Non trovato

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

EN-1948ES

Extraction Standard Solution
for European Standard Method EN 1948-4

PRODUCT CODE:	EN-1948ES
LOT NUMBER:	EN480412ES
SOLVENT(S):	Nonane/Toluene
DATE PREPARED: (mm/dd/yyyy)	04/24/2012
LAST TESTED: (mm/dd/yyyy)	10/03/2017
EXPIRY DATE: (mm/dd/yyyy)	04/01/2025
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place

AP 15-06-2022

DESCRIPTION:

EN-1948ES is a solution/mixture of mass-labelled ($^{13}C_{12}$) polychlorinated dibenzo-*p*-dioxins (PCDDs) and dibenzofurans (PCDFs). The components and their concentrations are given in Table A.

EN-1948ES was designed and prepared to be used according to the European Standard Method EN 1948-4 "Stationary Source Emissions - Determination of the Mass Concentration of PCDDs/PCDFs and dioxin-like PCBs" (EN 1948-4:2010).

The individual ^{13}C-labelled PCDDs and PCDFs all have chemical purities of >98% and isotopic purities of ≥99%.

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations of the Solution/Mixture
Figure 1: HRGC/HRMS Data (SIR; 10,000 mass resolving power)

ARPA umbria
Data 10.11.2021
Identif. 137 MRT
Approvato da

ADDITIONAL INFORMATION:

- See page 2 for further details.

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Dr

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

EN-1948IS

AP. 26-4-20

Syringe Standard Solution for European Standard Method EN 1948-4

PRODUCT CODE:	EN-1948IS
LOT NUMBER:	EN480905IS
SOLVENT(S):	Nonane/Toluene
DATE PREPARED: (mm/dd/yyyy)	09/14/2005
LAST TESTED: (mm/dd/yyyy)	02/02/2018
EXPIRY DATE: (mm/dd/yyyy)	04/01/2025
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place

ARPA umbria
Data 18/09/18
Identif. 1380 CRT
Approvato da HG

DESCRIPTION:

EN-1948IS is a solution/mixture of two $^{13}C_{12}$-labelled chlorinated dibenzo-p-dioxins ($^{13}C_{12}$-PCDDs). The components and their concentrations are given in Table A.

EN-1948IS was designed for, and prepared to be used according to, the European Standard Method EN 1948-4 "Stationary Source Emissions - Determination of the Mass Concentration of PCDDs/PCDFs and dixoin-like PCBs" (EN 1948-4:2010).

The individual $^{13}C_{12}$-PCDDs both have chemical purities of >98% and isotopic purities of ≥99%.

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations of the Solution/Mixture
Figure 1: HRGC/HRMS Data (SIR; 10,000 mass resolving power)

ADDITIONAL INFORMATION:

- See page 2 for further details.

Table A: **EN-1948IS; Components and Concentrations (pg/µl, ± 5% in nonane/1.6% toluene)**

$^{13}C_{12}$-PCDDs	Concentration (pg/µl)
$^{13}C_{12}$-1,2,3,4-TCDD	800
$^{13}C_{12}$-1,2,3,7,8,9-HxCDD	800

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Certified By: [signature] B.G. Chittim, General Manager **Date:** 04/04/2018 (mm/dd/yyyy)

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CERTIFICATE OF ANALYSIS
DOCUMENTATION

Terminato

EN-1948SS

Sampling Standard Solution
for European Standard Method EN 1948-4

ARPA Umbria
Data 27/3/14
Ident 139 07RT
Accettazione

PRODUCT CODE:	EN-1948SS
LOT NUMBER:	EN480905SS
SOLVENT(S):	Nonane/Toluene
DATE PREPARED: (mm/dd/yyyy)	09/14/2005
LAST TESTED: (mm/dd/yyyy)	01/07/2013
EXPIRY DATE: (mm/dd/yyyy)	04/01/2020
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place

DESCRIPTION:

EN-1948SS is a solution/mixture of $^{13}C_{12}$-labelled chlorinated dibenzofurans ($^{13}C_{12}$-PCDFs). The components and their concentrations are given in Table A.

EN-1948SS was designed for, and prepared to be used according to, the European Standard Method EN 1948-4 "Stationary Source Emissions - Determination of the Mass Concentration of PCDDs/PCDFs and dioxin-like PCBs" (EN 1948-4:2010).

The individual $^{13}C_{12}$-PCDFs all have chemical purities of >98% and isotopic purities of ≥99%.

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations of the Solution/Mixture
Figure 1: HRGC/HRMS Data (SIR; 10,000 mass resolving power)

ADDITIONAL INFORMATION:

- See page 2 for further details.

Ap 4-03-2018

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CERTIFICATE OF ANALYSIS
DOCUMENTATION

fp 15/06/22

EN-1948STK

PCDD/PCDF Solution/Mixture
for European Standard Method EN 1948-4

ARPA umbria
Data 28/7/20
Identif. 1 10 TRT
Approvato da MG

PRODUCT CODE:	EN-1948STK
LOT NUMBER:	EN481210STK
SOLVENT(S):	Nonane/Toluene
DATE PREPARED: (mm/dd/yyyy)	12/29/2010
LAST TESTED: (mm/dd/yyyy)	04/05/2018 (HRGC/LRMS)
EXPIRY DATE: (mm/dd/yyyy)	04/01/2025
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place

DESCRIPTION:

EN-1948STK is a solution/mixture of native chlorinated dibenzo-p-dioxins (PCDDs) and dibenzofurans (PCDFs). The components and their concentrations are given in Table A.

EN-1948STK was designed for, and prepared to be used according to, the European Standard Method EN 1948-4 "Stationary Source Emissions - Determination of the Mass Concentration of PCDDs/PCDFs and dioxin-like PCBs" (EN 1948-4:2010).

The individual PCDDs and PCDFs all have chemical purities of >98%.

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations of the Solution/Mixture
Figure 1: HRGC/HRMS Data (SIR; 10,000 mass resolving power)

ADDITIONAL INFORMATION:

- See page 2 for further details.

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Date Received: _____

Certificate of Analysis

Catalog No.:	Lot No.:	Storage:	Solvent:	Exp. Date:	Description:
116663-10	474876	≤-10 °C	Methylene Chloride	27-Oct-2026	Custom Deuterated PAH Mix, 7-3, 200 mg/L, 1 ml

Compound	CAS No.	Purity (%)	Neat Material Lot No.	Concentration	
acenaphthene-d10	15067-26-2	98.2	1.120.3P	199.3 ± 4.73	mg/L
benzo[a]anthracene-d12	1718-53-2	98.1	1270.120.1.1P	198.2 ± 4.7	mg/L
benzo(a)pyrene-d12	63466-71-7	98.2	1973.120.5.1P	201.3 ± 4.77	mg/L
dibenzo(a,h)anthracene-d14	13250-98-1	99.3	1974.120.3P	200.6 ± 4.76	mg/L
dibenzo(a,i)pyrene-d14	158776-07-9	98.8	2028.120.8.4P	199.6 ± 4.73	mg/L
fluoranthene-d10	93951-69-0	99	1458.120.2P	198 ± 5.09	mg/L
phenanthrene-d10	1517-22-2	98.6	6.120.3P	199.2 ± 4.72	mg/L

ARPA umbria
Data 03·03·2022
Identif. 145 MRT
Approvato da

Aperto il
15/12/2022

Certified By: _____

Clint Tipton

Manufacture Date 28-Oct-2021

Follow all storage requirements, keep tightly closed when not in use, and use good laboratory practices when handling.
This Reference Material was manufactured, produced, and/or certified under a quality management system that is accredited to ISO 17034 and ISO/IEC 17025.

All weights are traceable through N. I. S. T. Test No. 822/264157-00.
Concentration (correct for purity) and uncertainty (95% confidence) values listed are determined gravimetricly.

The stated uncertainty is the expanded uncertainty with a coverage factor of two to give a 95% confidence level.

