



Deutsche Akkreditierungsstelle GmbH

Annex to the Accreditation Certificate D-PL-14629-01-00 according to DIN EN ISO/IEC 17025:2018

Valid from: 16.11.2022

Date of issue: 16.11.2022

Holder of certificate:

Eurofins GfA Lab Service GmbH
Neuländer Gewerbepark 4, 21079 Hamburg

Tests in the fields:

Determination of organic residues and contaminants by GC/MS, -MS/MS, -HRMS as well as LC-MS/MS in food, feed, water, soil, waste, sewage sludge, sludge, air samples, emission samples, ambient air samples, dust, biological environmental markers (biota), human sample material, consumer products and chemical products incl. sample preparation;
Analyses according to the legislative environmental modules water, soil and contaminated sites as well as waste;
Immission protection module

Within the given testing field marked with */**), the testing laboratory is permitted, without being required to inform and obtain prior approval from DAkkS, the following:

- *) the free choice of standard or equivalent testing methods.
- **) the modification, development and refinement of testing methods.

The listed testing methods are exemplary. The testing laboratory maintains a current list of all testing methods within the flexible scope of accreditation.

The management system requirements of DIN EN ISO/IEC 17025 are written in the language relevant to the operations of testing laboratories. Laboratories that conform to the requirements of this standard, operate generally in accordance with the principles of DIN EN ISO 9001.

The certificate together with the annex reflects the status as indicated by the date of issue.

The current status of any given scope of accreditation can be found in the directory of accredited bodies maintained by Deutsche Akkreditierungsstelle GmbH at <https://www.dakks.de/en/content/accredited-bodies-dakks>.

Abbreviations used: see last page

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This document is a translation. The definitive version is the original German annex to the accreditation certificate.

1 Determination of organic pollutants using isotope dilution analysis and gas chromatography with mass spectrometric detection (MS, MS/MS und HRMS)

1.1 In food and animal feed **

DIN EN 16215 2020-05	Animal feeding stuffs - Determination of dioxins and dioxin-like PCBs by GC/HRMS and of indicator PCBs by GC/HRMS
BVL F 0027 (EG) 2019-06	Animal feedings stuffs - Determination of polychlorinated dioxins (PCDD/PCDF) and dioxin-like PCB - Annex of directive (EU) No 278/2012 of the Commission of 28 March 2012 and repealing Regulation (EU) No 152/2009 regarding the determination of dioxins and polychlorinated biphenyls
GLS DF 110 2021-06	Determination of polychlorinated dibenzodioxins (PCDD), polychlorinated dibenzofuranes (PCDF) and polychlorinated biphenyls (PCB) incl. all 209 PCB-congeners in food and feed as well as other samples by gas chromatography with mass spectrometric detection
GLS OC 200 2019-01	Determination of the mass concentration of polybrominated diphenylethers (PBDE) and polybrominated biphenyls (PBB) in diverse sample matrices by GC-MS (Scope here: <i>food and feed</i>)
GLS OC 300 2022-02	Determination of polycyclic aromatic hydrocarbons (PAH) in diverse sample matrices by gas chromatography with mass spectrometric detection (Scope here: <i>food and feed</i>)
GLS OC 500 2021-04	Determination of organochloric pesticides (OCP) and polychloriorited Biphenyle (PCB) in project matrices for monitoring by gas chromatography with mass spectrometric detection (Scope here: <i>food and feed</i>)
GLS OC 530 2021-08	Determination of organochloric pesticides (OCP) in diverse sample matrices by gas chromatography with mass spectrometric detection (Scope here: <i>food and feed</i>)
GLS OC 600 2019-01	Determination of organotin compounds (OTC) in diverse sample matrices by gas chromatography with mass spectrometric detection (Scope here: <i>food, drinking water and feed</i>)

GLS OC 720
2019-01

Determination of alkyl phenoles in diverse sample matrices by gas chromatography with mass spectrometric detection
(Scope here: *food and feed*)

1.2 In Water, soil, waste, sewage sludge, sludge, air/emissions, ambient air, dust and biological environment markers (Biota) **

DIN ISO 12884
2000-12

Ambient air - Determination of total (gas and particle phase) polycyclic aromatic hydrocarbons - Collection on sorbent-backed filters with gas chromatographic/mass spectrometric analysis
(restriction: *no sampling*)

DIN ISO 16000-13
2010-03

Indoor air - Part 13: Determination of total (gas and particle-phase) polychlorinated dioxin-like biphenyls (PCBs) and polychlorinated dibenzo-p-dioxins/dibenzofurans (PCDDs/PCDFs) - Collection on sorbent-backed filters
(restriction: *no sampling*)

DIN ISO 16000-14
2012-03

Indoor air - Part 14: Determination of total (gas and particle-phase) polychlorinated dioxin-like biphenyls (PCBs) and polychlorinated dibenzo-p-dioxins/dibenzofurans (PCDDs/PCDFs) - Extraction, clean-up and analysis by high-resolution gas chromatography and mass spectrometry
(restriction: *no sampling*)

DIN EN 15549
2008-06

Air quality - Standard method for the measurement of the concentration of benzo[a]pyrene in ambient air
(restriction: *no sampling*)

VDI 3498 sheet 2
2002-07

Ambient air measurement - Indoor air measurement - Measurement of polychlorinated dibenzo-p-dioxins and dibenzofurans; Method using small filters
(restriction: *no sampling*)

