Deutsche Akkreditierungsstelle GmbH

Annex to the Accreditation Certificate D-PL-20226-01-00 according to DIN EN ISO/IEC 17025:2018

Valid from: **25.11.2021**

Date of issue: 25.11.2021

Holder of certificate:

Eurofins Agraranalytik Deutschland GmbH
Löbstedter Straße 78, 07749 Jena

Tests in the fields:

Physical, physico-chemical, chemical and sensory analysis of soil intended for agriculture, sediments, aggregates, waste and materials for recycling or disposal;
Physical, physico-chemical and chemical analysis of compost, biowaste, growing media, soil improvers, fertilisers, digestate, plants;
Specialist module for waste

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, with the exception of the specialist module for waste.

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.

1 Analysis of soil intended for agriculture, sediments, aggregates, waste, growing media, soil improvers, fertilisers, plants, etc, waste, growing media, soil improvers, fertilisers, plants

1.1 Sample preparation

1.1.1 Sample preparation using mechanical methods

DIN ISO 11464 2006-12	Soil quality - Pretreatment of samples for physico-chemical analysis
DIN EN 16179 2012-11	Sludge, treated biowaste and soil - Guidance for sample pretreatment
DIN 19747 2009-07	Investigation of solids - Pretreatment, preparation and processing of samples for chemical, biological and physical investigations
BioAbfV Annex 3 No. 1.1/1.2 1998-09	Sample preparation of treated and untreated biowaste
Method book for the analysis of organic fertilisers, soil improvers and substrates Section I B 2006-09	Sample preparation - Sample preparation in the laboratory

1.1.2 Extraction with acids for physico-chemical analysis of elements

DIN ISO 11466 1997-06	Soil quality - Extraction of trace elements soluble in aqua regia
DIN EN 13346 (S 7a) 2001-04	Characterisation of sludges - Determination of trace elements and phosphorus - Aqua regia extraction methods
DIN EN 13650 2002-01	Soil improvers and growing media - Extraction of aqua regia soluble elements
DIN EN 13657 2003-01	Characterisation of waste - Digestion for subsequent determination of aqua regia soluble portion of elements in waste
DIN EN 16173 2012-11	Sludge, treated biowaste and soil - Digestion of nitric acid soluble fractions of elements

DIN EN 16174 2012-11	Sludge, treated biowaste and soil - Digestion of aqua regia soluble fractions of elements
DIN 38414-S 7 1983-01	Digestion using aqua regia for subsequent determination of the acid-soluble portion of metals

1.2 Determination of soil colour, soil texture and classification of soils using simple descriptive tests (sensory analysis)

DIN EN ISO 14688-1 2011-06	Geotechnical investigation and testing - Identification and classification of soil - Part 1: Identification and description
DIN 19682-1 2007-11	Determination of soil colour
Bodenkundliche Kartieranleitung 5th Edition Hanover 2005	Grain size distribution - Finger test in the field
VDLUFA Methodenbuch Volume I, Section D 2.1 1976	Determination of soil texture of fine soil with the finger test

1.3 Determination of conductivity and salt content by conductometry

DIN ISO 11265 1997-06	Soil quality - Determination of specific electrical conductivity
DIN EN 13038 2012-01	Soil improvers and growing media - Determination of electrical conductivity
DIN CEN/TS 15937 2013-08	Sludge, treated biowaste and soil - Determination of specific electrical conductivity
Method book for the analysis of organic fertilisers, soil improvers and substrates Section III C2, 2nd Supplement 2013-05	Determination of salt content

1.4 Determination of pH value by electrode measurement

DIN ISO 10390 2005-12	Soil quality - Determination of pH
DIN EN 13037 2012-01	Soil improvers and growing media - Determination of pH
DIN EN 15933 2012-11	Sludge, treated biowaste and soil - Determination of pH
DIN 19684-1 1977-02	Methods of soil investigations for agricultural water engineering - Chemical laboratory tests - Part 1: Determination of pH
VDLUFA Methodenbuch Volume I (5.1.1) 1991	Determination of pH of soils
Method book for the analysis of organic fertilisers, soil improvers and substrates Section III C1, 2. Supplement 2013-05	Determination of pH

