[*a*]anthracene		5.00 µg/mL
Chrysene		5.00 µg/mL
Benzo[*b*]fluoranthene		5.00 µg/mL
Benzo[*k*]fluoranthene		5.00 µg/mL
Benzo[*a*]pyrene		5.00 µg/mL
Indeno[1,2,3-*cd*]pyrene		5.00 µg/mL
Benzo[*ghi*]perylene		5.00 µg/mL
Dibenzo[*a*,*h*]anthracene		5.00 µg/mL

Catalogue Number	Product (toluene solution)	Qty/Conc
EPA-PAH-LCS	Deuterated PAH Solution/Mixture	1.2 mL
Naphthalene-d_8		5.00 µg/mL
Acenaphthylene-d_8		5.00 µg/mL
Acenaphthene-d_{10}		5.00 µg/mL
Fluorene-d_{10}		5.00 µg/mL
Phenanthrene-d_{10}		5.00 µg/mL
Anthracene-d_{10}		5.00 µg/mL
Fluoranthene-d_{10}		5.00 µg/mL
Pyrene-d_{10}		5.00 µg/mL
Benzo[*a*]anthracene-d_{12}		5.00 µg/mL
Chrysene-d_{12}		5.00 µg/mL
Benzo[*b*]fluoranthene-d_{12}		5.00 µg/mL
Benzo[*k*]fluoranthene-d_{12}		5.00 µg/mL
Benzo[*a*]pyrene-d_{12}		5.00 µg/mL
Indeno[1,2,3-*cd*]pyrene-d_{12}		5.00 µg/mL
Benzo[*ghi*]perylene-d_{12}		5.00 µg/mL
Dibenzo[*a*,*h*]anthracene-d_{14}		5.00 µg/mL

* The solutions above can be used with the **PAH-CVS-B** calibration solutions.

EPA & EU PAH SOLUTION/MIXTURE

Catalogue Number	Product (toluene solution)	Qty/Conc
EPA-EU-PAH-ISS	Deuterated PAH Solution/Mixture	1.2 mL
2-Methylnaphthalene-d_{10}		5.00 µg/mL
p-Terphenyl-d_{14}		5.00 µg/mL
Benzo[*e*]pyrene-d_{12}		5.00 µg/mL

EU PAH SOLUTION/MIXTURES

Catalogue Number	Product (toluene solution)	Qty/Conc
EU-PAH-STK	Native PAH Solution/Mixture	1.2 mL
Benzo[*c*]fluorene		5.00 µg/mL
Cyclopenta[*cd*]pyrene		5.00 µg/mL
Benzo[*a*]anthracene		5.00 µg/mL
Chrysene		5.00 µg/mL
5-Methylchrysene		5.00 µg/mL
Benzo[*b*]fluoranthene		5.00 µg/mL
Benzo[*k*]fluoranthene		5.00 µg/mL
Benzo[*j*]fluoranthene		5.00 µg/mL
Benzo[*a*]pyrene		5.00 µg/mL
Indeno[1,2,3-*cd*]pyrene		5.00 µg/mL
Benzo[*ghi*]perylene		5.00 µg/mL
Dibenzo[*a,h*]anthracene		5.00 µg/mL
Dibenzo[*a,l*]pyrene		5.00 µg/mL
Dibenzo[*a,e*]pyrene		5.00 µg/mL
Dibenzo[*a,i*]pyrene		5.00 µg/mL
Dibenzo[*a,h*]pyrene		5.00 µg/mL

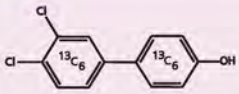
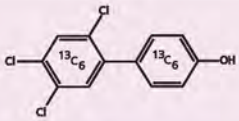
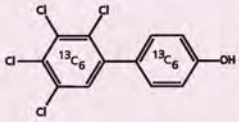
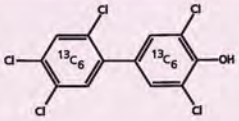
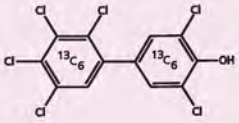
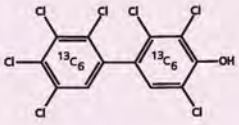
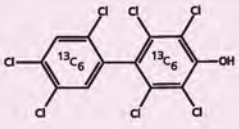
Catalogue Number	Product (toluene solution)	Qty/Conc
EU-PAH-LCS	Deuterated PAH Solution/Mixture	1.2 mL
Benzo[*a*]anthracene-d_{12}		5.00 µg/mL
Chrysene-d_{12}		5.00 µg/mL
Benzo[*b*]fluoranthene-d_{12}		5.00 µg/mL
Benzo[*k*]fluoranthene-d_{12}		5.00 µg/mL
Benzo[*a*]pyrene-d_{12}		5.00 µg/mL
Indeno[1,2,3-*cd*]pyrene-d_{12}		5.00 µg/mL
Benzo[*ghi*]perylene-d_{12}		5.00 µg/mL
Dibenzo[*a,h*]anthracene-d_{14}		5.00 µg/mL
Dibenzo[*a,i*]pyrene-d_{14}		5.00 µg/mL

* The solutions above can be used with the **PAH-CVS-B** calibration solutions.

NATIVE CHLORINATED BIPHENYLOLS (HO-PCBs)

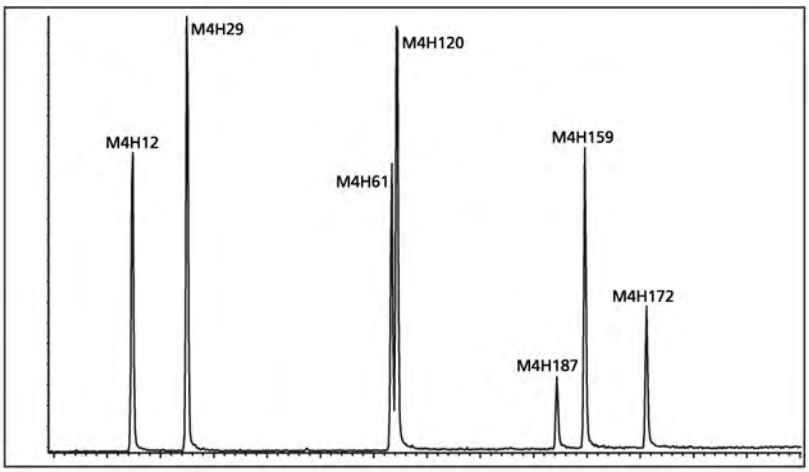
Catalogue Number	Product (nonane solution)	Qty/Conc	
4H107	2,3,3',4',5-Pentachloro-4-biphenylol	1.2 mL	50.0 µg/mL
4H108	2',3,3',4',5-Pentachloro-4-biphenylol (96.5%)	1.2 mL	48.3 µg/mL
3H118	2,3',4,4',5-Pentachloro-3-biphenylol	1.2 mL	50.0 µg/mL
4H130	2,2',3,3',4',5-Hexachloro-4-biphenylol	1.2 mL	50.0 µg/mL
3H138	2,2',3',4,4',5-Hexachloro-3-biphenylol	1.2 mL	50.0 µg/mL
4H146	2,2',3,4',5,5'-Hexachloro-4-biphenylol	1.2 mL	50.0 µg/mL
3H153	2,2',4,4',5,5'-Hexachloro-3-biphenylol	1.2 mL	50.0 µg/mL
4H172	2,2',3,3',4',5,5'-Heptachloro-4-biphenylol	1.2 mL	50.0 µg/mL
3H180	2,2',3',4,4',5,5'-Heptachloro-3-biphenylol	1.2 mL	50.0 µg/mL
4H187	2,2',3,4',5,5',6-Heptachloro-4-biphenylol	1.2 mL	50.0 µg/mL

MASS-LABELLED CHLORINATED BIPHENYLOLS

Catalogue Number		Product
M4H12		3',4'-Dichloro-4-($^{13}C_{12}$)biphenylol 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene; isotopic purity 99% or greater
M4H29		2',4',5'-Trichloro-4-($^{13}C_{12}$)biphenylol 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene; isotopic purity 99% or greater
M4H61		2',3',4',5'-Tetrachloro-4-($^{13}C_{12}$)biphenylol 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene; isotopic purity 99% or greater
M4H120		2',3,4',5,5'-Pentachloro-4-($^{13}C_{12}$)biphenylol 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene; isotopic purity 99% or greater
M4H159		2',3,3',4',5,5'-Hexachloro-4-($^{13}C_{12}$)biphenylol 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene; isotopic purity 99% or greater
M4H172		2,2',3,3',4',5,5'-Heptachloro-4-($^{13}C_{12}$)biphenylol 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene; isotopic purity 99% or greater
M4H187		2,2',3,4',5,5',6-Heptachloro-4-($^{13}C_{12}$)biphenylol 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene; isotopic purity 99% or greater

MASS-LABELLED CHLORINATED BIPHENYLOLS: SOLUTION/MIXTURE

Catalogue Number	Product (toluene solution)		Qty/Conc
MHPCB-MXA	Mass-Labelled Chlorinated Biphenylol Solution/Mixture		1.2 mL
3',4'-Dichloro-4-($^{13}C_{12}$)biphenylol		M4H12	5.00 µg/mL
2',4',5'-Trichloro-4-($^{13}C_{12}$)biphenylol		M4H29	5.00 µg/mL
2',3',4',5'-Tetrachloro-4-($^{13}C_{12}$)biphenylol		M4H61	5.00 µg/mL
2',3,4',5,5'-Pentachloro-4-($^{13}C_{12}$)biphenylol		M4H120	5.00 µg/mL
2',3,3',4',5,5'-Hexachloro-4-($^{13}C_{12}$)biphenylol		M4H159	5.00 µg/mL
2,2',3,3',4',5,5'-Heptachloro-4-($^{13}C_{12}$)biphenylol		M4H172	5.00 µg/mL
2,2',3,4',5,5',6-Heptachloro-4-($^{13}C_{12}$)biphenylol		M4H187	5.00 µg/mL



HRGC/LRMS Data for MHPCB-MXA on a 30m DB-XLB Column.



NATIVE METHOXY-CHLOROBIPHENYLS (MeO-PCBs)

Catalogue Number	Product (nonane solution)	Qty/Conc	
4PM79	3,3',4',5-Tetrachloro-4-methoxybiphenyl	1.2 mL	50.0 µg/mL
4PM97	2,2',3,4',5'-Pentachloro-4-methoxybiphenyl	1.2 mL	50.0 µg/mL
4PM101	2,2',4,5,5'-Pentachloro-4'-methoxybiphenyl	1.2 mL	50.0 µg/mL
4M107	2,3,3',4',5-Pentachloro-4-methoxybiphenyl	1.2 mL	50.0 µg/mL
4PM108	2,3,3',4,5'-Pentachloro-4'-methoxybiphenyl	1.2 mL	50.0 µg/mL
3M118	2,3',4,4',5-Pentachloro-3-methoxybiphenyl	1.2 mL	50.0 µg/mL
4PM120	2,3',4,5,5'-Pentachloro-4'-methoxybiphenyl	1.2 mL	50.0 µg/mL
4PM127	3,3',4,5,5'-Pentachloro-4'-methoxybiphenyl	1.2 mL	50.0 µg/mL
4PM130	2,2',3,3',4',5-Hexachloro-4-methoxybiphenyl	1.2 mL	50.0 µg/mL
4M134	2,2',3,3',5,6-Hexachloro-4-methoxybiphenyl	1.2 mL	50.0 µg/mL
3PM138	2,2',3',4,4',5-Hexachloro-3-methoxybiphenyl	1.2 mL	50.0 µg/mL
4M146	2,2',3,4',5,5'-Hexachloro-4-methoxybiphenyl	1.2 mL	50.0 µg/mL
33PDM155	2,2',4,4',6,6'-Hexachloro-3,3'-dimethoxybiphenyl	1.2 mL	50.0 µg/mL
4PM159	2,3,3',4,5,5'-Hexachloro-4'-methoxybiphenyl	1.2 mL	50.0 µg/mL
4M162	2,3,3',4',5,5'-Hexachloro-4-methoxybiphenyl	1.2 mL	50.0 µg/mL
4M163	2,3,3',4',5,6-Hexachloro-4-methoxybiphenyl	1.2 mL	50.0 µg/mL
4PM172	2,2',3,3',4,5,5'-Heptachloro-4'-methoxybiphenyl	1.2 mL	50.0 µg/mL
4M177	2,2',3,3',4',5,6-Heptachloro-4-methoxybiphenyl	1.2 mL	50.0 µg/mL
4M178	2,2',3,3',5,5',6-Heptachloro-4-methoxybiphenyl (>97%)	1.2 mL	48.5 µg/mL
3PM180	2,2',3,4,4',5,5'-Heptachloro-3'-methoxybiphenyl	1.2 mL	50.0 µg/mL
3PM182	2,2',3,4,4',5,6'-Heptachloro-3'-methoxybiphenyl	1.2 mL	50.0 µg/mL
3PM183	2,2',3',4,4',5,6'-Heptachloro-3-methoxybiphenyl	1.2 mL	50.0 µg/mL
3PM184	2,2',3,4,4',6,6'-Heptachloro-3'-methoxybiphenyl	1.2 mL	50.0 µg/mL
4M187	2,2',3,4',5,5',6-Heptachloro-4-methoxybiphenyl	1.2 mL	50.0 µg/mL
4M193	2,3,3',4',5,5',6-Heptachloro-4-methoxybiphenyl	1.2 mL	50.0 µg/mL
4PM198	2,2',3,3',4,5,5',6-Octachloro-4'-methoxybiphenyl	1.2 mL	50.0 µg/mL
4PM199	2,2',3,3',4',5,5',6-Octachloro-4-methoxybiphenyl	1.2 mL	50.0 µg/mL
4PM200	2,2',3,3',4,5,6,6'-Octachloro-4'-methoxybiphenyl	1.2 mL	50.0 µg/mL
4PM201	2,2',3,3',4',5,6,6'-Octachloro-4-methoxybiphenyl	1.2 mL	50.0 µg/mL
4M202	2,2',3,3',5,5',6,6'-Octachloro-4-methoxybiphenyl	1.2 mL	50.0 µg/mL
44PDM202	2,2',3,3',5,5',6,6'-Octachloro-4,4'-dimethoxybiphenyl	1.2 mL	50.0 µg/mL
3PM203	2,2',3,4,4',5,5',6-Octachloro-3'-methoxybiphenyl	1.2 mL	50.0 µg/mL
4PM208	2,2',3,3',4,5,5',6,6'-Nonachloro-4'-methoxybiphenyl	1.2 mL	50.0 µg/mL

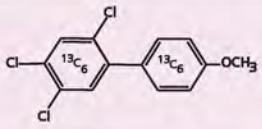
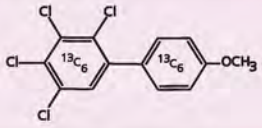
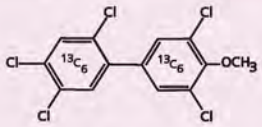
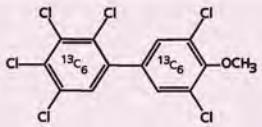
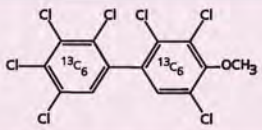
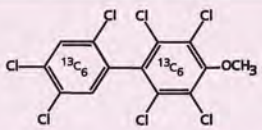
NATIVE METHOXY-CHLOROBIPHENYLS: SOLUTION/MIXTURES

Catalogue Number	Product (nonane solution)		Qty/Conc
MPCB-MXA	Native Chlorinated Methoxybiphenyl Solution/Mixture		1.2 mL
2,3,4,5-Tetrachloro-4'-methoxybiphenyl		4PM61	5.00 µg/mL
2,3',4,5,5'-Pentachloro-4'-methoxybiphenyl		4PM120	5.00 µg/mL
2,2',4,4',6,6'-Hexachloro-3,3'-dimethoxybiphenyl		33PDM155	5.00 µg/mL
2,2',3,4,4',6,6'-Heptachloro-3'-methoxybiphenyl		3PM184	5.00 µg/mL
2,2',3,3',5,5',6,6'-Octachloro-4-methoxybiphenyl		4M202	5.00 µg/mL
MPCB-MXB	Native Chlorinated Methoxybiphenyl Solution/Mixture		1.2 mL
3,3',4',5-Tetrachloro-4-methoxybiphenyl		4PM79	5.00 µg/mL
2,2',4,5,5'-Pentachloro-4'-methoxybiphenyl		4PM101	5.00 µg/mL
2,2',3,3',5,6-Hexachloro-4-methoxybiphenyl		4M134	5.00 µg/mL
2,2',3,3',5,5',6-Heptachloro-4-methoxybiphenyl		4M178	4.85 µg/mL
2,2',3,3',4',5,6,6'-Octachloro-4-methoxybiphenyl		4PM201	5.00 µg/mL
MPCB-MXC	Native Chlorinated Methoxybiphenyl Solution/Mixture		1.2 mL
2,3,4,4',5-Pentachloro-2'-methoxybiphenyl		2PM114	5.00 µg/mL
2,2',3,4',5,5'-Hexachloro-4-methoxybiphenyl		4M146	5.00 µg/mL
2,2',3,4,4',5,6'-Heptachloro-3'-methoxybiphenyl		3PM182	5.00 µg/mL
2,2',3,4,4',5,5',6-Octachloro-3'-methoxybiphenyl		3PM203	5.00 µg/mL
2,2',3,3',4,5,5',6,6'-Nonachloro-4'-methoxybiphenyl		4PM208	5.00 µg/mL
MPCB-MXD	Native Chlorinated Methoxybiphenyl Solution/Mixture		1.2 mL
2,3',4,4',5-Pentachloro-3-methoxybiphenyl		3M118	5.00 µg/mL
2,2',3',4,4',5-Hexachloro-3-methoxybiphenyl		3PM138	5.00 µg/mL
2,2',3',4,4',5,6'-Heptachloro-3-methoxybiphenyl		3PM183	5.00 µg/mL
2,2',3,3',4,5,5',6-Octachloro-4'-methoxybiphenyl		4PM198	5.00 µg/mL
MPCB-MXE	Native Chlorinated Methoxybiphenyl Solution/Mixture		1.2 mL
2,3,3',4,5'-Pentachloro-4'-methoxybiphenyl		4PM108	5.00 µg/mL
2,2',3,3',4',5-Hexachloro-4-methoxybiphenyl		4PM130	5.00 µg/mL
2,2',3,4',5,5',6-Heptachloro-4-methoxybiphenyl		4M187	5.00 µg/mL
2,2',3,3',4',5,5',6-Octachloro-4-methoxybiphenyl		4PM199	5.00 µg/mL
MPCB-MXF	Native Chlorinated Methoxybiphenyl Solution/Mixture		1.2 mL
2,3,3',4',5-Pentachloro-4-methoxybiphenyl		4M107	5.00 µg/mL
2,3,3',4',5,6-Hexachloro-4-methoxybiphenyl		4M163	5.00 µg/mL
2,2',3,3',4',5,6-Heptachloro-4-methoxybiphenyl		4M177	5.00 µg/mL
2,2',3,3',4,5,6,6'-Octachloro-4'-methoxybiphenyl		4PM200	5.00 µg/mL

NATIVE METHOXY-CHLOROBIPHENYLS: SOLUTION/MIXTURES

Catalogue Number	Product (nonane solution)		Qty/Conc
MPCB-MXG	Native Chlorinated Methoxybiphenyl Solution/Mixture		1.2 mL
	2,2',3,4',5'-Pentachloro-4-methoxybiphenyl	4PM97	5.00 µg/mL
	2,3,3',4,5,5'-Hexachloro-4'-methoxybiphenyl	4PM159	5.00 µg/mL
	2,2',3,4,4',5,5'-Heptachloro-3'-methoxybiphenyl	3PM180	5.00 µg/mL
	2,2',3,3',5,5',6,6'-Octachloro-4,4'-dimethoxybiphenyl	44PDM202	5.00 µg/mL
MPCB-MXH	Native Chlorinated Methoxybiphenyl Solution/Mixture		1.2 mL
	3,3',4,5,5'-Pentachloro-4'-methoxybiphenyl	4PM127	5.00 µg/mL
	2,2',3,3',4,5,5'-Heptachloro-4'-methoxybiphenyl	4PM172	5.00 µg/mL
MPCB-MXI	Native Chlorinated Methoxybiphenyl Solution/Mixture		1.2 mL
	2,3,3',4',5,5'-Hexachloro-4-methoxybiphenyl	4M162	5.00 µg/mL
	2,3,3',4',5,5',6-Heptachloro-4-methoxybiphenyl	4M193	5.00 µg/mL

MASS-LABELLED METHOXY-CHLOROBIPHENYLS

Catalogue Number		Product
M4M29		2,4,5-Trichloro-4'-methoxy($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
M4M61		2,3,4,5-Tetrachloro-4'-methoxy($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
M4M120		2,3',4,5,5'-Pentachloro-4'-methoxy($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
M4M159		2,3,3',4,5,5'-Hexachloro-4'-methoxy($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
M4M172		2,2',3,3',4,5,5'-Heptachloro-4'-methoxy($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene
M4M187		2,2',3,4',5,5',6-Heptachloro-4-methoxy($^{13}C_{12}$)biphenyl 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene

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

MASS-LABELLED METHOXY-CHLOROBIPHENYLS: SOLUTION/MIXTURE

Catalogue Number	Product (toluene solution)		Qty/Conc
MMPCB-MXA	Mass-Labelled Chlorinated Methoxybiphenyl Solution/Mixture		1.2 mL
	2,4,5-Trichloro-4'-methoxy($^{13}C_{12}$)biphenyl	M4M29	5.00 µg/mL
	2,3,4,5-Tetrachloro-4'-methoxy($^{13}C_{12}$)biphenyl	M4M61	5.00 µg/mL
	2,3',4,5,5'-Pentachloro-4'-methoxy($^{13}C_{12}$)biphenyl	M4M120	5.00 µg/mL
	2,3,3',4,5,5'-Hexachloro-4'-methoxy($^{13}C_{12}$)biphenyl	M4M159	5.00 µg/mL
	2,2',3,3',4,5,5'-Heptachloro-4'-methoxy($^{13}C_{12}$)biphenyl	M4M172	5.00 µg/mL
	2,2',3,4',5,5',6-Heptachloro-4-methoxy($^{13}C_{12}$)biphenyl	M4M187	5.00 µg/mL

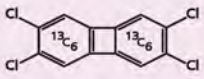
NATIVE CHLORINATED BIPHENYLENES (PCBPs)

Chlorinated Biphenylenes have been detected in samples taken in the aftermath of PCB fires. It is thought that they may be formed as the result of incomplete combustion of the PCBs.