VDI 3499 sheet 1
2003-07

Emission measurement - Determination of polychlorinated dibenzo-p-dioxins (PCDDs) and dibenzofurans (PCDFs) - Dilution method; Example of application of DIN EN 1948 for the concentration range < 0,1 ng I-TEQ/m³ and supplement to DIN EN 1948 for the concentration range > 0,1 ng I-TEQ/m³; Determination in filter dust, ash and slag
(restriction: *no sampling*)

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BIA 6880 1993-06	BIA-testing method for the determination of concentration of polychlorinated dibenzofuranes and dibenzodioxins (PCDF/PCDD) and polybrominated dibenzofuranes and dibenzo-p-dioxins (PBDF/PBDD) at working areas (restriction: <i>no sampling</i>)
GLS DF 110 2021-06	Determination of polychlorinated dibenzodioxins (PCDD), polychlorinated dibenzofuranes (PCDF) and polychlorinated biphenyls (PCB) incl. all 209 PCB-congeners in food and feed as well as other samples by gas chromatography with mass spectrometric detection (Scope here: <i>biota samples</i>)
GLS DF 130 2021-08	Determination of polychlorinated dibenzodioxins (PCDD), polychlorinated dibenzofuranes (PCDF) and polychlorinated biphenyls (PCB) incl. all 209 PCB-congeners in environmental samples, water, materials and chemicals by gas chromatography with mass spectrometric detection
GLS DF 140 2021-08	Determination of polychlorinated dibenzodioxins (PCDD), polychlorinated dibenzofuranes (PCDF) and polychlorinated biphenyls (PCB) in air samples by gas chromatography with mass spectrometric detection
GLS DF 150 2021-05	Determination of polybrominated dibenzodioxins (PBDD) and polybrominated dibenzofurans (PBDF) in air samples by gas chromatography with mass spectrometric detection
GLS OC 110 2019-01	Determination of polychlorinated benzenes (PCBz) in solids, emissions, immissions and air samples by gas chromatography with mass spectrometric detection
GLS OC 200 2019-01	Determination of polybrominated diphenyl ether (PBDE) and polybrominated biphenyles (PBB) in diverse sample matrices by gas chromatography with mass spectrometric detection (Scope here: <i>soil, sediments, sludge, recycling material, fire debris, adsorption media for air analysis, biota</i>)
GLS OC 230 2019-01	Determination of the mass concentration of short and middle chain C10-C17 Chlorparaffines (SCCP, MCCP) in diverse sample matrices by GC-MS (Scope here: <i>water, soil, sludge, fire debris, air</i>)

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GLS OC 300 2022-02	Determination of polycyclic aromatic hydrocarbons (PAH) in diverse sample matrices by gas chromatography with mass spectrometric detection (Scope here: air samples, water, sludge, soil, sediments, eluates, activated carbon, ash, filter dust)
GLS OC 310 2019-01	Determination of polycyclic aromatic hydrocarbons (PAH) in deposition samples by gas chromatography with mass spectrometric detection
GLS OC 320 2019-01	Determination of polycyclic aromatic hydrocarbons (PAH) in plant material by gas chromatography with mass spectrometric detection
GLS OC 500 2021-04	Determination of organochloric pesticides (OCP) and polychlorinated Biphenyle (PCB) in project matrices for monitoring by gas chromatography with mass spectrometric detection (Scope here: soil, sediment)
GLS OC 510 2019-01	Chlorinated pestizides in deposition samples Determination by high resolution gas chromatograph with high resolution mass spectrometer (HRGC/HRMS)
GLS OC 520 2019-01	Chlorinated pestizides in immission samples Determination by high resolution gas chromatograph and mass spectrometer (HRGC/HRMS)
GLS OC 600 2019-01	Determination of organotin compounds (OTC) in diverse matrices by gas chromatography with mass spectrometric detection (Scope here: soil, sediment, compost, sludge, water, biota)
GLS OC 720 2019-01	Determination of alkyl phenoles in diverse sample matrices by gas chromatography with mass spectrometric detection (Scope here: water, soil, sludge, fire debris, air samples)

1.3 In Human samples **

GLS DF 120 2021-06	Determination of polychlorinated dibenzodioxins (PCDD), polychlorinated dibenzofuranes (PCDF) and polychlorinated biphenyls (PCB) incl. all 209 PCB-congeners in human sample material by gas chromatography with mass spectrometric detection
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GLS OC 200
2019-01 Determination of the mass concentration of polybrominated diphenyl ether (PBDE) and polybrominated biphenyles (PBB) in diverse sample matrices by GC-MS
(Scope here: *tissue samples*)

GLS OC 240
2019-01 Determination of polybrominated diphenyl ether (PBDE) in milk/human milk by gas chromatography with mass spectrometric detection

1.4 In consumer products and chemical products **

GLS DF 110
2021-06 Determination of polychlorinated dibenzodioxins (PCDD), polychlorinated dibenzofuranes (PCDF) and polychlorinated biphenyls (PCB) incl. all 209 PCB-congeners in food and feed as well as other samples by gas chromatography with mass spectrometric detection
(Scope here: *consumer products and chemical products*)

GLS DF 130
2021-08 Determination of polychlorinated dibenzodioxins (PCDD), polychlorinated dibenzofuranes (PCDF) and polychlorinated biphenyls (PCB) incl. all 209 PCB-congeners in environmental samples, water, chemicals and materials by gas chromatography with mass spectrometric detection

GLS OC 110
2019-01 Determination of polychlorinated benzenes (PCBz) in solids, emissions, immissions and air samples by gas chromatography with mass spectrometric detection
(Scope here: *consumer products and chemical products*)

GLS OC 200
2019-01 Determination of the mass concentration of polybrominated diphenyl ether (PBDE) and polybrominated biphenyles (PBB) in diverse sample matrices by GC-MS
(Scope here: *textiles, consumer products and chemical products*)