1.5 Determination of organic matter, dry matter and water content by gravimetry

DIN EN 12048 1996-11	Solid fertilizers and liming material - Determination of moisture content - Gravimetric method by drying at (105 ± 2) °C
DIN EN 12879 (S 3a) 2001-02	Characterisation of sludges - Determination of loss on ignition of dry mass
DIN EN 13039 2012-01	Soil improvers and growing media - Determination of organic matter content and ash
DIN EN 13040 2008-01	Soil improvers and growing media - Sample preparation for chemical and physical tests, determination of dry matter content, moisture content and laboratory compacted bulk density
DIN EN 14346 2007-03	Characterisation of waste - Calculation of dry matter by determination of dry residue or water content
DIN EN 15169 2007-05	Characterisation of waste - Determination of loss on ignition in waste, sludge and sediments

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 18121-1 1998-04	Soil, investigation and testing - Water content - Part 1: Determination by drying in oven
DIN 19684-3 2000-08	Methods of soil investigations for agricultural water engineering - Chemical laboratory tests - Part 3: Determination of the loss on ignition and the residue of soil after ignition
Method book for the analysis of organic fertilisers, soil improvers and substrates Section II A1 2006-09	Determination of water content
Method book for the analysis of organic fertilisers, soil improvers and substrates Section III B1 2. Supplement 2013-05	Determination of loss on ignition

1.6 Determination of density by weighing a defined volume

DIN ISO 11272 2001-01	Soil quality - Determination of dry bulk density
DIN 19683-12 1973-04	Methods of soil analysis for water management for agricultural purposes - Physical laboratory tests - Part 12: Bulk density
BioAbfV Annex 3 1998-09	Dry bulk density
Method book for the analysis of organic fertilisers, soil improvers and substrates Section II A 4 2006-09	Determination of maximum bulk density

1.7 Determination of particle size or foreign matter and stone content by selection, sieving and sedimentation methods

DIN ISO 11277 2002-08	Soil quality - Determination of particle size distribution in mineral soil material - Method by sieving and sedimentation
DIN 18123 1996-11	Soil, investigation and testing - Determination of grain-size distribution
DIN 19682-2 2014-07	Soil quality - Field tests - Part 2: Determination of soil texture
Method book for the analysis of organic fertilisers, soil improvers and substrates Section II A 3.1 2006-09	Determination of the maximum grain size
Method book for the analysis of organic fertilisers, soil improvers and substrates Sections II C 1 and C 2, 2nd Supplement 2013-05	Determination of foreign matter and stone content
BioAbfV Annex 1 1998-09	Soil texture
BioAbfV Annex 3 No. 1.3.3 2012-03	Determination of foreign matter and stone content

1.8 Thermal determination of degree of decomposition

Method book for the analysis of organic fertilisers, soil improvers and substrates Section IV A 1 2006-09	Determination of degree of decomposition in self-heating test

1.9 Determination of phytohygienic parameters

DIN EN 16086-1 2012-01	Soil improvers and growing media - Determination of plant response - Part 1: Pot growth test with Chinese cabbage

DIN CEN/TS 16201 DIN SPEC 91276 2013-12	Sludge, treated biowaste and soil - Determination of viable plant seeds and propagules
BioAbfV Annex 2 No. 4.3.2 2012-03	Viable seeds and parts of plants capable of producing shoots
Method book for the analysis of organic fertilisers, soil improvers and substrates Section IV A 3 2006-09	Determination of plant tolerance of compost in seed planting test with spring barley
Method book for the analysis of organic fertilisers, soil improvers and substrates Section IV B 1 2006-09	Determination of content of viable seeds and parts of plants capable of producing shoots