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Date Received: _____

Certificate of Analysis

Catalog No.:	Lot No.:	Storage:	Solvent:	Exp. Date:	Description:
020188-04	438411	≤ -10 °C	P/T Methanol	3-Feb-2026	Trichloroethylene Solution, 5,000 mg/L, 1 ml

Compound	CAS No.	Purity (%)	Neat Material Lot No.	Concentration	
trichloroethylene	79-01-6	100	188.1.1P	5040 ± 51.55	mg/L

ARPA umbria
Data 23-03-2021
Identif. 150TRT
Approvato da

Aperto il 05/03/23

Melissa Workoff

Certified By: _____
Melissa Workoff
Manufacture Date 4-Feb-2021

Follow all storage requirements, keep tightly closed when not in use, and use good laboratory practices when handling.
This Reference Material was manufactured, produced, and/or certified under a quality management system that is accredited to ISO 17034 and ISO/IEC 17025.

All weights are traceable through N. I. S. T. Test No. 822/264157-00.
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Date Received: _____

Certificate of Analysis

Catalog No.:	Lot No.:	Storage:	Solvent:	Exp. Date:	Description:
132520-02	452510	≤-10 °C	Acetonitrile	14-Jun-2023	Carbonyl DNPH Derivatives Mix, Various Concentrations 500, 1,000, & 1,500 mg/L, 1 ml

Compound	CAS No.	Purity (%)	Neat Material Lot No.	Concentration	
acetaldehyde-DNPH	1019-57-4	99.5	1878.3.6P	1000 ± 7.33	mg/L
acetone-DNPH	1567-89-1	99	1879.286.1.2P	495 ± 7.07	mg/L
acrolein-DNPH	888-54-0	99.8	1880.7.1.3P	509 ± 5.11	mg/L
benzaldehyde-DNPH	1157-84-2	99.7	1881.421.1.1P	493.5 ± 7.08	mg/L
butanal-DNPH	1527-98-6	99.9	1882.7.1.1P	494.5 ± 5.11	mg/L
formaldehyde-DNPH	1081-15-8	99.5	1876.3.8P	1497 ± 9.47	mg/L
propionaldehyde-DNPH	725-00-8	97	1883.286.1.1P	499.6 ± 7.03	mg/L

ARPA umbria
Data 25·06·2021
Identif. 152/CRT
Approvato da

parker fletcher

Certified By: _____
Parker Fletcher
Manufacture Date 14-Jun-2021

Follow all storage requirements, keep tightly closed when not in use, and use good laboratory practices when handling.
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All weights are traceable through N. I. S. T. Test No. 822/264157-00.
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Catalog No.:	Lot No.:	Storage:	Solvent:	Exp. Date:	Description:
120020-02	509579	≤ -10 °C	P/T Methanol	24-Jun-2028	BTEX Solution, 2,000 mg/L, 1 mL

Compound	CAS No.	Purity (%)	Neat Material Lot No.	Concentration	
benzene	71-43-2	99.99	146.1.10VP	2001 ± 55.64	mg/L
ethylbenzene	100-41-4	100	174.7.1VP	2004 ± 55.76	mg/L
toluene	108-88-3	100	184.48.1P	2009 ± 55.9	mg/L
m-xylene	108-38-3	99.7	193.7.1.2VP	2000 ± 55.65	mg/L
o-xylene	95-47-6	99	192.29.3VP	2000 ± 59.1	mg/L
p-xylene	106-42-3	99.9	194.487.1VP	2000 ± 59.1	mg/L

Brian Stokes

Certified By: _____

Brian Stokes

Manufacture Date 26-Jun-2023

Follow all storage requirements, keep tightly closed when not in use, and use good laboratory practices when handling.
This Reference Material was manufactured, produced, and/or certified under a quality management system by an ISO/IEC accredited testing laboratory. Certificates of accreditation can be reviewed by visiting www.o2si.com.

All weights are traceable through N. I. S. T. Test No. 822/264157-00.
Concentration (correct for purity) and uncertainty (95% confidence) values listed are determined gravimetricly.
The stated uncertainty is the expanded uncertainty with a coverage factor of two to give a 95% confidence level.

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ARPA Umbria
Data 19-11-2022
Identif. 154 MRT
Approvato da

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Cert. No. 3031.01

Date Received: _____

Certificate of Analysis

Catalog No.:	Lot No.:	Storage:	Solvent:	Exp. Date:	Description:
116310-01	464399	≤-10 °C	Methylene Chloride	11-Jan-2026	Custom PAH Solution, 22-1, 200 mg/L, 1 mL

Compound	CAS No.	Purity (%)	Neat Material Lot No.	Concentration	
acenaphthene	83-32-9	99	13.1.4P	200 ± 5.65	mg/L
acenaphthylene	208-96-8	97.6	14.290.1P	199.9 ± 5.56	mg/L
anthracene	120-12-7	99.2	15.29.1.1P	199.9 ± 5.9	mg/L
benzo[a]anthracene	56-55-3	98.7	16.7.2.5P	199.9 ± 5.56	mg/L
benzo[b]fluoranthene	205-99-2	99.9	17.1.15P	200 ± 5.56	mg/L
benzo[k]fluoranthene	207-08-9	98.9	18.421.4P	199.9 ± 5.64	mg/L
benzo[ghi]perylene	191-24-2	97.3	19.286.3P	199.9 ± 6.84	mg/L
benzo[a]pyrene	50-32-8	98.3	20.286.1P	200 ± 6.85	mg/L
benzo[e]pyrene	192-97-2	99.9	619.1.8P	201.8 ± 4.99	mg/L
chrysene	218-01-9	96	21.286.2P	200.2 ± 5.91	mg/L
dibenz[a,h]anthracene	53-70-3	98	22.286.2.1P	200.2 ± 6.85	mg/L
dibenzo(a,e)pyrene	192-65-4	99.2	930.421.3P	200.4 ± 5.34	mg/L
dibenzo(a,h)pyrene	189-64-0	98.6	1517.7.4.3P	200.2 ± 4.95	mg/L
dibenzo(a,i)pyrene	189-55-9	97	1478.286.4P	199.8 ± 5.32	mg/L
dibenzo(a,l)pyrene	191-30-0	99.3	1516.421.1P	199.6 ± 5.32	mg/L
fluoranthene	206-44-0	98.6	23.7.4P	200 ± 5.56	mg/L

Follow all storage requirements, keep tightly closed when not in use, and use good laboratory practices when handling.
This Reference Material was manufactured, produced, and/or certified under a quality management system that is accredited to ISO 17034 and ISO/IEC 17025.

Certified By: Mlyons
Madalyn Lyons
Manufacture Date 12-Jan-2021

All weights are traceable through N. I. S. T. Test No. 822/264157-00.
Concentration (correct for purity) and uncertainty (95% confidence) values listed are determined gravimetricllly.
The stated uncertainty is the expanded uncertainty with a coverage factor of two to give a 95% confidence level.

Scad: 11-01-2026

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Date Received: _____

Certificate of Analysis

Catalog No.:	Lot No.:	Storage:	Solvent:	Exp. Date:	Description:
020183-04	365393	≤ -10 °C	P/T Methanol	1-Jan-2021	Tetrachloroethylene Solution, 5,000 mg/L, 1 ml

Compound	CAS No.	Purity (%)	Neat Material Lot No.	Concentration	
tetrachloroethylene	127-18-4	99.9	183.1.1P	5030 +/- 117.56	mg/L

ARPA umbria
Data 27.06.2019
Identif. 15 ART
Approvato da

Certified By: Jarrett Howard

Jarrett Howard
Manufacture Date 2-Jan-2019

Follow all storage requirements, keep tightly closed when not in use, and use good laboratory practices when handling.
This Reference Material was manufactured, produced, and/or certified under a quality management system that is accredited to ISO 17034 and ISO/IEC 17025.

All weights are traceable through N. I. S. T. Test No. 822/264157-00.
Concentration (correct for purity) and uncertainty (95% confidence) values listed are determined gravimetricly.

The stated uncertainty is the expanded uncertainty with a coverage factor of two to give a 95% confidence level.