GLS OC 230
2019-01 Determination of the mass concentration of short and middle chain C10-C17 Chlorparaffines (SCCP, MCCP) in diverse sample matrices by GC-MS
(Scope here: *consumer products and chemical products*)

GLS OC 300
2019-01 Determination of polycyclic aromatic hydrocarbons (PAH) in diverse sample matrices by gas chromatography with mass spectrometric detection
(Scope here: *consumer products and chemical products*)



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GLS OC 720
2019-01

Determination of alkyl phenoles in diverse sample matrices by gas chromatography with mass spectrometric detection
(Scope here: consumer products and chemical products)

2 Determination of organic pollutants using isotope dilution analysis and high performance liquid chromatography with mass spectrometric detection (LC-MS/MS)

2.1 In food and animal feed **

GLS OC 260
2019-01

Determination of the mass concentration of hexabromocyclododecane (HBCD) in diverse sample matrices by LC-MS/MS
(Scope here: *food, feed*)

GLS OC 400
2019-01

Determination of per- and polyfluorinated compounds (PFAS) in diverse sample matrices by LC-MS/MS
(Scope here: *food, feed*)

2.2 In water, soil, waste, sewage sludge, sludge, air/emissions, ambient air, dust and biological environment markers (Biota) **

GLS OC 260
2019-01

Determination of the mass concentration of hexabromocyclododecane (HBCD) in diverse sample matrices by LC-MS/MS
(Scope here: *water, soil, waste, sludge, air/emissions, immissions, dust and biota*)

GLS OC 400
2019-01

Determination of per- and polyfluorinated compounds (PFAS) in diverse sample matrices by LC-MS/MS
(Scope here: *water, soil, waste, air, biota*)

2.3 In Humansamples

GLS OC 400
2019-01

Determination of per- and polyfluorinated compounds (PFAS) in diverse sample matrices by LC-MS/MS
(Scope here: *blood*)

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3 Mechanical sample preparation for food, animal feed, solids and water *

DIN 19747 2009-07	Investigation of solids-pretreatment, preparation and processing of samples for chemical, biological and physical investigations
DIN 38402-30 1998-07	Pretreatment, homogenization and aliquotation of non-homogeneous water samples
Regulation (EU) 2017/644 Annex II, Point 3 2017-04	Laying down methods of sampling and analysis for the control of levels of dioxins, dioxin-like PCBs and non-dioxin-like PCBs in certain foodstuffs

4 Determination of moisture content, volatile compounds content, dry residue and fat content in food, animal feed, soil, sludge and waste using gravimetry *

DIN EN ISO 662 2016-08	Animal and vegetable fats and oils - Determination of moisture and volatile matter content
DIN EN ISO 16720 2007-06	Soil quality - Pretreatment of samples by freeze-drying for subsequent analysis <i>(Modification: Extension of the scope for sludges, sediments and food)</i>
DIN EN 12880 2001-02	Characterization of sludges - Determination of dry residue and water content <i>(Modification: Extension of the scope for soil, sediments and residual material of plastic recycling)</i>
DIN EN 14346 2007-03	Characterization of waste - Calculation of dry matter by determination of dry residue or water content
BVL L 13.00-16 2018-06	Investigation of foods - fats and oils of animal and plant origin - determination of the content of moisture and volatile compounds <i>(Adoption of the standard of the same name DIN EN ISO 662, August 2016)</i>
Verordnung (EG) Nr. 152/2009, Anhang III, A. 2009-01	Determination of moisture - Investigation of the composition of raw materials of feed and compound feed

GLS DF 110
2021-06

Determination of polychlorinated dibenzodioxins (PCDD),
polychlorinated dibenzofuranes (PCDF) and polychlorinated
biphenyls (PCB) incl. all 209 PCB-congeners in food and feed as well
as other samples by gas chromatography with mass spectrometric
detection
(Scope here: *gravimetric determination of dry mass and fat content*)

5 Test method for the pollution control module and annex A2 of VDI 4220

Test range / identification	Determination of emissions				
	Group I.1: Field of activity Sa:	Special sampling of substances that require special effort / activities during sampling or analysis			
Component	Standard / Directive / technical rule Title	Designation	SRM	QM-document	Comment Site
PCDD/PCDF	Stationary source emissions - Determination of the mass concentration of PCDDs/PCDFs and dioxin-like PCBs - Part 2: Extraction and clean-up of PCDDs/PCDFs Part 3: Identification and quantification of PCDDs/PCDFs	DIN EN 1948 Part 2-3 2006-06	<input checked="" type="checkbox"/>	GLS DF 140	
PCDD/PCDF	Emission measurement - Determination of polychlorinated dibenzo-p-dioxins (PCDDs) and dibenzofurans (PCDFs) - Dilution method; Example of application of DIN EN 1948 for the concentration range < 0,1 ng I-TEQ/m ³ and supplement to DIN EN 1948 for the concentration range > 0,1 ng I-TEQ/m ³ ; Determination in filter dust, ash and slag	VDI 3499 sheet 1 2003-07		GLS DF 140	
PCDD/PCDF	Emission measurement - Determination of polychlorinated dibenzo-p-dioxins (PCDDs) and dibenzofurans (PCDFs) - Filter/condenser method; Example of application of DIN EN 1948 for the concentration range < 0,1 ng I-TEQ/m ³ and supplement to DIN EN 1948 for the concentration range > 0,1 ng I-TEQ/m ³	VDI 3499 sheet 2 2004-02		GLS DF 140	