In microsomal enzyme studies, the 2,3,6,7-tetrachlorobiphenylene has shown similar potency to that of 2,3,7,8-tetrachlorodibenzo-*p*-dioxin in its toxicological effects.

Catalogue Number	Product (nonane solution)	Qty/Conc	
CBP-2	2-Chlorobiphenylene	1.2 mL	50.0 µg/mL
CBP-23	2,3-Dichlorobiphenylene	1.2 mL	50.0 µg/mL
CBP-236	2,3,6-Trichlorobiphenylene	1.2 mL	50.0 µg/mL
CBP-2367	2,3,6,7-Tetrachlorobiphenylene	1.2 mL	50.0 µg/mL

MASS-LABELLED CHLORINATED BIPHENYLENE

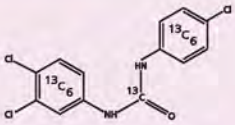
Catalogue Number		Product
MCBP-2367		2,3,6,7-Tetrachloro($^{13}C_{12}$)biphenylene 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane; isotopic purity 99% or greater

NATIVE TRICLOCARBAN

Triclocarban, like Triclosan, is an antimicrobial additive used in a variety of personal care products.

Catalogue Number	Product (methanol solution)	Qty/Conc	
TCC	N-(4-chlorophenyl)-N'-(3,4-dichlorophenyl)urea	1.2 mL	50.0 µg/mL

MASS-LABELLED TRICLOCARBAN

Catalogue Number		Product
MTCC		N-(4-chloro($^{13}C_6$)phenyl)-N'-(3,4-dichloro($^{13}C_6$)phenyl)(^{13}C)urea 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol; isotopic purity 99% or greater

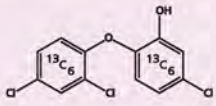
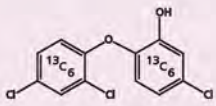
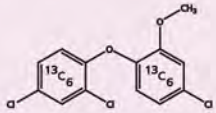
NATIVE TRICLOSAN AND METHYL TRICLOSAN

Triclosan is a widely used antibacterial and antifungal agent that has been incorporated into many common consumer products including toothpastes, deodorants, antibacterial soaps, and detergents.

The increasing use of these products over the last 30 years has led to Triclosan, and its biotransformation product, Methyl Triclosan, being found in the environment.

Catalogue Number	Product (nonane solution)	Qty/Conc	
TCS	5-Chloro-2-(2,4-dichlorophenoxy)phenol	1.2 mL	50.0 µg/mL
TCS-M	5-Chloro-2-(2,4-dichlorophenoxy)phenol (in methanol)	1.2 mL	50.0 µg/mL
MeTCS	5-Chloro-2-(2,4-dichlorophenoxy)anisole	1.2 mL	50.0 µg/mL

MASS-LABELLED TRICLOSAN AND METHYL TRICLOSAN

Catalogue Number		Product
MTCS		5-Chloro-2-(2,4-dichloro($^{13}C_6$)phenoxy)($^{13}C_6$)phenol 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in **nonane**; isotopic purity 99% or greater
MTCS-M		5-Chloro-2-(2,4-dichloro($^{13}C_6$)phenoxy)($^{13}C_6$)phenol 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in **methanol**; isotopic purity 99% or greater
MMeTCS		5-Chloro-2-(2,4-dichloro($^{13}C_6$)phenoxy)(1,2,3,4,5,6-$^{13}C_6$)anisole 1.2 ml; 50.0 µg/mL (±2.5 µg/mL); in **nonane**; isotopic purity 99% or greater

CHLORINATED DERIVATIVES OF TRICLOSAN AND METHYL TRICLOSAN

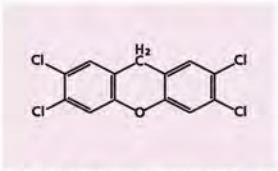
The reaction of Triclosan with free chlorine in water, or during wastewater treatment processes, may result in the formation of further chlorinated Triclosan isomers.

Catalogue Number	Product (nonane solution)		Qty/Conc	
6TCS	2,3-Dichloro-6-(2,4-dichlorophenoxy)phenol	(6-Chlorotriclosan)	1.2 mL	50.0 µg/mL
6MeTCS	2,3-Dichloro-6-(2,4-dichlorophenoxy)anisole	(6-Chloro-methyltriclosan)	1.2 mL	50.0 µg/mL
4TCS	4,5-Dichloro-2-(2,4-dichlorophenoxy)phenol	(4-Chlorotriclosan)	1.2 mL	50.0 µg/mL
4MeTCS	4,5-Dichloro-2-(2,4-dichlorophenoxy)anisole	(4-Chloro-methyltriclosan)	1.2 mL	50.0 µg/mL
46TCS	2,3,4-Trichloro-6-(2,4-dichlorophenoxy)phenol	(4,6-Dichlorotriclosan)	1.2 mL	50.0 µg/mL
46MeTCS	2,3,4-Trichloro-6-(2,4-dichlorophenoxy)anisole	(4,6-Dichloro-methyltriclosan)	1.2 mL	50.0 µg/mL

NATIVE CHLOROXANTHENE

The tetrachloroxanthene was originally suspected to be an environmental contaminant due to pulp bleaching.

Catalogue Number	Product (toluene solution)	Qty/Conc	
XE-2367-S	2,3,6,7-Tetrachloroxanthene	1.2 mL	50.0 µg/mL



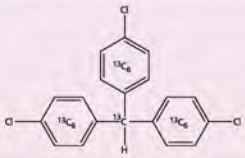
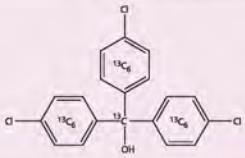
2,3,6,7-Tetrachloroxanthene

NATIVE TRIS(4-CHLOROPHENYL)METHANE AND TRIS(4-CHLOROPHENYL)METHANOL

These two compounds have been found in a variety of environmental samples including fish, marine mammals and birds.
It is possible that they may originate from DDT or other agrochemicals.

Catalogue Number	Product (nonane solution)	Qty/Conc	
T4CPM	Tris(4-chlorophenyl)methane	1.2 mL	50.0 µg/mL
T4CPME	Tris(4-chlorophenyl)methanol	1.2 mL	50.0 µg/mL

MASS-LABELLED TRIS(4-CHLOROPHENYL)METHANE AND TRIS(4-CHLOROPHENYL)METHANOL

Catalogue Number		Product
MT4CPM		Tris(4-chlorophenyl)methane-$^{13}C_{19}$ 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane; isotopic purity 99% or greater
MT4CPME		Tris(4-chlorophenyl)methanol-$^{13}C_{19}$ 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane; isotopic purity 99% or greater



PCN-CVS-A

Catalogue Number	Product (nonane solution)	Qty/Conc
PCN-CVS-A	PCN-CVS-A Calibration Solutions CS1-CS5	1 kit (5 ampoules)
PCN-CS1-A	CS1	200 µL
PCN-CS2-A	CS2	200 µL
PCN-CS3-A	CS3	200 µL
PCN-CS4-A	CS4	200 µL
PCN-CS5-A	CS5	200 µL

NATIVE PCNs	*Congener #*	PCN-CS1-A (ng/mL)	PCN-CS2-A (ng/mL)	PCN-CS3-A (ng/mL)	PCN-CS4-A (ng/mL)	PCN-CS5-A (ng/mL)
1-Chloronaphthalene	*1*	1.00	5.00	20.0	100	500
2-Chloronaphthalene	*2*	1.00	5.00	20.0	100	500
1,3-Dichloronaphthalene	*4*	1.00	5.00	20.0	100	500
1,4-Dichloronaphthalene	*5*	1.00	5.00	20.0	100	500
1,8-Dichloronaphthalene	*9*	1.00	5.00	20.0	100	500
2,7-Dichloronaphthalene	*12*	1.00	5.00	20.0	100	500
1,2,3-Trichloronaphthalene	*13*	1.00	5.00	20.0	100	500
1,2,7-Trichloronaphthalene	*17*	1.00	5.00	20.0	100	500
1,2,8-Trichloronaphthalene	*18*	1.00	5.00	20.0	100	500
1,3,6-Trichloronaphthalene	*20*	1.00	5.00	20.0	100	500
1,4,5-Trichloronaphthalene	*23*	1.00	5.00	20.0	100	500
1,4,6-Trichloronaphthalene	*24*	1.00	5.00	20.0	100	500
1,2,3,5-Tetrachloronaphthalene	*28*	1.00	5.00	20.0	100	500
1,2,5,7-Tetrachloronaphthalene	*37*	1.00	5.00	20.0	100	500
1,2,6,8-Tetrachloronaphthalene	*40*	1.00	5.00	20.0	100	500
1,2,7,8-Tetrachloronaphthalene	*41*	1.00	5.00	20.0	100	500
1,3,5,7-Tetrachloronaphthalene	*42*	1.00	5.00	20.0	100	500
2,3,6,7-Tetrachloronaphthalene	*48*	1.00	5.00	20.0	100	500
1,2,3,5,7-Pentachloronaphthalene	*52*	1.00	5.00	20.0	100	500
1,2,3,5,8-Pentachloronaphthalene	*53*	1.00	5.00	20.0	100	500
1,2,3,6,7-Pentachloronaphthalene	*54*	1.00	5.00	20.0	100	500
1,2,3,7,8-Pentachloronaphthalene	*56*	1.00	5.00	20.0	100	500
1,2,4,5,8-Pentachloronaphthalene	*59*	1.00	5.00	20.0	100	500
1,2,3,4,5,6-Hexachloronaphthalene	*63*	1.00	5.00	20.0	100	500
1,2,3,5,6,7-Hexachloronaphthalene	*67*	1.00	5.00	20.0	100	500
1,2,3,5,6,8-Hexachloronaphthalene	*68*	1.00	5.00	20.0	100	500
1,2,3,5,7,8-Hexachloronaphthalene	*69*	1.00	5.00	20.0	100	500
1,2,3,6,7,8-Hexachloronaphthalene	*70*	1.00	5.00	20.0	100	500
1,2,4,5,7,8-Hexachloronaphthalene	*72*	1.00	5.00	20.0	100	500
1,2,3,4,5,6,7-Heptachloronaphthalene	*73*	1.00	5.00	20.0	100	500
1,2,3,4,5,6,8-Heptachloronaphthalene	*74*	1.00	5.00	20.0	100	500
Octachloronaphthalene	*75*	1.00	5.00	20.0	100	500
EXTRACTION STANDARDS						
1-Chloro($^{13}C_{10}$)naphthalene	*1L*	10.0	10.0	10.0	10.0	10.0
1,4-Dichloro($^{13}C_{10}$)naphthalene	*5L*	10.0	10.0	10.0	10.0	10.0
1,4,6-Trichloro($^{13}C_{10}$)naphthalene	*24L*	10.0	10.0	10.0	10.0	10.0
2,3,6,7-Tetrachloro($^{13}C_{10}$)naphthalene	*48L*	10.0	10.0	10.0	10.0	10.0
1,2,3,6,7-Pentachloro($^{13}C_{10}$)naphthalene	*54L*	10.0	10.0	10.0	10.0	10.0
1,2,3,5,6,7-Hexachloro($^{13}C_{10}$)naphthalene	*67L*	10.0	10.0	10.0	10.0	10.0
1,2,3,6,7,8-Hexachloro($^{13}C_{10}$)naphthalene	*70L*	10.0	10.0	10.0	10.0	10.0
1,2,4,5,7,8-Hexachloro($^{13}C_{10}$)naphthalene	*72L*	10.0	10.0	10.0	10.0	10.0
1,2,3,4,5,6,7-Heptachloro($^{13}C_{10}$)naphthalene	*73L*	10.0	10.0	10.0	10.0	10.0
Octachloro($^{13}C_{10}$)naphthalene	*75L*	10.0	10.0	10.0	10.0	10.0
INJECTION STANDARDS						
1,4,5-Trichloro($^{13}C_{10}$)naphthalene	*23L*	10.0	10.0	10.0	10.0	10.0
1,2,4,5,8-Pentachloro($^{13}C_{10}$)naphthalene	*59L*	10.0	10.0	10.0	10.0	10.0
1,2,3,4,5,6,8-Heptachloro($^{13}C_{10}$)naphthalene	*74L*	10.0	10.0	10.0	10.0	10.0
SAMPLING STANDARD						
1,2,3,7,8-Pentachloro($^{13}C_{10}$)naphthalene	*56L*	10.0	10.0	10.0	10.0	10.0

Catalogue Number	Product (nonane solution)	Qty/Conc
PCN-LCS-A	PCN Extraction Standard Solution	1.2 mL
PCN-ISS-A	PCN Injection Standard Solution	1.2 mL
PCN-SS-A	PCN Sampling Standard Solution	1.2 mL
PCN-STK-A	PCN Native Stock Solution	1.2 mL

NATIVE PCNs	*Congener #*	PCN-LCS-A (ng/mL)	PCN-ISS-A (ng/mL)	PCN-SS-A (ng/mL)	PCN-STK-A (ng/mL)
1-Chloronaphthalene	*1*	—	—	—	1000
2-Chloronaphthalene	*2*	—	—	—	1000
1,3-Dichloronaphthalene	*4*	—	—	—	1000
1,4-Dichloronaphthalene	*5*	—	—	—	1000
1,8-Dichloronaphthalene	*9*	—	—	—	1000
2,7-Dichloronaphthalene	*12*	—	—	—	1000
1,2,3-Trichloronaphthalene	*13*	—	—	—	1000
1,2,7-Trichloronaphthalene	*17*	—	—	—	1000
1,2,8-Trichloronaphthalene	*18*	—	—	—	1000
1,3,6-Trichloronaphthalene	*20*	—	—	—	1000
1,4,5-Trichloronaphthalene	*23*	—	—	—	1000
1,4,6-Trichloronaphthalene	*24*	—	—	—	1000
1,2,3,5-Tetrachloronaphthalene	*28*	—	—	—	1000
1,2,5,7-Tetrachloronaphthalene	*37*	—	—	—	1000
1,2,6,8-Tetrachloronaphthalene	*40*	—	—	—	1000
1,2,7,8-Tetrachloronaphthalene	*41*	—	—	—	1000
1,3,5,7-Tetrachloronaphthalene	*42*	—	—	—	1000
2,3,6,7-Tetrachloronaphthalene	*48*	—	—	—	1000
1,2,3,5,7-Pentachloronaphthalene	*52*	—	—	—	1000
1,2,3,5,8-Pentachloronaphthalene	*53*	—	—	—	1000
1,2,3,6,7-Pentachloronaphthalene	*54*	—	—	—	1000
1,2,3,7,8-Pentachloronaphthalene	*56*	—	—	—	1000
1,2,4,5,8-Pentachloronaphthalene	*59*	—	—	—	1000
1,2,3,4,5,6-Hexachloronaphthalene	*63*	—	—	—	1000
1,2,3,5,6,7-Hexachloronaphthalene	*67*	—	—	—	1000
1,2,3,5,6,8-Hexachloronaphthalene	*68*	—	—	—	1000
1,2,3,5,7,8-Hexachloronaphthalene	*69*	—	—	—	1000
1,2,3,6,7,8-Hexachloronaphthalene	*70*	—	—	—	1000
1,2,4,5,7,8-Hexachloronaphthalene	*72*	—	—	—	1000
1,2,3,4,5,6,7-Heptachloronaphthalene	*73*	—	—	—	1000
1,2,3,4,5,6,8-Heptachloronaphthalene	*74*	—	—	—	1000
Octachloronaphthalene	*75*	—	—	—	1000
EXTRACTION STANDARDS					
1-Chloro($^{13}C_{10}$)naphthalene	*1L*	1000	—	—	—
1,4-Dichloro($^{13}C_{10}$)naphthalene	*5L*	1000	—	—	—
1,4,6-Trichloro($^{13}C_{10}$)naphthalene	*24L*	1000	—	—	—
2,3,6,7-Tetrachloro($^{13}C_{10}$)naphthalene	*48L*	1000	—	—	—
1,2,3,6,7-Pentachloro($^{13}C_{10}$)naphthalene	*54L*	1000	—	—	—
1,2,3,5,6,7-Hexachloro($^{13}C_{10}$)naphthalene	*67L*	1000	—	—	—
1,2,3,6,7,8-Hexachloro($^{13}C_{10}$)naphthalene	*70L*	1000	—	—	—
1,2,4,5,7,8-Hexachloro($^{13}C_{10}$)naphthalene	*72L*	1000	—	—	—
1,2,3,4,5,6,7-Heptachloro($^{13}C_{10}$)naphthalene	*73L*	1000	—	—	—
Octachloro($^{13}C_{10}$)naphthalene	*75L*	1000	—	—	—
INJECTION STANDARDS					
1,4,5-Trichloro($^{13}C_{10}$)naphthalene	*23L*	—	1000	—	—
1,2,4,5,8-Pentachloro($^{13}C_{10}$)naphthalene	*59L*	—	1000	—	—
1,2,3,4,5,6,8-Heptachloro($^{13}C_{10}$)naphthalene	*74L*	—	1000	—	—
SAMPLING STANDARD					
1,2,3,7,8-Pentachloro($^{13}C_{10}$)naphthalene	*56L*	—	—	1000	—