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Quality System Audited & Registered by NSF-ISR to ISO 9001:2008

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Date Received: _____

Certificate of Analysis

Catalog No.:	Lot No.:	Storage:	Solvent:	Exp. Date:	Description:
010116-06	231043	≤ -10 °C	Methanol	27-Jun-2017	p-Cresol (4-Methylphenol) Solution, 5000 mg/L, 1 ml

Compound	CAS No.	Purity (%)	Neat Material Lot No.	Concentration	
4-methylphenol	106-44-5	99	116.1.3P	5000 +/- 28.68	mg/L

ARPA umbria
Data 04/07/2016
Identif. 170MRT
Approvato da

Certified By: _____
Nicholas Collins

All weights are traceable through N. I. S. T. Test No. 822/264157-00.
Concentration (correct for purity) and uncertainty (95% confidence) values listed are determined gravimetricly.

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

P48-W-ES-STK

EN 1948-4:2010
Mass-Labelled WHO PCB
Extraction Standard Stock Solution

PRODUCT CODE:	P48-W-ES-STK
LOT NUMBER:	WPLCS0914
SOLVENT(S):	Nonane/Toluene
DATE PREPARED: (mm/dd/yyyy)	09/29/2014
LAST TESTED: (mm/dd/yyyy)	06/23/2018
EXPIRY DATE: (mm/dd/yyyy)	08/01/2025
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place

DESCRIPTION:

P48-W-ES-STK is a solution/mixture of twelve $^{13}C_{12}$-labelled chlorinated biphenyls ($^{13}C_{12}$-PCBs). The components and their concentrations are given in Table A.

P48-W-ES-STK was designed for, and prepared to be used according to, the European Standard Method EN 1948-4 "Stationary Source Emissions - Determination of the Mass Concentration of PCDDs/PCDFs and dioxin-like PCBs" (EN 1948-4:2010). This solution contains the twelve $^{13}C_{12}$-labelled analogues of the PCB congeners designated by the World Health Organization (WHO) and U.S. Environmental Protection Agency (EPA) as being "dioxin-like" in their potential health effects.

The individual $^{13}C_{12}$-PCBs all have chemical purities of >98% and isotopic purities of ≥99%.

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations of the Solution/Mixture
Figure 1: HRGC/HRMS Data for P48-W-ES-STK (1/10 Dilution)
(SIR; 10,000 mass resolving power)

ADDITIONAL INFORMATION:

- See page 2 for further details.

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CERTIFICATE OF ANALYSIS
DOCUMENTATION

IS

P48-RS-STK

EN 1948-4:2010
Mass-Labelled PCB Recovery Standard Stock

PRODUCT CODE:	P48-RS-STK
LOT NUMBER:	111509
SOLVENT(S):	Nonane
DATE PREPARED: (mm/dd/yyyy)	11/15/2009
LAST TESTED: (mm/dd/yyyy)	08/20/2018
EXPIRY DATE: (mm/dd/yyyy)	08/01/2025
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place

ARPA umbria
Data 25/8/2020
Identif. 1730RT
Approvato da HG

DESCRIPTION:

P48-RS-STK is a solution/mixture of three $^{13}C_{12}$-labelled chlorinated biphenyls ($^{13}C_{12}$-PCBs). The components and their concentrations are given in Table A.

P48-RS-STK was designed for, and prepared to be used according to, the European Standard Method EN 1948-4 "Stationary Source Emissions - Determination of the Mass Concentration of PCDDs/PCDFs and dioxin-like PCBs" (EN 1948-4:2010). It can be used with either of two sets of calibration solutions: P48-M-CVS or P48-W-CVS.

The individual $^{13}C_{12}$-PCBs all have chemical purities of >98% and isotopic purities of ≥99%.

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations of the Solution/Mixture
Figure 1: HRGC/HRMS Data for a dilution of P48-RS-STK (P48-RS)
(SIR; 10,000 mass resolving power)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~ 0.2% of an unknown Trichloro[$^{13}C_{12}$]biphenyl and ~ 0.7% of 2,3,3',4,4',5'-Hexachloro[$^{13}C_{12}$]biphenyl (157L).

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CERTIFICATE OF ANALYSIS
DOCUMENTATION

P48-M-ES

EN 1948-4:2010
Mass-Labelled Marker PCB Extraction Standard

PRODUCT CODE:	P48-M-ES
LOT NUMBER:	P48MES1109
SOLVENT(S):	Nonane
DATE PREPARED: (mm/dd/yyyy)	11/15/2009
LAST TESTED: (mm/dd/yyyy)	10/04/2018
EXPIRY DATE: (mm/dd/yyyy)	08/01/2025
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place

ARPA umbria
Data 13/12/2019
Identif. 7641RT
Approvato da MG

DESCRIPTION:

P48-M-ES is a solution/mixture of six $^{13}C_{12}$-labelled chlorinated biphenyls ($^{13}C_{12}$-PCBs). The components and their concentrations are given in Table A.

P48-M-ES was designed for, and prepared to be used according to, the European Standard Method EN 1948-4 "Stationary Source Emissions - Determination of the Mass Concentration of PCDDs/PCDFs and dioxin-like PCBs" (EN 1948-4:2010). This solution contains the six $^{13}C_{12}$-labelled analogues of the Marker PCB congeners.

The individual $^{13}C_{12}$-PCBs all have chemical purities of >98% and isotopic purities of ≥99%.

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations of the Solution/Mixture
Figure 1: HRGC/HRMS Data (SIR; 10,000 mass resolving power)

ADDITIONAL INFORMATION:

- See page 2 for further details.

Ap 21/03/2021
MG

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ARPA Umbria
Data 06/06/17
Identif. 1980RT
Approvato da MG

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Date Received: _____

Certificate of Analysis

Rev 0

Catalog No.:	Lot No.:	Storage:	Solvent:	Exp. Date:	Description:
130307-01	306333	≤ -10 °C	Isooctane	1-May-2020	PCB Congener Solution 32-2, 10 mg/L, 1 mL

Compound	CAS No.	Purity (%)	Neat Material Lot No.	Concentration	
2,2',3,3',4',5,6-heptachlorobiphenyl (BZ# 177)	52663-70-4	100	833.5.2.6P	9.96 +/- .13	mg/L
2,2',3,3',4,4',5-heptachlorobiphenyl (BZ# 170)	35065-30-6	99	526.4.2P	9.9 +/- .27	mg/L
2,2',3,4',5,5',6-heptachlorobiphenyl (BZ# 187)	52663-68-0	98.8	542.4.2P	10.15 +/- .22	mg/L
2,2',3,4,4',5',6-heptachlorobiphenyl (BZ# 183)	52663-69-1	99	664.5.5.5P	10.05 +/- .25	mg/L
2,2',3,4,4',5,5'-heptachlorobiphenyl (BZ# 180)	35065-29-3	99	527.4.2P	10.04 +/- .22	mg/L
2,3,3',4,4',5,5'-heptachlorobiphenyl (BZ# 189)	39635-31-9	100	656.5.4.1P	10.1 +/- .14	mg/L
2,2',3,3',4,4'-hexachlorobiphenyl (BZ# 128)	38380-07-3	99	523.4.1P	9.999 +/- .15	mg/L
2,2',3,4',5',6-hexachlorobiphenyl (BZ# 149)	38380-04-0	99.9	811.5.5.3P	9.946 +/- .17	mg/L
2,2',3,4',5,5'-hexachlorobiphenyl (BZ# 146)	51908-16-8	99	808.421.2.1P	10.03 +/- .24	mg/L
2,2',3,4,4',5'-hexachlorobiphenyl (BZ# 138)	35065-28-2	99.5	541.3.1.1S	10.09 +/- .25	mg/L
2,2',3,5,5',6-hexachlorobiphenyl (BZ# 151)	52663-63-5	99.6	813.5.3.3P	10.06 +/- .52	mg/L
2,2',4,4',5,5'-hexachlorobiphenyl (BZ# 153)	35065-27-1	97	525.257.1P	9.959 +/- .15	mg/L
2,3',4,4',5,5'-hexachlorobiphenyl (BZ# 167)	52663-72-6	99.4	655.5.4P	9.909 +/- .19	mg/L
2,3,3',4,4',5-hexachlorobiphenyl (BZ# 156)	38380-08-4	99	659.4.1.2P	10.02 +/- .3	mg/L
2,3,3',4,4',5'-hexachlorobiphenyl (BZ# 157)	69782-90-7	99	654.421.1.1P	10.04 +/- .21	mg/L
3,3',4,4',5,5'-hexachlorobiphenyl (BZ# 169)	32774-16-6	99	660.5.5.1P	10.01 +/- .22	mg/L
2',3,4,4',5-pentachlorobiphenyl (BZ# 123)	65510-44-3	99.3	658.5.4P	9.99 +/- .25	mg/L
2,2',3,5',6-pentachlorobiphenyl (BZ# 95)	38379-99-6	97	767.421.2.1P	10 +/- .16	mg/L
2,2',4,4',5-pentachlorobiphenyl (BZ# 99)	38380-01-7	99.5	771.257.1.1P	10.09 +/- .24	mg/L
2,2',4,5,5'-pentachlorobiphenyl (BZ# 101)	37680-73-2	99	520.421.4P	9.9 +/- .17	mg/L
2,3,3',4,4'-pentachlorobiphenyl (BZ# 105)	32598-14-4	98.8	521.4.2P	9.939 +/- .27	mg/L
2,3',4,4',5-pentachlorobiphenyl (BZ# 118)	31508-00-6	99.2	539.257.1P	9.935 +/- .21	mg/L

22

Certified By: _____

Katrina Emelianoff

Manufacture Date 27-Apr-2017

All weights are traceable through N. I. S. T. Test No. 822/264157-00. Concentration (correct for purity) and uncertainty (95% confidence) values listed are determined gravimetricly.

AP. 6-05-2019

European Commission

ERM European Reference Materials

JOINT RESEARCH CENTRE
Directorate F – Health, Consumers and Reference Materials

CERTIFICATE OF ANALYSIS

ERM®- CZ100

N° 1911

FINE DUST (PM_{10}-LIKE)		
PAH	Mass Fraction	
	Certified value [1] [mg/kg]	Uncertainty [2] [mg/kg]
Benzo[*a*]anthracene	0.91	0.07
Benzo[*a*]pyrene	0.72	0.05
Benzo[*b*]fluoranthene	1.42	0.14
Benzo[*j*]fluoranthene	0.75	0.14
Benzo[*k*]fluoranthene	0.67	0.06
Dibenzo[*a,h*]anthracene	0.18	0.04
Indeno[1,2,3-*c,d*]pyrene	1.07	0.10
Sum of benzo[*b*]fluoranthene, benzo[*k*]fluoranthene and benzo[*j*]fluoranthene[3]	2.84	0.21

[1] Unweighted mean value of the means of accepted sets of data, each set being obtained in a different laboratory and/or with a different method of determination. The certified values and their uncertainties are mass fractions based on the mass of the sample after conditioning as described in EN12341. They are traceable to the SI.

[2] The certified uncertainty is the expanded uncertainty with a coverage factor $k = 2$ corresponding to a level of confidence of about 95 % estimated in accordance with ISO/IEC Guide 98-3, Guide to the Expression of Uncertainty in Measurement (GUM:1995), ISO, 2008.

[3] The mass fraction of the sum of benzo[*b*]fluoranthene, benzo[*k*]fluoranthene and benzo[*j*]fluoranthene was calculated as the sum of the individual certified values of each compound. The uncertainty was calculated as the combined expanded uncertainty of the uncertainties of the individual compounds.

This certificate is valid for one year after purchase.

Sales date: 10 NOV 2021

The minimum amount of sample to be used is 50 mg.

Geel, November 2010
Latest revision January 2019

Signed: D. Flo

Dr Doris Florian
Head of Unit Reference Materials
European Commission, Joint Research Centre
Directorate F – Health, Consumers and Reference Materials
Retieseweg 111
B-2440 Geel, Belgium

SIGMA-ALDRICH

sigma-aldrich.com

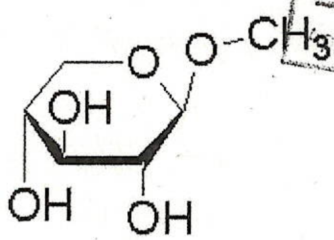
3050 Spruce Street, Saint Louis, MO 63103, USA
Website: www.sigmaaldrich.com
Email USA: techserv@sial.com
Outside USA: eurtechserv@sial.com

ARPA umbria
Data 9 Giugno 2011
Identif. 207 HRT
Approvato Fa Mg

Certificate of Analysis

Product Name:
Methyl β-D-xylopyranoside - ≥99% (GC)

Product Number:	**M5878**
Lot Number:	**041M1620V**
Brand:	SIGMA
CAS Number:	612-05-5
MDL Number:	MFCD00047532
Formula:	$C_6H_{12}O_5$
Formula Weight:	164.16 g/mol
Quality Release Date:	24 JUN 2011



Test	Specification	Result
Appearance (Color)	White to Off-White	White
Appearance (Form)	Powder	Powder
Solubility (Color)	Colorless to Light Yellow	Colorless
Solubility (Turbidity) 100 mg/mL, H_2O	Clear to Hazy	Clear
Proton NMR spectrum	Conforms to Structure	Conforms
Specific Rotation C = 10 in H_2O at 20 deg C	-66.5 - -64.5 °	-65.5 °
Purity (GC)	≥ 99 %	100 %

Rodney Burbach

Rodney Burbach, Manager
Analytical Services
St. Louis, Missouri US

Scadenza a 1 anno dall'apertura
24/06/2011 24/06/2013
24/06/2012 24/06/2014 Mg*

* ~~[illegible]~~ viene utilizzato con standard di estrazione e non x la taratura. Mg

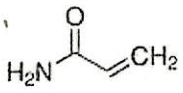
Sigma-Aldrich.

3050 Spruce Street, Saint Louis, MO 63103, USA
Website: www.sigmaaldrich.com
Email USA: techserv@sial.com
Outside USA: eurtechserv@sial.com

Certificate of Analysis

Product Name:
Acrylamide - suitable for electrophoresis, ≥99%

Product Number:	**A8887**
Batch Number:	**BCCJ1257**
Brand:	SIGMA
CAS Number:	79-06-1
Formula:	C3H5NO
Formula Weight:	71,08 g/mol
Quality Release Date:	19 AUG 2022
Recommended Retest Date:	JUL 2025



Test	Specification	Result
Appearance (Color)	White	White
Appearance (Form)	Powder or Crystals	Crystals
Purity (HPLC)	≥ 99 %	100 %
Solubility (Color)	Colorless	Colorless
Solubility (Turbidity) 250mg/ml in Water	Clear	Clear
Miscellaneous Assay Water Insolubles < = 0.02 %	Corresponds to Requirements	Corresponds
Electrophoresis Suitable for Use in Electrophoresis	Pass	Pass

Dr. R. Schwenninger

Dr.Reinhold Schwenninger
Quality Assurance
Buchs,Switzerland CH

CERTIFICATE OF ANALYSIS

PRODUCT NAME	Acrylamide-2,3,3-d_3
PRODUCT NO.	D-5184
BULK LOT NO.	FG-361
CAS #	122775-19-3
MOLECULAR FORMULA	$C_3H_2D_3NO$
MOLECULAR WEIGHT	74.10
DATE:	02/24/2023

SC. 02/24/2027

Stable if stored under recommended conditions (see section 7 of SDS).
After 4 years, the compound should be re-checked for chemical purity before use.

N.M.R.
98.6%-d3

HPLC
99% Chemical purity

Melting Point
84-85°C

ARPA umbria
Data 03/03/2023
Identif. 252 TRT
Approvato da GPiccini

Iuri Lutenco, M.Sc. Chemist
Quality Specialist

C/D/N ISOTOPES INC. - 88 Leacock Street - Pointe-Claire - Quebec - Canada - H9R 1H1
Tel. (514) 697-6254 (800) 565-4696 Fax (514) 697-6148 www.cdnisotopes.com sales@cdnisotopes.com

Supelco®

www.sigmaaldrich.com

Certificate of Analysis - Analytical Standard

Perfluorotributylamine (PFTBA)

Product no.:	442747-U
Lot no.:	LRAC8041
Description of CRM:	COLORLESS LIQUID
Expiry date:	September 2023
Storage:	ROOM TEMPERATURE
Certificate version:	LRAC8041.01 *(Note: Certificates may be updated due to the availability of new data. Check our website at: www.sigma-aldrich.com for the most current version.)*
Chemical formula:	N(CF2CF2CF2CF3)3
Molecular mass:	671.09
CAS No.	311-89-7

Order Information
CRESCENT CHEMICAL
Tel: (631) 348-0333
Fax: (631) 348-0913
crescentchemical.com
sales@creschem.com

Analyte	Purity (Mass Balance/ basis)
Perfluorotributylamine (PFTBA)	**99.5%**

Intended use:	Intended for Laboratory Use only. Not for drug, household or other uses
Minimum sample size:	10 mg
Instructions for handling and correct use:	Do not dry, use on the as is basis. The internal pressure of the container may be slightly different from the atmospheric pressure at the user`s location. Open slowly and carefully to avoid dispersion of the material. Attachment of a 20 mm aluminum crimp seal recommended for unused portions.
Health and safety information:	All chemical reference materials should be considered potentially hazardous and should be used only by qualified laboratory personnel. Please refer to the Safety Data Sheet for detailed information about the nature of any hazard and appropriate precautions to be taken.
Certificate issue date:	25-September-2020
Packaging:	1G in amber ampule

ARPA umbria
Data 22-09/2021
Identif. 269TRT
op. ato.

[Andy Ommen - QC]

[Mark Pooler - QA]

Sigma-Aldrich RTC, 2931 Soldier Springs Rd. Laramie, WY 82070, USA;
Tel. 1 307-742-5452; Fax 1 307-855-831-9211; www.sigmaaldrich.com
Sigma-Aldrich RTC is a subsidiary of Merck KGaA, Darmstadt, Germany.

WELLINGTON
LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

P48-SS-STK

**EN 1948-4:2010 Mass-Labelled PCB
Sampling Standard Stock Solution**

SS

ARPA umbria
08/09/2016
270 MRT
Approvato da

PRODUCT CODE:	P48-SS-STK
LOT NUMBER:	111509
SOLVENT(S):	Nonane
DATE PREPARED: (mm/dd/yyyy)	11/15/2009
LAST TESTED: (mm/dd/yyyy)	10/08/2013
EXPIRY DATE: (mm/dd/yyyy)	08/01/2020
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place

DESCRIPTION:

P48-SS-STK is a solution/mixture of three $^{13}C_{12}$-labelled chlorinated biphenyls ($^{13}C_{12}$-PCBs). The components and their concentrations are given in Table A.

P48-SS-STK was designed for, and prepared to be used according to, the European Standard Method EN 1948-4 "Stationary Source Emissions - Determination of the Mass Concentration of PCDDs/PCDFs and dioxin-like PCBs" (EN 1948-4:2010). It can be used with either of two sets of calibration solutions: P48-M-CVS or P48-W-CVS.

The individual $^{13}C_{12}$-PCBs all have chemical purities of >98% and isotopic purities of ≥99%.

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations of the Solution/Mixture
Figure 1: HRGC/HRMS Data for a dilution of P48-SS-STK (P48-SS)
(SIR; 10,000 mass resolving power)

AP 09/08/2019

ADDITIONAL INFORMATION:

- See page 2 for further details.

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ACCREDITED

ISO 17025 Accredited Chemical Testing Lab
Cert. No. 3031.01

Date Received: _____

Certificate of Analysis

Catalog No.:	Lot No.:	Storage:	Solvent:	Exp. Date:	Description:
120257-01	461964	2°C - 8°C	P/T Methanol:Water 97:3	13-Dec-2021	High Concentration Custom Standard, 50-257, 1,000 ppm, 1 ml

Compound	CAS No.	Purity (%)	Neat Material Lot No.	Concentration	
acetone	67-64-1	99.6	196.271.4P	1005 ± 10.45	mg/L
benzene	71-43-2	99.99	146.1.9P	999.7 ± 10.38	mg/L
bromodichloromethane	75-27-4	97.2	149.1.10P	1006 ± 10.5	mg/L
1-butanol	71-36-3	99.9	224.29.2P	1001 ± 14.43	mg/L
2-butanone (MEK)	78-93-3	99.9	197.18.1P	1003 ± 14.46	mg/L
butyl acetate	123-86-4	99.8	358.7.1P	998 ± 4.57	mg/L
chloroform	67-66-3	99.8	156.7.1P	1003 ± 10.47	mg/L
decane (C10)	124-18-5	99.7	415.7.2P	1000 ± 10.44	mg/L
decylaldehyde	112-31-2	99.5	613.7.1P	1019 ± 4.58	mg/L
dibromochloromethane	124-48-1	98.8	159.29.1.1P	1002 ± 10.46	mg/L
1,4-dichlorobenzene	106-46-7	99.9	45.29.2P	995.8 ± 10.4	mg/L
1,2-dichloroethane	107-06-2	99.9	164.158.1P	1002 ± 10.46	mg/L
1,2-dichloropropane	78-87-5	99.7	168.8.1.1P	1002 ± 14.45	mg/L
2,4-dimethylpentane	108-08-7	98.6	2009.247.1P	1002 ± 4.53	mg/L
dodecane (C12)	112-40-3	99.34	416.29.1P	1003 ± 10.43	mg/L
ethanol	64-17-5	99.7	202.52.1P	1003 ± 10.47	mg/L

Certified By: _____

Erica Lawson
Manufacture Date 14-Sep-2021

ARPA Umbria
Data 24.09.2021
Identif. 2PP ART
Approvato da

Follow all storage requirements, keep tightly closed when not in use, and use good laboratory practices when handling.
This Reference Material was manufactured, produced, and/or certified under a quality management system that is accredited to ISO 17034 and ISO/IEC 17025.

All weights are traceable through N. I. S. T. Test No. 822/264157-00.
Concentration (correct for purity) and uncertainty (95% confidence) values listed are determined gravimetricly.
The stated uncertainty is the expanded uncertainty with a coverage factor of two to give a 95% confidence level.

Enrico Nuovo

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

WM48-CVS

EN 1948-4:2010 Combined HRGC/HRMS Calibration Solutions for the WHO and Marker PCBs

PRODUCT CODES:	WM48-CVS WM48-CS1 WM48-CS2 WM48-CS3 WM48-CS4 WM48-CS5 WM48-CS6	**LOT NUMBERS:**	(see below) WM481112CS1 WM481112CS2 WM481112CS3 WM481112CS4 WM481112CS5 WM481112CS6
SOLVENT(S):	Nonane		
DATE PREPARED: (mm/dd/yyyy)	11/20/2012		
LAST TESTED: (mm/dd/yyyy)	01/02/2019		
EXPIRY DATE: (mm/dd/yyyy)	08/01/2025		
RECOMMENDED STORAGE:	Store ampoules in a cool, dark place		

ARPA umbria
Data 03/03/2022
Identif. 300 MRT
Approvato da G. Riccini

DESCRIPTION:

WM48-CVS is a series of six HRGC/HRMS calibration solutions containing native and $^{13}C_{12}$-labelled chlorinated biphenyls (PCBs). The components of each solution, and their concentrations, are given in Table A.

These solutions were designed for, and prepared to be used according to, the European Standard Method EN 1948-4 "Stationary Source Emissions - Determination of the Mass Concentration of PCDDs/PCDFs and dioxin-like PCBs" (EN 1948-4:2010). These solutions contain the twelve "dioxin-like" (WHO) PCB congeners and the six "marker" PCB congeners, as well as their $^{13}C_{12}$-labelled analogues. Additional $^{13}C_{12}$-labelled PCBs, to be used as sampling and recovery standards, are also included.

The individual native PCBs all have chemical purities of >98%. The individual ^{13}C-labelled PCBs all have chemical purities of >98% and isotopic purities of ≥99%.

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations
Table B: HRGC/HRMS Calibration and RRF Summary
Figure 1: HRGC/HRMS Data for WM48-CS3 (SIR; 10,000 mass resolving power)

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CSL 0,05 NON IN US

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS DOCUMENTATION

APERTA IL 10/05/16

DF-CVS-A10

PCDD/PCDF HRMS Calibration and Verification Solutions

PRODUCT CODES:	DF-CVS-A10	**LOT NUMBERS:**	(see below)
	DF-A10-CSL		CSLA100301
	DF-A10-CS1		CS1A100301
	DF-A10-CS2		CS2A100301
	DF-A10-CS3		CS3A100301
	DF-A10-CS4		CS4A100301
	DF-A10-CS5		CS5A100301
	DF-A10-CS6		CS6A100301
	DF-A10-CS7		CS7A100301
	DF-A10-CS8		CS8A100301
	DF-A10-CS9		CS9A100301
	DF-A10-CS10		CS10A100301
	DF-A10-CS11		CS11A100301
	DF-A10-CSH		CSHA100301

SOLVENT(S):	Nonane
DATE PREPARED: (mm/dd/yyyy)	03/13/2001
LAST TESTED: (mm/dd/yyyy)	02/25/2016
EXPIRY DATE: (mm/dd/yyyy)	02/01/2023
RECOMMENDED STORAGE:	Store ampoules in a cool, dark place

ARPA umbria
Data 22/04/16
Identif. 302 MRT
Approvato da R. Quaranta

DESCRIPTION:

DF-CVS-A10 is a series of 13 calibration solutions containing native ($^{12}C_{12}$) and mass-labelled ($^{13}C_{12}$) chlorinated dibenzo-p-dioxins (PCDDs) and dibenzofurans (PCDFs). The components of each solution, and their concentrations, are given in Table A.

The individual native PCDDs and PCDFs all have chemical purities of >98%. The individual ^{13}C-labelled PCDDs and PCDFs all have chemical purities of >98% and isotopic purities of ≥99%.

DF-CVS-A10 was prepared using, and is compatible with, the following stock solutions: DF-ST-A; DF-LCS-A; DF-IS-B; and DF-IS-I.

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WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

EPA-8290STN

Native PCDD/PCDF Stock Solution for U.S. EPA Method 8290

ARPA umbria
Data 13/12/2019
Identif. 304TRT
Approvato da

PRODUCT CODE:	EPA-8290STN
LOT NUMBER:	90STN0518
SOLVENT(S):	Nonane/Toluene
DATE PREPARED: (mm/dd/yyyy)	05/02/2018
LAST TESTED: (mm/dd/yyyy)	05/04/2018
EXPIRY DATE: (mm/dd/yyyy)	03/01/2025
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place

DESCRIPTION:

EPA-8290STN is a solution/mixture containing native ($^{12}C_{12}$) chlorinated dibenzo-p-dioxins (PCDDs) and dibenzofurans (PCDFs). The components and their concentrations are given in Table A.

EPA-8290STN was designed for, and prepared to be used according to, U.S. EPA Method 8290.

The individual native PCDDs and PCDFs all have chemical purities of >98%.

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations of the Solution/Mixture
Figure 1: HRGC/HRMS Data for a 1/20 dilution of EPA-8290STN (SIR; 10,000 mass resolving power)

ADDITIONAL INFORMATION:

- See page 2 for further details.

Aperto il 13/05/2

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CERTIFICATE OF ANALYSIS DOCUMENTATION

In Uso

DF-IS-J

Mass-Labelled PCDD Internal Standard Solution

PRODUCT CODE:	DF-IS-J
LOT NUMBER:	DFISJ0110
SOLVENT(S):	Nonane/Toluene
DATE PREPARED: (mm/dd/yyyy)	01/25/2010
LAST TESTED: (mm/dd/yyyy)	04/01/2021
EXPIRY DATE: (mm/dd/yyyy)	04/01/2028
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place

ARPA umbria
Data 03/03/2022
Identif. 305MRT
Approvato da G. Piccini

DESCRIPTION:

DF-IS-J is a solution/mixture of mass-labelled ($^{13}C_{12}$) polychlorinated dibenzo-*p*-dioxins (PCDDs). The components and their concentrations are given in Table A.

The individual ^{13}C-labelled PCDDs all have chemical purities of >98% and isotopic purities of ≥99%.

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations of the Solution/Mixture
Figure 1: HRGC/HRMS Data for a dilution of DF-IS-J (DF-IS-J20) (SIR; 10,000 mass resolving power)

ADDITIONAL INFORMATION:

- See page 2 for further details.

Aperto il 31/3/2022

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WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

ARPA umbria
Data 07.03.2023
Identif. 306 HRT
Approvato da G Riccini

DF-LCS-C200

Mass-Labelled PCDD/PCDF Solution/Mixture

PRODUCT CODE:	DF-LCS-C200
LOT NUMBER:	LCSC2000301
SOLVENT(S):	Nonane/Toluene
DATE PREPARED: (mm/dd/yyyy)	03/19/2001
LAST TESTED: (mm/dd/yyyy)	06/23/2021
EXPIRY DATE: (mm/dd/yyyy)	06/01/2028
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place

DESCRIPTION:

DF-LCS-C200 is a solution/mixture of mass-labelled ($^{13}C_{12}$) polychlorinated dibenzo-*p*-dioxins (PCDDs) and dibenzofurans (PCDFs). The components and their concentrations are given in Table A.

The individual ^{13}C-labelled PCDDs and PCDFs all have chemical purities of >98% and isotopic purities of ≥99%.

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations of the Solution/Mixture
Figure 1: HRGC/HRMS Data for a dilution of DF-LCS-C200 (SIR; 10,000 mass resolving power)

ADDITIONAL INFORMATION:

- See page 2 for further details.

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ACCREDITED
ISO 17025 Accredited Chemical Testing Lab
Cert No. 3031.01

Date Received: _____

Certificate of Analysis

Catalog No.:	Lot No.:	Storage:	Solvent:	Exp. Date:	Description:
110615-02	386942	≤ -10 °C	Methanol	14-Sep-2023	Custom Semi-Volatile Mix, 4-615, 2000 mg/L, 1 ml

Compound	CAS No.	Purity (%)	Neat Material Lot No.	Concentration	
2-methylphenol	95-48-7	99.6	114.7.3P	1980 +/- 5.95	mg/L
3-methylphenol	108-39-4	99.2	115.7.3P	1996 +/- 5.97	mg/L
4-methylphenol	106-44-5	99	116.1.3P	2020 +/- 20.97	mg/L
phenol	108-95-2	99.9	112.9.5P	1998 +/- 5.99	mg/L

ARPA umbria
Data 24/9/19
Identif. 316 TERT
Approvato da _____

Certified By: _____
Leslie Huneycutt
Manufacture Date 10-Sep-2019

Follow all storage requirements, keep tightly closed when not in use, and use good laboratory practices when handling.
This Reference Material was manufactured, produced, and/or certified under a quality management system that is accredited to ISO 17034 and ISO/IEC 17025.

All weights are traceable through N. I. S. T. Test No. 822/264157-00. Concentration (correct for purity) and uncertainty (95% confidence) values listed are determined gravimetricly.

The stated uncertainty is the expanded uncertainty with a coverage factor of two to give a 95% confidence level.

EUROPEAN COMMISSION
JOINT RESEARCH CENTRE
Institute for Reference Materials and Measurements

Institute for Reference Materials and Measurements

CERTIFIED REFERENCE MATERIAL
BCR® – 490

CERTIFICATE OF ANALYSIS

327

FLY ASH			
	Mass fraction		Number of accepted sets of data p
	Certified value [1] [µg/kg]	Uncertainty [2] [µg/kg]	
2,3,7,8-T4CDD (D48)	0.169	0.012	13
1,2,3,7,8-P5CDD (D54)	0.67	0.04	13
1,2,3,4,7,8-H6CDD (D66)	0.95	0.11	16
1,2,3,6,7,8-H6CDD (D67)	4.8	0.4	16
1,2,3,7,8,9-H6CDD (D70)	2.84	0.17	15
2,3,7,8-T4CDF (F83)	0.90	0.05	15
1,2,3,7,8-P5CDF (F94)	1.71	0.12	14
2,3,4,7,8-P5CDF (F114)	1.85	0.11	15
1,2,3,4,7,8-H6CDF (F118)	2.37	0.12	8
1,2,3,6,7,8-H6CDF (F121)	2.64	0.14	15
1,2,3,7,8,9-H6CDF (F124)	0.34	0.05	11
2,3,4,6,7,8-H6CDF (F130)	2.47	0.17	16

[1] The certified value was calculated from the average of the p accepted datasets based on dry mass. The certified value is traceable to determinations by GC.

[2] The uncertainty is taken as the half-width of the 95 % confidence interval of the mean given in [1].

This certificate is valid for one year after purchase.

Sales date: 06. APR. 2018

Ap. 20-05-2018

The minimum amount of sample to be used is 1 g.

NOTE

This material has been certified by BCR (Community Bureau of Reference, the former reference materials programme of the European Commission). The certificate has been revised under the responsibility of IRMM.

Brussels, April 1996
Revised: May 2007

ARPA umbria
Data 16/04/18
Identif. 328 TLRT
Approvato da MG

Signed:

Prof. Dr. Hendrik Emons
Unit for Reference Materials
EC-JRC-IRMM
Retieseweg 111
2440 Geel, Belgium

1ª scadenza 6/04/2019 prolungata scadenza all'uso x conferma con valori certificati (Vedi CC MD-LAB 31) MG

xQC

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ISO 17025 Accredited Chemical Testing Lab
Cert. No. 3031.01

Date Received: _____

Certificate of Analysis

Catalog No.:	Lot No.:	Storage:	Solvent:	Exp. Date:	Description:
112683-09 -5PAK	340635	≤ -10 °C	Methanol	26-Apr-2019	Custom Mix, 33-4849, 4 mg/L, 5 x 1 mL

Compound	CAS No.	Purity (%)	Neat Material Lot No.	Concentration	
acenaphthene	83-32-9	99	13.1.4P	4.004 +/- .05	mg/l
acenaphthene-d_{10}	15067-26-2	99	1.12.3.3P	4 +/- .05	mg/l
acenaphthylene	208-96-8	98	14.282.4P	4 +/- .06	mg/l
acenaphthylene-d_8	93951-97-4	99.1	1975.12.5P	4.059 +/- .05	mg/l
anthracene	120-12-7	99.2	15.29.1.1P	4.016 +/- .06	mg/l
benzo[a]anthracene	56-55-3	99	16.7.2.4P	4.006 +/- .05	mg/l
benzo[a]anthracene-d_{12}	1718-53-2	99.9	1270.12.2P	3.996 +/- .05	mg/l
benzo(a)pyrene-d_{12}	63466-71-7	98.6	1973.12.4P	4.023 +/- .05	mg/l
benzo[b]fluoranthene	205-99-2	99.5	17.282.1.2P	4.002 +/- .06	mg/l
benzo(j)fluoranthene	205-82-3	99	1766.421.1P	4.004 +/- .1	mg/l
benzo[k]fluoranthene	207-08-9	99.5	18.282.3P	4.007 +/- .06	mg/l
benzo[ghi]perylene	191-24-2	96	19.286.1P	4.001 +/- .06	mg/l
benzo[a]pyrene	50-32-8	99.5	20.282.3P	4.002 +/- .06	mg/l
benzo[e]pyrene	192-97-2	99.5	619.282.4P	4.02 +/- .05	mg/l
chrysene	218-01-9	98	21.286.1P	4.003 +/- .06	mg/l
chrysene-d_{12}	1719-03-5	99	2.120.5P	4.005 +/- .06	mg/l
dibenz[a,h]anthracene	53-70-3	99.5	22.286.1P	4.001 +/- .06	mg/l
dibenzo(a,h)anthracene-d_{14}	13250-98-1	99	1974.12.4P	4 +/- .05	mg/l
dibenzo(a,c)pyrene	192-65-4	99.6	930.1.3P	4.032 +/- .04	mg/l
dibenzo(a,h)pyrene	189-64-0	98	1517.7.4.4P	3.998 +/- .05	mg/l
dibenzo(a,i)pyrene-d_{14}	158776-07-9	99	2028.120.8.3P	4 +/- .05	mg/l

Certified By: Jarrett Howard

Jarrett Howard

Manufacture Date 6-Apr-2018

ARPA umbria
Data 26/5/18
Identif. 329 MRT
Approvato da

Follow all storage requirements, keep tightly closed when not in use, and use good laboratory practices when handling.
This Reference Material was manufactured, produced, and/or certified under a quality management system that is accredited to ISO 17034 and ISO/IEC 17025.

All weights are traceable through N. I. S. T. Test No. 822/264157-00.
Concentration (correct for purity) and uncertainty (95% confidence) values listed are determined gravimetricly.
The stated uncertainty is the expanded uncertainty with a coverage factor of two to give a 95% confidence level.

Verifica efficienza della colonna

WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

TDTFWD

Combined Window Defining and Resolution Testing Mixture for 3 Capillary Columns

PRODUCT CODE:	TDTFWD
LOT NUMBER:	TDTFWD0715
SOLVENT(S):	Nonane
DATE PREPARED: (mm/dd/yyyy)	07/03/2015
LAST TESTED: (mm/dd/yyyy)	04/20/2018
EXPIRY DATE: (mm/dd/yyyy)	03/01/2025
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place

ARPA Umbria
Data 10/10/18
Identif. 334 MRT
Approvato da

DESCRIPTION:

TDTFWD is a solution/mixture of native and $^{13}C_{12}$-labelled chlorinated dibenzo-p-dioxins (PCDDs) and dibenzofurans (PCDFs). The components and their concentrations are given in Table A.

TDTFWD was designed to be used to set retention time windows for the tetra- through octa- chlorinated PCDDs and PCDFs on the capillary columns specified. A series of tetrachlorodibenzo-p-dioxins (TCDDs) and tetrachlorodibenzofurans (TCDFs) are also included so that the resolution of 2,3,7,8-TCDD and 2,3,7,8-TCDF on the specified columns can be tested and confirmed.

The individual native PCDDs and PCDFs all have chemical purities of >98%. The individual $^{13}C_{12}$-PCDDs and $^{13}C_{12}$-PCDF all have chemical purities of >98% and isotopic purities of ≥99%.

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations of the Solution/Mixture
Table B: HRGC/HRMS Conditions and Capillary Columns Used
Figure 1: HRGC/HRMS Data on a 60 m DB-5 Column (SIR; 10,000 mass resolving power)
Figure 2: HRGC/HRMS Data on a 30 m DB-225 Column (SIR; 10,000 mass resolving power)
Figure 3: HRGC/HRMS Data on a 60 m SP-2331 Column (SIR; 10,000 mass resolving power)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Note that certain other PCDD and PCDF isomers are present in this mixture and are identified where possible.
- **This solution is not intended to be used for quantitation and the concentrations of each of the components should only be considered approximate.**

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CERTIFICATE OF ANALYSIS
DOCUMENTATION

PFAC-MXC

Native Perfluorinated Compound Solution/Mixture

AP 27-10-21

ARPA umbria
Data 26/P/2021
Identif. 351 MRT
Approvato da IG

PRODUCT CODE:	PFAC-MXC
LOT NUMBER:	PFACMXC1120
SOLVENT(S):	Methanol / Water (<1%)
DATE PREPARED: (mm/dd/yyyy)	11/18/2020
LAST TESTED: (mm/dd/yyyy)	11/20/2020
EXPIRY DATE: (mm/dd/yyyy)	11/20/2025
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place

DESCRIPTION:

PFAC-MXC is a solution/mixture of thirteen native perfluoroalkylcarboxylic acids (C_4-C_{14}, C_{16}, and C_{18}) and eight native perfluoroalkylsulfonates (C_4-C_{10} and C_{12}). The full name, abbreviation and concentration for each of the components are given in Table A.

The individual perfluoroalkylcarboxylic acids and perfluoroalkylsulfonates all have chemical purities of >98%.

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations of the Solution/Mixture
Figure 1: LC/MS Data (SIR)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acids to their respective methyl esters.

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CERTIFICATE OF ANALYSIS DOCUMENTATION

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AP 27 10 21

MPFAC-C-ES

Mass-Labelled Perfluorinated Compound Extraction Standards Solution

PRODUCT CODE:	MPFAC-C-ES
LOT NUMBER:	MPFACCES0121
SOLVENT(S):	Methanol / Water (<1%)
DATE PREPARED: (mm/dd/yyyy)	01/11/2021
LAST TESTED: (mm/dd/yyyy)	01/13/2021
EXPIRY DATE: (mm/dd/yyyy)	01/13/2026
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place

DESCRIPTION:

MPFAC-C-ES is a solution/mixture of mass-labelled (^{13}C) perfluoroalkylcarboxylic acids and mass-labelled (^{13}C) perfluoroalkylsulfonates. The components and their concentrations are given in Table A.

MPFAC-C-ES was designed for, and prepared to be used with, PFC-CVS-C.

The individual mass-labelled perfluoroalkylcarboxylic acids and mass-labelled perfluoroalkylsulfonates all have chemical purities of >98% and isotopic purities of ≥99%.

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations of the Solution/Mixture
Figure 1: LC/MS Data (SIR)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- All mass-labelled perfluoroalkylsulfonate compound concentrations are reported as the salt.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acids to their respective methyl esters.

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CERTIFICATE OF ANALYSIS
DOCUMENTATION

Ap 27 10 21
Terminato

ARPA umbria
Data 24/9/2021
Identif. 353/7RT
Approvato da

MPFAC-C-IS

Mass-Labelled Perfluorinated Compound Injection Standards Solution

PRODUCT CODE:	MPFAC-C-IS
LOT NUMBER:	MPFACCIS0421
SOLVENT(S):	Methanol/Water (<1%)
DATE PREPARED: (mm/dd/yyyy)	04/21/2021
LAST TESTED: (mm/dd/yyyy)	04/26/2021
EXPIRY DATE: (mm/dd/yyyy)	04/26/2026
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place

DESCRIPTION:

MPFAC-C-IS is a solution/mixture of mass-labelled (^{13}C) perfluoroalkylcarboxylic acids and a mass-labelled (^{13}C) perfluoroalkylsulfonate. The components and their concentrations are given in Table A.

MPFAC-C-IS was designed for, and prepared to be used with, PFC-CVS-C.

The individual ^{13}C-labelled perfluoroalkylcarboxylic acids and perfluoroalkylsulfonate all have chemical purities of >98% and isotopic purities of ≥99%.

DOCUMENTATION/ DATA ATTACHED:

Table A: Components and Concentrations of the Solution/Mixture
Figure 1: LC/MS Data (SIR)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- The mass-labelled perfluoroalkylsulfonate compound concentration is reported as the salt.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acids to their respective methyl esters.

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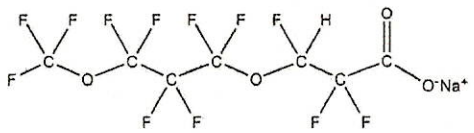
CERTIFICATE OF ANALYSIS
DOCUMENTATION

Ap 10/10/23

PRODUCT CODE: NaDONA **LOT NUMBER:** NaDONA0723

COMPOUND: Sodium dodecafluoro-3H-4,8-dioxanonanoate

STRUCTURE: **CAS #:** 2250081-67-3



MOLECULAR FORMULA:	$C_7HF_{12}O_4Na$	**MOLECULAR WEIGHT:**	400.05
CONCENTRATION:	50.0 ± 2.5 µg/mL (Na salt)	**SOLVENT(S):**	Methanol
	47.3 ± 2.4 µg/mL (NaDONA acid)		Water (<1%)
	47.1 ± 2.4 µg/mL (NaDONA anion)		
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	07/24/2023		
EXPIRY DATE: (mm/dd/yyyy)	07/24/2028		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

ARPA umbria
Data 06/10/2023
Identif. 364 MRT
Approvato da

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Product is commercially known as ADONA.
- Contains 4 mole eq. of NaOH to prevent conversion of the carboxylic acid to the methyl ester.

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Certified By: _____ **Date:** 07/31/2023 (mm/dd/yyyy)
B.G. Chittim, General Manager

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WELLINGTON LABORATORIES

CERTIFICATE OF ANALYSIS
DOCUMENTATION

GenX

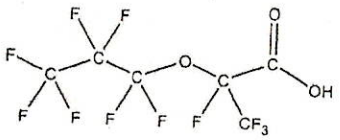
Ap 10/10/23

PRODUCT CODE: HFPO-DA

COMPOUND: 2,3,3,3-Tetrafluoro-2-(1,1,2,2,3,3,3-heptafluoropropoxy)propanoic acid

LOT NUMBER: HFPODA0523

STRUCTURE:



CAS #: 13252-13-6

MOLECULAR FORMULA:	$C_6HF_{11}O_3$	**MOLECULAR WEIGHT:**	330.05
CONCENTRATION:	50.0 ± 2.5 µg/mL	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	05/19/2023		
EXPIRY DATE: (mm/dd/yyyy)	05/19/2026		
RECOMMENDED STORAGE:	Refrigerate ampoule		

ARPA umbria
Data 06/01/2023
Identif. 365 MRT
Approvato da

DOCUMENTATION/ DATA ATTACHED:

Figure 1: LC/MS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- This product is also known as hexafluoropropylene oxide dimer acid and commercially known as GenX.

FOR LABORATORY USE ONLY: NOT FOR HUMAN OR DRUG USE

Certified By: _____ **Date:** 05/31/2023 (mm/dd/yyyy)
B.G. Chittim, General Manager

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Form#:27, Issued 2004-11-10
Revision#:9, Revised 2020-12-23

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CERTIFICATE OF ANALYSIS
DOCUMENTATION

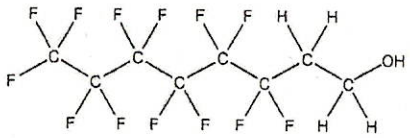
AR 10/10/23

PRODUCT CODE: FHET
COMPOUND: 2-Perfluorohexyl ethanol

LOT NUMBER: FHET0823

STRUCTURE:

CAS #: 647-42-7



MOLECULAR FORMULA:	$C_8H_5F_{13}O$	**MOLECULAR WEIGHT:**	364.10
CONCENTRATION:	50.0 ± 2.5 µg/mL	**SOLVENT(S):**	Methanol
CHEMICAL PURITY:	>98%		
LAST TESTED: (mm/dd/yyyy)	08/04/2023 (HRGC/LRMS) 08/03/2023 (LC/MS)		
EXPIRY DATE: (mm/dd/yyyy)	08/04/2028		
RECOMMENDED STORAGE:	Store ampoule in a cool, dark place		

ARPA Umbria
Data 06/10/2023
Identif. 366MRT
Approv.ta

DOCUMENTATION/ DATA ATTACHED:

Figure 1: HRGC/LRMS Data (Full Scan and Mass Spectrum)
Figure 2: LC/MS Data (Full Scan and Mass Spectrum)
Figure 3: LC/MS/MS Data (Selected MRM Transitions)

ADDITIONAL INFORMATION:

- See page 2 for further details.
- Contains ~0.6% of an unknown impurity.

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Certified By: _____ **Date:** 08/08/2023 (mm/dd/yyyy)
B.G. Chittim, General Manager

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