Test range / identification	Group I.1: Field of activity Sa:	Determination of emissions Special sampling of substances that require special effort / activities during sampling or analysis				
Component	Standard / Directive / technical rule	Title	Designation	SRM	QM-document	Comment Site
PCDD/PCDF	Emission measurement - Determination of polychlorinated dibenzo-p-dioxins (PCDDs) and dibenzofurans (PCDFs) - Cooled probe method; Example of application of DIN EN 1948 for the concentration range < 0,1 ng I-TEQ/m ³ and supplement to DIN EN 1948 for the concentration range > 0,1 ng I-TEQ/m ³	VDI 3499 sheet 3 2004-02			GLS DF 140	
dl-PCB	Stationary source emissions - Determination of the mass concentration of PCDDs/PCDFs and dioxin-like PCBs - Part 4: Sampling and analysis of dioxin-like PCBs; German version EN 1948-4:2010	DIN EN 1948-4 2014-03			GLS DF 140	
PCDD/PCDF and PCB	Stationary source emissions - Determination of the mass concentration of PCDDs/PCDFs and dioxin-like PCBs - Part 5: Long-term sampling of PCDDs/PCDFs and PCBs	DIN CEN/TS 1948-5 2015-06			GLS DF 140	
PAH	Stationary source emissions - Determination of gas and particle-phase polycyclic aromatic hydrocarbons - Part 2: Sample preparation, clean-up and determination	ISO 11338-2 2003-06			GLS OC 300	
PAH	Stationary source emissions - Determination of polycyclic aromatic hydrocarbons (PAH) - GC/MC method	VDI 3874 2006-12			GLS OC 300	
PCBz	Ambient air measurement - Indoor air measurement - Measurement of persistent organic pollutants (POPs) with GC/HRMS	VDI 2464 sheet 4 2015-06			GLS OC 110	

Testing area / Identifier	Group IV: Task area Sa:	Determination of ambient air Special analysis of substances which require specific conditions in sampling or analysis		
Component	Standard / Directive / technical rule	Designation	SRM	QM-document
	Title			
PCDD/PCDF	Ambient air measurement - Indoor air measurement - Measurement of polychlorinated dibenzo-p-dioxins and dibenzofurans; Method using large filters	VDI 3498 sheet 1 2002-07	<input checked="" type="checkbox"/>	GLS DF 140
PCDD/PCDF	Ambient air measurement - Indoor air measurement - Measurement of polychlorinated dibenzo-p-dioxins and dibenzofurans; Method using small filters	VDI 3498 sheet 2 2002-07	<input checked="" type="checkbox"/>	GLS DF 140
PCDD/PCDF	Ambient air measurement - Deposition measurement of low volatile organic compounds - Determination of PCDD/F deposition; Bergerhoff sampling device and GC/HRMS analysis	VDI 2090 sheet 1 2001-01		GLS DF 140
PCDD/PCDF	Ambient air measurement - Deposition measurement of low volatile organic compounds - Determination of PCDD/F-deposition; Funnel adsorber sampling and GC/HRMS-analysis	VDI 2090 sheet 2 2002-12		GLS DF 140
PCDD/PCDF	Stationary source emissions - Determination of the mass concentration of PCDDs/PCDFs and dioxin-like PCBs - Part 2: Extraction and clean-up of PCDDs/PCDFs Part 3: Identification and quantification of PCDDs/PCDFs	DIN EN 1948 Part 2-3 2006-06		GLS DF 140
PCB	Ambient air measurement - Indoor air measurement - Measurement of polychlorinated biphenyls (PCBs) - GC/MS method for PCB 28, 52, 101, 138, 153, 180	VDI 2464 sheet 1 2009-09		GLS DF 140
PCB	Ambient air measurement - Indoor air measurement - Measurement of polychlorinated biphenyls (PCBs) - HR-GC/HR-MS method for coplanar PCBs	VDI 2464 sheet 2 2009-09		GLS DF 140

Testing area / Identifier	Group IV: Task area Sa:	Determination of ambient air Special analysis of substances which require specific conditions in sampling or analysis			
Component	Standard / Directive / technical rule	Title	Designation	SRM	QM-document
PAH	Ambient air - Determination of total (gas and particle phase) polycyclic aromatic hydrocarbons - Collection on sorbent-backed filters with gas chromatographic/mass spectrometric analysis	DIN ISO 12884 2000-12		GLS OC 300	
Benzo[a]pyrene	Air quality - Standard method for the measurement of the concentration of benzo[a]pyrene in ambient air	DIN EN 15549 2008-06		GLS OC 300	
PCBz	Ambient air measurement - Indoor air measurement - Measurement of persistent organic pollutants (POPs) with GC/HRMS	VDI 2464 sheet 4 2019-07		GLS OC 110	