NATIVE POLYCHLORINATED NAPHTHALENES: SOLUTION/MIXTURES

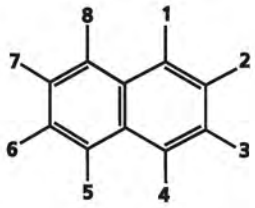
Catalogue Number	Product (nonane solution)	Qty/Conc
PCN-MXA	Native PCN Solution/Mixture	1.2 mL
	Congener #	
2-Chloronaphthalene	*2*	5.00 µg/mL
1,5-Dichloronaphthalene	*6*	5.00 µg/mL
1,2,3-Trichloronaphthalene	*13*	5.00 µg/mL
1,2,3,5-Tetrachloronaphthalene	*28*	5.00 µg/mL
1,2,3,5,7-Pentachloronaphthalene	*52*	5.00 µg/mL
1,2,3,4,6,7-Hexachloronaphthalene	*66*	5.00 µg/mL
1,2,3,4,5,6,7-Heptachloronaphthalene	*73*	5.00 µg/mL
Octachloronaphthalene	*75*	5.00 µg/mL
PCN-MXC	Native PCN Solution/Mixture	1.2 mL
	Congener #	
1,2,3,4-Tetrachloronaphthalene	*27*	5.00 µg/mL
1,2,5,6-Tetrachloronaphthalene	*36*	5.00 µg/mL
1,4,5,8-Tetrachloronaphthalene	*46*	4.80 µg/mL
2,3,6,7-Tetrachloronaphthalene	*48*	5.00 µg/mL
1,2,3,4,6-Pentachloronaphthalene	*50*	5.00 µg/mL
1,2,3,5,8-Pentachloronaphthalene	*53*	5.00 µg/mL
1,2,3,5,7,8-Hexachloronaphthalene	*69*	5.00 µg/mL
1,2,4,5,7,8-Hexachloronaphthalene	*72*	5.00 µg/mL
PCN-WD	PCN Window Defining Solution/Mixture	1.2 mL
	Congener #	
1-Chloronaphthalene	*1*	2.00 µg/mL
2-Chloronaphthalene	*2*	2.00 µg/mL
1,3-Dichloronaphthalene	*4*	2.00 µg/mL
1,2,8-Trichloronaphthalene	*18*	2.00 µg/mL
1,3,6-Trichloronaphthalene	*20*	2.00 µg/mL
1,2,7,8-Tetrachloronaphthalene	*41*	2.00 µg/mL
1,3,5,7-Tetrachloronaphthalene	*42*	2.00 µg/mL
1,2,3,5,7-Pentachloronaphthalene	*52*	2.00 µg/mL
1,2,3,7,8-Pentachloronaphthalene	*56*	2.00 µg/mL
1,2,3,4,6,7-Hexachloronaphthalene	*66*	2.00 µg/mL
1,2,3,6,7,8-Hexachloronaphthalene	*70*	2.00 µg/mL
1,2,3,4,5,6,7-Heptachloronaphthalene	*73*	2.00 µg/mL
1,2,3,4,5,6,8-Heptachloronaphthalene	*74*	2.00 µg/mL
Octachloronaphthalene	*75*	2.00 µg/mL

NATIVE POLYCHLORINATED NAPHTHALENES: SOLUTION/MIXTURES

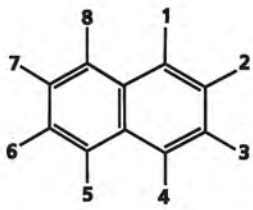
Catalogue Number	Product (nonane solution)	Qty/Conc
PCN-HWX	PCN Major Halowax Congeners Solution/Mixture	1.2 mL
	Congener #	
1-Chloronaphthalene	*1*	2.00 µg/mL
1,4-Dichloronaphthalene	*5*	2.00 µg/mL
1,4,5-Trichloronaphthalene	*23*	2.00 µg/mL
1,4,6-Trichloronaphthalene	*24*	2.00 µg/mL
1,2,4,6-Tetrachloronaphthalene	*33*	2.00 µg/mL
1,2,6,8-Tetrachloronaphthalene	*40*	2.00 µg/mL
1,2,4,5,8-Pentachloronaphthalene	*59*	2.00 µg/mL
1,2,4,5,7,8-Hexachloronaphthalene	*72*	2.00 µg/mL
1,2,3,4,5,6,8-Heptachloronaphthalene	*74*	2.00 µg/mL
Octachloronaphthalene	*75*	2.00 µg/mL
PCN-INC	PCN Major Incineration Congeners Solution/Mixture	1.2 mL
	Congener #	
2-Chloronaphthalene	*2*	2.00 µg/mL
2,7-Dichloronaphthalene	*12*	2.00 µg/mL
1,2,3-Trichloronaphthalene	*13*	2.00 µg/mL
1,2,7-Trichloronaphthalene	*17*	2.00 µg/mL
1,2,3,5-Tetrachloronaphthalene	*28*	2.00 µg/mL
1,2,4,7-Tetrachloronaphthalene	*34*	2.00 µg/mL
1,2,3,6,7-Pentachloronaphthalene	*54*	2.00 µg/mL
1,2,3,5,7,8-Hexachloronaphthalene	*69*	2.00 µg/mL
1,2,3,4,5,6,7-Heptachloronaphthalene	*73*	2.00 µg/mL
Octachloronaphthalene	*75*	2.00 µg/mL
PCN-TOX	PCN Potentially Toxic Congeners Solution/Mixture	1.2 mL
	Congener #	
2,3,6,7-Tetrachloronaphthalene	*48*	2.00 µg/mL
1,2,3,6,7-Pentachloronaphthalene	*54*	2.00 µg/mL
1,2,3,4,6,7-Hexachloronaphthalene	*66*	2.00 µg/mL
1,2,3,5,7,8-Hexachloronaphthalene	*69*	2.00 µg/mL
1,2,3,6,7,8-Hexachloronaphthalene	*70*	2.00 µg/mL
1,2,3,4,5,6,7-Heptachloronaphthalene	*73*	2.00 µg/mL

NATIVE POLYCHLORINATED NAPHTHALENES (PCNs)

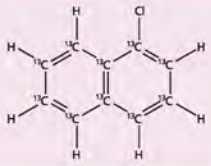
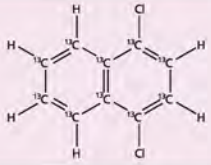
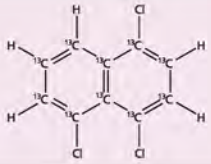
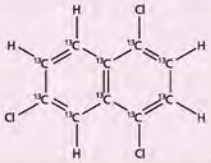
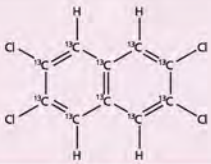
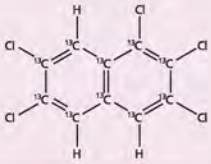
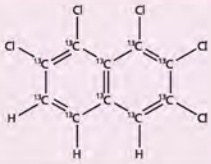
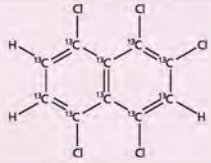
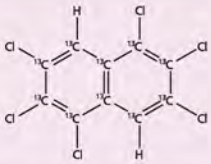
Catalogue Number	Product (nonane solution)	Qty/Conc	
PN-1S	1-Chloronaphthalene	1.2 mL	50.0 µg/mL
PN-2S	2-Chloronaphthalene	1.2 mL	50.0 µg/mL
PN-4S	1,3-Dichloronaphthalene	1.2 mL	50.0 µg/mL
PN-5S	1,4-Dichloronaphthalene	1.2 mL	50.0 µg/mL
PN-6S	1,5-Dichloronaphthalene	1.2 mL	50.0 µg/mL
PN-9S	1,8-Dichloronaphthalene	1.2 mL	50.0 µg/mL
PN-12S	2,7-Dichloronaphthalene	1.2 mL	50.0 µg/mL
PN-13S	1,2,3-Trichloronaphthalene	1.2 mL	50.0 µg/mL
PN-17S	1,2,7-Trichloronaphthalene	1.2 mL	50.0 µg/mL
PN-18S	1,2,8-Trichloronaphthalene	1.2 mL	50.0 µg/mL
PN-19S	1,3,5-Trichloronaphthalene	1.2 mL	50.0 µg/mL
PN-20S	1,3,6-Trichloronaphthalene	1.2 mL	50.0 µg/mL
PN-21S	1,3,7-Trichloronaphthalene	1.2 mL	50.0 µg/mL
PN-23S	1,4,5-Trichloronaphthalene	1.2 mL	50.0 µg/mL
PN-24S	1,4,6-Trichloronaphthalene	1.2 mL	50.0 µg/mL
PN-27S	1,2,3,4-Tetrachloronaphthalene	1.2 mL	50.0 µg/mL
PN-28S	1,2,3,5-Tetrachloronaphthalene	1.2 mL	50.0 µg/mL
PN-31S	1,2,3,8-Tetrachloronaphthalene	1.2 mL	50.0 µg/mL
PN-33S	1,2,4,6-Tetrachloronaphthalene	1.2 mL	50.0 µg/mL
PN-34S	1,2,4,7-Tetrachloronaphthalene	1.2 mL	50.0 µg/mL
PN-35S	1,2,4,8-Tetrachloronaphthalene	1.2 mL	50.0 µg/mL
PN-36S	1,2,5,6-Tetrachloronaphthalene	1.2 mL	50.0 µg/mL



Catalogue Number	Product (nonane solution)	Qty/Conc	
PN-37S	1,2,5,7-Tetrachloronaphthalene	1.2 mL	50.0 µg/mL
PN-40S	1,2,6,8-Tetrachloronaphthalene	1.2 mL	50.0 µg/mL
PN-41S	1,2,7,8-Tetrachloronaphthalene	1.2 mL	50.0 µg/mL
PN-42S	1,3,5,7-Tetrachloronaphthalene	1.2 mL	50.0 µg/mL
PN-46S	1,4,5,8-Tetrachloronaphthalene (96% pure)	1.2 mL	48.0 µg/mL
PN-48S	2,3,6,7-Tetrachloronaphthalene	1.2 mL	50.0 µg/mL
PN-50S	1,2,3,4,6-Pentachloronaphthalene	1.2 mL	50.0 µg/mL
PN-52S	1,2,3,5,7-Pentachloronaphthalene	1.2 mL	50.0 µg/mL
PN-53S	1,2,3,5,8-Pentachloronaphthalene	1.2 mL	50.0 µg/mL
PN-54S	1,2,3,6,7-Pentachloronaphthalene	1.2 mL	50.0 µg/mL
PN-56S	1,2,3,7,8-Pentachloronaphthalene	1.2 mL	50.0 µg/mL
PN-57S	1,2,4,5,6-Pentachloronaphthalene	1.2 mL	50.0 µg/mL
PN-59S	1,2,4,5,8-Pentachloronaphthalene	1.2 mL	50.0 µg/mL
PN-63S	1,2,3,4,5,6-Hexachloronaphthalene	1.2 mL	50.0 µg/mL
PN-66S	1,2,3,4,6,7-Hexachloronaphthalene	1.2 mL	50.0 µg/mL
PN-68S	1,2,3,5,6,8-Hexachloronaphthalene	1.2 mL	50.0 µg/mL
PN-69S	1,2,3,5,7,8-Hexachloronaphthalene	1.2 mL	50.0 µg/mL
PN-70S	1,2,3,6,7,8-Hexachloronaphthalene	1.2 mL	50.0 µg/mL
PN-72S	1,2,4,5,7,8-Hexachloronaphthalene	1.2 mL	50.0 µg/mL
PN-73S	1,2,3,4,5,6,7-Heptachloronaphthalene	1.2 mL	50.0 µg/mL
PN-74S	1,2,3,4,5,6,8-Heptachloronaphthalene	1.2 mL	50.0 µg/mL
PN-75S	Octachloronaphthalene	1.2 mL	50.0 µg/mL

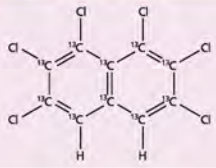
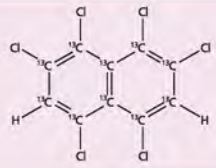
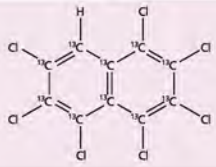
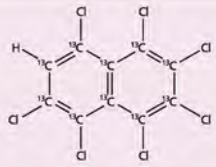
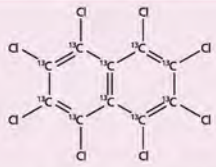


MASS-LABELLED POLYCHLORINATED NAPHTHALENES (PCNs)

Catalogue Number		Product
MPN-1		1-Chloro($^{13}C_{10}$)naphthalene 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MPN-5		1,4-Dichloro($^{13}C_{10}$)naphthalene 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MPN-23		1,4,5-Trichloro($^{13}C_{10}$)naphthalene 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MPN-24		1,4,6-Trichloro($^{13}C_{10}$)naphthalene 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MPN-48		2,3,6,7-Tetrachloro($^{13}C_{10}$)naphthalene 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MPN-54		1,2,3,6,7-Pentachloro($^{13}C_{10}$)naphthalene 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MPN-56		1,2,3,7,8-Pentachloro($^{13}C_{10}$)naphthalene 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MPN-59		1,2,4,5,8-Pentachloro($^{13}C_{10}$)naphthalene 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MPN-67		1,2,3,5,6,7-Hexachloro($^{13}C_{10}$)naphthalene 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane

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

MASS-LABELLED POLYCHLORINATED NAPHTHALENES (PCNs)

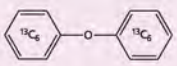
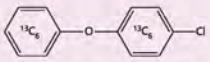
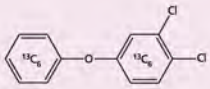
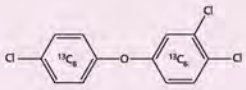
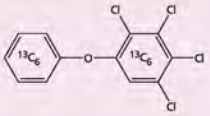
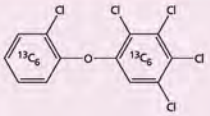
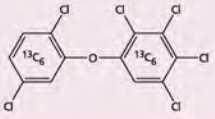
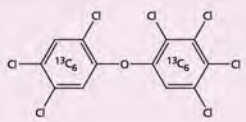
Catalogue Number		Product
MPN-70		1,2,3,6,7,8-Hexachloro($^{13}C_{10}$)naphthalene 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MPN-72		1,2,4,5,7,8-Hexachloro($^{13}C_{10}$)naphthalene 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MPN-73		1,2,3,4,5,6,7-Heptachloro($^{13}C_{10}$)naphthalene 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MPN-74		1,2,3,4,5,6,8-Heptachloro($^{13}C_{10}$)naphthalene 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MPN-75		Octachloro($^{13}C_{10}$)naphthalene 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane

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

NATIVE POLYCHLORINATED DIPHENYL ETHERS (PCDEs)

Catalogue Number	Product (nonane solution)	Qty/Conc	
DPE-0	Diphenyl ether	1.2 mL	50.0 µg/mL
DPE-3	4-Chlorodiphenyl ether	1.2 mL	50.0 µg/mL
DPE-15	4,4'-Dichlorodiphenyl ether	1.2 mL	50.0 µg/mL
DPE-28	2,4,4'-Trichlorodiphenyl ether	1.2 mL	50.0 µg/mL
DPE-74	2,4,4',5-Tetrachlorodiphenyl ether	1.2 mL	50.0 µg/mL
DPE-77	3,3',4,4'-Tetrachlorodiphenyl ether	1.2 mL	50.0 µg/mL
DPE-99	2,2',4,4',5-Pentachlorodiphenyl ether	1.2 mL	50.0 µg/mL
DPE-209	Decachlorodiphenyl ether	1.2 mL	50.0 µg/mL

MASS-LABELLED POLYCHLORINATED DIPHENYL ETHERS (PCDEs)

Catalogue Number		Product
MCDE-0		($^{13}C_{12}$)Diphenyl ether 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MCDE-3		4-Chloro($^{13}C_{12}$)diphenyl ether 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MCDE-12		3,4-Dichloro($^{13}C_{12}$)diphenyl ether 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MCDE-37		3,4,4'-Trichloro($^{13}C_{12}$)diphenyl ether 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MCDE-61		2,3,4,5-Tetrachloro($^{13}C_{12}$)diphenyl ether 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MCDE-86		2,2',3,4,5-Pentachloro($^{13}C_{12}$)diphenyl ether 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MCDE-141		2,2',3,4,5,5'-Hexachloro($^{13}C_{12}$)diphenyl ether 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MCDE-180		2,2',3,4,4',5,5'-Heptachloro($^{13}C_{12}$)diphenyl ether 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane

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

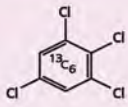
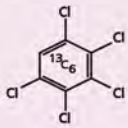
NATIVE CHLOROBENZENES: SOLUTION/MIXTURE

Catalogue Number	Product (isooctane solution)	Qty/Conc
CBS	Native Chlorobenzene Solution/Mixture	1.2 mL
	Chlorobenzene	100 µg/mL
	1,2-Dichlorobenzene	100 µg/mL
	1,3-Dichlorobenzene	100 µg/mL
	1,4-Dichlorobenzene	100 µg/mL
	1,2,3-Trichlorobenzene	100 µg/mL
	1,2,4-Trichlorobenzene	100 µg/mL
	1,3,5-Trichlorobenzene	100 µg/mL
	1,2,3,4-Tetrachlorobenzene	100 µg/mL
	1,2,3,5-Tetrachlorobenzene	100 µg/mL
	1,2,4,5-Tetrachlorobenzene	100 µg/mL
	Pentachlorobenzene	100 µg/mL
	Hexachlorobenzene	100 µg/mL

MASS-LABELLED CHLOROBENZENES: SOLUTION/MIXTURE

Catalogue Number	Product (isooctane solution)	Qty/Conc
MCBS	Mass-Labelled Chlorobenzene Solution/Mixture	1.2 mL
	Chloro($^{13}C_6$)benzene	100 µg/mL
	1,4-Dichloro($^{13}C_6$)benzene	100 µg/mL
	1,2,3-Trichloro($^{13}C_6$)benzene	100 µg/mL
	1,2,3,4-Tetrachloro($^{13}C_6$)benzene	100 µg/mL
	Pentachloro($^{13}C_6$)benzene	100 µg/mL
	Hexachloro($^{13}C_6$)benzene	100 µg/mL

MASS-LABELLED CHLOROBENZENES

Catalogue Number		Product
MBZ-1235		1,2,3,5-Tetrachloro($^{13}C_6$)benzene 1.2 mL; 100 µg/mL (±5.0 µg/mL); in isooctane
MCBZ-12345		1,2,3,4,5-Pentachloro($^{13}C_6$)benzene 1.2 mL; 100 µg/mL (±5.0 µg/mL); in isooctane

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



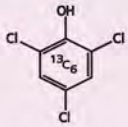
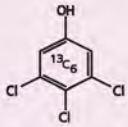
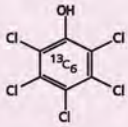
NATIVE CHLOROPHENOLS: SOLUTION/MIXTURE

Catalogue Number	Product (isooctane solution)	Qty/Conc
CPS	Native Chlorophenol Solution/Mixture	1.2 mL
	2-Chlorophenol	100 µg/mL
	3-Chlorophenol	100 µg/mL
	4-Chlorophenol	100 µg/mL
	2,3-Dichlorophenol	100 µg/mL
	2,4-Dichlorophenol	100 µg/mL
	2,5-Dichlorophenol	100 µg/mL
	2,6-Dichlorophenol	100 µg/mL
	3,4-Dichlorophenol	100 µg/mL
	3,5-Dichlorophenol	100 µg/mL
	2,3,4-Trichlorophenol	100 µg/mL
	2,3,5-Trichlorophenol	100 µg/mL
	2,3,6-Trichlorophenol	100 µg/mL
	2,4,5-Trichlorophenol	100 µg/mL
	2,4,6-Trichlorophenol	100 µg/mL
	3,4,5-Trichlorophenol	100 µg/mL
	2,3,4,5-Tetrachlorophenol	100 µg/mL
	2,3,4,6-Tetrachlorophenol	100 µg/mL
	2,3,5,6-Tetrachlorophenol	100 µg/mL
	Pentachlorophenol	100 µg/mL