1.10 Determination of elements

1.10.1 By atomic absorption spectroscopy (AAS)

DIN EN ISO 12846 (E 12) 2012-08	Water quality - Determination of mercury - Method using atomic absorption spectrometry (AAS) with and without enrichment (Modification: *Only "without enrichment", application on soil and biowaste/compost after extraction with aqua regia in accordance with DIN EN 16174*)
DIN EN 1483 2007-07	Water quality - Determination of mercury (Modification: *Application for soil, extraction with aqua regia in accordance with DIN EN 16174*)
DIN EN 16175-1 2016-12	Sludge, treated biowaste and soil - Determination of mercury - Part 1: Cold-vapour atomic absorption spectrometry (CV-AAS)
VDLUFA Methodenbuch Volume I (6.2.4.1) 1991	Determination of magnesium in soils in calcium chloride extract

Method book for the analysis of organic fertilisers, soil improvers and substrates Section III A 2.1 2006-09	Determination of nitrate, ammonium and magnesium in $CaCl_2$ extract (*Here only determination of magnesium*)
Method book for the analysis of organic fertilisers, soil improvers and substrates Section III C4.1.1 2006-09	Determination of heavy metals in aqua regia digestion

1.10.2 By inductively coupled plasma mass spectrometry (ICP-MS)

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: *Application for soil, extraction with water or aqua regia in accordance with DIN EN 16174*)
DIN EN 16171 2017-01	Sludge, treated biowaste and soil - Determination of trace elements using inductively coupled plasma mass spectrometry (ICP-MS)

1.10.3 By inductively coupled plasma atomic emission spectrometry (ICP-OES)

DIN ISO 22036 2009-06	Soil quality - Determination of trace elements in extracts of soil by inductively coupled plasma atomic emission spectrometry (ICP-AES)
DIN EN 16170 2017-01	Sludge, treated biowaste and soil - Determination of elements using inductively coupled plasma optical emission spectrometry (ICP-OES)
SS 028310 1995-12	Markundersökningar - Extraktion och bestämning av fosfor, kalium, kalcium, magnesium och natrium ur jord med ammoniumlaktat/ättiksyralösning (AL-metoden) (Analysis of soil: Extraction and determination of phosphorus, potassium, calcium, magnesium and sodium from soils using ammonium lactate/acetic acid solution (AL method))
Kungl Lantbruksstyrelsens Kungörelse Nr.1 Section 5.31-5.34 1965-04	Förråd av fosfor och kalium HCl-tal (Determination of phosphorus and potassium from the 2M Hcl extract) (Modification: *Measurement with ICP-OES in accordance with DIN ISO 11885; additionally copper*)

VDLUFA Methodenbuch Volume I (A 6.3.1) 7th Part 2016	Determination of soluble sulphur in soil profiles (S_{min})
VDLUFA-Methodenbuch Volume I (6.2.4.1) 1991	Determination of plant-available magnesium in calcium chloride extract (Modification: *Measurement with ICP-OES*)
VDLUFA-Methodenbuch Volume I (6.4.1) 3. Part 2002	Determination of magnesium, sodium and the trace nutrients copper, manganese, zinc and boron in calcium chloride/DTPA extract
Method book for the analysis of organic fertilisers, soil improvers and substrates Section III A 1.2 2006-09	Determination of P, K, Ca, Mg in aqua regia digestion
Method book for the analysis of organic fertilisers, soil improvers and substrates Section III A 2.1 2006-09	Determination of nitrate, ammonium and magnesium in $CaCl_2$ extract (Modification: *Measurement of magnesium with ICP-OES*)
Method book for the analysis of organic fertilisers, soil improvers and substrates Section III C4.1.1 2006-09	Determination of heavy metals in aqua regia digestion
Fælles arbejdsmetoder for jordbundsanalyser III, Metode 19; March 1994	Mangantal (Determination of manganese content in magnesium nitrate extract by ICP-OES)
Fælles arbejdsmetoder for jordbundsanalyser III, Metode 20/21; March 1994	Kobbertal/Zinktal (Determination of copper, zinc and iron from EDTA extract by ICP-OES)

1.10.4 Determination of C, S, N by elemental analysis after combustion

DIN ISO 10694 1996-08	Soil quality - Determination of organic carbon and total carbon after dry combustion (elemental analysis)