6 List of test methods for the WATER module

Status: LAWA dated 18.10.2018

Section 1: Sampling and general characteristics

not used

Section 2: Photometry, ion chromatography, dimensional analysis

not used

Section 3: Elemental analysis

not used

Sections 4/5: Group and sum parameters

not used

Section 6: Gas chromatography methods

Parameter	Method	Was	Sur	Raw
Volatile halogenated hydrocarbons (VOC)	DIN EN ISO 10301: 1997-08 (F 4)*	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN 38407-F 43: 2014-10	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 15680: 2004-04 (F 19)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 17943: 2016-11 (F 41)		<input type="checkbox"/>	<input type="checkbox"/>
Benzene and derivates (BTEX)	DIN 38407-F 9: 1991-05*	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN 38407-F 43: 2014-10	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 15680: 2004-04 (F 19)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 17943: 2016-11 (F 41)		<input type="checkbox"/>	<input type="checkbox"/>
Organochloric insecticides (OCP)	DIN EN ISO 6468: 1997-02 (F 1)*		<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN 38407-F 37: 2013-11		<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN 16693: 2015-12 (F 51)		<input type="checkbox"/>	<input type="checkbox"/>
Polychlorinated biphenyles (PCB)	DIN EN ISO 6468: 1997-02 (F 1)*		<input type="checkbox"/>	<input type="checkbox"/>
	DIN 38407-F 3: 1998-07		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
	DIN 38407-F 37: 2013-11		<input type="checkbox"/>	<input type="checkbox"/>
Mono- and dichloric benzenes	DIN EN ISO 15680: 2004-04 (F 19)		<input type="checkbox"/>	<input type="checkbox"/>
	DIN 38407-F 43: 2014-10		<input type="checkbox"/>	<input type="checkbox"/>
Tri- to hexachloric benzenes	DIN EN ISO 6468: 1997-02 (F 1)*	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN 38407-F 2: 1993-02	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN ISO 15680 (F19):2004-04**	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN 38407-F 43: 2014-10**	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN 38407-F 37: 2013-11	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Chlorphenoles	DIN EN 16693: 2015-12 (F 51)***		<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN 12673: 1999-05 (F 15)		<input type="checkbox"/>	<input type="checkbox"/>
Organophosphoric- and organonitrogen compounds	DIN EN ISO 10695: 2000-11 (F 6) *		<input type="checkbox"/>	<input type="checkbox"/>
Polycyclic aromatic hydrocarbons (PAH) <i>(see also section 7)</i>	DIN 38407-F 39: 2011-09	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN ISO 28540: 2014-05 (F 40)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	DIN EN 16691: 2015-12 (F 50)		<input type="checkbox"/>	<input type="checkbox"/>
Hydrocarbon-Index	DIN EN ISO 9377-2: 2001-07 (H 53)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

* Mass spectrometric detection allowed

** Only applicable to trichlorobenzene

*** Only applicable to hexachlorobenzene

Section 7: HPLC methods

not used

Section 8: Microbiological methods (not used)

Section 9.1: Biological methods biotests (part 1)

not used

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Section 9.2: Biological methods biotests (part 2)

not used

7 List of test methods for the SOIL AND INHERITED WASTE module

Status: LABO, dated 16.08.2012

Examination area 1: Solids

Section 1.1 sampling and on-site examination

not used

Section 1.2 laboratory analysis of inorganic parameters

not used

Section 1.3 laboratory analysis of organic parameters

Examination parameters	Methods/Notes	Method	
Specific sample preparation	Note: For chemical drying or air-drying of the sample material, it should be noted that if non-water-miscible solvents such as hexane/heptane in conjunction with a 1x extraction are used (widely used as a laboratory method), the residual moisture will produce results that are lower than they should be, particularly with cohesive soil material samples. Soxhlet extractions or solvent mixtures with acetone for extraction are essential for samples dried in this way.	DIN 19747: 2009	<input checked="" type="checkbox"/>
Dry matter	Field-fresh or air-dried soil samples	DIN ISO 11465: 1996	<input type="checkbox"/>
		DIN EN 14346: 2007	<input checked="" type="checkbox"/>
Organic carbon and total carbon after dry combustion (TOC)	Air-dried soil samples	DIN ISO 10694: 1996	<input type="checkbox"/>
		DIN EN 13137: 2001	<input type="checkbox"/>
		DIN EN 15936: 2012	<input type="checkbox"/>
pH value (CaCl_2)	Field-fresh or air-dried soil samples, $c(\text{CaCl}_2)$: 0.01 mol/l	DIN ISO 10390: 2005	<input type="checkbox"/>
Raw density - optional	Drying of a suitable volume of soil sample at 105 °C, weigh again	DIN ISO 11272: 2001	<input type="checkbox"/>

Examination parameters	Methods/Notes	Method	
Grain size distribution - optional	1) Sieving, dispersion, pipette analysis	DIN ISO 11277: 2002	<input type="checkbox"/>
	2) Sieving, dispersion, hydrometer method	DIN 18123: 2011 with LAGA PN98	<input type="checkbox"/>
Polycyclic aromatic hydrocarbons (PAHs) 16 PAHs (EPA) Naphthalene, acenaphthylene, acenaphthene, fluorene, phenanthrene, anthracene, fluoranthene, pyrene, chrysene, benzo[a]anthracene, benzo[b]- / benzo[k]fluoranthene, benzo[a]pyrene, indeno[1,2,3- cd]pyrene, dibenz[a,h]anthracene, benzo[g,h,i]perylene	GC - MS	DIN ISO 18287: 2006	<input type="checkbox"/>
	HPLC-UV/F* (*Acenaphthylene cannot be determined by fluorescence detector)	DIN ISO 13877: 2000	<input type="checkbox"/>
	Note on the type of summation must be appended to the result.	DIN 38414-23: 2002	<input type="checkbox"/>
Hexachlorobenzene	GC - ECD, GC - MS	DIN ISO 10382: 2003	<input type="checkbox"/>
Pentachlorophenol	GC - ECD, GC - MS	DIN ISO 14154: 2005	<input type="checkbox"/>
Aldrin, DDT, HCH mixture	GC - ECD, GC - MS	DIN ISO 10382: 2003	<input type="checkbox"/>
		DIN EN 15308: 2008	<input type="checkbox"/>
Polychlorinated biphenyls (PCB6/ PCB7): PCB6 congeners 28, 52, 101, 138, 153, 180, and 118	GC-ECD, GC-MS	DIN ISO 10382: 2003* (* This standard takes into account congener PCB 118)	<input type="checkbox"/>
	Extraction with acetone/petroleum ether or Soxhlet extraction	DIN EN 15308: 2008* (* This standard takes into account congener PCB 118)	<input type="checkbox"/>
	The type of summation must be indicated (PCB6/PCB7)	DIN 38414-20: 1996 (This standard is also suitable for determination of the congener PCB 118 - relevant SOP must be available)	<input checked="" type="checkbox"/>
Typical explosive compounds (HPLC) (2,4-dinitrotoluene, 2,6- dinitrotoluene hexanitrodiphenylamine, hexogen, nitropenta (PETN), 2,4,6- trinitrotoluene) - optional -	Extraction with methanol or acetonitrile and quantification using HPLC- UV/DAD	E DIN ISO 11916-1: 2011 (ISO/FDIS 11916-1: 2011)	<input type="checkbox"/>