MASS-LABELLED CHLOROPHENOLS: SOLUTION/MIXTURE

Catalogue Number	Product (isooctane solution)	Qty/Conc
MCPS	Mass-Labelled Chlorophenol Solution/Mixture	1.2 mL
	4-Chloro($^{13}C_6$)phenol	100 µg/mL
	2,4-Dichloro($^{13}C_6$)phenol	100 µg/mL
	2,4,5-Trichloro($^{13}C_6$)phenol	100 µg/mL
	2,3,4,5-Tetrachloro($^{13}C_6$)phenol	100 µg/mL
	Pentachloro($^{13}C_6$)phenol	100 µg/mL

MASS-LABELLED CHLOROPHENOLS

Catalogue Number		Product
MCP-246		2,4,6-Trichloro($^{13}C_6$)phenol 1.2 mL; 100 µg/mL (±5.0 µg/mL); in isooctane
MCP-345		3,4,5-Trichloro($^{13}C_6$)phenol 1.2 mL; 100 µg/mL (±5.0 µg/mL); in isooctane
MCP-23456		Pentachloro($^{13}C_6$)phenol 1.2 mL; 100 µg/mL (±5.0 µg/mL); in isooctane

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

NATIVE MELAMINE AND CYANURIC ACID

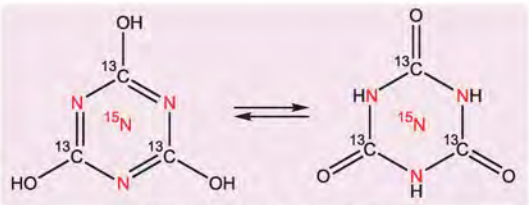
Catalogue Number	Product (water solution)	Qty/Conc	
MEL	Melamine	1.2 mL	100 µg/mL
CYA	Cyanuric Acid	1.2 mL	100 µg/mL

MASS-LABELLED MELAMINE

Catalogue Number	Product (water solution)	Qty/Conc	
M3-MEL	($^{13}C_3$)Melamine	1.2 mL	100 µg/mL

MASS-LABELLED CYANURIC ACID

Catalogue Number	Product (water solution)	Qty/Conc	
M3-CYA	($^{13}C_3$)Cyanuric Acid	1.2 mL	100 µg/mL
M6-CYA	($^{13}C_3$,$^{15}N_3$)Cyanuric Acid	1.2 mL	100 µg/mL

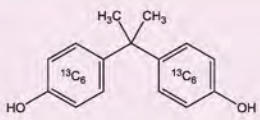


($^{13}C_3$,$^{15}N_3$)Cyanuric Acid

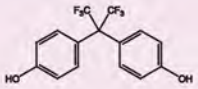
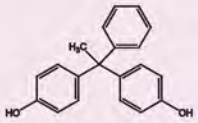
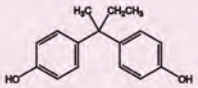
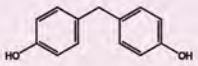
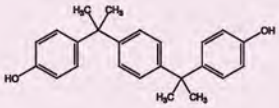
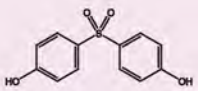
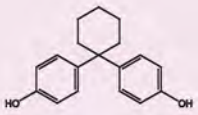
NATIVE BISPHENOL-A

Catalogue Number	Product (methanol solution)	Qty/Conc
BPA	2,2-Bis(4-hydroxyphenyl)propane	1.2 mL 50.0 µg/mL

MASS-LABELLED BISPHENOL-A

Catalogue Number		Product
MBPA		2,2-Bis[4-hydroxy-($^{13}C_6$)-phenyl]propane 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol; isotopic purity 99% or greater ($^{13}C_{12}$-rings)

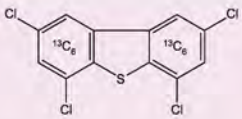
NATIVE BISPHENOL ANALOGUES

Catalogue Number		Product
BPAF		2,2-Bis(4-hydroxyphenyl)hexafluoropropane 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol
BPAP		4,4'-(1-Phenylethylidene)bisphenol 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol
BPB		2,2-Bis(4-hydroxyphenyl)butane 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol
BPF		4,4'-Dihydroxydiphenylmethane 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol
BPP		4,4'-(1,4-Phenylenediisopropylidene)bisphenol 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol
BPS		Bis(4-hydroxyphenyl) sulfone 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol
BPZ		1,1-Bis(4-hydroxyphenyl)cyclohexane 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in methanol

NATIVE TETRACHLORODIBENZOTHIOPHENES

Catalogue Number	Product (toluene solution)	Qty/Conc	
TCDT-83	2,3,7,8-Tetrachlorodibenzothiophene	1.2 mL	50.0 µg/mL
TCDT-85	2,4,6,8-Tetrachlorodibenzothiophene	1.2 mL	50.0 µg/mL

MASS-LABELLED TETRACHLORODIBENZOTHIOPHENE

Catalogue Number		Product
MTCDT-85		2,4,6,8-Tetrachloro($^{13}C_{12}$)dibenzothiophene 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in toluene; isotopic purity 99% or greater

NATIVE CHLORINATED CARBAZOLES

Catalogue Number	Product (nonane solution)	Qty/Conc	
CCZ-3	3-Chloro-9H-carbazole	1.2 mL	50.0 µg/mL
CCZ-36	3,6-Dichloro-9H-carbazole	1.2 mL	50.0 µg/mL
CCZ-1368	1,3,6,8-Tetrachloro-9H-carbazole	1.2 mL	50.0 µg/mL
CCZ-2367	2,3,6,7-Tetrachloro-9H-carbazole	1.2 mL	50.0 µg/mL

NATIVE BROMINATED CARBAZOLES

Catalogue Number	Product (nonane solution)	Qty/Conc	
BCZ-3	3-Bromo-9H-carbazole	1.2 mL	50.0 µg/mL
BCZ-27	2,7-Dibromo-9H-carbazole	1.2 mL	50.0 µg/mL
BCZ-36	3,6-Dibromo-9H-carbazole	1.2 mL	50.0 µg/mL
BCZ-136	1,3,6-Tribromo-9H-carbazole	1.2 mL	50.0 µg/mL
BCZ-1368	1,3,6,8-Tetrabromo-9H-carbazole	1.2 mL	50.0 µg/mL

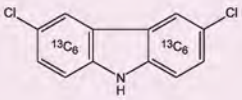
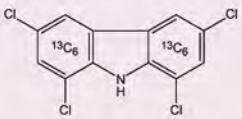
NATIVE BROMO/CHLORO CARBAZOLES

Catalogue Number	Product (nonane solution)	Qty/Conc	
1-B-36-CCZ	1-Bromo-3,6-dichloro-9H-carbazole	1.2 mL	50.0 µg/mL
18-B-36-CCZ	1,8-Dibromo-3,6-dichloro-9H-carbazole	1.2 mL	50.0 µg/mL

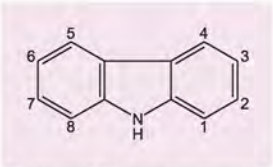
NATIVE HALOGENATED CARBAZOLES: SOLUTION/MIXTURE

Catalogue Number	Product (nonane solution)		Qty/Conc
CBCZ-MXB	Native Halogenated Carbazoles Solution/Mixture		1.2 mL
	3-Chloro-9H-carbazole	CCZ-3	2.50 µg/mL
	3,6-Dichloro-9H-carbazole	CCZ-36	2.50 µg/mL
	1,3,6,8-Tetrachloro-9H-carbazole	CCZ-1368	2.50 µg/mL
	2,3,6,7-Tetrachloro-9H-carbazole	CCZ-2367	2.50 µg/mL
	3-Bromo-9H-carbazole	BCZ-3	2.50 µg/mL
	2,7-Dibromo-9H-carbazole	BCZ-27	2.50 µg/mL
	3,6-Dibromo-9H-carbazole	BCZ-36	2.50 µg/mL
	1,3,6-Tribromo-9H-carbazole	BCZ-136	2.50 µg/mL
	1,3,6,8-Tetrabromo-9H-carbazole	BCZ-1368	2.50 µg/mL
	1-Bromo-3,6-dichloro-9H-carbazole	1-B-36-CCZ	2.50 µg/mL
	1,8-Dibromo-3,6-dichloro-9H-carbazole	18-B-36-CCZ	2.50 µg/mL

MASS-LABELLED CHLORINATED CARBAZOLES

Catalogue Number		Product
MCCZ-36		3,6-Dichloro-9H-($^{13}C_{12}$)carbazole 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane
MCCZ-1368		1,3,6,8-Tetrachloro-9H-($^{13}C_{12}$)carbazole 1.2 mL; 50.0 µg/mL (±2.5 µg/mL); in nonane

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



General Structure and
Numbering System for Carbazoles

In order to keep up-to-date on new releases from Wellington Laboratories Inc., please visit our website at www.well-labs.com.

New Products are announced in the Wellington Reporter.



Elora Mill
Elora, Ontario

APPENDIX

Some of the information provided in this Appendix can also be found in our **Reference and Handling Guide: GC/MS Characterization and Analysis of Selected Halogenated Aromatic Compounds**, which is available separately in hard copy and is also posted on our website. On the following pages you will find:

Guidelines for the Use and Handling of Wellington Products

General Structure and Numbering System of Selected Aromatic Hydrocarbons

Number of Possible Isomers for Selected Halogenated Aromatic Compounds

Molecular Weights for Selected Chlorinated and Brominated Aromatic Hydrocarbons

Exact Mass & Relative Ion Abundance of Selected Chlorinated Aromatic Hydrocarbons

Molecular Ion Clusters for Chlorinated Aromatic Hydrocarbons & Brominated Aromatic Hydrocarbons

Exact Mass & Relative Ion Abundance of Selected Brominated Aromatic Hydrocarbons

Systematic Numbering of Chlorinated Dibenzo-*p*-dioxins, Chlorinated Dibenzofurans, Chlorinated Biphenyls, and Chlorinated Naphthalenes

We also have a **Reference and Handling Guide for Perfluoroalkyl Compounds**, which can be downloaded from our website, and a **Quick Reference Guide for Perfluoroalkyl Compounds**, available in hard copy.

If you would like to receive copies of either Reference Guide, please contact us or one of our distributors. In addition, if you have suggestions for future guides, please contact us.





GUIDELINES FOR THE USE AND HANDLING OF WELLINGTON PRODUCTS

HAZARDS

The majority of our products are halogenated aromatic hydrocarbons in solution in organic solvents such as nonane, toluene and isooctane. Although the maximum concentration is 100 µg/mL, that is 0.01% (w/v), these compounds must be considered toxic and potentially carcinogenic and should be handled accordingly.

With all of our products due care should be exercised to prevent human contact and ingestion. The absence of a toxicity warning for any of our products must not be interpreted as an indication that there is no possible health hazard.



NOTE:
THESE MATERIALS SHOULD ONLY BE USED BY PERSONNEL TRAINED IN THE HANDLING OF HAZARDOUS CHEMICALS.
ALL PROCEDURES SHOULD BE PERFORMED IN A FUME HOOD AND SUITABLE GLOVES, EYE PROTECTION AND CLOTHING SHOULD BE WORN AT ALL TIMES.

RECEIPT, INSPECTION, HANDLING AND STORAGE

Unless crystalline material is provided, all of our reference standard solutions come in flame-sealed, pre-scored amber glass ampoules. Upon receipt, inspect the ampoules for breakage and leakage, and then store them upright until needed. The ampoules can be stored at ambient temperature until opened unless other storage requirements are stated on the Certificate of Analysis.

Prior to opening, allow the solution to drain into the bottom of the ampoule, lightly tapping the ampoule if necessary. Using the plastic ampoule collar provided, hold the ampoule upright and snap the top off, breaking away from the body.

Transfer the solution to an amber glass container that can be tightly sealed for storage. To prevent evaporation of the solvent, it is suggested that this solution, and subsequent mixtures and/or dilutions, be stored at refrigerator temperatures.

DISPOSAL

All waste materials generated during the use of these solutions should be treated as hazardous in accordance with national and regional regulations. A licensed disposal company should be employed. Some options for the destruction of these materials include high temperature incineration, photolysis, or chemical treatment using reagents such as sodium naphthalene or KPEG reagent. Literature references for some of these methods can be provided upon request.

ACCURACY

All of our stock solutions are prepared from crystalline material that has been well characterized as to its structure and purity.

The crystalline material is weighed using microbalances whose calibration is verified using external weights traceable to an ISO/IEC 17025 accredited laboratory. Solutions are prepared by completely dissolving the crystalline material in ultrapure, distilled-in-glass solvents. The volumetric flasks and pipets used for individual stock solution preparation and subsequent mixtures and/or dilutions are all of Class A tolerance and calibrated and traceable to an ISO/IEC 17025 accredited laboratory.

The maximum percent relative combined uncertainty for solution preparation is calculated to be ±5%.

INTERLABORATORY CERTIFICATION

Wellington continues to submit its standards for independent interlaboratory testing and certification. Since 1991, our standards have been tested over 30 international round-robins.

To date, solutions of the compounds listed below have been repeatedly tested and the approximate total number of analyses are given.

- 2,3,7,8-substituted PCDDs and PCDFs.....1750 HRMS analyses
- Dioxin-like (WHO) PCB congeners .....1200 HRMS analyses
- PBDEs .....350 HRMS analyses
- PFCs .....350 LCMS analyses

The overall averages of the data received for all of the compounds were found to be well within ±10% of the design values.

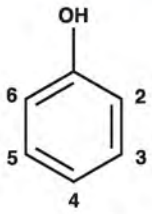
EXPIRY DATE/SHELF LIFE

In order to accurately determine the shelf life of products such as ours, testing must reveal significant degradation or loss in concentration of the particular analyte. In comparing freshly prepared solutions to older solutions by GC/MS or LC/MS, we have not detected any significant changes. Many of these older solutions were prepared and ampouled more than 15 years ago. Thus our stability studies, as they should, remain ongoing.

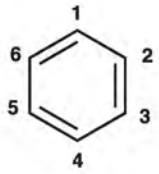
For our products where the expiry date on the CofA states, "stability studies ongoing", we consider that our reference standard solutions retain their accuracy for a period of 5 years from delivery in the unopened ampoule.

NOTE: The predominant degradation pathway for our compounds is likely photolysis and thus protection from light is critical.

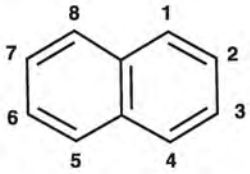




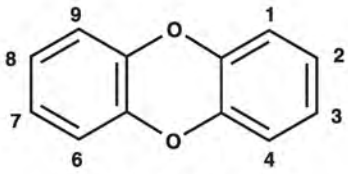
phenol



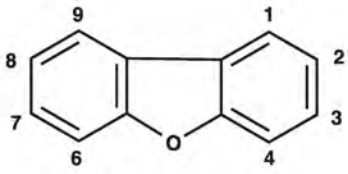
benzene



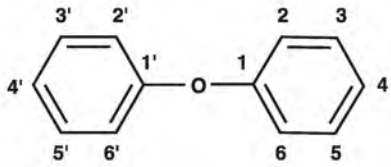
naphthalene



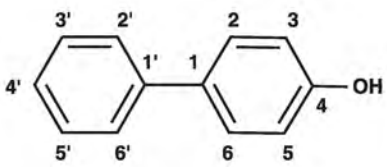
dibenzo-*p*-dioxin



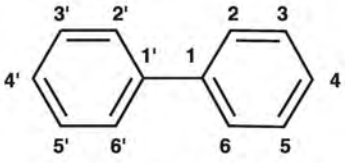
dibenzofuran



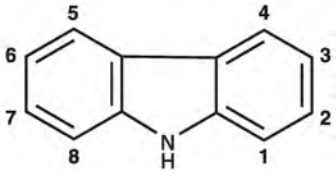
diphenyl ether



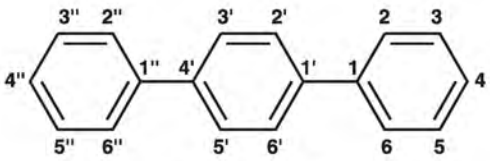
4-hydroxybiphenyl



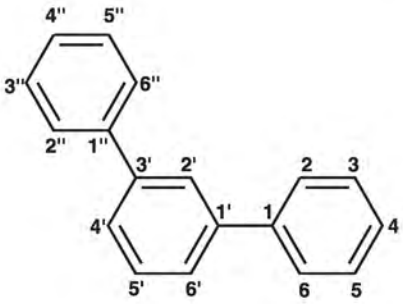
biphenyl



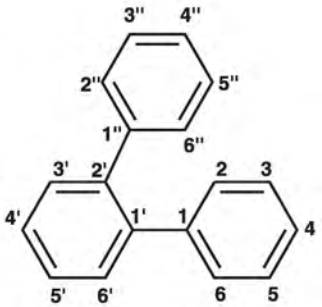
carbazole



p-terphenyl



m-terphenyl



o-terphenyl

NUMBER OF POSSIBLE ISOMERS FOR SELECTED HALOGENATED AROMATIC COMPOUNDS

# of X	Terphenyl			Biphenyl	Biphenylol	Dibenzo-*p*-dioxin	Dibenzofuran	Naphthalene	Benzene	Phenol
	ortho	meta	para							
1	5	6	4	3	19	2	4	2	1	3
2	28	28	21	12	64	10	16	10	3	6
3	80	87	55	24	136	14	28	14	3	6
4	211	211	139	42	198	22	38	22	3	3
5	355	382	226	46	198	14	28	14	1	1
6	544	544	351	42	136	10	16	10	1	
7	596	638	358	24	64	2	4	2		
8	544	544	351	12	19	1	1	1		
9	355	382	226	3	3					
10	211	211	139	1						
11	80	87	55							
12	28	28	21							
13	5	6	4							
14	1	1	1							

X = Halogen (does not apply to mixed halogenated compounds)
For diphenyl ethers use the biphenyl values

MOLECULAR WEIGHTS FOR SELECTED CHLORINATED AND BROMINATED AROMATIC HYDROCARBONS

# of Cl/Br	PCTs	PCBs	PCDEs	PCDDs	PCDFs	PCNs	CBs	CPs	PBBs	PBDEs	PBDDs	PBDFs
0	230.31	154.21	170.21	184.19	168.19	128.17	78.11	94.11	154.21	170.21	184.19	168.19
1	264.75	188.66	204.66	218.64	202.64	162.62	112.56	128.56	233.11	249.11	263.09	247.09
2	299.20	223.10	239.10	253.08	237.09	197.06	147.00	163.00	312.00	328.00	341.99	325.99
3	333.64	257.55	273.55	287.53	271.53	231.51	181.45	197.45	390.90	406.90	420.88	404.88
4	368.09	291.99	307.99	321.97	305.98	265.95	215.89	231.89	469.80	485.80	499.78	483.78
5	402.53	326.44	342.44	356.42	340.42	300.40	250.34	266.34	548.69	564.69	578.67	562.68
6	436.98	360.88	376.88	390.86	374.87	334.84	284.78		627.59	643.59	657.57	641.57
7	471.42	395.33	411.33	425.31	409.31	369.29			706.48	722.48	736.47	720.47
8	505.87	429.77	445.77	459.75	443.76	403.73			785.38	801.38	815.36	799.36
9	540.31	464.22	480.22						864.28	880.28		
10	574.76	498.66	514.66						943.17	959.17		
11	609.20											
12	643.65											
13	678.09											
14	712.54											

Note: The molecular weight for PCHBs ($C_{12}H_{9-n}Cl_nOH$) is the same as the PCDEs ($C_{12}H_{10-n}Cl_nO$), but the maximum # of Chlorines is one less for the PCHBs.