DIN ISO 13878 1998-11	Soil quality - Determination of total nitrogen content by dry combustion (“elemental analysis”)
DIN EN 13137 2001-12	Characterisation of waste - Determination of total organic carbon (TOC) in waste, sludges and sediments
DIN EN 13654-2 2002-01	Soil improvers and growing media - Determination of nitrogen - Part 2: Dumas method
DIN EN 15936 2012-11	Sludge, treated biowaste, soil and waste - Determination of total organic carbon (TOC) by dry combustion
DIN EN 16168 2012-11	Sludge, treated biowaste and soil - Determination of total nitrogen using dry combustion method

1.11 Determination of phosphorus, potassium and nitrogen compounds and characteristics

1.11.1 By inductively coupled plasma atomic emission spectrometry (ICP-OES)

DIN ISO 13536 1997-04	Soil quality - Determination of the potential cation exchange capacity and exchangeable cations using barium chloride solution buffered at pH = 8.1 (Modification: *Use of a barium chloride:triethanolamine solution (ratio 1:1)*)
DIN EN ISO 11260 2011-09	Soil quality - Determination of effective cation exchange capacity and base saturation level using barium chloride solution (Modification: *Measurement with ICP-OES*)

1.11.2 By photometry

DIN EN ISO 11732 (E 23) 2005-05	Water quality - Determination of ammonium nitrogen - Method by flow analysis (CFA and FIA) and spectrometric detection (Modification: *Application to soil after processing as per DIN EN 13652 and / or VDLUFA Methodenbuch Volume I (6.1.4.1) 1997, also determination of nitrate nitrogen*)
DIN CEN/TS 16177 DIN SPEC 91260 2012-05	Sludge, treated biowaste and soil - Extraction for the determination of extractable ammonia, nitrate and nitrite

Method book for the analysis of organic fertilisers, soil improvers and substrates Section III A 2.1 2006-09	Determination of nitrate, ammonium and magnesium in $CaCl_2$ extract *(Here only determination of nitrate and ammonium*)
Method book for the analysis of organic fertilisers, soil improvers and substrates Section III A 2.2 2006-09	Determination of phosphorus and potassium in CAL extract
VDLUFA-Methodenbuch Volume I (6.1.4.1) 2. Part 1997	Determination of mineral nitrogen in soil profiles (N_{min} method)
VDLUFA-Methodenbuch Volume I (6.2.1.1) 1991	Determination of phosphorus and potassium in the calcium acetate lactate extract (CAL method)
VDLUFA-Methodenbuch Volume I (6.2.1.2) 1991	Determination of phosphorus and potassium in double lactate extract (DL method)
Fælles arbejdsmetoder for jordbundsanalyser III, Metode 14; March 1994	Fosfortallet Pt (Determination of phosphorus content in accordance with OLSEN by CFA)

1.11.3 By titrimetry

DIN ISO 11261 1997-05	Soil quality - Determination of total nitrogen - Modified Kjeldahl method
DIN EN ISO 14254 2011-09	Soil quality - Determination of exchangeable acidity in barium chloride extracts
DIN EN 13342 2001-01	Characterisation of sludges - Determination of Kjeldahl nitrogen
DIN EN 13654-1 2002-01	Soil improvers and growing media - Determination of nitrogen - Part 1: Modified Kjeldahl method
DIN EN 16169 2012-11	Sludge, treated biowaste and soil - Determination of Kjeldahl nitrogen

VDLUFA Methodenbuch Volume II.2 (4.5.1) 1. Supp. 2008	Determination of the alkaline agents in lime, converter lime, lime fertilisers from [...] as well as organic and organic-mineral fertilisers
Method book for the analysis of organic fertilisers, soil improvers and substrates Section III A 1.1 2006-09	Determination of total nitrogen content

2 Test method list for specialist module for waste

Revised: LAGA, May 2018

Test area 1: Sewage sludge

not used

Test area 2: Base

	Sections / Parameters	**Basis /** Methods	
		AbfKlärV and BioAbfV	
2.1	**Sampling and sample preparation**	**Section 32 (2) AbfKlärV and Section 9 BioAbfV**	
a)	**Sampling**	**DIN ISO 10381-1 (08.03) and DIN ISO 10381-4 (04.04)**	☐
b)	**Sample preparation**	**DIN ISO 19747 (07.09)**	☒

2.2	**Heavy metals**	**Section 4 (1) AbfKlärV Section 9 (2) BioAbfV**	
	Aqua regia digestion	**DIN EN 16174 (11.12)**	☐
		DIN EN 13657 (01.03)	☒
	Lead, cadmium, chromium, copper, nickel, zinc, (from aqua regia digestion)	**DIN ISO 11047 (05.03)**	☐
		DIN EN ISO 17294-2 (01.17)	☒
		DIN ISO 22036 (06.09)	☒
		DIN EN 16170 (01.17)	☒
		DIN EN 16171 (01.17)	☒
		DIN EN ISO 11885 (09.09)	☒

	Mercury (from aqua regia digestion)	**DIN ISO 16772 (06.05)**	☒
		DIN EN 12846 (08.12)* a method incorrectly specified in legislation; DIN EN ISO 12846 (08.12) correct	☒
		EN 16175-1 (12.16)	☒
		EN 16175-2 (12.16)	☐
		DIN EN 16171 (01.17)	☐
		DIN EN ISO 17852 (04.08)	☐
2.3	**Physical parameters, phosphate**	**Section 4 (1) AbfKlärV Section 9 (2) BioAbfV**	
	Phosphate (from CAL/DL extract; P-content determination must be converted to o-phosphate)	**VDLUFA-Methodenbuch, Volume I, Method A 6.2.1.1 (6. Part 2012)**	☒
		VDLUFA Methodenbuch, Volume I, Method A 6.2.1.2 (Main Volume	☒
		DIN EN ISO 10304-1 (07.09)	☐
		DIN ISO 22036 (06.09)	☒
	Soil texture (clay content)	**DIN 19682-2 (07.14)**	☒
		DIN 18123 (04.11)	☒
	pH value	**DIN EN 15933 (11.12)**	☒
		ISO 10390 (02.05)	☒
		VDLUFA-Methodenhandbuch I A 5.1.1	☒
	Dry residue	**DIN EN 15934 (11.12)**	☒
		DIN EN 12880 (02.01)	☒

2.4 Polychlorinated biphenyls (PCB)

not used

2.5 Benzo(a)pyrene (B(a)P)

not used

Test area 3: Biowaste

	Sections/ Parameter	**Basis/** Method	
		BioAbfV	
3.1	**Sampling and sample preparation**	**Section 4 (9) BioAbfV**	
a)	**Sampling**	**DIN EN 12579 (01.00) and** **DIN 51750- 1 (12.90) and** **DIN 51750- 2 (12.90) and** **DIN EN ISO 5667- 13 (08.11)**	☐
b)	**Sample preparation**	DIN 19747 (07.09) in conjunction with Annex 3, Section 1.3.3	☒
		DIN EN 13040 (02.07)	☒

3.2	**Heavy metals**	**Section 4 (5) BioAbfV**	
	Aqua regia digestion	**DIN EN 13650 (01.02)**	☒
		DIN EN 16174 (11.12)	☒
		DIN EN 13657 (01.03)	☐
		DIN EN 13346 (04.01)	☒
	Lead (from aqua regia digestion)	**DIN 38406- 6 (07.98)**	☐
		DIN ISO 11047 (05.03)	☐
		DIN EN ISO 11885 (04.98)	☐
		DIN EN ISO 17294- 2 (02.05)	☒
		DIN EN ISO 11885 (09.09)	☒
		DIN EN ISO 22036 (06.09)	☒
	Cadmium (from aqua regia digestion)	**DIN EN ISO 5961 (05.95)**	☐
		DIN ISO 11047 (05.03)	☐
		DIN EN ISO 11885 (04.98)	☐
		DIN EN ISO 17294- 2 (02.05)	☒
		DIN EN ISO 17294- 2 (01.17)	☒
		DIN EN ISO 11885 (09.09)	☒
		DIN EN ISO 22036 (06.09)	☒

	Chromium (from aqua regia digestion)	**DIN EN 1233 (08.96)**	☐
		DIN ISO 11047 (05.03)	☐
		DIN EN ISO 11885 (04.98)	☐
		DIN EN ISO 17294- 2 (02.05)	☒
		DIN EN ISO 17294- 2 (01.17)	☒
		DIN EN ISO 11885 (09.09)	☒
		DIN EN ISO 22036 (06.09)	☒
	Copper (from aqua regia digestion)	**DIN 38406- 7 (09.91)**	☐
		DIN ISO 11047 (05.03)	☐
		DIN EN ISO 11885 (04.98)	☐
		DIN EN ISO 17294- 2 (02.05)	☒
		DIN EN ISO 17294- 2 (01.17)	☒
		DIN EN ISO 11885 (09.09)	☒
		DIN EN ISO 22036 (06.09)	☒
	Nickel (from aqua regia digestion)	**DIN 38406- 11 (09.91)**	☐
		DIN ISO 11047 (05.03)	☐
		DIN EN ISO 11885 (04.98)	☐
		DIN EN ISO 17294- 2 (02.05)	☒
		DIN EN ISO 17294- 2 (01.17)	☒
		DIN EN ISO 11885 (09.09)	☒
		DIN EN ISO 22036 (06.09)	☒
	Mercury (from aqua regia digestion)	**DIN EN 1483 (07.07)**	☒
		DIN EN 12338 (10.98)	☐
		DIN EN ISO 12846 (08.12)	☒
	Zinc (from aqua regia digestion)	**DIN 38406- 8 (10.04)**	☐
		DIN ISO 11047 (05.03)	☐
		DIN EN ISO 11885 (04.98)	☐
		DIN EN ISO 17294- 2 (02.05)	☒
		DIN EN ISO 17294- 2 (01.17)	☒
		DIN EN ISO 11885 (09.09)	☒
		DIN EN ISO 22036 (06.09)	☒

3.3	**Physical parameters, foreign matter**	**Section 4 (5) BioAbfV**	
	Dry residue	**DIN EN 13040 (02.07)**	☒
		DIN EN 13040 (01.08)	☒
	pH value	**DIN EN 13037 (02.00)**	☒
		DIN EN 13037 (01.12)	☒
	Salt content	**DIN EN 13038 (02.00)**	☒
		DIN EN 13038 (01.12)	☒
	Organic substance as loss on ignition (from dry residue)	**DIN EN 13039 (02.00)**	☒
	Stones and foreign matter	**Annex 3 BioAbfV, No. 1.3.3 Method book for the analysis of organic fertilisers, soil improvers and substrates, Bundesgütegemeinschaft Kompost e.V.**	☒

3.4 Process testing *)

not used

3.5	**Testing of sanitised biowaste *)**	**Section 3 (4) BioAbfV**	
-	**Disease hygiene**		
	Salmonella	**Annex 2 BioAbfV**	☐
-	**Phyto-hygiene**		
	Viable seeds and parts of plants capable of producing shoots	**Annex 2 BioAbfV**	☒

*) By way of derogation from Section III No. 1, proof of competence for sections 3.4 and 3.5 can be provided for each individual parameter.

Test area 4: Waste oil, insulating liquid

not used

Test area 5: Landfill waste

not used

Test area 6: Wood waste

not used

Abbreviations used:

CEN	European Committee for Standardization
DIN	Deutsches Institut für Normung e. V. (German Institute for Standardization)
EN	European standards
IEC	International Electrotechnical Commission
ISO	International Organization for Standardization
LAGA	Bund/Länder-Arbeitsgemeinschaft Abfall (Federal/Regional Working Group on Waste)
KS	Swedish standard
VDLUFA	Verband Deutscher Landwirtschaftlicher Untersuchungs- und Forschungsanstalten (Association of German Agricultural Testing and Research Institutions)