Examination parameters	Methods/Notes	Method	
Typical explosive compounds (GC) (2,4-dinitrotoluene, 2,6-dinitrotoluene 2,4,6-trinitrotoluene) - optional -	Extraction with methanol. Dissolution in toluene and quantification using GC-ECD or GC-MS	E DIN ISO 11916-2: 2011 (ISO/FDIS 11916-2: 2011)	<input type="checkbox"/>
Petroleum hydrocarbons (MKW, C ₁₀ -C ₄₀) - optional -	GC-FID The chromatogram must be evaluated and information on mobile (C ₁₀ -C ₂₂) and low mobility (>C ₂₂ -C ₄₀) fractions must be provided (LAGA KW/04)	DIN ISO 16703: 2005	<input type="checkbox"/>
		LAGA KW/04: 2009	<input type="checkbox"/>
BTEX aromatics, volatile halogenated hydrocarbons (VHHC) Individual parameters as per the standard - optional -	Headspace, GC See also SIC-20: "Determination of BTEX/LHKW in solids from brownfields", Handbuch Altlasten Volume 7, Methods of analysis, Expert Committee on Contaminated Sites Analysis, Part 4, Hessian Agency for Nature Conservation, Environment and Geology, Wiesbaden 2000	DIN ISO 22155: 2006	<input type="checkbox"/>

Examination area 1.4: Laboratory - PCDD, PCDF and dioxin-like PCB analysis

Examination parameters	Methods/Notes	Method	
Sample preparation and processing		DIN 19747: 2009	<input checked="" type="checkbox"/>
Dry matter	Field-fresh or air-dried soil samples	DIN ISO 11465: 1996	<input type="checkbox"/>
		DIN EN 14346: 2007	<input checked="" type="checkbox"/>
Organic carbon and total carbon after dry combustion (TOC)	Air-dried soil samples	DIN ISO 10694: 1996	<input type="checkbox"/>
		DIN EN 13137: 2001	<input type="checkbox"/>
		DIN EN 15936: 2012	<input type="checkbox"/>
pH value (CaCl ₂)	Field-fresh or air-dried soil samples, c(CaCl ₂): 0.01 mol/l	DIN ISO 10390: 2005	<input type="checkbox"/>
Raw density - optional	Drying of a suitable volume of soil sample at 105 °C, weigh again	DIN ISO 11272: 2001	<input type="checkbox"/>
Grain size distribution - optional	1) Sieving, dispersion, pipette analysis	DIN ISO 11277: 2002	<input type="checkbox"/>
	2) Sieving, dispersion, hydrometer method	DIN 18123: 2011 in conjunction with LAGA PN 98	<input type="checkbox"/>

Examination parameters	Methods/Notes	Method	
PCDD / PCDF, dl-PCB	GC-MS, assessment according to internal standard method using the respective standard of a congener respectively marked $^{13}\text{C}_{12}$.	DIN 38414-24: 2000 The standard is also suitable for determination of the dioxin-like congeners of PCBs; see the explanations set out in DIN 38407-3 for this purpose: 1998, method F 3-3 - section 14 - should also be consulted. The limit of quantification of dl-PCB in soil is comparable to that of PCDD/F (1 ng/kg to 10 ng/kg).	<input checked="" type="checkbox"/>

Examination area 2: Eluates and percolates, aqueous media

Section 2.1 sampling and on-site examination

not used

Section 2.2 laboratory analysis of eluates/percolates for inorganic parameters

not used

Section 2.3 laboratory analysis of eluates/percolates for organic parameters

Eluates / percolates			
Examination parameters	Methods/Notes	Method	
Shaking method - elution of inorganic substances	Liquid to solid ratio of 2 l/kg	DIN 19529: 2009	<input type="checkbox"/>
Shaking method - elution of organic substances	Liquid to solid ratio of 2 l/kg	DIN 19527: 2012	<input type="checkbox"/>
Shaking method - elution of inorganic substances – optional	Liquid to solid ratio of 10 l/kg	DIN EN 12457-4: 2003	<input type="checkbox"/>
Percolation method for organic and inorganic substances – optional		DIN 19528: 2009	<input type="checkbox"/>
Examination for resorption availability - optional		DIN 19738: 2004	<input type="checkbox"/>