PCTs = polychlorinated terphenyls, **PCBs** = polychlorinated biphenyls, **PCDEs** = polychlorinated diphenyl ethers
PCHBs = polychlorinated hydroxybiphenyls (biphenylols), **PCDDs** = polychlorinated dibenzo-*p*-dioxins,
PCDFs = polychlorinated dibenzofurans, **PCNs** = polychlorinated naphthalenes, **CBs** = chlorobenzenes, **CPs** = chlorophenols,
PBBs = polybrominated biphenyls, **PBDEs** = polybrominated diphenyl ethers,
PBDDs = polybrominated dibenzo-*p*-dioxins, **PBDFs** = polybrominated dibenzofurans



EXACT MASS & RELATIVE ION ABUNDANCE OF SELECTED CHLORINATED AROMATIC HYDROCARBONS

	PCTs			PCBs			PCHBs			PCDDs		
	$^{12}C_{18}$	$C_{18}H_{14-n}Cl_n$	$^{13}C_{18}$	$^{12}C_{12}$	$C_{12}H_{10-n}Cl_n$	$^{13}C_{12}$	$^{12}C_{12}$	$C_{12}H_{9-n}Cl_nOH$	$^{13}C_{12}$	$^{12}C_{12}$	$C_{12}H_{8-n}Cl_nO_2$	$^{13}C_{12}$
# of Cl	Exact Mass	Relative Abundance	Exact Mass	Exact Mass	Relative Abundance	Exact Mass	Exact Mass	Relative Abundance	Exact Mass	Exact Mass	Relative Abundance	Exact Mass
0	230.1096	100	248.1699	154.0783	100	166.1185	170.0732	100	182.1134	184.0524	100	196.0927
1	264.0706	100	282.1310	188.0393	100	200.0795	204.0342	100	216.0745	218.0135	100	230.0537
	266.0676	34.4	284.1280	190.0363	33.2	202.0766	206.0312	33.5	218.0715	220.0105	33.7	232.0508
2	298.0316	100	316.0920	222.0003	100	234.0406	237.9952	100	250.0355	251.9745	100	264.0147
	300.0287	66.8	318.0890	223.9974	65.6	236.0376	239.9923	65.9	252.0325	253.9715	66.1	266.0118
	302.0257	11.8	320.0861	225.9944	11.0	238.0347	241.9893	11.2	254.0296	255.9686	11.3	268.0088
3	331.9926	100	350.0530	255.9613	100	268.0016	271.9562	100	283.9965	285.9355	100	297.9758
	333.9897	99.2	352.0501	257.9584	98.0	269.9986	273.9533	98.2	285.9936	287.9326	98.5	299.9728
	335.9867	33.4	354.0471	259.9554	32.3	271.9957	275.9503	32.5	287.9906	289.9296	32.7	301.9699
	337.9838	4.0	356.0442	261.9525	3.7	273.9927	277.9474	3.7	289.9877	291.9267	3.8	303.9669
4	365.9537	76.0	384.0141	289.9224	76.7	301.9626	305.9173	76.5	317.9575	319.8965	76.4	331.9368
	367.9507	100	386.0111	291.9194	100	303.9597	307.9143	100	319.9546	321.8936	100	333.9339
	369.9478	49.8	388.0082	293.9165	49.1	305.9567	309.9114	49.3	321.9516	323.8906	49.4	335.9309
	371.9448	11.3	390.0052	295.9135	10.8	307.9538	311.9084	10.9	323.9487	325.8877	11.0	337.9280
5	399.9147	61.0	417.9751	323.8834	61.4	335.9237	339.8783	61.3	351.9186	353.8576	61.3	365.8978
	401.9117	100	419.9721	325.8804	100	337.9207	341.8754	100	353.9156	355.8546	100	367.8949
	403.9088	66.0	421.9692	327.8775	65.3	339.9178	343.8724	65.4	355.9127	357.8517	65.5	369.8919
	405.9058	22.0	423.9662	329.8745	21.4	341.9148	345.8695	21.5	357.9097	359.8487	21.6	371.8890
6	433.8757	50.9	451.9361	357.8444	51.2	369.8847	373.8393	51.2	385.8796	387.8186	51.1	399.8589
	435.8728	100	453.9332	359.8415	100	371.8817	375.8364	100	387.8766	389.8156	100	401.8559
	437.8698	82.1	455.9302	361.8385	81.5	373.8788	377.8334	81.6	389.8737	391.8127	81.7	403.8530
	439.8669	36.2	457.9273	363.8356	35.5	375.8758	379.8305	35.6	391.8707	393.8097	35.8	405.8500
7	467.8367	43.7	485.8971	391.8054	43.9	403.8457	407.8004	43.9	419.8406	421.7796	43.9	433.8199
	469.8338	100	487.8942	393.8025	100	405.8428	409.7974	100	421.8377	423.7767	100	435.8169
	471.8308	98.3	489.8912	395.7995	97.7	407.8398	411.7945	97.8	423.8347	425.7737	97.9	437.8140
	473.8279	53.9	491.8883	397.7966	53.1	409.8369	413.7915	53.3	425.8318	427.7708	53.4	439.8110
	475.8249	17.9	493.8853	399.7936	17.4	411.8339	415.7886	17.5	427.8288	429.7678	17.6	441.8081
8	501.7978	33.5	519.8582	425.7665	33.8	437.8067	441.7614	33.7	453.8016	455.7407	33.7	467.7809
	503.7948	87.4	521.8552	427.7635	87.8	439.8038	443.7584	87.7	455.7987	457.7377	87.6	469.7780
	505.7919	100	523.8523	429.7606	100	441.8008	445.7555	100	457.7957	459.7348	100	471.7750
	507.7889	65.6	525.8493	431.7576	65.2	443.7979	447.7525	65.2	459.7928	461.7318	65.3	473.7721
	509.7860	27.0	527.8464	433.7547	26.6	445.7949	449.7496	26.7	461.7898	463.7289	26.8	475.7691
9	535.7588	26.1	553.8192	459.7275	26.3	471.7678	475.7224	26.3	487.7627			
	537.7559	76.5	555.8162	461.7246	76.9	473.7648	477.7195	76.8	489.7597			
	539.7529	100	557.8133	463.7216	100	475.7619	479.7165	100	491.7568			
	541.7500	76.4	559.8103	465.7187	75.9	477.7589	481.7136	76.0	493.7538			
	543.7470	37.6	561.8074	467.7157	37.1	479.7560	483.7106	37.2	495.7509			
10	569.7198	20.9	587.7802	493.6885	21.1	505.7288						
	571.7169	68.1	589.7773	495.6856	68.4	507.7258						
	573.7139	100	591.7743	497.6826	100	509.7229						
	575.7110	87.2	593.7714	499.6797	86.7	511.7199						
	577.7080	50.0	595.7684	501.6767	49.4	513.7170						
11	603.6809	17.1	621.7412									
	605.6779	61.3	623.7383									
	607.6750	100	625.7353									
	609.6720	98.0	627.7324									
	611.6691	64.1	629.7294									
	613.6661	29.4	631.7265									
12	637.6419	13.1	655.7023									
	639.6389	51.3	657.6993									
	641.6360	92.0	659.6964									
	643.6330	100	661.6934									
	645.6301	73.5	663.6905									
	647.6271	38.5	665.6875									
13	671.6029	10.1	689.6633									
	673.6000	42.8	691.6604									
	675.5970	83.7	693.6574									
	677.5941	100	695.6545									
	679.5911	81.6	697.6515									
	681.5882	48.0	699.6486									
14	705.5639	8.0	723.6243									
	707.5610	36.3	725.6214									
	709.5580	76.7	727.6184									
	711.5551	100	729.6155									
	713.5521	89.7	731.6125									
	715.5492	58.6	733.6096									

EXACT MASS & RELATIVE ION ABUNDANCE OF SELECTED CHLORINATED AROMATIC HYDROCARBONS

	PCDFs			PCNs			CBs			CPs		
	$^{12}C_{12}$	$C_{12}H_{8-n}Cl_nO$	$^{13}C_{12}$	$^{12}C_{10}$	$C_{10}H_{8-n}Cl_n$	$^{13}C_{10}$	$^{12}C_6$	$C_6H_{6-n}Cl_n$	$^{13}C_6$	$^{12}C_6$	$C_6H_{5-n}Cl_nOH$	$^{13}C_6$
# of Cl	Exact Mass	Relative Abundance	Exact Mass	Exact Mass	Relative Abundance	Exact Mass	Exact Mass	Relative Abundance	Exact Mass	Exact Mass	Relative Abundance	Exact Mass
0	168.0575	100	180.0978	128.0626	100	138.0962	78.0470	100	84.0671	94.0419	100	100.0620
1	202.0185	100	214.0588	162.0236	100	172.0572	112.0080	100	118.0281	128.0029	100	134.0230
	204.0156	33.5	216.0559	164.0207	33.0	174.0542	114.0050	32.6	120.0252	129.9999	32.8	136.0201
2	235.9796	100	248.0198	195.9847	100	206.0182	145.9690	100	151.9891	161.9639	100	167.9841
	237.9766	65.8	250.0169	197.9817	65.4	208.0153	147.9661	65.0	153.9862	163.9610	65.2	169.9811
	239.9737	11.2	252.0139	199.9788	10.9	210.0123	149.9631	10.6	155.9832	165.9580	10.8	171.9782
3	269.9406	100	281.9809	229.9457	100	239.9792	179.9300	100	185.9502	195.9249	100	201.9451
	271.9376	98.2	283.9779	231.9427	97.8	241.9763	181.9271	97.4	187.9472	197.9220	97.6	203.9421
	273.9347	32.5	285.9750	233.9398	32.0	243.9733	183.9241	31.7	189.9443	199.9190	31.9	205.9392
	275.9317	3.7	287.9720	235.9368	3.6	245.9704	185.9212	3.5	191.9413	201.9161	3.5	207.9362
4	303.9016	76.5	315.9419	263.9067	76.8	273.9403	213.8911	77.1	219.9112	229.8860	76.9	235.9061
	305.8987	100	317.9389	265.9038	100	275.9373	215.8881	100	221.9082	231.8830	100	237.9032
	307.8957	49.2	319.9360	267.9008	49.0	277.9344	217.8852	48.7	223.9053	233.8801	48.8	239.9002
	309.8928	10.9	321.9330	269.8979	10.7	279.9314	219.8822	10.6	225.9023	235.8771	10.7	241.8973
5	337.8627	61.3	349.9029	297.8677	61.5	307.9013	247.8521	61.7	253.8722	263.8470	61.6	269.8671
	339.8597	100	351.9000	299.8648	100	309.8983	249.8491	100	255.8693	265.8441	100	271.8642
	341.8568	65.4	353.8970	301.8618	65.1	311.8954	251.8462	64.9	257.8663	267.8411	65.0	273.8612
	343.8538	21.5	355.8941	303.8589	21.3	313.8924	253.8432	21.1	259.8634	269.8382	21.2	275.8583
6	371.8237	51.2	383.8639	331.8288	51.3	341.8623	281.8131	51.4	287.8332			
	373.8207	100	385.8610	333.8258	100	343.8594	283.8102	100	289.8303			
	375.8178	81.6	387.8580	335.8229	81.3	345.8564	285.8072	81.1	291.8273			
	377.8148	35.6	389.8551	337.8199	35.3	347.8535	287.8043	35.1	293.8244			
7	405.7847	43.9	417.8250	365.7898	44.0	375.8233						
	407.7818	100	419.8220	367.7868	100	377.8204						
	409.7788	97.8	421.8191	369.7839	97.5	379.8174						
	411.7759	53.3	423.8161	371.7809	52.9	381.8145						
	413.7729	17.5	425.8132	373.7780	17.3	383.8115						
8	439.7457	33.7	451.7860	399.7508	33.9	409.7844						
	441.7428	87.7	453.7830	401.7479	87.9	411.7814						
	443.7398	100	455.7801	403.7449	100	413.7785						
	445.7369	65.2	457.7771	405.7420	65.0	415.7755						
	447.7339	26.7	459.7742	407.7390	26.5	417.7726						

PCTs = polychlorinated terphenyls
PCBs = polychlorinated biphenyls
PCHBs = polychlorinated hydroxybiphenyls
PCDDs = polychlorinated dibenzo-*p*-dioxins
PCDFs = polychlorinated dibenzofurans
PCNs = polychlorinated naphthalenes
CBs = chlorobenzenes
CPs = chlorophenols

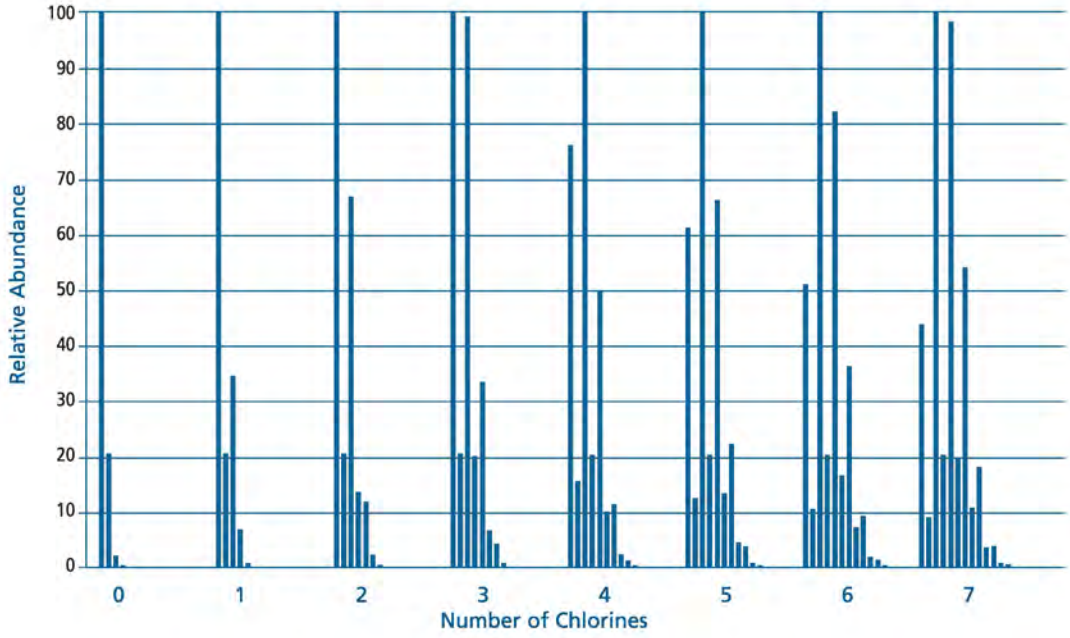
Accurate masses: ^{12}C=12.000000, ^{13}C=13.003355, ^{1}H=1.007825, ^{35}Cl= 34.968853, ^{37}Cl=36.965903, ^{16}O=15.994915

Relative abundances of isotopes were determined using the method described in: Pretsch,Clerc,Seibl,Simon, Tables of Spectral Data for Structure Determination of Organic Compounds, Springer-Verlag, 1983.
The following natural isotopic abundances were used in all calculations: ^{12}C=98.89%, ^{13}C=1.11%, ^{1}H=99.985%, ^{2}H=0.015%, ^{35}Cl=75.53%, ^{37}Cl=24.47%, ^{16}O=99.759%, ^{17}O=0.037%, ^{18}O=0.204%.

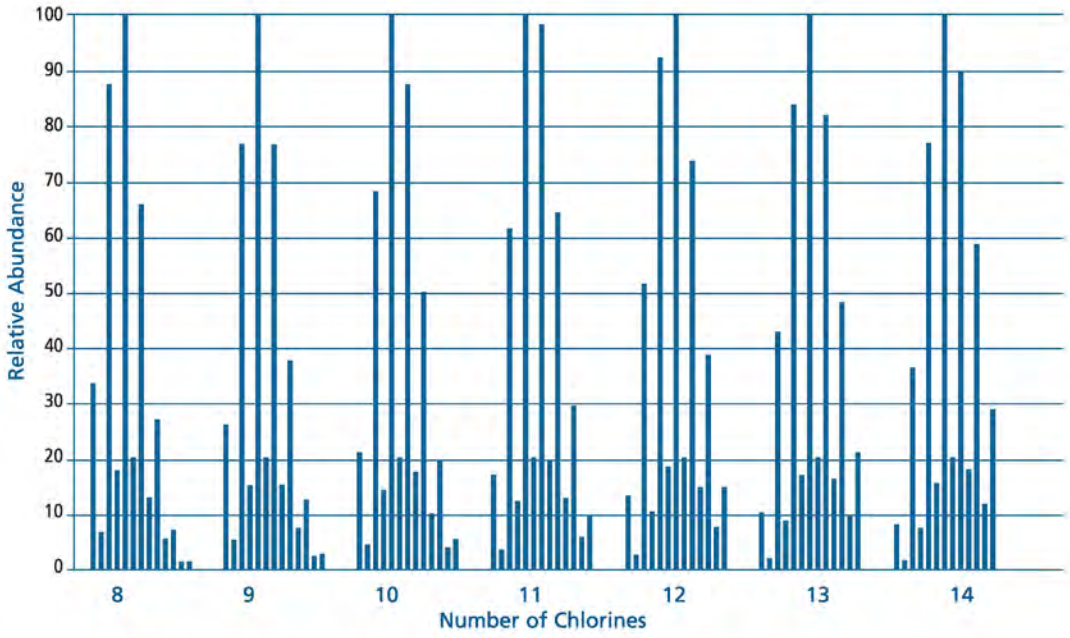
www.well-labs.com



MOLECULAR ION CLUSTERS FOR CHLORINATED AROMATIC HYDROCARBONS

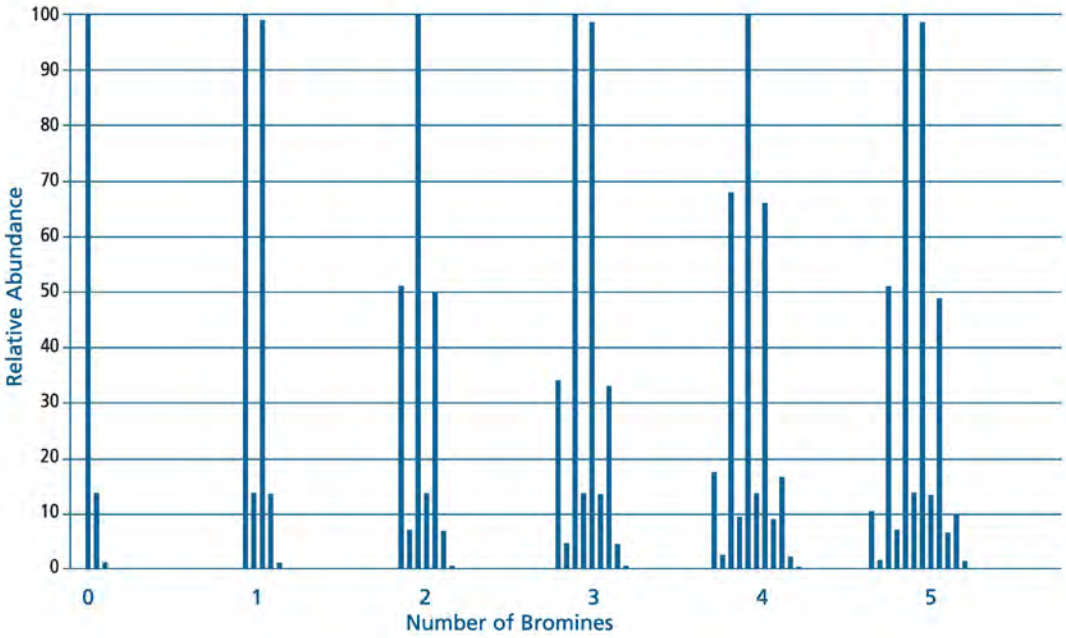


MOLECULAR ION CLUSTERS FOR CHLORINATED AROMATIC HYDROCARBONS

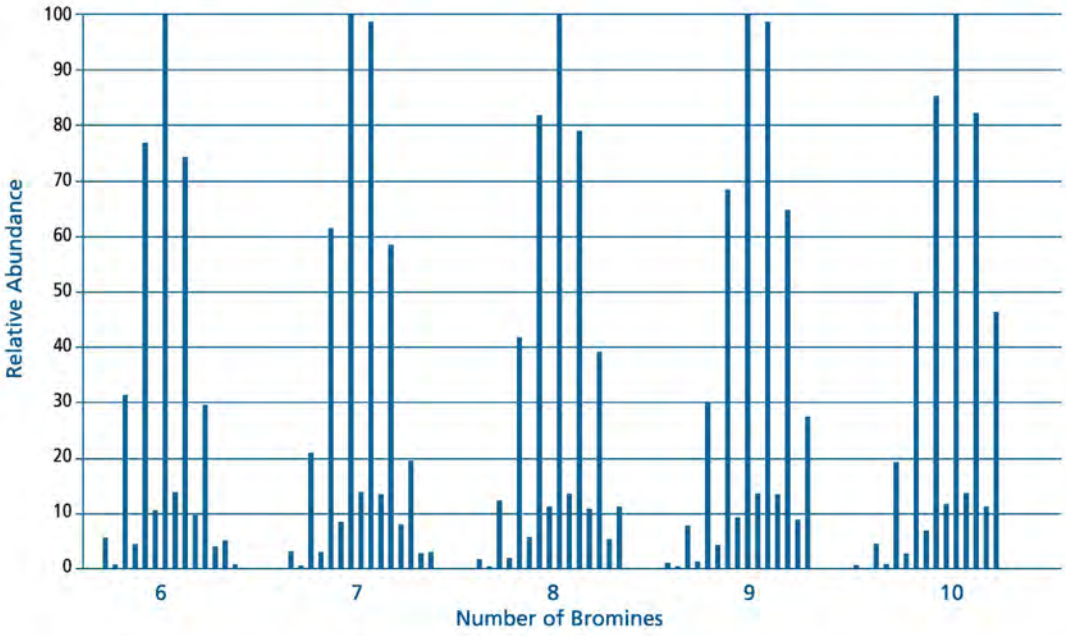


Ions shown are M, M+1, M+2, M+3, M+4, M+5, M+6, M+7, M+8, M+9, M+10, M+11, M+12, and are representative of chlorinated terphenyls ($C_{18}H_{14-n}Cl_n$)

