

Deutsche Akkreditierungsstelle

Annex to the Partial Accreditation Certificate D-PL-14498-01-03 according to DIN EN ISO/IEC 17025:2018

Valid from: 17.11.2023

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This annex is a part of the accreditation certificate D-PL-14498-01-00.

Holder of partial accreditation certificate:

VKTA - Strahlenschutz, Analytik & Entsorgung Rossendorf e. V.
Bautzner Landstr. 400, 01328 Dresden

with the location

VKTA - Strahlenschutz, Analytik & Entsorgung Rossendorf e. V.
Labor für Umwelt- und Radionuklidanalytik
Bautzner Landstr. 400, 01328 Dresden

The testing laboratory meets the requirements of DIN EN ISO/IEC 17025:2018 to carry out the conformity assessment activities listed in this annex. The testing laboratory meets additional legal and normative requirements, if applicable, including those in relevant sectoral schemes, provided that these are explicitly confirmed below.

The management system requirements of DIN EN ISO/IEC 17025 are written in the language relevant to the operations of testing laboratories and they conform to the principles of DIN EN ISO 9001.

This certificate annex is only valid together with the written accreditation certificate and 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>.

Annex to the Partial Accreditation Certificate D-PL-14498-01-03

Tests in the fields:

**physical, physico-chemical and chemical analysis of waste, soils, sludges and sediments;
sampling of waste, soils, sludges and sediments;
Investigations of waste for disposition according to Landfill Ordinance Annex 4**

The testing laboratory is permitted, without being required to inform and obtain prior approval from DAkKS, to use standards or equivalent testing methods listed here with different issue dates.

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

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4 Sampling, sample preparation and analysis of waste in accordance with the German Landfill Ordinance Annex 9

Abbreviations used:..... 13

1 Investigations of waste

1.1 Sampling

MB-110 Sampling of building and construction materials
2015-01

1.2 Sample pre-treatment

DIN EN ISO 54321 Soil, treated biowaste, sludge and waste - Digestion of aqua regia
2021-04 soluble fractions of elements

DIN EN 12457-4 Characterisation of waste – Leaching – Compliance test for leaching
2003-01 of granular waste materials and sludges – Part 4: One stage batch test at a liquid to solid ratio of 10 l/kg for materials with particle size below 10 mm (without or with size reduction)

DIN EN 16174 Sludge, treated biowaste and soil – Digestion of aqua regia soluble
2012-11 fractions of elements
(Modification: *application to building and construction materials, extraction of the unfractionated, crushed sample*)

DIN EN 1744-3 Tests for chemical properties of aggregates – Part 3: Preparation of
2002-11 eluates by leaching of aggregates

DIN 19529 Leaching of solid materials - Batch test for the examination of the
2015-12 leaching behaviour of inorganic and organic substances at a liquid to solid ratio of 2 l/kg

DIN 19747 Investigation of solids – Pre-treatment, preparation and processing
2009-07 of samples for chemical, biological and physical investigations

1.3 Anions

DIN EN ISO 10304-1 (D 20) Water quality - Determination of dissolved anions by liquid
2009-07 chromatography of ions - Part 1: Determination of bromide, chloride, fluoride, nitrate, nitrite, phosphate and sulfate
(Modification: *determination of bromide, chloride, fluoride and sulfate in solutions after oxidative pressure digestion of waste*)

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DIN EN ISO 10304-3 (D 22)
1997-11

Water quality - Determination of dissolved anions by liquid chromatography of ions - Part 3: Determination of chromate, iodide, sulfite, thiocyanate and thiosulfate
(Modification: *determination of iodide after oxidative pressure digestion of waste*)

1.4 Elements

DIN EN 14582
2016-12

Characterization of waste - Halogen and sulfur content - Oxygen combustion in closed systems and determination methods

DIN EN 16171
2017-01

Sludge, treated biowaste and soil - Determination of elements using inductively coupled plasma mass spectrometry (ICP-MS);
(Modification: *extended by the elements Nb, Tc, Ta und Ra*)

1.5 Organic substances

DIN EN ISO 22155
2016-07

Soil quality - Gas chromatographic determination of volatile aromatic and halogenated hydrocarbons and selected ethers - Static headspace method

DIN EN 14039
2005-01

Characterization of waste - Determination of hydrocarbon content in the range of C₁₀ to C₄₀ by gas chromatography

DIN EN 15527
2008-09

Characterization of waste - Determination of polycyclic aromatic hydrocarbons (PAH) in waste using gas chromatography mass spectrometry (GC/MS)