Analysis of organic parameters			
Examination parameters	Methods/Notes	Method	
Note on volatile compounds (especially BTEX, LHKW): The preparation of eluates and percolates for the subsequent determination of volatile substances is prone to error due to the high rate of loss. These compounds can therefore only be determined from directly extracted leachate, groundwater and surface water. Because of the negative pressure effects, only submersible pumps and not suction pumps should be used with these compounds when taking groundwater samples.			
BTEX aromatics: Benzene, toluene, ethylbenzene, xylenes, styrene	Purge+Trap/ Desorption, GC-MS	DIN EN ISO 15680: 2004	<input type="checkbox"/>
	Liquid extraction or headspace, GC	DIN 38407-9: 1991	<input type="checkbox"/>
	Headspace SPME, GC-MS	DIN 38407-41: 2011	<input type="checkbox"/>
Volatile halogenated hydrocarbons (VOC) Individual parameters as per standard	Purge+Trap/ Desorption, GC-MS	DIN EN ISO 15680: 2004	<input type="checkbox"/>
	Liquid extraction or headspace, GC	DIN EN ISO 10301: 1997	<input type="checkbox"/>
	Headspace SPME, GC-MS	DIN 38407-41: 2011	<input type="checkbox"/>
Aldrin	GC - ECD, GC - MS	DIN EN ISO 6468: 1997	<input type="checkbox"/>
		DIN 38407-2: 1993	<input type="checkbox"/>
Dichlorodiphenyltrichloroethane (DDT)	GC - ECD, GC - MS	DIN EN ISO 6468: 1997	<input type="checkbox"/>
		DIN 38407-2: 1993	<input type="checkbox"/>
Chlorophenols	GC - ECD, GC - MS	DIN EN 12673: 1999	<input type="checkbox"/>
Chlorobzenes (Cl3-Cl6)	GC - ECD, GC - MS	DIN 38407-2: 1993	<input type="checkbox"/>
	Liquid extraction, GC - ECD, GC - MS	DIN EN ISO 6468: 1997	<input type="checkbox"/>
Chlorobzenes (Cl1-Cl3)	Liquid extraction or headspace, GC-ECD, MS (if required)	DIN EN ISO 10301: 1997	<input type="checkbox"/>
Polychlorinated biphenyls (PCB6 / PCB7): PCB6 congeners 28, 52, 101, 138, 153, 180, and 118	GC - ECD, GC - MS Method of sum calculation (PCB6/PCB7) must be specified	DIN 38407-2: 1993	<input checked="" type="checkbox"/>
		DIN 38407-3: 1998	<input checked="" type="checkbox"/>
16 PAH (EPA) (For HPLC without acenaphthylene)	GC-MS	DIN EN ISO 17993: 2004	<input type="checkbox"/>
	HPLC-F	DIN 38407-39: 2011	<input type="checkbox"/>
Naphthalene	GC - FID, GC - MS	DIN EN ISO 15680: 2004	<input type="checkbox"/>
		DIN 38407-9: 1991	<input type="checkbox"/>
Mineral oil hydrocarbons (MKW, C ₁₀ -C ₄₀)	GC-FID	DIN EN ISO 9377-2: 2001	<input type="checkbox"/>

Analysis of organic parameters			
Examination parameters	Methods/Notes	Method	
Typical explosive compounds (HPLC) (2-nitrotoluene, 3-nitrotoluene, 4-nitrotoluene, 2,4-dinitrotoluene, 2,6-dinitrotoluene, 2,4,6-trinitrotoluene, 2-amino-4,6-dinitrotoluene, 4-amino-2,6-dinitrotoluene, nitropenta (PETN), hexogen, 2,4,6-trinitrophenol (picric acid), nitrobenzene, 1,3-dinitrobenzene, 1,3,5-trinitrobenzene, hexanitrodiphenylamine (hexyl), N-methyl-N,2,4,6-tetranitroaniline, octogen (HMX)) - optional -	Determination of certain explosives and related compounds - Method using HPLC / UV detection	DIN EN ISO 22478: 2006	<input type="checkbox"/>
Typical explosive compounds (GC) (2-nitrotoluene, 3-nitrotoluene, 4-nitrotoluene, 2,4-dinitrotoluene, 2,6-dinitrotoluene, 2,4,6-trinitrotoluene, 2-amino-4,6-dinitrotoluene, 4-amino-2,6-dinitrotoluene, nitrobenzene, 1,3-dinitrobenzene, 1,3,5-trinitrobenzene) - optional -	Determination of selected nitroaromatic compounds by gas chromatography	DIN 38407-17: 1999	<input type="checkbox"/>
Phenols (Phenol, 2-methylphenol; 3-methylphenol; 4-methylphenol, 2,3-dimethylphenol; 2,4-dimethylphenol; 2,5-dimethylphenol; 2,6-dimethylphenol; 3,4-dimethylphenol; 3,5-dimethylphenol; 2-ethylphenol; 3-ethylphenol; 4-ethylphenol; 2,3,5-trimethylphenol; 2,3,6-trimethylphenol; 2,4,6-trimethylphenol; 3,4,5-trimethylphenol) - optional -	GC-ECD, GC-MS	ISO 8165-2: 1999	<input type="checkbox"/>
		DIN EN 12673: 1999	<input type="checkbox"/>

Examination area 3: Soil air, landfill gas

Section 3.1 sampling and on-site examination

not used

Section 3.2 laboratory analysis of soil air, landfill gas

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not used

8 List of test methods for the WASTE module

Status: LAGA dated May 2018

Examination area 1: Sewage sludge

	Sections / Parameters	Basis / Methods	
		AbfKlärV	
1.1	Sampling and sample preparation	Section 32 (3) and (4) AbfKlärV	
a)	Sampling	DIN EN ISO 5667-13 (08.11) <u>and</u> DIN 19698-1 (05.14)	<input type="checkbox"/>
b)	Sample preparation	DIN 19747 (07.09)	<input checked="" type="checkbox"/>

Section 1.2 Heavy metals and chromium VI

not used

Section 1.3 Adsorbed organic bound halogens

not used

1.4	Physical parameters, nutrients	Section 5 (1) (3) - (9) AbfKlärV	
	Dry residue	DIN EN 15934 (11.12)	<input type="checkbox"/>
		DIN EN 12880 (02.01)	<input checked="" type="checkbox"/>
	Organic substance as loss on ignition (from dry residue)	DIN EN 15935 (11.12)	<input type="checkbox"/>
		DIN EN 12879 (02.01)	<input type="checkbox"/>
	pH value	DIN EN 15933 (11.12)	<input type="checkbox"/>
		DIN 38414-5 (07.09)	<input type="checkbox"/>
	Alkaline agents as CaO	VDLUFA Method handbook Volume II.2, Method 4.5.1	<input type="checkbox"/>
	Ammonium nitrogen (NH ₄ -N)	DIN 38406-5 (10.83)	<input type="checkbox"/>
	Total nitrogen (N _{total})	DIN EN 13342 (01.01)	<input type="checkbox"/>
		DIN EN 16169 (11.12)	<input type="checkbox"/>
		DIN ISO 11261 (05.97)	<input type="checkbox"/>
	Aqua regia digestion	DIN EN 16174 (11.12)	<input type="checkbox"/>

		DIN EN 13346 Method A (04.01)	<input type="checkbox"/>
	Phosphorus (P) (from aqua regia digestion) (conversion: phosphorus (P) = 2,291 for phosphorus pentoxide (P_2O_5))	DIN EN ISO 11885 (09.09)	<input type="checkbox"/>
		DIN EN ISO 6878 (09.04)	<input type="checkbox"/>
		DIN EN ISO 17294-2 (01.17)	<input type="checkbox"/>
		DIN EN 16171 (01.17)	<input type="checkbox"/>
		DIN EN 16170 (01.17)	<input type="checkbox"/>

	Persistent organic pollutants	Section 5 (2) (1) - (4) AbfKlärV	
1.5	Polychlorinated biphenyls (PCB)	DIN 38414-20 (01.96)	<input checked="" type="checkbox"/>
		DIN EN 16167 (11.12)	<input type="checkbox"/>

1.6	Polychlorinated dibenzodioxins and furans (PCDD/PCDF) and dioxin-like polychlorinated biphenyls (dl-PCB)	DIN CEN/TS 16190; DIN SPEC 91267 (05.12)	<input checked="" type="checkbox"/>
		DIN 38414-24 (10.00)	<input checked="" type="checkbox"/>

1.7	Benzo(a)pyrene (BaP)	DIN EN 15527 (09.08)	<input type="checkbox"/>
		DIN 38414-23 (02.02)	<input type="checkbox"/>
		DIN CEN/TS 16181; DIN SPEC 91243 (12.13)	<input checked="" type="checkbox"/>

1.8	Polyfluorinated compounds (PFC) with the individual substances perfluorooctanoic acid and perfluorooctanesulphonic acid (PFOA/PFOS)	DIN 38414-14 (08.11)	<input checked="" type="checkbox"/>
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Examination area 2: Base

not used

Examination area 3: Biowaste

not used

Examination area 4: Waste oil, insulating liquid

Section 4.1 Sampling

not used

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4.2	PCB, halogen (only in accordance with AltöLV)	Annex 2 No. 2, 3	
	PCB	DIN EN 12766- 1 (11.00) in conjunction with DIN EN 12766- 2 (12.01), Method B	<input checked="" type="checkbox"/>
	Total halogen (for AltöLV only)	Annex 2, No. 3 AltöLV	<input type="checkbox"/>

Examination area 5: Landfill waste

not used

Examination area 6: Wood waste

	Sections/ Parameter	Basis/ Method	
		AltholzV	
6.1	Sampling and sample preparation	Section 6 (6) AltholzV	
a)	Sampling	LAGA PN 98 in conjunction with Annex IV No. 1.1, AltholzV	<input type="checkbox"/>
b)	Sample preparation	DIN 19747 (07.09) in conjunction with Annex IV No. 1.3	<input checked="" type="checkbox"/>
	Preparation of laboratory sample	DIN 19747 (07.09) in conjunction with DIN 51701- 3 (08.85)	<input type="checkbox"/>
	Moisture content	DIN 52183 (11.77)	<input type="checkbox"/>

Section 6.2 Heavy metals

not used

Section 6.3 Halogens

not used

6.4	Organic parameters	Annex IV No. 1.4.4 and 1.4.5 AltholzV	
	Pentachlorophenol (PCP)	Annex IV AltholzV, No. 1.4.4	<input type="checkbox"/>
		DIN ISO 14154 (12.05)	<input type="checkbox"/>
	Polychlorinated biphenyls (PCB)	Annex IV AltholzV, No. 1.4.5 in conjunction with DIN 38414- 20 (01.96)	<input checked="" type="checkbox"/>

Abbreviations used:

AbfKlärV	German Sewage Sludge Ordinance
BIA	methods published by the Federal Institut for Health and Safety at Work (IFA)
CEN	Comité Européen de Normalisation
DIN	Deutsches Institut für Normung (German Institute for Standardization)
EN	European Standard
GLS DF xxx	SOP of Eurofins GfA Lab Service GmbH from PCDD/F-Analytics
GLS OC xxx	SOP of Eurofins GfA Lab Service GmbH from Organic Chemistry
IEC	International Electrotechnical Commission
ISO	International Organization for Standardization
SOP	Standard Operating Procedure
SRM	Standard reference method
TS	Technical Specification
VDI	Verein deutscher Ingenieure (Association of German Engineers)