MOLECULAR ION CLUSTERS FOR BROMINATED AROMATIC HYDROCARBONS



MOLECULAR ION CLUSTERS FOR BROMINATED AROMATIC HYDROCARBONS



Ions shown are M, M+1, M+2, M+3, M+4, M+5, M+6, M+7, M+8, M+9, M+10, M+11, M+12, M+13, M+14 and are representative of brominated diphenyl ethers ($C_{12}H_{10-n}Br_nO$)

www.well-labs.com



EXACT MASS & RELATIVE ION ABUNDANCE OF SELECTED BROMINATED AROMATIC HYDROCARBONS

	PBBs			PBDEs			PBDDs			PBDFs		
	$^{12}C_{12}$	$C_{12}H_{10-n}Br_n$	$^{13}C_{12}$	$^{12}C_{12}$	$C_{12}H_{10-n}Br_nO$	$^{13}C_{12}$	$^{12}C_{12}$	$C_{12}H_{8-n}Br_nO_2$	$^{13}C_{12}$	$^{12}C_{12}$	$C_{12}H_{8-n}Br_nO$	$^{13}C_{12}$
# of Br	Exact Mass	Relative Abundance	Exact Mass	Exact Mass	Relative Abundance	Exact Mass	Exact Mass	Relative Abundance	Exact Mass	Exact Mass	Relative Abundance	Exact Mass
0	154.0783	100	166.1185	170.0732	100	182.1134	184.0524	100	196.0927	168.0575	100	180.0978
1	231.9887	100	244.0290	247.9836	100	260.0239	261.9629	100	274.0032	245.9680	100	258.0083
	233.9867	98.7	246.0270	249.9816	98.9	262.0219	263.9609	99.1	276.0012	247.9660	98.9	260.0063
2	309.8992	50.9	321.9395	325.8941	50.8	337.9344	339.8734	50.8	351.9136	323.8785	50.8	335.9187
	311.8972	100	323.9375	327.8921	100	339.9324	341.8714	100	353.9116	325.8765	100	337.9167
	313.8952	49.6	325.9355	329.8901	49.7	341.9304	343.8694	49.9	355.9096	327.8745	49.7	339.9147
3	387.8097	34.0	399.8499	403.8046	33.9	415.8449	417.7839	33.9	429.8241	401.7889	33.9	413.8292
	389.8077	100	401.8479	405.8026	100	417.8429	419.7819	100	431.8221	403.7869	100	415.8272
	391.8057	98.4	403.8459	407.8006	98.6	419.8409	421.7799	98.7	433.8201	405.7849	98.6	417.8252
	393.8037	32.7	405.8439	409.7986	32.8	421.8389	423.7779	33.0	435.8181	407.7829	32.8	419.8232
4	465.7202	17.3	477.7604	481.7151	17.3	493.7553	495.6943	17.3	507.7346	479.6994	17.3	491.7397
	467.7182	67.9	479.7584	483.7131	67.8	495.7533	497.6923	67.8	509.7326	481.6974	67.8	493.7377
	469.7162	100	481.7564	485.7111	100	497.7513	499.6903	100	511.7306	483.6954	100	495.7357
	471.7142	65.7	483.7544	487.7091	65.8	499.7493	501.6883	65.9	513.7286	485.6934	65.8	497.7337
	473.7122	16.4	485.7524	489.7071	16.5	501.7473	503.6863	16.6	515.7266	487.6914	16.5	499.7317
5	543.6306	10.4	555.6709	559.6255	10.4	571.6658	573.6048	10.4	585.6451	557.6099	10.4	569.6502
	545.6286	51.0	557.6689	561.6235	50.9	573.6638	575.6028	50.9	587.6431	559.6079	50.9	571.6482
	547.6266	100	559.6669	563.6215	100	575.6618	577.6008	100	589.6411	561.6059	100	573.6462
	549.6246	98.3	561.6649	565.6195	98.4	577.6598	579.5988	98.5	591.6391	563.6039	98.4	575.6442
	551.6226	48.5	563.6629	567.6175	48.7	579.6578	581.5968	48.8	593.6371	565.6019	48.7	577.6422
	553.6206	9.7	565.6609	569.6155	9.8	581.6558	583.5948	9.9	595.6351	567.5999	9.8	579.6402
6	621.5411	5.3	633.5814	637.5360	5.3	649.5763	651.5153	5.3	663.5555	635.5204	5.3	647.5606
	623.5391	31.2	635.5794	639.5340	31.1	651.5743	653.5133	31.1	665.5535	637.5184	31.1	649.5586
	625.5371	76.4	637.5774	641.5320	76.4	653.5723	655.5113	76.3	667.5515	639.5164	76.4	651.5566
	627.5351	100	639.5754	643.5300	100	655.5703	657.5093	100	669.5495	641.5144	100	653.5546
	629.5331	73.8	641.5734	645.5280	73.9	657.5683	659.5073	73.9	671.5475	643.5124	73.9	655.5526
	631.5311	29.2	643.5714	647.5260	29.3	659.5663	661.5053	29.4	673.5455	645.5104	29.3	657.5506
7	699.4516	3.0	711.4918	715.4465	3.0	727.4868	729.4258	3.0	741.4660	713.4308	3.0	725.4711
	701.4496	20.8	713.4898	717.4445	20.8	729.4848	731.4238	20.8	743.4640	715.4288	20.8	727.4691
	703.4476	61.2	715.4878	719.4425	61.1	731.4828	733.4218	61.1	745.4620	717.4268	61.1	729.4671
	705.4456	100	717.4858	721.4405	100	733.4808	735.4198	100	747.4600	719.4248	100	731.4651
	707.4436	98.2	719.4838	723.4385	98.3	735.4788	737.4178	98.4	749.4580	721.4228	98.3	733.4631
	709.4416	58.0	721.4818	725.4365	58.1	737.4768	739.4158	58.2	751.4560	723.4208	58.1	735.4611
8	777.3621	1.5	789.4023	793.3570	1.5	805.3972	807.3362	1.5	819.3765	791.3413	1.5	803.3816
	779.3601	12.1	791.4003	795.3550	12.1	807.3952	809.3342	12.1	821.3745	793.3393	12.1	805.3796
	781.3581	41.6	793.3983	797.3530	41.5	809.3932	811.3322	41.5	823.3725	795.3373	41.5	807.3776
	783.3561	81.5	795.3963	799.3510	81.5	811.3912	813.3302	81.4	825.3705	797.3353	81.5	809.3756
	785.3541	100	797.3943	801.3490	100	813.3892	815.3282	100	827.3685	799.3333	100	811.3736
	787.3521	78.6	799.3923	803.3470	78.7	815.3872	817.3262	78.7	829.3665	801.3313	78.7	813.3716
	789.3501	38.7	801.3903	805.3450	38.8	817.3852	819.3242	38.9	831.3645	803.3293	38.8	815.3696
9	855.2725	0.9	867.3128	871.2674	0.9	883.3077						
	857.2705	7.6	869.3108	873.2654	7.6	885.3057						
	859.2685	29.7	871.3088	875.2634	29.7	887.3037						
	861.2665	68.0	873.3068	877.2614	68.0	889.3017						
	863.2645	100	875.3048	879.2594	100	891.2997						
	865.2625	98.1	877.3028	881.2574	98.2	893.2977						
	867.2605	64.3	879.3008	883.2554	64.4	895.2957						
	869.2585	27.2	881.2988	885.2534	27.3	897.2937						
10	933.1830	0.4	945.2233	949.1779	0.4	961.2182						
	935.1810	4.3	947.2213	951.1759	4.3	963.2162						
	937.1790	19.0	949.2193	953.1739	18.9	965.2142						
	939.1770	49.5	951.2173	955.1719	49.5	967.2122						
	941.1750	85.0	953.2153	957.1699	84.9	969.2102						
	943.1730	100	955.2133	959.1679	100	971.2082						
	945.1710	81.8	957.2113	961.1659	81.9	973.2062						
	947.1690	46.0	959.2093	963.1639	46.0	975.2042						
	949.1670	17.0	961.2073	965.1619	17.1	977.2022						

PBBs = polybrominated biphenyls
PBDEs = polybrominated diphenyl ethers
PBDDs = polybrominated dibenzo-*p*-dioxins
PBDFs = polybrominated dibenzofurans

Accurate masses: ^{12}C=12.000000, ^{13}C=13.003355, ^{1}H=1.007825, ^{79}Br= 78.918300, ^{81}Br=80.916300, ^{16}O=15.994915

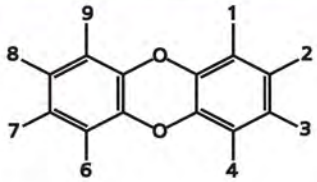
Relative abundances of isotopes were determined using the method described in: Pretsch,Clerc,Seibl,Simon, Tables of Spectral Data for Structure Determination of Organic Compounds, Springer-Verlag, 1983.
The following natural isotopic abundances were used in all calculations: ^{12}C=98.89%, ^{13}C=1.11%, ^{1}H=99.985%, ^{2}H=0.015%, ^{79}Br=50.54%, ^{81}Br=49.46%, ^{16}O=99.759%, ^{17}O=0.037%, ^{18}O=0.204%.

Note: ID numbers for PBBs and PBDEs are analogous to the IUPAC numbering system developed for PCBs.

SYSTEMATIC NUMBERING OF CHLORINATED DIBENZO-*p*-DIOXINS

ID Number*	Congener	CAS Number
1	1-Chlorodibenzo-*p*-dioxin	39227-53-7
2	2-Chlorodibenzo-*p*-dioxin	39227-54-8
3	1,2-Dichlorodibenzo-*p*-dioxin	54536-18-4
4	1,3-Dichlorodibenzo-*p*-dioxin	50585-39-2
5	1,4-Dichlorodibenzo-*p*-dioxin	54536-19-5
6	1,6-Dichlorodibenzo-*p*-dioxin	58178-38-0
7	1,7-Dichlorodibenzo-*p*-dioxin	82291-26-7
8	1,8-Dichlorodibenzo-*p*-dioxin	82291-27-8
9	1,9-Dichlorodibenzo-*p*-dioxin	82291-28-9
10	2,3-Dichlorodibenzo-*p*-dioxin	29446-15-9
11	2,7-Dichlorodibenzo-*p*-dioxin	33857-26-0
12	2,8-Dichlorodibenzo-*p*-dioxin	38964-22-6
13	1,2,3-Trichlorodibenzo-*p*-dioxin	54536-17-3
14	1,2,4-Trichlorodibenzo-*p*-dioxin	39227-58-2
15	1,2,6-Trichlorodibenzo-*p*-dioxin	82291-29-0
16	1,2,7-Trichlorodibenzo-*p*-dioxin	82291-30-3
17	1,2,8-Trichlorodibenzo-*p*-dioxin	82291-31-4
18	1,2,9-Trichlorodibenzo-*p*-dioxin	82291-32-5
19	1,3,6-Trichlorodibenzo-*p*-dioxin	82291-33-6
20	1,3,7-Trichlorodibenzo-*p*-dioxin	67028-17-5
21	1,3,8-Trichlorodibenzo-*p*-dioxin	82306-61-4
22	1,3,9-Trichlorodibenzo-*p*-dioxin	82306-62-5
23	1,4,6-Trichlorodibenzo-*p*-dioxin	82306-63-6
24	1,4,7-Trichlorodibenzo-*p*-dioxin	82306-64-7
25	1,7,8-Trichlorodibenzo-*p*-dioxin	82306-65-8
26	2,3,7-Trichlorodibenzo-*p*-dioxin	33857-28-2
27	1,2,3,4-Tetrachlorodibenzo-*p*-dioxin	30746-58-8
28	1,2,3,6-Tetrachlorodibenzo-*p*-dioxin	71669-25-5
29	1,2,3,7-Tetrachlorodibenzo-*p*-dioxin	67028-18-6
30	1,2,3,8-Tetrachlorodibenzo-*p*-dioxin	53555-02-5
31	1,2,3,9-Tetrachlorodibenzo-*p*-dioxin	71669-26-6
32	1,2,4,6-Tetrachlorodibenzo-*p*-dioxin	71669-27-7

* Ballschmiter et. al.

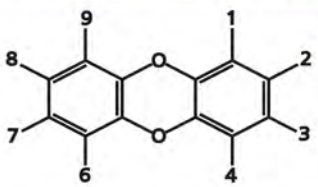




SYSTEMATIC NUMBERING OF CHLORINATED DIBENZO-*p*-DIOXINS

ID Number*	Congener	CAS Number
33	1,2,4,7-Tetrachlorodibenzo-*p*-dioxin	71669-28-8
34	1,2,4,8-Tetrachlorodibenzo-*p*-dioxin	71669-29-9
35	1,2,4,9-Tetrachlorodibenzo-*p*-dioxin	71665-99-1
36	1,2,6,7-Tetrachlorodibenzo-*p*-dioxin	40581-90-6
37	1,2,6,8-Tetrachlorodibenzo-*p*-dioxin	67323-56-2
38	1,2,6,9-Tetrachlorodibenzo-*p*-dioxin	40581-91-7
39	1,2,7,8-Tetrachlorodibenzo-*p*-dioxin	34816-53-0
40	1,2,7,9-Tetrachlorodibenzo-*p*-dioxin	71669-23-3
41	1,2,8,9-Tetrachlorodibenzo-*p*-dioxin	62470-54-6
42	1,3,6,8-Tetrachlorodibenzo-*p*-dioxin	33423-92-6
43	1,3,6,9-Tetrachlorodibenzo-*p*-dioxin	71669-24-4
44	1,3,7,8-Tetrachlorodibenzo-*p*-dioxin	50585-46-1
45	1,3,7,9-Tetrachlorodibenzo-*p*-dioxin	62470-53-5
46	1,4,6,9-Tetrachlorodibenzo-*p*-dioxin	40581-93-9
47	1,4,7,8-Tetrachlorodibenzo-*p*-dioxin	40581-94-0
48	2,3,7,8-Tetrachlorodibenzo-*p*-dioxin	1746-01-6
49	1,2,3,4,6-Pentachlorodibenzo-*p*-dioxin	67028-19-7
50	1,2,3,4,7-Pentachlorodibenzo-*p*-dioxin	39227-61-7
51	1,2,3,6,7-Pentachlorodibenzo-*p*-dioxin	71925-15-0
52	1,2,3,6,8-Pentachlorodibenzo-*p*-dioxin	71925-16-1
53	1,2,3,6,9-Pentachlorodibenzo-*p*-dioxin	82291-34-7
54	1,2,3,7,8-Pentachlorodibenzo-*p*-dioxin	40321-76-4
55	1,2,3,7,9-Pentachlorodibenzo-*p*-dioxin	71925-17-2
56	1,2,3,8,9-Pentachlorodibenzo-*p*-dioxin	71925-18-3
57	1,2,4,6,7-Pentachlorodibenzo-*p*-dioxin	82291-35-8
58	1,2,4,6,8-Pentachlorodibenzo-*p*-dioxin	71998-76-0
59	1,2,4,6,9-Pentachlorodibenzo-*p*-dioxin	82291-36-9
60	1,2,4,7,8-Pentachlorodibenzo-*p*-dioxin	58802-08-7
61	1,2,4,7,9-Pentachlorodibenzo-*p*-dioxin	82291-37-0
62	1,2,4,8,9-Pentachlorodibenzo-*p*-dioxin	82291-38-1
63	1,2,3,4,6,7-Hexachlorodibenzo-*p*-dioxin	58200-66-1
64	1,2,3,4,6,8-Hexachlorodibenzo-*p*-dioxin	58200-67-2
65	1,2,3,4,6,9-Hexachlorodibenzo-*p*-dioxin	58200-68-3

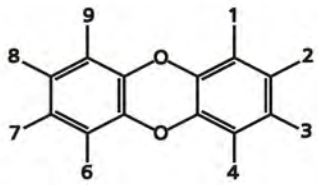
* Ballschmiter et. al.



SYSTEMATIC NUMBERING OF CHLORINATED DIBENZO-*p*-DIOXINS

ID Number*	Congener	CAS Number
66	1,2,3,4,7,8-Hexachlorodibenzo-*p*-dioxin	39227-28-6
67	1,2,3,6,7,8-Hexachlorodibenzo-*p*-dioxin	57653-85-7
68	1,2,3,6,7,9-Hexachlorodibenzo-*p*-dioxin	64461-98-9
69	1,2,3,6,8,9-Hexachlorodibenzo-*p*-dioxin	58200-69-4
70	1,2,3,7,8,9-Hexachlorodibenzo-*p*-dioxin	19408-74-3
71	1,2,4,6,7,9-Hexachlorodibenzo-*p*-dioxin	39227-62-8
72	1,2,4,6,8,9-Hexachlorodibenzo-*p*-dioxin	58802-09-8
73	1,2,3,4,6,7,8-Heptachlorodibenzo-*p*-dioxin	35822-46-9
74	1,2,3,4,6,7,9-Heptachlorodibenzo-*p*-dioxin	58200-70-7
75	Octachlorodibenzo-*p*-dioxin	3268-87-9

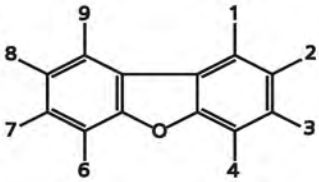
* Ballschmiter et. al.



SYSTEMATIC NUMBERING OF CHLORINATED DIBENZOFURANS

ID Number*	Congener	CAS Number
1	1-Chlorodibenzofuran	84761-86-4
2	2-Chlorodibenzofuran	51230-49-0
3	3-Chlorodibenzofuran	25074-67-3
4	4-Chlorodibenzofuran	74992-96-4
5	1,2-Dichlorodibenzofuran	64126-85-8
6	1,3-Dichlorodibenzofuran	94538-00-8
7	1,4-Dichlorodibenzofuran	94538-01-9
8	1,6-Dichlorodibenzofuran	74992-97-5
9	1,7-Dichlorodibenzofuran	94538-02-0
10	1,8-Dichlorodibenzofuran	81638-37-1
11	1,9-Dichlorodibenzofuran	70648-14-5

* Ballschmiter et. al.