DIN EN 17322
2021-03

Environmental Solid Matrices - Determination of polychlorinated biphenyls (PCB) by gas chromatography - mass selective detection (GC-MS) or electron-capture detection (GC-ECD)

LAGA KW/04
2019-09

Determination of the hydrocarbon content in waste

2 Investigations of soils

2.1 Sampling

DIN EN ISO 18589-2
2017-12

Measurement of radioactivity in the environment - Soil - Part 2: Guidance for the selection of the sampling strategy, sampling and pre-treatment of samples

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MB-109 Sampling of soil for the determination of radionuclides
2015-06

2.2 Sample pre-treatment

DIN EN ISO 18589-2 Measurement of radioactivity in the environment - Soil - Part 2:
2017-12 Guidance for the selection of the sampling strategy, sampling and
pre-treatment of samples

DIN EN ISO 54321 Soil, treated biowaste, sludge and waste - Digestion of aqua regia
2021-04 soluble fractions of elements

DIN EN 12457-4 Characterization of waste - Leaching; Compliance test for leaching
2003-01 of granular waste materials and sludges - Part 4: One stage batch
test at a liquid to solid ratio of 10 l/kg for materials with particle
size below 10 mm (without or with limited size reduction)

DIN EN 16174 Sludge, treated biowaste and soil - Digestion of aqua regia soluble
2012-11 fractions of elements

DIN EN 16179 Sludge, treated biowaste and soil - Guidance for sample
2012-11 pretreatment

DIN 19529 Leaching of solid materials - Batch test for the examination of the
2015-12 leaching behaviour of inorganic and organic substances at a liquid
to solid ratio of 2 l/kg

DIN 19747 Investigation of solids - Pre-treatment, preparation and processing
2009-07 of samples for chemical, biological and physical investigations

2.3 Simple descriptive procedures

DIN EN ISO 17892-4 Geotechnical investigation and testing - Laboratory testing of soil -
2017-04 Part 4: Determination of particle size distribution
(Restriction: *only sieving*)

2.4 Anions

DIN 38405-D 4 Determination of fluoride
1985-07 (Modification: *after alkaline digestion of soils*)

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2.5 Elements

DIN EN 16171
2017-01 Sludge, treated biowaste and soil - Determination of elements using inductively coupled plasma mass spectrometry (ICP-MS) (Modification: *extended by the elements Nb, Tc, Ta und Ra*)

2.6 Summary indices of actions and substances

DIN EN 15934
2012-11 Sludge, treated biowaste, soil and waste - Calculation of dry matter fraction after determination of dry residue or water content

DIN EN 15935
2012-11 Sludge, treated biowaste, soil and waste - Determination of loss on ignition

2.7 Organic substances

DIN EN ISO 16703
2011-09 Soil quality - Determination of content of hydrocarbon in the range C₁₀ to C₄₀ by gas chromatography

DIN EN ISO 22155
2016-07 Soil quality - Gas chromatographic determination of volatile aromatic and halogenated hydrocarbons and selected ethers - Static headspace method

DIN ISO 11349 (H 56)
2015-12 Water quality - Determination of low-volatility lipophilic substances - Gravimetric method (Modification: *application to soils; Extraction of the air-dried sample*)

DIN ISO 18287
2006-05 Soil quality - Determination of polycyclic aromatic hydrocarbons (PAH) - Gas chromatographic method with mass spectrometric detection (GC-MS) (Modification: *extraction of the sample using ultrasound with cyclohexane*)

DIN EN 15527
2008-09 Characterization of waste - Determination of polycyclic aromatic hydrocarbons (PAH) in waste using gas chromatography mass spectrometry (GC/MS)

DIN EN 15936
2012-11 Sludge, treated biowaste, soil and waste - Determination of total organic carbon (TOC) by dry combustion

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DIN EN 16181 2019-08	Soil, treated biowaste and sludge - Determination of polycyclic aromatic hydrocarbons (PAH) by gas chromatography (GC) and high performance liquid chromatography (HPLC)
DIN EN 17322 2021-03	Environmental Solid Matrices - Determination of polychlorinated biphenyls (PCB) by gas chromatography - mass selective detection (GC-MS) or electron-capture detection (GC-ECD)
LAGA KW/04 2019-09	Determination of the hydrocarbon content in waste (Modification: <i>application on soils</i>)

3 Investigations of sludges and sediments

3.1 Sampling

DIN 38414-S 11 1987-08	Sampling of sediments
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3.2 Sample pre-treatment

DIN EN ISO 54321 2021-04	Soil, treated biowaste, sludge and waste - Digestion of aqua regia soluble fractions of elements
DIN EN 12457-4 2003-01	Characterization of waste - Leaching; Compliance test for leaching of granular waste materials and sludges - Part 4: One stage batch test at a liquid to solid ratio of 10 l/kg for materials with particle size below 10 mm (without or with limited size reduction)
DIN EN 13346 (S 7a) 2001-04	Characterization of sludges - Determination of trace elements and phosphorus - Aqua regia extraction methods
DIN EN 13657 2003-01	Characterization of waste - Digestion for subsequent determination of aqua regia soluble portion of elements in waste
DIN EN 16174 2012-11	Sludge, treated biowaste and soil - Digestion of aqua regia soluble fractions of elements
DIN EN 16179 2012-11	Sludge, treated biowaste and soil - Guidance for sample pre-treatment

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DIN 4030-2 2008-06	Assessment of water, soil and gases for their aggressiveness to concrete - Part 2: Sampling and analysis of water and soil samples (Restriction: <i>only sample preparation for the investigation of chloride in sludges according to point 6.3.5</i>)
DIN 19529 2015-12	Leaching of solid materials - Batch test for the examination of the leaching behaviour of inorganic and organic substances at a liquid to solid ratio of 2 l/kg

3.3 Selected physical and physico-chemical parameters

DIN EN 15933 2012-11	Sludge, treated biowaste and soil - Determination of pH
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3.4 Anions

DIN EN ISO 10304-1 (D 20) 2009-07	Water quality - Determination of dissolved anions by liquid chromatography of ions - Part 1: Determination of bromide, chloride, fluoride, nitrate, nitrite, phosphate and sulfate (Modification: <i>determination of chloride in solutions after higher temperature elution of sludges and sediments</i>)
DIN 38405-D 4 1985-07	Determination of fluoride (Modification: <i>after alkaline digestion of sludges and sediments</i>)

3.5 Elements

DIN EN ISO 17294-2 (E 29) 2017-01	Water quality - Application of inductively coupled plasma mass spectrometry (ICP-MS) - Part 2: Determination of selected elements including uranium isotopes (Modification: <i>Extended by the elements Si, S, Ti, Fe, Nb, Tc, Ta, Hg and Ra; Annex A: Extended by aqueous digestion solutions of sludges and sediments</i>)
DIN EN 16171 2017-01	Sludge, treated biowaste and soil - Determination of elements using inductively coupled plasma mass spectrometry (ICP-MS) (Modification: <i>extended by the elements Nb, Tc, Ta and Ra</i>)

3.6 Summary indices of actions and substances

DIN EN 12880 (S 2a) 2001-02	Characterization of sludges - Determination of dry residue and water content
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DIN EN 14346 2007-03	Characterization of waste - Calculation of dry matter by determination of dry residue or water content
DIN EN 15169 2007-05	Characterization of waste - Determination of loss on ignition in waste, sludge and sediments
DIN EN 15216 2008-01	Characterization of waste - Determination of total dissolved solids (TDS) in water and eluates
DIN EN 15934 2012-11	Sludge, treated biowaste, soil and waste - Calculation of dry matter fraction after determination of dry residue or water content
DIN EN 15935 2012-11	Sludge, treated biowaste, soil and waste - Determination of loss on ignition
DIN EN 15936 2012-11	Sludge, treated biowaste, soil and waste - Determination of total organic carbon (TOC) by dry combustion

3.7 Organic substances

DIN EN ISO 16703 2011-09	Soil quality - Determination of content of hydrocarbon in the range C ₁₀ to C ₄₀ by gas chromatography
DIN EN 14039 2005-01	Characterization of waste - Determination of hydrocarbon content in the range of C10 to C40 by gas chromatography
DIN EN 15527 2008-09	Characterization of waste - Determination of polycyclic aromatic hydrocarbons (PAH) in waste using gas chromatography mass spectrometry (GC/MS)

4 Sampling, sample preparation and analysis of waste in accordance with the German Landfill Ordinance Annex

DepV, Annex 4	Parameter	Section 8 (1), (3) and (5) DepV	
2	Sampling	LAGA PN 98 (May 2019)	<input type="checkbox"/>
3	Determination of total content in solid and elutable fraction		
3.1	Determination of total content in solid		
3.1.1	Sample preparation	DIN 19747 (July 2009)	<input checked="" type="checkbox"/>

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DepV, Annex 4	Parameter	Section 8 (1), (3) and (5) DepV	
3.1.2	Digestion method (aqua regia)	DIN EN 13657 (January 2003)	<input checked="" type="checkbox"/>
3.1.3	Organic portion of the dry residue of the original substance		
3.1.3.1	Loss on ignition	DIN EN 15169 (May 2007)	<input checked="" type="checkbox"/>
3.1.3.2	TOC (total organic carbon)	DIN EN 15936 (November 2012)	<input checked="" type="checkbox"/>
3.1.4	BTEX (benzene, toluene, ethylbenzene, o-, m-, p-xylene, styrene, cumene)	DIN EN ISO 22155 (July 2016)	<input checked="" type="checkbox"/>
3.1.5	PCB (polychlorinated biphenyls – sum of the 7 PCB congeners, PCB 28, 52, 101, 118, 138, 153, 180)	DIN EN 15308 (December 2016)	<input checked="" type="checkbox"/>
3.1.6	Petroleum hydrocarbons (C 10 to C 40)	DIN EN 14039 (January 2005) in conjunction with LAGA KW/04 (September 2019)	<input checked="" type="checkbox"/>
3.1.7	PAH (polycyclic aromatic hydrocarbons)	DIN ISO 18287 (May 2006)	<input checked="" type="checkbox"/>
3.1.8	Density	DIN 18125-2 (March 2011)	<input type="checkbox"/>
3.1.9	Gross calorific value	DIN EN 15170 (May 2009)	<input type="checkbox"/>
3.1.10	Cadmium, chromium, copper, nickel, lead, zinc	DIN EN ISO 17294-2 (January 2017)	<input checked="" type="checkbox"/>
		DIN ISO 22036 (June 2009)	<input type="checkbox"/>
		DIN EN ISO 11885 (E 22) (September 2009)	<input type="checkbox"/>
3.1.11	Mercury	DIN EN ISO 12846 (E 12) (August 2012)	<input type="checkbox"/>
		DIN EN ISO 17852 (E 35) (April 2008)	<input type="checkbox"/>
3.1.12	Extractable lipophilic substances Stoffe	LAGA KW/04 (September 2019)	<input checked="" type="checkbox"/>
3.2	Determination of contents in eluate		
3.2.1	Eluate preparation		
3.2.1.1	Eluate preparation with a liquid to solid ration of 10/1	DIN EN 12457-4 (January 2003)	<input checked="" type="checkbox"/>
3.2.1.2	Eluate preparation each with constant pH 4 and 11 / acid neutralisation capacity	LAGA Guideline EW 98 (September 2017)	<input checked="" type="checkbox"/>
3.2.2	Up-flow percolation test	DIN 19528 (January 2009)	<input type="checkbox"/>
		DIN EN 14405 (May 2017)	<input type="checkbox"/>

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DepV, Annex 4	Parameter	Section 8 (1), (3) and (5) DepV	
3.2.3	pH value of eluate	DIN EN ISO 10523 (April 2012)	<input checked="" type="checkbox"/>
3.2.4	DOC (dissolved organic carbon)		
3.2.4.1	DOC	DIN EN 1484 (April 2019)	<input checked="" type="checkbox"/>
3.2.4.2	DOC at a pH between 7.5 and 8	LAGA Guideline EW 98 (September 2017)	<input type="checkbox"/>
3.2.5	Phenol indexs	DIN 38409-H 16 (June 1984)	<input type="checkbox"/>
		DIN EN ISO 14402 (H 37) (December 1999)	<input type="checkbox"/>
3.2.6	Arsenic	DIN EN ISO 17294-2 (January 2017)	<input checked="" type="checkbox"/>
		DIN EN ISO 11885 (E 22) (September 2009)	<input type="checkbox"/>
		DIN ISO 22036 (June 2009)	<input type="checkbox"/>
3.2.7	Lead	DIN EN ISO 17294-2, (January 2017)	<input checked="" type="checkbox"/>
		DIN ISO 22036 (June 2009)	<input type="checkbox"/>
		DIN EN ISO 11885 (E 22) (September 2009)	<input type="checkbox"/>
3.2.8	Cadmium	DIN EN ISO 17294-2, (January 2017)	<input checked="" type="checkbox"/>
		DIN ISO 22036 (June 2009)	<input type="checkbox"/>
		DIN EN ISO 11885 (E 22) (September 2009)	<input type="checkbox"/>
3.2.9	Copper	DIN EN ISO 17294-2, (January 2017)	<input type="checkbox"/>
		DIN ISO 22036 (June 2009)	<input type="checkbox"/>
		DIN EN ISO 11885 (E 22) (September 2009)	<input type="checkbox"/>
3.2.10	Nickel	DIN EN ISO 17294-2, (January 2017)	<input checked="" type="checkbox"/>
		DIN ISO 22036 (June 2009)	<input type="checkbox"/>
		DIN EN ISO 11885 (E 22) (September 2009)	<input type="checkbox"/>
3.2.11	Mercury	DIN EN ISO 12846 (E 12) (August 2012)	<input type="checkbox"/>
		DIN EN ISO 17852 (E 35) (April 2008)	<input type="checkbox"/>

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DepV, Annex 4	Parameter	Section 8 (1), (3) and (5) DepV	
3.2.12	Zinc	DIN EN ISO 17294-2, (January 2017)	<input checked="" type="checkbox"/>
		DIN ISO 22036 (June 2009)	<input type="checkbox"/>
		DIN EN ISO 11885 (E 22) (September 2009)	<input type="checkbox"/>
3.2.13	Chloride	DIN EN ISO 10304-1 (D 20) (July 2009)	<input checked="" type="checkbox"/>
		DIN EN ISO 15682 (D 31) (January 2002)	<input type="checkbox"/>
3.2.14	Sulphate	DIN EN ISO 10304-1 (D 20) (July 2009)	<input checked="" type="checkbox"/>
3.2.15	Cyanide, readily liberated	DIN 38405-D 13 (April 2011)	<input checked="" type="checkbox"/>
		In waste containing sulphide: DIN ISO 17380 (May 2006)	<input type="checkbox"/>
		DIN EN ISO 14403-1 (D 2) (October 2012)	<input type="checkbox"/>
		DIN EN ISO 14403-2, (October 2012)	<input type="checkbox"/>
3.2.16	Fluoride	DIN 38405-D 4 (July 1985)	<input checked="" type="checkbox"/>
		DIN EN ISO 10304-1 (D 20) (July 2009)	<input type="checkbox"/>
3.2.17	Barium	DIN ISO 22036 (June 2009)	<input type="checkbox"/>
		DIN EN ISO 11885 (E 22) (September 2009)	<input type="checkbox"/>
		DIN EN ISO 17294-2 (E 29) (January 2017)	<input checked="" type="checkbox"/>
3.2.18	Chromium, total	DIN ISO 22036 (June 2009)	<input type="checkbox"/>
		DIN EN ISO 11885 (E 22) (September 2009)	<input type="checkbox"/>
		DIN EN ISO 17294-2 (January 2017)	<input checked="" type="checkbox"/>
3.2.19	Molybdenum	DIN ISO 22036 (June 2009)	<input type="checkbox"/>
		DIN EN ISO 11885 (E 22) (September 2009)	<input type="checkbox"/>
		DIN EN ISO 17294-2 (E 29) (January 2017)	<input checked="" type="checkbox"/>

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DepV, Annex 4	Parameter	Section 8 (1), (3) and (5) DepV	
3.2.20	Antimony	DIN ISO 22036 (June 2009)	<input type="checkbox"/>
		DIN EN ISO 11885 (E 22) (September 2009)	<input type="checkbox"/>
		DIN 38405-D 32 (May 2000)	<input type="checkbox"/>
		DIN EN ISO 17294-2 (E 29) (January 2017)	<input checked="" type="checkbox"/>
3.2.21	Selenium	DIN ISO 22036 (June 2009)	<input type="checkbox"/>
		DIN EN ISO 11885 (E 22) (September 2009)	<input type="checkbox"/>
		DIN EN ISO 17294-2 (E 29) (January 2017)	<input checked="" type="checkbox"/>
3.2.22	Total dissolved solids	DIN EN 15216 (January 2008)	<input checked="" type="checkbox"/>
		DIN 38409-H 1 (January 1987)	<input type="checkbox"/>
		DIN 38409-H 2 (March 1987)	<input type="checkbox"/>
3.2.23	Conductivity of eluate	DIN EN 27888 (C 8) (November 1993)	<input checked="" type="checkbox"/>
3.2.24	Determination of dry residue	DIN EN 14346 (March 2007)	<input checked="" type="checkbox"/>
3.3	Biodegradability of the dry residue of the original substance		
3.3.1	Breathability over 4 days (AT4)		<input type="checkbox"/>
3.3.2	Gas formation rate in fermentation test over 21 days (GB21)		<input type="checkbox"/>

Abbreviations used:

DIN	Deutsches Institut für Normung e. V. (German Institute for Standardization)
EN	Europäische Norm (European standard)
IEC	International Electrotechnical Commission
ISO	International Organization for Standardization
LAGA	Working Group of the Federation and Federal States on Waste
MB	Method Description - Labor für Umwelt- und Radionuklidanalytik des VKTA -Strahlenschutz, Analytik & Entsorgung Rossendorf e. V. - In-house specification

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