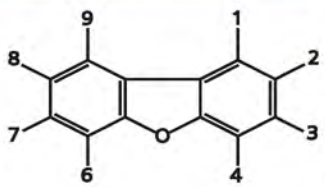




SYSTEMATIC NUMBERING OF CHLORINATED DIBENZOFURANS

ID Number*	Congener	CAS Number
12	2,3-Dichlorodibenzofuran	64126-86-9
13	2,4-Dichlorodibenzofuran	
14	2,6-Dichlorodibenzofuran	60390-27-4
15	2,7-Dichlorodibenzofuran	74992-98-6
16	2,8-Dichlorodibenzofuran	5409-83-6
17	3,4-Dichlorodibenzofuran	94570-83-9
18	3,6-Dichlorodibenzofuran	74918-40-4
19	3,7-Dichlorodibenzofuran	58802-21-4
20	4,6-Dichlorodibenzofuran	
21	1,2,3-Trichlorodibenzofuran	83636-47-9
22	1,2,4-Trichlorodibenzofuran	24478-73-7
23	1,2,6-Trichlorodibenzofuran	64560-15-2
24	1,2,7-Trichlorodibenzofuran	83704-37-4
25	1,2,8-Trichlorodibenzofuran	83704-34-1
26	1,2,9-Trichlorodibenzofuran	83704-38-5
27	1,3,4-Trichlorodibenzofuran	82911-61-3
28	1,3,6-Trichlorodibenzofuran	83704-39-6
29	1,3,7-Trichlorodibenzofuran	64560-16-3
30	1,3,8-Trichlorodibenzofuran	76621-12-0
31	1,3,9-Trichlorodibenzofuran	83704-40-9
32	1,4,6-Trichlorodibenzofuran	82911-60-2
33	1,4,7-Trichlorodibenzofuran	83704-41-0
34	1,4,8-Trichlorodibenzofuran	64560-14-1
35	1,4,9-Trichlorodibenzofuran	70648-13-4
36	1,6,7-Trichlorodibenzofuran	83704-46-5
37	1,6,8-Trichlorodibenzofuran	82911-59-9
38	1,7,8-Trichlorodibenzofuran	58802-18-9
39	2,3,4-Trichlorodibenzofuran	57117-34-7
40	2,3,6-Trichlorodibenzofuran	57117-33-6
41	2,3,7-Trichlorodibenzofuran	58802-17-8
42	2,3,8-Trichlorodibenzofuran	57117-32-5
43	2,4,6-Trichlorodibenzofuran	58802-14-5
44	2,4,7-Trichlorodibenzofuran	83704-42-1
45	2,4,8-Trichlorodibenzofuran	54589-71-8

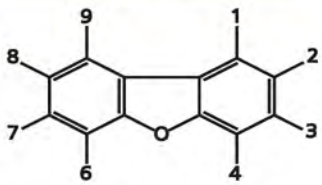
* Ballschmiter et. al.



SYSTEMATIC NUMBERING OF CHLORINATED DIBENZOFURANS

ID Number*	Congener	CAS Number
46	2,6,7-Trichlorodibenzofuran	83704-45-4
47	3,4,6-Trichlorodibenzofuran	83704-43-2
48	3,4,7-Trichlorodibenzofuran	83704-44-3
49	1,2,3,4-Tetrachlorodibenzofuran	24478-72-6
50	1,2,3,6-Tetrachlorodibenzofuran	83704-21-6
51	1,2,3,7-Tetrachlorodibenzofuran	83704-22-7
52	1,2,3,8-Tetrachlorodibenzofuran	62615-08-1
53	1,2,3,9-Tetrachlorodibenzofuran	83704-23-8
54	1,2,4,6-Tetrachlorodibenzofuran	71998-73-7
55	1,2,4,7-Tetrachlorodibenzofuran	83719-40-8
56	1,2,4,8-Tetrachlorodibenzofuran	64126-87-0
57	1,2,4,9-Tetrachlorodibenzofuran	83704-24-9
58	1,2,6,7-Tetrachlorodibenzofuran	83704-25-0
59	1,2,6,8-Tetrachlorodibenzofuran	83710-07-0
60	1,2,6,9-Tetrachlorodibenzofuran	70648-18-9
61	1,2,7,8-Tetrachlorodibenzofuran	58802-20-3
62	1,2,7,9-Tetrachlorodibenzofuran	83704-26-1
63	1,2,8,9-Tetrachlorodibenzofuran	70648-22-5
64	1,3,4,6-Tetrachlorodibenzofuran	83704-27-2
65	1,3,4,7-Tetrachlorodibenzofuran	70648-16-7
66	1,3,4,8-Tetrachlorodibenzofuran	92341-04-3
67	1,3,4,9-Tetrachlorodibenzofuran	83704-28-3
68	1,3,6,7-Tetrachlorodibenzofuran	57117-36-9
69	1,3,6,8-Tetrachlorodibenzofuran	71998-72-6
70	1,3,6,9-Tetrachlorodibenzofuran	83690-98-6
71	1,3,7,8-Tetrachlorodibenzofuran	57117-35-8
72	1,3,7,9-Tetrachlorodibenzofuran	64560-17-4
73	1,4,6,7-Tetrachlorodibenzofuran	66794-59-0
74	1,4,6,8-Tetrachlorodibenzofuran	82911-58-8
75	1,4,6,9-Tetrachlorodibenzofuran	70648-19-0
76	1,4,7,8-Tetrachlorodibenzofuran	83704-29-4
77	1,6,7,8-Tetrachlorodibenzofuran	83704-33-0
78	2,3,4,6-Tetrachlorodibenzofuran	83704-30-7
79	2,3,4,7-Tetrachlorodibenzofuran	83704-31-8

* Ballschmiter et. al.

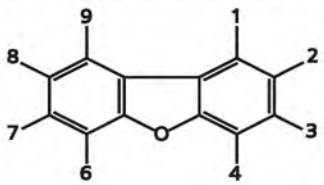




SYSTEMATIC NUMBERING OF CHLORINATED DIBENZOFURANS

ID Number*	Congener	CAS Number
80	2,3,4,8-Tetrachlorodibenzofuran	83704-32-9
81	2,3,6,7-Tetrachlorodibenzofuran	57117-39-2
82	2,3,6,8-Tetrachlorodibenzofuran	57117-37-0
83	2,3,7,8-Tetrachlorodibenzofuran	51207-31-9
84	2,4,6,7-Tetrachlorodibenzofuran	57117-38-1
85	2,4,6,8-Tetrachlorodibenzofuran	58802-19-0
86	3,4,6,7-Tetrachlorodibenzofuran	57117-40-6
87	1,2,3,4,6-Pentachlorodibenzofuran	83704-47-6
88	1,2,3,4,7-Pentachlorodibenzofuran	83704-48-7
89	1,2,3,4,8-Pentachlorodibenzofuran	67517-48-0
90	1,2,3,4,9-Pentachlorodibenzofuran	83704-49-8
91	1,2,3,6,7-Pentachlorodibenzofuran	57117-42-7
92	1,2,3,6,8-Pentachlorodibenzofuran	83704-51-2
93	1,2,3,6,9-Pentachlorodibenzofuran	83704-52-3
94	1,2,3,7,8-Pentachlorodibenzofuran	57117-41-6
95	1,2,3,7,9-Pentachlorodibenzofuran	83704-53-4
96	1,2,3,8,9-Pentachlorodibenzofuran	83704-54-5
97	1,2,4,6,7-Pentachlorodibenzofuran	83704-50-1
98	1,2,4,6,8-Pentachlorodibenzofuran	69698-57-3
99	1,2,4,6,9-Pentachlorodibenzofuran	70648-24-7
100	1,2,4,7,8-Pentachlorodibenzofuran	58802-15-6
101	1,2,4,7,9-Pentachlorodibenzofuran	71998-74-8
102	1,2,4,8,9-Pentachlorodibenzofuran	70648-23-6
103	1,2,6,7,8-Pentachlorodibenzofuran	69433-00-7
104	1,2,6,7,9-Pentachlorodibenzofuran	70872-82-1
105	1,3,4,6,7-Pentachlorodibenzofuran	83704-36-3
106	1,3,4,6,8-Pentachlorodibenzofuran	83704-55-6
107	1,3,4,6,9-Pentachlorodibenzofuran	70648-15-6
108	1,3,4,7,8-Pentachlorodibenzofuran	58802-16-7
109	1,3,4,7,9-Pentachlorodibenzofuran	70648-20-3
110	1,3,6,7,8-Pentachlorodibenzofuran	70648-21-4
111	1,4,6,7,8-Pentachlorodibenzofuran	83704-35-2
112	2,3,4,6,7-Pentachlorodibenzofuran	57117-43-8
113	2,3,4,6,8-Pentachlorodibenzofuran	67481-22-5

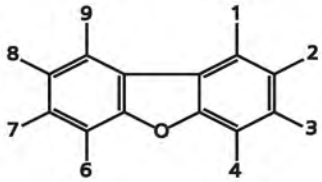
* Ballschmiter et. al.



SYSTEMATIC NUMBERING OF CHLORINATED DIBENZOFURANS

ID Number*	Congener	CAS Number
114	2,3,4,7,8-Pentachlorodibenzofuran	57117-31-4
115	1,2,3,4,6,7-Hexachlorodibenzofuran	79060-60-9
116	1,2,3,4,6,8-Hexachlorodibenzofuran	69698-60-8
117	1,2,3,4,6,9-Hexachlorodibenzofuran	91538-83-9
118	1,2,3,4,7,8-Hexachlorodibenzofuran	70648-26-9
119	1,2,3,4,7,9-Hexachlorodibenzofuran	91538-84-0
120	1,2,3,4,8,9-Hexachlorodibenzofuran	92341-07-6
121	1,2,3,6,7,8-Hexachlorodibenzofuran	57117-44-9
122	1,2,3,6,7,9-Hexachlorodibenzofuran	92341-06-5
123	1,2,3,6,8,9-Hexachlorodibenzofuran	
124	1,2,3,7,8,9-Hexachlorodibenzofuran	72918-21-9
125	1,2,4,6,7,8-Hexachlorodibenzofuran	67562-40-7
126	1,2,4,6,7,9-Hexachlorodibenzofuran	75627-02-0
127	1,2,4,6,8,9-Hexachlorodibenzofuran	69698-59-5
128	1,3,4,6,7,8-Hexachlorodibenzofuran	71998-75-9
129	1,3,4,6,7,9-Hexachlorodibenzofuran	92341-05-4
130	2,3,4,6,7,8-Hexachlorodibenzofuran	60851-34-5
131	1,2,3,4,6,7,8-Heptachlorodibenzofuran	67562-39-4
132	1,2,3,4,6,7,9-Heptachlorodibenzofuran	70648-25-8
133	1,2,3,4,6,8,9-Heptachlorodibenzofuran	69698-58-4
134	1,2,3,4,7,8,9-Heptachlorodibenzofuran	55673-89-7
135	Octachlorodibenzofuran	39001-02-0

* Ballschmiter et. al.

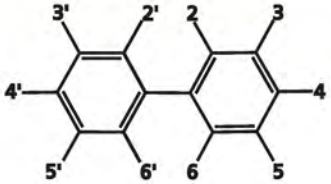




SYSTEMATIC NUMBERING OF CHLORINATED BIPHENYLS

ID Number*	Congener	CAS Number
1	2-Chlorobiphenyl	2051-60-7
2	3-Chlorobiphenyl	2051-61-8
3	4-Chlorobiphenyl	2051-62-9
4	2,2'-Dichlorobiphenyl	13029-08-8
5	2,3-Dichlorobiphenyl	16605-91-7
6	2,3'-Dichlorobiphenyl	25569-80-6
7	2,4-Dichlorobiphenyl	33284-50-3
8	2,4'-Dichlorobiphenyl	34883-43-7
9	2,5-Dichlorobiphenyl	34883-39-1
10	2,6-Dichlorobiphenyl	33146-45-1
11	3,3'-Dichlorobiphenyl	2050-67-1
12	3,4-Dichlorobiphenyl	2974-92-7
13	3,4'-Dichlorobiphenyl	2974-90-5
14	3,5-Dichlorobiphenyl	34883-41-5
15	4,4'-Dichlorobiphenyl	2050-68-2
16	2,2',3-Trichlorobiphenyl	38444-78-9
17	2,2',4-Trichlorobiphenyl	37680-66-3
18	2,2',5-Trichlorobiphenyl	37680-65-2
19	2,2',6-Trichlorobiphenyl	38444-73-4
20	2,3,3'-Trichlorobiphenyl	38444-84-7
21	2,3,4-Trichlorobiphenyl	55702-46-0
22	2,3,4'-Trichlorobiphenyl	38444-85-8
23	2,3,5-Trichlorobiphenyl	55720-44-0
24	2,3,6-Trichlorobiphenyl	55702-45-9
25	2,3',4-Trichlorobiphenyl	55712-37-3
26	2,3',5-Trichlorobiphenyl	38444-81-4
27	2,3',6-Trichlorobiphenyl	38444-76-7
28	2,4,4'-Trichlorobiphenyl	7012-37-5
29	2,4,5-Trichlorobiphenyl	15862-07-4
30	2,4,6-Trichlorobiphenyl	35693-92-6
31	2,4',5-Trichlorobiphenyl	16606-02-3
32	2,4',6-Trichlorobiphenyl	38444-77-8
33	2',3,4-Trichlorobiphenyl	38444-86-9

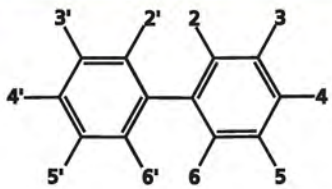
* Ballschmiter and Zell



SYSTEMATIC NUMBERING OF CHLORINATED BIPHENYLS

ID Number*	Congener	CAS Number
34	2',3,5-Trichlorobiphenyl	37680-68-5
35	3,3',4-Trichlorobiphenyl	37680-69-6
36	3,3',5-Trichlorobiphenyl	38444-87-0
37	3,4,4'-Trichlorobiphenyl	38444-90-5
38	3,4,5-Trichlorobiphenyl	53555-66-1
39	3,4',5-Trichlorobiphenyl	38444-88-1
40	2,2',3,3'-Tetrachlorobiphenyl	38444-93-8
41	2,2',3,4-Tetrachlorobiphenyl	52663-59-9
42	2,2',3,4'-Tetrachlorobiphenyl	36559-22-5
43	2,2',3,5-Tetrachlorobiphenyl	70362-46-8
44	2,2',3,5'-Tetrachlorobiphenyl	41464-39-5
45	2,2',3,6-Tetrachlorobiphenyl	70362-45-7
46	2,2',3,6'-Tetrachlorobiphenyl	41464-47-5
47	2,2',4,4'-Tetrachlorobiphenyl	2437-79-8
48	2,2',4,5-Tetrachlorobiphenyl	70362-47-9
49	2,2',4,5'-Tetrachlorobiphenyl	41464-40-8
50	2,2',4,6-Tetrachlorobiphenyl	62796-65-0
51	2,2',4,6'-Tetrachlorobiphenyl	68194-04-7
52	2,2',5,5'-Tetrachlorobiphenyl	35693-99-3
53	2,2',5,6'-Tetrachlorobiphenyl	41464-41-9
54	2,2',6,6'-Tetrachlorobiphenyl	15968-05-5
55	2,3,3',4-Tetrachlorobiphenyl	74338-24-2
56	2,3,3',4'-Tetrachlorobiphenyl	41464-43-1
57	2,3,3',5-Tetrachlorobiphenyl	70424-67-8
58	2,3,3',5'-Tetrachlorobiphenyl	41464-49-7
59	2,3,3',6-Tetrachlorobiphenyl	74472-33-6
60	2,3,4,4'-Tetrachlorobiphenyl	33025-41-1
61	2,3,4,5-Tetrachlorobiphenyl	33284-53-6
62	2,3,4,6-Tetrachlorobiphenyl	54230-22-7
63	2,3,4',5-Tetrachlorobiphenyl	74472-34-7
64	2,3,4',6-Tetrachlorobiphenyl	52663-58-8
65	2,3,5,6-Tetrachlorobiphenyl	33284-54-7
66	2,3',4,4'-Tetrachlorobiphenyl	32598-10-0
67	2,3',4,5-Tetrachlorobiphenyl	73575-53-8

* Ballschmiter and Zell

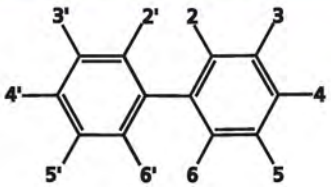




SYSTEMATIC NUMBERING OF CHLORINATED BIPHENYLS

ID Number*	Congener	CAS Number
68	2,3',4,5'-Tetrachlorobiphenyl	73575-52-7
69	2,3',4,6-Tetrachlorobiphenyl	60233-24-1
70	2,3',4',5-Tetrachlorobiphenyl	32598-11-1
71	2,3',4',6-Tetrachlorobiphenyl	41464-46-4
72	2,3',5,5'-Tetrachlorobiphenyl	41464-42-0
73	2,3',5',6-Tetrachlorobiphenyl	74338-23-1
74	2,4,4',5-Tetrachlorobiphenyl	32690-93-0
75	2,4,4',6-Tetrachlorobiphenyl	32598-12-2
76	2',3,4,5-Tetrachlorobiphenyl	70362-48-0
77	3,3',4,4'-Tetrachlorobiphenyl	32598-13-3
78	3,3',4,5-Tetrachlorobiphenyl	70362-49-1
79	3,3',4,5'-Tetrachlorobiphenyl	41464-48-6
80	3,3',5,5'-Tetrachlorobiphenyl	33284-52-5
81	3,4,4',5-Tetrachlorobiphenyl	70362-50-4
82	2,2',3,3',4-Pentachlorobiphenyl	52663-62-4
83	2,2',3,3',5-Pentachlorobiphenyl	60145-20-2
84	2,2',3,3',6-Pentachlorobiphenyl	52663-60-2
85	2,2',3,4,4'-Pentachlorobiphenyl	65510-45-4
86	2,2',3,4,5-Pentachlorobiphenyl	55312-69-1
87	2,2',3,4,5'-Pentachlorobiphenyl	38380-02-8
88	2,2',3,4,6-Pentachlorobiphenyl	55215-17-3
89	2,2',3,4,6'-Pentachlorobiphenyl	73575-57-2
90	2,2',3,4',5-Pentachlorobiphenyl	68194-07-0
91	2,2',3,4',6-Pentachlorobiphenyl	68194-05-8
92	2,2',3,5,5'-Pentachlorobiphenyl	52663-61-3
93	2,2',3,5,6-Pentachlorobiphenyl	73575-56-1
94	2,2',3,5,6'-Pentachlorobiphenyl	73575-55-0
95	2,2',3,5',6-Pentachlorobiphenyl	38379-99-6
96	2,2',3,6,6'-Pentachlorobiphenyl	73575-54-9
97	2,2',3',4,5-Pentachlorobiphenyl	41464-51-1
98	2,2',3',4,6-Pentachlorobiphenyl	60233-25-2
99	2,2',4,4',5-Pentachlorobiphenyl	38380-01-7
100	2,2',4,4',6-Pentachlorobiphenyl	39485-83-1
101	2,2',4,5,5'-Pentachlorobiphenyl	37680-73-2

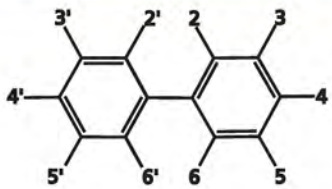
* Ballschmiter and Zell



SYSTEMATIC NUMBERING OF CHLORINATED BIPHENYLS

ID Number*	Congener	CAS Number
102	2,2',4,5,6'-Pentachlorobiphenyl	68194-06-9
103	2,2',4,5',6-Pentachlorobiphenyl	60145-21-3
104	2,2',4,6,6'-Pentachlorobiphenyl	56558-16-8
105	2,3,3',4,4'-Pentachlorobiphenyl	32598-14-4
106	2,3,3',4,5-Pentachlorobiphenyl	70424-69-0
107 (BZ #108)	2,3,3',4,5'-Pentachlorobiphenyl	70362-41-3
108 (BZ #109)	2,3,3',4,6-Pentachlorobiphenyl	74472-35-8
109 (BZ #107)	2,3,3',4',5-Pentachlorobiphenyl	70424-68-9
110	2,3,3',4',6-Pentachlorobiphenyl	38380-03-9
111	2,3,3',5,5'-Pentachlorobiphenyl	39635-32-0
112	2,3,3',5,6-Pentachlorobiphenyl	74472-36-9
113	2,3,3',5',6-Pentachlorobiphenyl	68194-10-5
114	2,3,4,4',5-Pentachlorobiphenyl	74472-37-0
115	2,3,4,4',6-Pentachlorobiphenyl	74472-38-1
116	2,3,4,5,6-Pentachlorobiphenyl	18259-05-7
117	2,3,4',5,6-Pentachlorobiphenyl	68194-11-6
118	2,3',4,4',5-Pentachlorobiphenyl	31508-00-6
119	2,3',4,4',6-Pentachlorobiphenyl	56558-17-9
120	2,3',4,5,5'-Pentachlorobiphenyl	68194-12-7
121	2,3',4,5',6-Pentachlorobiphenyl	56558-18-0
122	2',3,3',4,5-Pentachlorobiphenyl	76842-07-4
123	2',3,4,4',5-Pentachlorobiphenyl	65510-44-3
124	2',3,4,5,5'-Pentachlorobiphenyl	70424-70-3
125	2',3,4,5,6'-Pentachlorobiphenyl	74472-39-2
126	3,3',4,4',5-Pentachlorobiphenyl	57465-28-8
127	3,3',4,5,5'-Pentachlorobiphenyl	39635-33-1
128	2,2',3,3',4,4'-Hexachlorobiphenyl	38380-07-3
129	2,2',3,3',4,5-Hexachlorobiphenyl	55215-18-4
130	2,2',3,3',4,5'-Hexachlorobiphenyl	52663-66-8
131	2,2',3,3',4,6-Hexachlorobiphenyl	61798-70-7
132	2,2',3,3',4,6'-Hexachlorobiphenyl	38380-05-1
133	2,2',3,3',5,5'-Hexachlorobiphenyl	35694-04-3
134	2,2',3,3',5,6-Hexachlorobiphenyl	52704-70-8
135	2,2',3,3',5,6'-Hexachlorobiphenyl	52744-13-5

* Ballschmiter and Zell

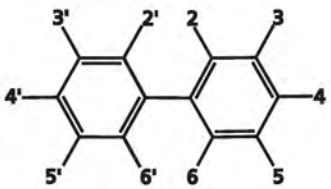




SYSTEMATIC NUMBERING OF CHLORINATED BIPHENYLS

ID Number*	Congener	CAS Number
136	2,2',3,3',6,6'-Hexachlorobiphenyl	38411-22-2
137	2,2',3,4,4',5-Hexachlorobiphenyl	35694-06-5
138	2,2',3,4,4',5'-Hexachlorobiphenyl	35065-28-2
139	2,2',3,4,4',6-Hexachlorobiphenyl	56030-56-9
140	2,2',3,4,4',6'-Hexachlorobiphenyl	59291-64-4
141	2,2',3,4,5,5'-Hexachlorobiphenyl	52712-04-6
142	2,2',3,4,5,6-Hexachlorobiphenyl	41411-61-4
143	2,2',3,4,5,6'-Hexachlorobiphenyl	68194-15-0
144	2,2',3,4,5',6-Hexachlorobiphenyl	68194-14-9
145	2,2',3,4,6,6'-Hexachlorobiphenyl	74472-40-5
146	2,2',3,4',5,5'-Hexachlorobiphenyl	51908-16-8
147	2,2',3,4',5,6-Hexachlorobiphenyl	68194-13-8
148	2,2',3,4',5,6'-Hexachlorobiphenyl	74472-41-6
149	2,2',3,4',5',6-Hexachlorobiphenyl	38380-04-0
150	2,2',3,4',6,6'-Hexachlorobiphenyl	68194-08-1
151	2,2',3,5,5',6-Hexachlorobiphenyl	52663-63-5
152	2,2',3,5,6,6'-Hexachlorobiphenyl	68194-09-2
153	2,2',4,4',5,5'-Hexachlorobiphenyl	35065-27-1
154	2,2',4,4',5,6'-Hexachlorobiphenyl	60145-22-4
155	2,2',4,4',6,6'-Hexachlorobiphenyl	33979-03-2
156	2,3,3',4,4',5-Hexachlorobiphenyl	38380-08-4
157	2,3,3',4,4',5'-Hexachlorobiphenyl	69782-90-7
158	2,3,3',4,4',6-Hexachlorobiphenyl	74472-42-7
159	2,3,3',4,5,5'-Hexachlorobiphenyl	39635-35-3
160	2,3,3',4,5,6-Hexachlorobiphenyl	41411-62-5
161	2,3,3',4,5',6-Hexachlorobiphenyl	74472-43-8
162	2,3,3',4',5,5'-Hexachlorobiphenyl	39635-34-2
163	2,3,3',4',5,6-Hexachlorobiphenyl	74472-44-9
164	2,3,3',4',5',6-Hexachlorobiphenyl	74472-45-0
165	2,3,3',5,5',6-Hexachlorobiphenyl	74472-46-1
166	2,3,4,4',5,6-Hexachlorobiphenyl	41411-63-6
167	2,3',4,4',5,5'-Hexachlorobiphenyl	52663-72-6
168	2,3',4,4',5',6-Hexachlorobiphenyl	59291-65-5
169	3,3',4,4',5,5'-Hexachlorobiphenyl	32774-16-6

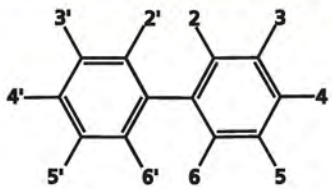
* Ballschmiter and Zell



SYSTEMATIC NUMBERING OF CHLORINATED BIPHENYLS

ID Number*	Congener	CAS Number
170	2,2',3,3',4,4',5-Heptachlorobiphenyl	35065-30-6
171	2,2',3,3',4,4',6-Heptachlorobiphenyl	52663-71-5
172	2,2',3,3',4,5,5'-Heptachlorobiphenyl	52663-74-8
173	2,2',3,3',4,5,6-Heptachlorobiphenyl	68194-16-1
174	2,2',3,3',4,5,6'-Heptachlorobiphenyl	38411-25-5
175	2,2',3,3',4,5',6-Heptachlorobiphenyl	40186-70-7
176	2,2',3,3',4,6,6'-Heptachlorobiphenyl	52663-65-7
177	2,2',3,3',4',5,6-Heptachlorobiphenyl	52663-70-4
178	2,2',3,3',5,5',6-Heptachlorobiphenyl	52663-67-9
179	2,2',3,3',5,6,6'-Heptachlorobiphenyl	52663-64-6
180	2,2',3,4,4',5,5'-Heptachlorobiphenyl	35065-29-3
181	2,2',3,4,4',5,6-Heptachlorobiphenyl	74472-47-2
182	2,2',3,4,4',5,6'-Heptachlorobiphenyl	60145-23-5
183	2,2',3,4,4',5',6-Heptachlorobiphenyl	52663-69-1
184	2,2',3,4,4',6,6'-Heptachlorobiphenyl	74472-48-3
185	2,2',3,4,5,5',6-Heptachlorobiphenyl	52712-05-7
186	2,2',3,4,5,6,6'-Heptachlorobiphenyl	74472-49-4
187	2,2',3,4',5,5',6-Heptachlorobiphenyl	52663-68-0
188	2,2',3,4',5,6,6'-Heptachlorobiphenyl	74487-85-7
189	2,3,3',4,4',5,5'-Heptachlorobiphenyl	39635-31-9
190	2,3,3',4,4',5,6-Heptachlorobiphenyl	41411-64-7
191	2,3,3',4,4',5',6-Heptachlorobiphenyl	74472-50-7
192	2,3,3',4,5,5',6-Heptachlorobiphenyl	74472-51-8
193	2,3,3',4',5,5',6-Heptachlorobiphenyl	69782-91-8
194	2,2',3,3',4,4',5,5'-Octachlorobiphenyl	35694-08-7
195	2,2',3,3',4,4',5,6-Octachlorobiphenyl	52663-78-2
196	2,2',3,3',4,4',5,6'-Octachlorobiphenyl	42740-50-1
197	2,2',3,3',4,4',6,6'-Octachlorobiphenyl	33091-17-7
198	2,2',3,3',4,5,5',6-Octachlorobiphenyl	68194-17-2
199 (BZ #201)	2,2',3,3',4,5,5',6'-Octachlorobiphenyl	52663-75-9
200 (BZ #199)	2,2',3,3',4,5,6,6'-Octachlorobiphenyl	52663-73-7
201 (BZ #200)	2,2',3,3',4,5',6,6'-Octachlorobiphenyl	40186-71-8
202	2,2',3,3',5,5',6,6'-Octachlorobiphenyl	2136-99-4
203	2,2',3,4,4',5,5',6-Octachlorobiphenyl	52663-76-0

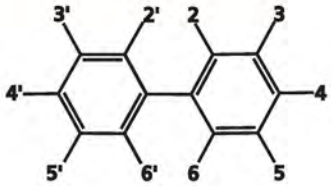
* Ballschmiter and Zell



SYSTEMATIC NUMBERING OF CHLORINATED BIPHENYLS

ID Number*	Congener	CAS Number
204	2,2',3,4,4',5,6,6'-Octachlorobiphenyl	74472-52-9
205	2,3,3',4,4',5,5',6-Octachlorobiphenyl	74472-53-0
206	2,2',3,3',4,4',5,5',6-Nonachlorobiphenyl	40186-72-9
207	2,2',3,3',4,4',5,6,6'-Nonachlorobiphenyl	52663-79-3
208	2,2',3,3',4,5,5',6,6'-Nonachlorobiphenyl	52663-77-1
209	Decachlorobiphenyl	2051-24-3

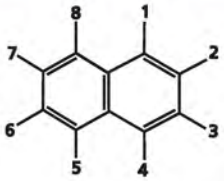
* Ballschmiter and Zell



SYSTEMATIC NUMBERING OF CHLORINATED NAPHTHALENES

ID Number*	Congener	CAS Number
1	1-Chloronaphthalene	90-13-1
2	2-Chloronaphthalene	91-58-7
3	1,2-Dichloronaphthalene	2050-69-3
4	1,3-Dichloronaphthalene	2198-75-6
5	1,4-Dichloronaphthalene	1825-31-6
6	1,5-Dichloronaphthalene	1825-30-5
7	1,6-Dichloronaphthalene	2050-72-8
8	1,7-Dichloronaphthalene	2050-73-9
9	1,8-Dichloronaphthalene	2050-74-0
10	2,3-Dichloronaphthalene	2050-75-1
11	2,6-Dichloronaphthalene	2065-70-5
12	2,7-Dichloronaphthalene	2198-77-8
13	1,2,3-Trichloronaphthalene	50402-52-3
14	1,2,4-Trichloronaphthalene	50402-51-2

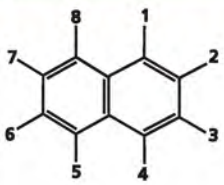
* Wiedmann and Ballschmiter



SYSTEMATIC NUMBERING OF CHLORINATED NAPHTHALENES

ID Number*	Congener	CAS Number
15	1,2,5-Trichloronaphthalene	55720-33-7
16	1,2,6-Trichloronaphthalene	51570-44-6
17	1,2,7-Trichloronaphthalene	55720-34-8
18	1,2,8-Trichloronaphthalene	55720-35-9
19	1,3,5-Trichloronaphthalene	51570-43-5
20	1,3,6-Trichloronaphthalene	55720-36-0
21	1,3,7-Trichloronaphthalene	55720-37-1
22	1,3,8-Trichloronaphthalene	55720-38-2
23	1,4,5-Trichloronaphthalene	2437-55-0
24	1,4,6-Trichloronaphthalene	2737-54-9
25	1,6,7-Trichloronaphthalene	55720-39-3
26	2,3,6-Trichloronaphthalene	55720-40-6
27	1,2,3,4-Tetrachloronaphthalene	20020-02-4
28	1,2,3,5-Tetrachloronaphthalene	53555-63-8
29	1,2,3,6-Tetrachloronaphthalene	
30	1,2,3,7-Tetrachloronaphthalene	55720-41-7
31	1,2,3,8-Tetrachloronaphthalene	149864-81-3
32	1,2,4,5-Tetrachloronaphthalene	6733-54-6
33	1,2,4,6-Tetrachloronaphthalene	51570-45-7
34	1,2,4,7-Tetrachloronaphthalene	67922-21-8
35	1,2,4,8-Tetrachloronaphthalene	6529-87-9
36	1,2,5,6-Tetrachloronaphthalene	67922-22-9
37	1,2,5,7-Tetrachloronaphthalene	67922-23-0
38	1,2,5,8-Tetrachloronaphthalene	149864-80-2
39	1,2,6,7-Tetrachloronaphthalene	149864-79-9
40	1,2,6,8-Tetrachloronaphthalene	67922-24-1
41	1,2,7,8-Tetrachloronaphthalene	149864-82-4
42	1,3,5,7-Tetrachloronaphthalene	53555-64-9
43	1,3,5,8-Tetrachloronaphthalene	31604-28-1
44	1,3,6,7-Tetrachloronaphthalene	55720-42-8
45	1,3,6,8-Tetrachloronaphthalene	150224-15-0
46	1,4,5,8-Tetrachloronaphthalene	3432-57-3
47	1,4,6,7-Tetrachloronaphthalene	55720-43-9
48	2,3,6,7-Tetrachloronaphthalene	34588-40-4

* Wiedmann and Ballschmiter

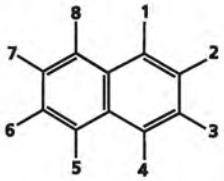




SYSTEMATIC NUMBERING OF CHLORINATED NAPHTHALENES

ID Number*	Congener	CAS Number
49	1,2,3,4,5-Pentachloronaphthalene	67922-25-2
50	1,2,3,4,6-Pentachloronaphthalene	67922-26-3
51	1,2,3,5,6-Pentachloronaphthalene	
52	1,2,3,5,7-Pentachloronaphthalene	53555-65-0
53	1,2,3,5,8-Pentachloronaphthalene	150224-24-1
54	1,2,3,6,7-Pentachloronaphthalene	150224-16-1
55	1,2,3,6,8-Pentachloronaphthalene	150224-23-0
56	1,2,3,7,8-Pentachloronaphthalene	150205-21-3
57	1,2,4,5,6-Pentachloronaphthalene	150224-20-7
58	1,2,4,5,7-Pentachloronaphthalene	150224-19-4
59	1,2,4,5,8-Pentachloronaphthalene	150224-25-2
60	1,2,4,6,7-Pentachloronaphthalene	150224-17-2
61	1,2,4,6,8-Pentachloronaphthalene	150224-22-9
62	1,2,4,7,8-Pentachloronaphthalene	
63	1,2,3,4,5,6-Hexachloronaphthalene	58877-88-6
64	1,2,3,4,5,7-Hexachloronaphthalene	67927-27-4
65	1,2,3,4,5,8-Hexachloronaphthalene	103426-93-3
66	1,2,3,4,6,7-Hexachloronaphthalene	103426-96-6
67	1,2,3,5,6,7-Hexachloronaphthalene	103426-97-7
68	1,2,3,5,6,8-Hexachloronaphthalene	103426-95-5
69	1,2,3,5,7,8-Hexachloronaphthalene	103426-94-4
70	1,2,3,6,7,8-Hexachloronaphthalene	17062-87-2
71	1,2,4,5,6,8-Hexachloronaphthalene	90948-28-0
72	1,2,4,5,7,8-Hexachloronaphthalene	103426-92-2
73	1,2,3,4,5,6,7-Heptachloronaphthalene	58863-14-2
74	1,2,3,4,5,6,8-Heptachloronaphthalene	58863-15-3
75	Octachloronaphthalene	2234-13-1

* Wiedmann and Ballschmiter



U.S. EPA Method 1613B:
Tetra- through Octa-Chlorinated Dioxins and Furans by Isotope Dilution HRGC/HRMS - Revision B, October 1994

U.S. EPA Method 513:
Determination of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin in Drinking Water by Gas Chromatography with High Resolution Mass Spectrometry - July 1990

U.S. EPA Method 8280B:
Polychlorinated Dibenzo-*p*-dioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by High-Resolution Gas Chromatography/Low-Resolution Mass Spectrometry (HRGC/LRMS) - Revision 2, February 2007

U.S. EPA Method 8290A:
Polychlorinated Dibenzodioxins (PCDDs) and Polychlorinated Dibenzofurans (PCDFs) by High-Resolution Gas Chromatography/High-Resolution Mass Spectrometry (HRGC/HRMS) - Revision 1, January 1998

U.S. EPA Method 23:
Determination of Polychlorinated Dibenzo-*p*-dioxins and Polychlorinated Dibenzofurans from Stationary Sources

European Standard EN 1948-4:2010:
Stationary Source Emissions - Determination of the Mass Concentration of PCDDs/PCDFs and Dioxin-Like PCBs - October 2010

Japanese Industrial Standard JIS K 0311:2005:
Method for Determination of Tetra- Through Octachlorodibenzo-*p*-dioxins, Tetra- Through Octachlorodibenzofurans and Dioxin-Like Polychlorinatedbiphenyls in Stationary Source Emissions - January 2008

Japanese Industrial Standard JIS K 0312:2005:
Method for Determination of Tetra- Through Octachlorodibenzo-*p*-dioxins, Tetra- Through Octachlorodibenzofurans and Dioxin-Like Polychlorinatedbiphenyls in Industrial Water and Waste Water - January 2008

U.S. EPA Method 1668C:
Chlorinated Biphenyl Congeners in Water, Soil, Sediment, Biosolids, and Tissue by HRGC/HRMS - April 2010

U.S. EPA Method 1668:
Toxic Polychlorinated Biphenyls by Isotope Dilution High Resolution Gas Chromatography/High Resolution Mass Spectrometry - March 1997

Environment Canada Report EPS 1/RM/31:
Reference Method for the Analysis of Polychlorinated Biphenyls (PCBs) - March 1997



REFERENCE METHODS

California Environmental Protection Agency Air Resources Board Method 429:
Determination of Polycyclic Aromatic Hydrocarbon (PAH) Emissions from Stationary Sources - July 1997

U.S. EPA Method 537.1:
Determination of Selected Per- and Polyfluorinated Alkyl Substances in Drinking Water by Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry (LC/MS/MS) - November 2018

International Standard ISO 21675:2019:
Water quality - Determination of Perfluoroalkyl and Polyfluoroalkyl Substances (PFAS) in Water - Method Using Solid Phase Extraction and Liquid Chromatography-Tandem Mass Spectrometry (LC-MS/MS) - October 2019

U.S. EPA Method 533:
Determination of Per- and Polyfluoroalkyl Substances in Drinking Water by Isotope Dilution Anion Exchange Solid Phase Extraction and Liquid Chromatography/Tandem Mass Spectrometry - November 2019

U.S. EPA Draft Method 1633:
Analysis of Per- and Polyfluoroalkyl Substances (PFAS) in Aqueous, Solid, Biosolids, and Tissue Samples by LC-MS/MS - August 2021

In order to keep up-to-date on new releases from Wellington Laboratories Inc., please visit our website at www.well-labs.com.

New Products are announced in the Wellington Reporter.

ANAB

ANSI National Accreditation Board

CERTIFICATE OF ACCREDITATION

The ANSI National Accreditation Board

Hereby attests that

Wellington Laboratories Inc.
345 Southgate Drive
Guelph, ON N1G 3M5

Fulfills the requirements of

ISO 17034:2016

In the field of

REFERENCE MATERIAL PRODUCER

This certificate is valid only when accompanied by a current scope of accreditation document.
The current scope of accreditation can be verified at www.anab.org.

R. Douglas Leonard Jr., VP, PILR SBU

Expiry Date: 17 February 2023
Certificate Number: AR-1523

ANAB

ANSI National Accreditation Board

ilac-MRA

This reference material producer is accredited in accordance with the recognized International Standard ISO 17034:2016. This accreditation demonstrates technical competence for a defined scope and the operation of a reference material producer quality management system.

Wellington Laboratories Inc.

345 Southgate Drive, Guelph, Ontario, Canada N1G 3M5

Phone: 519-822-2436 Toll Free: 1-800-578-6985 fax: 519-822-2849



Distributed by: