

Deutsche Akkreditierungsstelle

Annex to the Accreditation Certificate D-PL-17471-01-00 according to DIN EN ISO/IEC 17025:2018

Valid from: 29.11.2023

Date of issue: 12.03.2024

Holder of accreditation certificate:

ThyssenKrupp Steel Europe AG
Kaiser-Wilhelm-Straße 100, 47166 Duisburg

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 in the annexes to the partial accreditation certificates listed below.

D-PL-17471-01-01

D-PL-17471-01-02

D-PL-17471-01-03

D-PL-17471-01-04

D-PL-17471-01-05

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>.

Accreditation



The Deutsche Akkreditierungsstelle attests with this **Partial Accreditation Certificate** that the testing laboratory

ThyssenKrupp Steel Europe AG
Kaiser-Wilhelm-Straße 100, 47166 Duisburg

meets the requirements according to DIN EN ISO/IEC 17025:2018 for the conformity assessment activities listed in the annex to this certificate. This includes additional existing legal and normative requirements for the testing laboratory, including those in relevant sectoral schemes, provided they are explicitly confirmed in the annex to this certificate.

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 accreditation was issued in accordance with Art. 5 Para. 1 Sentence 2 of Regulation (EC) 765/2008, after an accreditation procedure was carried out in compliance with the minimum requirements of DIN EN ISO/IEC 17011 and on the basis of a review and decision of the appointed accreditation committees.

This partial accreditation certificate only applies in connection with the notice of 29.11.2023 with accreditation number D-PL-17471-01.

It consists of this cover sheet, the reverse side of the cover sheet and the following annex with a total of 19 pages.

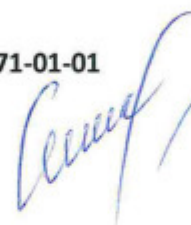
Registration number of the partial accreditation certificate: **D-PL-17471-01-01**

It is a part of the accreditation certificate: D-PL-17471-01-00.

Berlin, 29.11.2023

Dr. Olga Lettau
Head of Technical Unit

Translation issued:
22.10.2024


Dr. Olga Lettau
Head of Technical Unit

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

See notes overleaf

Deutsche Akkreditierungsstelle GmbH

Office Berlin
Spittelmarkt 10
10117 Berlin

Office Frankfurt am Main
Europa-Allee 52
60327 Frankfurt am Main

Office Braunschweig
Bundesallee 100
38116 Braunschweig

The Deutsche Akkreditierungsstelle GmbH (DAkkS) is the entrusted national accreditation body of the Federal Republic of Germany according to § 8 section 1 AkkStelleG in conjunction with § 1 section 1 AkkStelleGBV. DAkkS is designated as the national accreditation authority by Germany according to Art. 4 Para. 4 of Regulation (EC) 765/2008 and clause 4.7 of DIN EN ISO/IEC 17000.

Pursuant to Art. 11 section 2 of Regulation (EC) 765/2008, the accreditation certificate shall be recognised as equivalent by the national authorities within the scope of this Regulation as well as by the WTO member states that have committed themselves in bilateral or multilateral mutual agreements to recognise the certificates of accreditation bodies that are members of ILAC or IAF as equivalent.

DAkkS is a signatory to the multilateral agreements for mutual recognition of the European co-operation for Accreditation (EA), International Accreditation Forum (IAF) and International Laboratory Accreditation Co-operation (ILAC).

The up-to-date state of membership can be retrieved from the following websites:

EA: www.european-accreditation.org

ILAC: www.ilac.org

IAF: www.iaf.nu

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It consists of this cover sheet, the reverse side of the cover sheet and the following annex with a total of 23 pages.

Registration number of the partial accreditation certificate: **D-PL-17471-01-02**

It is a part of the accreditation certificate: D-PL-17471-01-00.

Berlin, 29.11.2023

Dr. Joachim Kintrup
Head of Technical Unit

Translation issued:
04.12.2024



Dr. Joachim Kintrup
Head of Technical Unit

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Registration number of the partial accreditation certificate: **D-PL-17471-01-03**

It is a part of the accreditation certificate: D-PL-17471-01-00.

Berlin, 29.11.2023

Dr. Sebastian Kitzig
Head of Technical Unit

Translation issued:
22.11.2024



Dr. Sebastian Kitzig
Head of Technical Unit

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This partial accreditation certificate only applies in connection with the notice of 29.11.2023 with accreditation number D-PL-17471-01.

It consists of this cover sheet, the reverse side of the cover sheet and the following annex with a total of 10 pages.

Registration number of the partial accreditation certificate: **D-PL-17471-01-04**

It is a part of the accreditation certificate: D-PL-17471-01-00.

Berlin, 29.11.2023

Dr. Tobias Poeste
Head of Technical Unit

Translation issued:
19.11.2024



Dr Tobias Poeste
Head of Technical Unit

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It consists of this cover sheet, the reverse side of the cover sheet and the following annex with a total of 2 pages.

Registration number of the partial accreditation certificate: **D-PL-17471-01-05**

It is a part of the accreditation certificate: D-PL-17471-01-00.



Berlin, 29.11.2023

Dr. Haiko Blumenthal
Head of Technical Unit

Translation issued:
04.11.2024

Dr. Haiko Blumenthal
Head of Technical Unit

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Deutsche Akkreditierungsstelle

Annex to the Partial Accreditation Certificate

D-PL-17471-01-01

according to DIN EN ISO/IEC 17025:2018

Valid from: 29.11.2023

Date of issue: 12.03.2024

This annex is a part of the accreditation certificate D-PL-17471-01-00.

Holder of partial accreditation certificate:

ThyssenKrupp Steel Europe AG
Kaiser-Wilhelm-Straße 100, 47166 Duisburg

with the locations

ThyssenKrupp Steel Europe AG
Chemie und Werkstoffprüfung
Kaiser-Wilhelm-Straße 100, 47166 Duisburg

ThyssenKrupp Steel Europe AG
Chemie und Werkstoffprüfung
Eberhardstraße 12, 44145 Dortmund

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.

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Annex to the Partial Accreditation Certificate D-PL-17471-01-01

Tests in the areas of:

Chemical and thermal investigations of steels, ferrous and non-ferrous materials, alloys, pig iron, and other metallic materials;
Chemical investigations and selected determinations of the reactivity of oxides, ores, sinter, slags, refractory materials, and other solid, non-metallic materials;
Chemical investigations of metallurgical products, metallurgical gases, petroleum products, refractory materials, sinter, slags, polymers, paints and films, as well as phosphating baths and electrolysis/treatment baths;
Investigation of solid fuels, mineral oils and mineral oil products.

The testing laboratory is permitted to apply standardized or equivalent testing methods with different versions without prior notification and approval from DAkkS.

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

The testing methods are marked with the following symbols of the locations where they are carried out:

DU = Kaiser-Wilhelm-Straße 100, 47166 Duisburg

DO = Eberhardstraße 12, 44145 Dortmund

Table of Contents

1	Investigations of Steels, Iron and Non-Ferrous Materials, Alloys, Pig Iron and other Metallic Materials.....	4
1.1	Element Determinations by ICP-OES and ICP-MS.....	4
1.2	Element Determination by XRF.....	5
1.3	Determination of Elements and Compounds by IR and WLD	6
1.4	Element Determinations by Spark-OES	6
1.5	Determination of Elements by Photometry and Titrimetry	7
1.6	Thermal Investigations.....	7
2	Investigations of Oxides, Ores, Sinter, Slags, Rocks, Refractory Materials, and Other Solid Non-Metallic Materials.....	7
2.1	Element Determination by ICP-OES and ICP-MS	7
2.2	Element Determination by XRF.....	8
2.3	Determination of Elements and Compounds by IR, WLD, and Raman Spectroscopy	8
2.4	Determination of Elements and Compounds by Photometry, Gravimetry, and Titrimetry	9
2.5	Element Determination by Thermal Analysis	9

Valid from: 29.11.2023

Date of issue: 12.03.2024

Page 2 of 19

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Annex to the Partial Accreditation Certificate D-PL-17471-01-01

2.6	Determination of Reactivity.....	10
2.7	Determination of Physical Parameters	10
2.8	Thermal Investigations.....	10
3	Investigations of Blast Furnace Gases	10
4	Investigations of Blast Furnace Products and Refractory Materials	11
4.1	Determination of Elements and Compounds by GC.....	11
4.2	Determination of Elements and Compounds by FTIR, IR, and Raman Spectroscopy.....	11
4.3	Element Determinations by ICP-OES	12
4.4	Other Determinations of Elements and Compounds	12
4.5	Thermal Investigations.....	12
5	Investigations of Polymers, Coatings, and Films	12
5.1	Determination of Elements and Compounds by GC.....	12
5.2	Determination of Elements and Compounds by FTIR, IR, and Raman Spectroscopy.....	13
5.3	Element Determinations by ICP-OES	13
5.4	Thermal Investigations.....	13
6	Investigations of Phosphating Baths and Electrolysis/Treatment Baths.....	14
6.1	Determination of Elements and Compounds by FTIR, IR, and Raman Spectroscopy.....	14
6.2	Element Determination by ICP-OES.....	14
6.3	Element Determination by CFA and FIA	14
6.4	Determination of Elements and Compounds by Photometry, Gravimetry, and Titrimetry	14
7	Investigation of Solid Fuels	14
7.1	Physico-Chemical Tests.....	14
7.2	Determination of Elements and Compounds by Photometry, Titrimetry, and Ion Chromatography	15
7.3	Element Determination by ICP-OES and ICP-MS	16
7.4	Element Determinations by IR and WLD	16
7.5	Element Determination by XRF.....	16
7.6	Thermal Investigations.....	17
7.7	Other Determinations of Elements and Compounds	17
8	Investigation of Mineral Oils and Mineral Oil Products	17
8.1	Physical, Physico-Chemical, and Chemical Investigations	17
8.2	Determination of Elements and Compounds by Titration.....	17
8.3	Determination of Elements and Compounds by GC.....	18
8.4	Determination of Elements and Compounds by FTIR, IR, and Raman Spectroscopy.....	18

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Page 3 of 19

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Annex to the Partial Accreditation Certificate D-PL-17471-01-01

8.5	Element Determination by ICP-OES and ICP-MS	18
8.6	Thermal Investigations.....	19
	Abbreviations used:.....	19

1 Investigations of Steels, Iron and Non-Ferrous Materials, Alloys, Pig Iron and other Metallic Materials

1.1 Element Determinations by ICP-OES and ICP-MS

DIN EN ISO 11885 (E 22) 2009-09	Water quality - Determination of 33 elements by inductively coupled plasma atomic emission spectroscopy (Modification: <i>Here for metallic materials; from digestion solutions and extended testing scope niobium</i>)	DU
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>Here for metallic materials; from digestion solutions</i>)	DU
TKSE-10564 Vers.5.0 2022-09	Simultaneous determination of Al, As, Ca, Cd, Co, Cr, Cu, Fe, Mg, Mn, Mo, Ni, P, Pb, Si, Sn, Ti and V in Zink-Bad mittels ICP-OES	DU
TKSE-10582 Vers. 4.0 2023-01	Simultane Bestimmung der Prüfgrößen Al, B, Ca, Mg, Mn, P, Ti and V in Ferro - Silizium mittels ICP-OES	DU
TKSE-10593 Vers. 3.0 2023-01	Simultaneous determination of Al, B, Bi, Ca, Cu, Cr, Mg, Mn, Mo, Ni, P, Pb, Si, Sn and V in Ferro-Titan mittels ICP-OES	DU
TKSE-10597 Vers 7.0 2022-09	Simultane Bestimmung der Prüfgrößen Al, As, B, Ca, Co, Cu, Cr, Mg, Mn, Mo, Nb, Ni, P, Pb, Si, Sn, Ti, V, W, Zn and Zr in niedrig legiertem Stahl mittels ICP-OES	DU
TKSE-10612 Vers 4.0 2022-12	Simultaneous determination of Al, B, Cr, Cu, Mn, Mo, P and Si in Ferro-Vanadium mittels ICP-OES	DU
TKSE-17857 Vers. 1.0 2022-11	Bestimmung von As in Ferro-Vanadium mittels ICP-MS	DU
TKSE-10620 Vers. 5.0 2023-01	Simultane Al, B, Co, Cu, Mn, P, Si and Ti-Bestimmung in Ferro-Chrom mittels ICP-OES	DU

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Page 4 of 19

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TKSE-10623 Vers. 3.0 2022-10	Simultane Cu, P, Si and Ti - Bestimmung in Ferro - Schwefel	DU
TKSE-10625 Vers. 4.0 2023-01	Simultane Al, B, P and Si-Bestimmung in Ferro-Bor mittels ICP-OES	DU
TKSE-10630 Vers. 3.0 2022-10	Simultane Bestimmung von Al, B, Co, Cr, Cu, Nb, Ti and V in Ferro-Mangan mittels ICP-OES	DU
TKSE-10642 Vers. 3.0 2023-01	Simultane Bestimmung von Al, As, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, Mg, Mn, Mo, Nb, P, Pb, Si, Sn, Ti, V, Zn and Zr in Nickelmetall mittels ICP-OES	DU
TKSE-10649 Vers. 2.0 2022-09	Simultane Bestimmung von Pb, Te and Bi in Bleistaub mittels ICP-OES	DU
TKSE-10655 Vers. 2.0 2022-09	Simultane Bestimmung von Al, As, Ca, Co, Cr, Cu, Mg, Mn, Mo, Nb, Ni, P, Si, Sn, Ti and V in Mn-Stahl	DU
TKSE-10659 Vers. 2.0 2022-09	Simultane Bestimmung von Al, As, Ca, Co, Cr, Cu, Mg, Mn, Mo, Nb, Ni, P, Si, Sn, Ti, V and W in mittel- bis hochlegiertem Stahl mittels ICP-OES	DU
TKSE-10662 Vers. 2.0 2022-10	Simultane Bestimmung von Al, Ca, Fe, Mg, Mn, P, Si and Zn in Magnesium zur Entschwefelung mittels ICP-OES	DU
TKSE-14619 Vers. 3.0 2022-09	Simultane Al, B and Ti-Bestimmung in Silico-Mangan mittels ICP-OES	DU
TKSE-17610 Vers. 2.0 2023-01	Simultane Bestimmung von Al, B, Cr, Cu, Mo, Mn, P and Si in Ferro-Vanadium (60%) mittels ICP-OES	DU
TKSE-14136 Vers. 3.0 2023-01	Al säurelöslich-Bestimmung in ORSI-Stählen mittels ICP-OES	DU
EPA METHOD 7473 2007-02	Mercury in solids and solutions by thermal decomposition, amalgamation, and atomic absorption spectrophotometry	DU

1.2 Element Determination by XRF

DIN EN ISO 12677 2013-02	Chemical analysis of refractory products by X-ray fluorescence (XRF) - Fused cast-bead method	DU
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Page 5 of 19

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DIN EN 10315 2006-10	Routine method for analysis of high alloy steel by X-ray Fluorescence Spectrometry (XRF) by using a near by technique	DU
DIN 51418-2 2015-03	X-ray spectrometry - X-ray emission and X-ray fluorescence analysis (XRF) - Part 2: Definitions and basic principles for measurements, calibration and evaluation of results	DU
DIN 51418-2 Beiblatt 1 2015-03	X-ray spectrometry - X-ray emission and X-ray fluorescence analysis (XRF) - Part 2: Definitions and basic principles for measurements, calibration and evaluation of results; Further explanations and calculation examples	DU

1.3 Determination of Elements and Compounds by IR and WLD

DIN EN ISO 15350 2010-08	Steel and iron - Determination of total carbon and sulfur content - Infrared absorption method after combustion in an induction furnace (Routine method)	DU DO
DIN EN ISO 15351 2010-08	Steel and iron - Determination of nitrogen content - Thermal conductimetric method after fusion in a current of inert gas (Routine method)	DU DO
DIN EN 10276-2 2003-10	Chemical analysis of ferrous materials - Determination of oxygen content in steel and iron - Part 2: Infrared method after fusion under inert gas	DU DO
Handbuch für das Eisenhüttenlaboratorium Band 2, Teil 2, 2. Ausgabe 1998, S. 116 1985-01	Bestimmung des Gesamtkohlenstoff and Schwefelanteils von Stahl - infrarotabsorptionsspektrometrisches Verfahren	DU
Handbuch für das Eisenhüttenlaboratorium Band 2, Teil 2, 2. Ausgabe 1998, S. 235, 1995	Bestimmung von Wasserstoff in Stahl durch Heißextraktion - Trärgasverfahren, Wärmeleitfähigkeit	DU

1.4 Element Determinations by Spark-OES

ASTM E 415 2017	Standard Test Method for Atomic Emission Vacuum Spectrometric Analysis of Carbon and Low-Alloy Steel	DU DO
ASTM E 415 2021-11	Standard Test Method for Atomic Emission Vacuum Spectrometric Analysis of Carbon and Low-Alloy Steel	DU

Valid from: 29.11.2023

Date of issue: 12.03.2024

Page 6 of 19

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

Annex to the Partial Accreditation Certificate D-PL-17471-01-01

1.5 Determination of Elements by Photometry and Titrimetry

Handbuch für das Eisenhüttenlaboratorium Band 2, Teil 1, 3. Auflage 2004 Seite 360 bis 362	Die Untersuchung von Ferrovanadium Die Bestimmung des Vanadiumgehaltes	DU
Handbuch für das Eisenhüttenlaboratorium Band 2, Teil 1, 3. Auflage 2004 Seite 349 bis 359	Die Untersuchung von Ferrotitan Die Bestimmung des Titangehaltes Die photometrische Bestimmung	DU

1.6 Thermal Investigations

DIN 51004 1994-06	Thermal analysis; determination of melting temperatures of crystalline materials by differential thermal analysis	DU
DIN 51006 2005-07	Thermal analysis (TA) - Thermogravimetry (TG) - Principles	DU
DIN 51007 1994-06	Thermal analysis; differential thermal analysis; principles	DU
ASTM E 2105 2016	Standard Practice for General Techniques of Thermogravimetric Analysis (TGA) Coupled with Infrared Analysis (TGA/IR) (Modification: <i>Sample supply via skimmer and capillary coupling</i>)	DU

2 Investigations of Oxides, Ores, Sinter, Slags, Rocks, Refractory Materials, and Other Solid Non-Metallic Materials

2.1 Element Determination by ICP-OES and ICP-MS

DIN EN ISO 11885 (E 22) 2009-09	Water quality - Determination of 33 elements by inductively coupled plasma atomic emission spectroscopy (Modification: <i>Measurement of dissolved salts</i>)	DU
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>Measurement of dissolved salts; application to non- metallic materials</i>)	DU

Valid from: 29.11.2023

Date of issue: 12.03.2024

Page 7 of 19

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

Annex to the Partial Accreditation Certificate D-PL-17471-01-01

TKSE-16941 Vers. 2.0 2022-12	Bestimmung der löslichen Anteile von Al, As, Ba, Cd, Co, Cr, Cu, K, Mn, Mo, Ni, P, Pb, Sb, Si, Se, Sn, Ti, V und Zink in Eisensulfat mittels ICP-MS und ICP-OES	DU
TKSE-17858 Vers. 1.0 2022-12	Bestimmung der säurelöslichen Anteile von As, Cd, Hg, Mo, Pb, Sb, Se und Sn in Eisensulfat mittels ICP-MS	DU
EPA METHOD 7473 2007-02	Mercury in solids and solutions by thermal decomposition, amalgamation, and atomic absorption spectrophotometry	DU
Handbuch für das Eisenhüttenlaboratorium <i>Band 3</i> , Teil 1, 3. Ausgabe 2011, S. 246	Die Bestimmung der citronensäurelöslichen Phosphorsäure	DU

2.2 Element Determination by XRF

ISO 9516-1 2003-04	Iron ores - Determination of various elements by X-ray fluorescence spectrometry - Part 1: Comprehensive procedure (Modification: <i>Testing scope: Fe, Mn, P, Si, Ti, Al, Ca, Mg, Zn, Cr, V, Ni, K, W</i>)	DU
DIN EN ISO 12677 2013-02	Chemical analysis of refractory products by X-ray fluorescence (XRF) - Fused cast-bead method	DU
DIN 51001 2003-08	Testing of oxidic raw materials and basic materials - General bases of work for X-ray fluorescence method (XRF)	DU

2.3 Determination of Elements and Compounds by IR, WLD, and Raman Spectroscopy

DIN EN ISO 15350 2010-08	Steel and iron - Determination of total carbon and sulfur content - Infrared absorption method after combustion in an induction furnace (routine method)	DU DO
DIN EN ISO 15351 2010-08	Steel and iron - Determination of nitrogen content - Thermal conductimetric method after fusion in a current of inert gas (Routine method)	DU DO
DIN EN ISO 21068-2 2008-12	Chemical analysis of silicon-carbide-containing raw materials and refractory products - Part 2: Determination of loss on ignition, total carbon, free carbon and silicon carbide, total and free silica and total and free silicon	DU

Valid from: 29.11.2023

Date of issue: 12.03.2024

Page 8 of 19

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

Annex to the Partial Accreditation Certificate D-PL-17471-01-01

DIN EN ISO 21068-3 2008-12	Chemical analysis of silicon-carbide-containing raw materials and refractory products - Part 3: Determination of nitrogen, oxygen and metallic and oxidic constituents	DU
AWS A4.4M 2001.00 (R 2006)	Standard Procedures for Determination of Moisture Content of Welding Fluxes and Welding Electrode Flux Coverings	DO
TKSE 15934 2021-04	Qualitative Charakterisierung von Roh-, Hilfs-, Einsatz- und Betriebsstoffen sowie Produkten in und aus dem Umfeld der Metallindustrie mittels der Raman-Spektroskopie	DU

2.4 Determination of Elements and Compounds by Photometry, Gravimetry, and Titrimetry

DIN EN ISO 787-13 2019-12	General methods of test for pigments and extenders - Part 13: Determination of water-soluble sulfates, chlorides and nitrates (Limitation: here only chloride determination)	DO
DIN 51081 2002-12	Testing of oxidic raw materials and materials - Determination of change in mass on ignition	DU
Handbuch für das Eisenhüttenlaboratorium Band 3, Teil 2, 1. Auflage 1997, Seite 38 – 52	Die Ermittlung des Gehaltes an metallischem Eisen, Eisen(II)-oxid und Eisen(III)-oxid (Modification in volumetric methods: <i>potentiometry</i>)	DU
Handbuch für das Eisenhüttenlaboratorium Band 3, Teil 2, 1. Ausgabe 1997 Seite 59ff	Tests zur Ermittlung des Gehaltes an freiem Kalk in Schlacken Verfahren A: Atomabsorptionsspektrometrische Bestimmung (Modification: <i>only method A; microwave-assisted digestion at 80°C, detection method ICP-OES</i>)	DU

2.5 Element Determination by Thermal Analysis

DIN 51007 1994-06	Thermal analysis; differential thermal analysis; principles (Modification: <i>Here $Al_{met.}$ in FF-material</i>)	DU
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Valid from: 29.11.2023

Date of issue: 12.03.2024

Page 9 of 19

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

Annex to the Partial Accreditation Certificate D-PL-17471-01-01

2.6 Determination of Reactivity

Handbuch für das Eisenhüttenlaboratorium Band 3, Teil 2, 1. Ausgabe 1997 Seite 88ff	Tests zur Ermittlung der Reaktionsfähigkeit von Branntkalk (Modification: <i>temperature range of the wet quenching curve 40 to 70°C</i>)	DU
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2.7 Determination of Physical Parameters

DIN EN ISO 60 2000-01	Determination of apparent density of material that can be poured from a specified funnel	DO
EN ISO 787-11 1995-08	General methods of test for pigments and extenders - Part 11: Determination of tamped volume and apparent density after tamping	DO
DIN 55913-2 1972-03	Pigments; iron oxide pigments, methods for analysis (Modification: <i>only loss on ignition, moisture determination, and water-soluble fraction</i>)	DO

2.8 Thermal Investigations

DIN 51004 1994-06	Thermal analysis; determination of melting temperatures of crystalline materials by differential thermal analysis	DU
DIN 51006 2005-07	Thermal analysis (TA) - Thermogravimetry (TG) - Principles	DU
DIN 51007 1994-06	Thermal analysis; differential thermal analysis; principles	DU
ASTM E 2105 2016	Standard Practice for General Techniques of Thermogravimetric Analysis (TGA) coupled with Infrared Analysis (TGA/IR) (Modification: <i>Sample supply via skimmer and capillary coupling</i>)	DU

3 Investigations of Blast Furnace Gases

DIN 51894 2012-09	Gas analysis - Gas chromatographic method for fuel gases/natural gas and other gas mixtures	DU
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Valid from: 29.11.2023

Date of issue: 12.03.2024

Page 10 of 19

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

Annex to the Partial Accreditation Certificate D-PL-17471-01-01

(Modification: *Carrier gas: Argon; columns: Porapak-T, molecular sieve; analytes: H₂, O₂, N₂, CH₄, CO, CO₂, C₂H₄, C₂H₆, (C₃H₈, i-C₄H₁₀, n-C₄H₁₀)*)

DIN 51857 1997-03	Gaseous fuels and other gases - Calculation of calorific value, density, relative density and Wobbe index of pure gases and gas mixtures	DU
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4 Investigations of Blast Furnace Products and Refractory Materials

4.1 Determination of Elements and Compounds by GC

DIN EN 15527 2008-09	Characterization of waste - Determination of polycyclic aromatic hydrocarbons (PAH) in waste using gas chromatography mass spectrometry (GC/MS) (Modification: <i>Here in metallurgical products and refractory materials; extension of toluene as extraction solvent</i>)	DO
TKSE 11012 2018-04	Qualitative Bestimmung von flüchtigen organischen Verbindungen von Roh-, Hilfs- und Betriebsstoffen der Stahlindustrie mittels GC-MS	DO

4.2 Determination of Elements and Compounds by FTIR, IR, and Raman Spectroscopy

DIN 51451 2020-02	Testing of petroleum products and related products - Analysis by infrared spectrometry - General working principles (Modification: <i>Application of ATR technique, extension of application range to solid substances</i>)	DO
TKSE 15934 2021-04	Qualitative Charakterisierung von Roh-, Hilfs-, Einsatz- und Betriebsstoffen sowie Produkten in und aus dem Umfeld der Metallindustrie mittels der Raman-Spektroskopie	DU
ASTM E1252-98 (2021)	Standard Practice for General Techniques for Obtaining Infrared Spectra for Qualitative Analysis	DO
ASTM E573-01 (2021)	Standard Practices for Internal Reflection Spectroscopy	DO

Valid from: 29.11.2023

Date of issue: 12.03.2024

Page 11 of 19

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

Annex to the Partial Accreditation Certificate D-PL-17471-01-01

4.3 Element Determinations by ICP-OES

DIN EN ISO 11885 (E 22) 2009-09	Water quality - Determination of 33 elements by inductively coupled plasma atomic emission spectroscopy (Here: <i>in metallurgical products and refractory materials</i>)	DU
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4.4 Other Determinations of Elements and Compounds

DIN 38414-17 (S 17) 2017-01	German standard methods for the examination of water, waste water and sludge - Sludge and sediments (group S) - Part 17: Determination of the organically bound halogens amenable to extraction (EOX) (Modification: <i>Implementation with automatic extraction unit. Determination with hydropyrolysis at AQF</i>)	DU
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4.5 Thermal Investigations

DIN 51004 1994-06	Thermal analysis; determination of melting temperatures of crystalline materials by differential thermal analysis	DU
DIN 51006 2005-07	Thermal analysis (TA) - Thermogravimetry (TG) - Principles	DU
DIN 51007 1994-06	Thermal analysis; differential thermal analysis; principles	DU
ASTM E 2105 2016	Standard Practice for General Techniques of Thermogravimetric Analysis (TGA) coupled with Infrared Analysis (TGA/IR) (Modification: <i>Sample supply via skimmer and capillary coupling</i>)	DU

5 Investigations of Polymers, Coatings, and Films

5.1 Determination of Elements and Compounds by GC

TKSE 11012 2018-04	Qualitative Bestimmung von flüchtigen organischen Verbindungen von Roh-, Hilfs- und Betriebsstoffen der Stahlindustrie mittels GC-MS	DO
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Valid from: 29.11.2023

Date of issue: 12.03.2024

Page 12 of 19

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

Annex to the Partial Accreditation Certificate D-PL-17471-01-01

5.2 Determination of Elements and Compounds by FTIR, IR, and Raman Spectroscopy

DIN 51451 2020-02	Testing of petroleum products and related products - Analysis by infrared spectrometry - General working principles (Modification: <i>Extension of the application range to solid substances</i>)	DO
TKSE 15934 2021-04	Qualitative Charakterisierung von Roh-, Hilfs-, Einsatz- und Betriebsstoffen sowie Produkten in und aus dem Umfeld der Metallindustrie mittels der Raman-Spektroskopie	DU
ASTM E1252-98 (2021)	Standard Practice for General Techniques for Obtaining Infrared Spectra for Qualitative Analysis	DO
ASTM E573-01 (2021)	Standard Practices for Internal Reflection Spectroscopy	DO

5.3 Element Determinations by ICP-OES

DIN EN ISO 11885 (E 22) 2009-09	Water quality - Determination of 33 elements by inductively coupled plasma atomic emission spectroscopy (Here: <i>in metallurgical products and refractory materials</i>)	DU
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5.4 Thermal Investigations

DIN EN ISO 11358-1 2022-07	Plastics - Thermogravimetry (TG) of polymers - Part 1: General principles	DU
DIN EN ISO 11357-1 2017-02	Plastics - Differential scanning calorimetry (DSC) - Part 1: General principles	DU
DIN EN ISO 11357-3 2018-07	Plastics - Differential scanning calorimetry (DSC) - Part 3: Determination of temperature and enthalpy of melting and crystallization	DU
DIN EN ISO 11357-6 2018-07	Plastics - Differential scanning calorimetry (DSC) - Part 6: Determination of oxidation induction time (isothermal OIT) and oxidation induction temperature (dynamic OIT)	DU
DIN EN ISO 1716 2018-10	Reaction to fire tests for products - Determination of the gross heat of combustion (calorific value)	DU

Valid from: 29.11.2023

Date of issue: 12.03.2024

Page 13 of 19

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

Annex to the Partial Accreditation Certificate D-PL-17471-01-01

6 Investigations of Phosphating Baths and Electrolysis/Treatment Baths

6.1 Determination of Elements and Compounds by FTIR, IR, and Raman Spectroscopy

TKSE 15934 2021-04	Qualitative Charakterisierung von Roh-, Hilfs-, Einsatz- und Betriebsstoffen sowie Produkten in und aus dem Umfeld der Metallindustrie mittels der Raman-Spektroskopie	DU
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6.2 Element Determination by ICP-OES

DIN EN ISO 11885 (E 22) 2009-09	Water quality - Determination of 33 elements by inductively coupled plasma atomic emission spectroscopy (Modification: <i>Application to phosphating, electrolysis, and treatment baths</i>)	DU
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6.3 Element Determination by CFA and FIA

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: <i>Working range narrowed to 0.01-2.0 mg/l and application to the matrix electrolyte/treatment baths</i>)	DU
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6.4 Determination of Elements and Compounds by Photometry, Gravimetry, and Titrimetry

Handbuch für das Eisenhüttenlaboratorium Band 4, 10. Auflage 1997 Seite 118	Die Ermittlung des Eisen-Gehaltes von Beizbädern (Modification: <i>Potentiometric</i>)	DU
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7 Investigation of Solid Fuels

7.1 Physico-Chemical Tests

ISO 1928 2020-10	Solid mineral fuels - Determination of gross calorific value by the bomb calorimetric method and calculation of net calorific value	DU
DIN 51718 2002-06	Testing of solid fuels - Determination of the water content and the moisture of analysis sample	DU
DIN 51719 1997-07	Testing of solid fuels - Solid mineral fuels - Determination of ash content	DU

Valid from: 29.11.2023

Date of issue: 12.03.2024

Page 14 of 19

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

Annex to the Partial Accreditation Certificate D-PL-17471-01-01

ISO 1171 2010-06	Solid mineral fuels - Determination of ash content	DU
DIN 51903 2012-11	Testing of carbonaceous materials - Determination of ash value - Solid materials	DU
DIN 51720 2001-03	Testing of solid fuels - Determination of volatile matter content	DU
ISO 562 2010-06	Hard coal and coke - Determination of volatile matter	DU
DIN 51900-3 2005-01	Testing of Solid and Liquid Fuels; Determination of the Gross Calorific Value by the Bomb Calorimeter and Calculation of the Net Calorific Value; Part 3: Method Using Adiabatic Jacket	DU
E DIN 51900 2022-06	Testing of solid and liquid fuels - Determination of gross calorific value by the bomb calorimeter and calculation of net calorific value	DU
DIN 53922 1979-07	Calcium Carbide (Modification: <i>Only determination of gas yield, implementation of the procedure on a laboratory scale</i>)	DU

7.2 Determination of Elements and Compounds by Photometry, Titrimetry, and Ion Chromatography

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>After combustion in the Seuthe furnace</i>)	DU
DIN 51723 2002-06	Testing of solid fuels - Determination of fluorine content (Modification: <i>additional implementation of the standard for the AQF device from Mitsubischi</i>)	DU
DIN 51727 2011-11	Testing of solid fuels - Determination of chlorine content (Modification: <i>additional implementation of the standard for the AQF device from Mitsubischi</i>)	DU
DIN 51777 2020-04	Petroleum products - Determination of water content using titration according to Karl Fischer	DU

Valid from: 29.11.2023

Date of issue: 12.03.2024

Page 15 of 19

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

Annex to the Partial Accreditation Certificate D-PL-17471-01-01

(Modification: *Indirect method C: high-temperature furnace module for the treatment of coal, coke, and other solid substances; automatic titration*)

7.3 Element Determination by ICP-OES and ICP-MS

DIN EN ISO 11885 (E 22) 2009-09	Water quality - Determination of 33 elements by inductively coupled plasma atomic emission spectroscopy (Modification: <i>From digestion solutions, extended testing scope niobium, palladium</i>)	DU
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 for solid fuels: <i>Sample preparation using microwave-assisted high-pressure digestion system</i>)	DU
TKSE 14800, Vers. 4.0 2022-12	Pd-Bestimmung in Katalysatorkohle mittels ICP-OES	DU
TKSE 14624, Vers. 4.0 2022-12	Simultane Bestimmung von Al, Ba, Be, Ca, Cd, Co, Cr, Cu, Fe, K, Mg, Mn, Mo, Na, Nb, Ni, P, Pb, Si, Sn, Sr, Ti, V, Zn und Zr in festen Brennstoffen mittels ICP-OES	DU
TKSE-10566 Vers. 5.0 2023-01	Simultane Fe, Pb- und Zn-Bestimmung in festen Brennstoffen mittels ICP-OES	DU
EPA METHOD 7473 2007-02	Mercury in solids and solutions by thermal decomposition, amalgamation, and atomic absorption spectrophotometry	DU

7.4 Element Determinations by IR and WLD

DIN 51732 2014-07	Testing of solid mineral fuels - Determination of total carbon, hydrogen and nitrogen - Instrumental methods	DU
DIN 51724-3 2012-07	Solid mineral fuels - Determination of sulfur content - Part 3: Instrumental methods	DU

7.5 Element Determination by XRF

DIN 51729-10 2011-04	Testing of solid fuels - Determination of chemical composition of fuel ash - Part 10: X-Ray Fluorescence Analysis	DU
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Valid from: 29.11.2023

Date of issue: 12.03.2024

Page 16 of 19

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

Annex to the Partial Accreditation Certificate D-PL-17471-01-01

(Modification: *Test scope: Fe, Mn, P, Si, Ti, Al, Ca, Mg, Cr, Zr, Hf, Co, W, Ba, Ni, V, Na, K, Cu, Pb, Zn, Sr*)

7.6 Thermal Investigations

DIN 51006 2005-07	Thermal analysis (TA) - Thermogravimetry (TG) - Principles	DU
ASTM E 2105 2016	Standard Practice for General Techniques of Thermogravimetric Analysis (TGA) coupled with Infrared Analysis (TGA/IR) (Modification: <i>Sample supply introduction via skimmer and capillary coupling</i>)	DU

7.7 Other Determinations of Elements and Compounds

DIN 51733 2016-04	Testing of solid mineral fuels - Ultimate analysis and calculation of oxygen content (Modification: <i>Sulfur in ash according to DIN EN ISO 15350:2010-08</i>)	DU
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8 Investigation of Mineral Oils and Mineral Oil Products

8.1 Physical, Physico-Chemical, and Chemical Investigations

DIN ISO 2137 2016-12	Petroleum products and lubricants - Determination of cone penetration of lubricating greases and petrolatum	DU
DIN ISO 6614 2002-04	Petroleum products - Determination of water separability of petroleum oils and synthetic fluids	DU
DIN EN ISO 2719 2021-06	Determination of flash point - Pensky-Martens closed cup method	DU
DIN EN ISO 12185 1997-11	Crude petroleum and petroleum products - Determination of density - Oscillating U-tube method	DU
DIN 51659-2 2017-02	Lubricants - Test methods - Part 2: Determination of the kinematic viscosity of used lubricating oils by Stabinger viscometer	DU

8.2 Determination of Elements and Compounds by Titration

DIN 51558-1 1979-07	Testing of petroleum products; determination of neutralization number; colour indicator titration	DU
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Valid from: 29.11.2023

Date of issue: 12.03.2024

Page 17 of 19

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

Annex to the Partial Accreditation Certificate D-PL-17471-01-01

DIN 51559-1 2009-04	Testing of mineral oils - Determination of the saponification number - Part 1: Saponification numbers above 2, colorindicator titration	DU
DIN 51777 2020-04	Petroleum products - Determination of water content using titration according to Karl Fischer; (direct method B)	DU

8.3 Determination of Elements and Compounds by GC

DIN EN 12766-1 2000-11	Petroleum products and used oils - Determination of PCBs and related products - Part 1: Separation and determination of selected PCB congeners by gas chromatography (GC) using an electron capture detector (ECD)	DO
DIN EN 12766-2 2001-12	Petroleum products and used oils - Determination of PCBs and related products - Part 2: Calculation of polychlorinated biphenyl (PCB) content, method B	DO
TKSE 11012 2018-04	Qualitative Bestimmung von flüchtigen organischen Verbindungen von Roh-, Hilfs- und Betriebsstoffen der Stahlindustrie mittels GC-MS	DO

8.4 Determination of Elements and Compounds by FTIR, IR, and Raman Spectroscopy

DIN 51451 2020-02	Testing of petroleum products and related products - Analysis by infrared spectrometry - General working principles (Modification: <i>Application of ATR technique, extension of the application range to solid substances</i>)	DO
TKSE 15934 2021-04	Qualitative Charakterisierung von Roh-, Hilfs-, Einsatz- und Betriebsstoffen sowie Produkten in und aus dem Umfeld der Metallindustrie mittels der Raman-Spektroskopie	DU

8.5 Element Determination by ICP-OES and ICP-MS

DIN EN ISO 11885 (E 22) 2009-09	Water quality - Determination of 33 elements by inductively coupled plasma atomic emission spectroscopy (Modification for <i>mineral oils and mineral oil products; sample preparation using microwave-assisted high-pressure digestion system</i>)	DU
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	DU

Valid from: 29.11.2023

Date of issue: 12.03.2024

Page 18 of 19

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

Annex to the Partial Accreditation Certificate D-PL-17471-01-01

	elements including uranium isotopes (Modification for mineral oils: Sample preparation using microwave-assisted high-pressure digestion system)	
EPA METHOD 7473 2007-02	Mercury in solids and solutions by thermal decomposition, amalgamation, and atomic absorption spectrophotometry	DU
TKSE-10603 Vers. 4.0 2022-12	Simultane Bestimmung der Prüfgrößen Ca, Mg, Na und Pd-Bestimmung in Lipoiden mittels ICP-OES	DU
TKSE-10673 Vers. 3.0 2022-10	Simultane Bestimmung von Al, Ag, B, Ba, Bi, Ca, Cd, Cr, Cu, Fe, K, Li, Mg, Mn, Mo, Na, Ni, P, Pb, S, Sb, Si, Sn, Ti, V und Zn in Fetten und Ölen mittels ICP-OES	DU
TKSE 10606 Vers. 2.0 2022-12	Pd-Bestimmung in Lipoiden mittels ICP-MS	DU

8.6 Thermal Investigations

DIN 51006 2005-07	Thermal analysis (TA) - Thermogravimetry (TG) - Principles	DU
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Abbreviations used:

ASTM	American Society for Testing and Materials	American Society for Testing and Materials
AWS	American Welding Society	American Welding Society
DIN	Deutsches Institut für Normung e. V.	German Institute for Standardization
EN	Europäische Norm	European Standard
EP	Eingangs- und Plausibilitätsprüfung	Incoming and Plausibility Check
EPA	Environmental Protection Agency	Environmental Protection Agency
IEC	International Electrotechnical Commission – Internationale Elektrotechnische Kommission	International Electrotechnical Commission
ISO	International Organization for Standardization – Internationale Organisation für Normung	International Organization for Standardization
St.	Standort	Location
TKSE	Hausverfahren der ThyssenKrupp Steel Europe AG	In-house Procedures of ‘ ThyssenKrupp Steel Europe AG
VDEW	Vereinigung Deutscher Elektrizitätswerke	Association of German Electrical Engineers
VDI	Verein Deutscher Ingenieure	Association of German Engineers

Valid from: 29.11.2023

Date of issue: 12.03.2024

Page 19 of 19

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

Deutsche Akkreditierungsstelle

Annex to the Partial Accreditation Certificate D-PL-17471-01-02 according to DIN EN ISO/IEC 17025:2018

Valid from: 29.11.2023

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This annex is a part of the accreditation certificate D-PL-17471-01-00.

Holder of partial accreditation certificate:

ThyssenKrupp Steel Europe AG
Kaiser-Wilhelm-Straße 100, 47166 Duisburg

with the locations

ThyssenKrupp Steel Europe AG
Chemie und Werkstoffprüfung
Kaiser-Wilhelm-Straße 100, 47166 Duisburg

ThyssenKrupp Steel Europe AG
Chemie und Werkstoffprüfung
Eberhardstraße 12, 44145 Dortmund

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-17471-01-02

Tests in the areas of:

physical, physico-chemical, chemical, and microbiological examinations of water (wastewater, raw water, groundwater, utility water, drinking water);

selected microbiological and chemical examinations according to the Ordinance on the Quality of Water Intended for Human Consumption;

sampling of raw and drinking water, wastewater and groundwater

Water module;

sampling and microbiological examination of utility water according to 42. BImSchV §3 paragraph 8

The testing laboratory is permitted to apply standardized or equivalent testing methods with different versions without prior notification and approval from DAkkS This does not apply to the water module.

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

The testing methods are marked with the following symbols of the locations where they are carried out:

DU = Kaiser-Wilhelm-Straße 100, 47166 Duisburg

DO = Eberhardstraße 12, 44145 Dortmund

Valid from: 29.11.2023

Date of issue: 12.03.2024

Page 2 of 23

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

Annex to the Partial Accreditation Certificate D-PL-17471-01-02

Table of Contents

1	Examination of water (raw water, groundwater, wastewater, utility water, drinking water).....	4
1.1	Sampling and sample preparation	4
1.2	Selected rapid tests with ready-to-use reagents	4
1.3	Physical and physico-chemical parameters	5
1.4	Determination of elements and compounds using photometry, gravimetry, titrimetry and atomic absorption spectrometry	5
1.5	Determination of elements and compounds using GC (Gas Chromatography)	8
2	Biological examinations in water	9
3	Microbiological examinations of water (raw water, groundwater, utility water, and drinking water)9	
3.1	Microbiological examinations of raw water, groundwater, and drinking water.....	9
3.2	Microbiological examinations of utility water	10
4	Examinations according to the Ordinance on the Quality of Water Intended for Human Consumption – “Trinkwasserverordnung” -TrinkwV -of June 20, 2023 (BGBl. 2023 I No. 159, p. 2)	10
5	LIST OF TEST METHODS FOR THE WATER MODULE	14
	Section 1: Sampling and General Characteristics	14
	Section 2: Photometry, Ion Chromatography, Titrimetry	15
	Section 3: Elemental Analysis	17
	Section 4/5: Group and Sum Parameters.....	19
	Section 6: Gas Chromatographic Methods	20
	Section 9.1: Biological Methods, Biotests (Part 1)	21
6	Section 5: Sampling and Microbiological Investigations of Utility Water According to §3 Paragraph 8, 42nd BImSchV	22
6.1	Sampling.....	22
6.2	Microbiological Investigations	22

Valid from: 29.11.2023

Date of issue: 12.03.2024

Page 3 of 23

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

Annex to the Partial Accreditation Certificate D-PL-17471-01-02

1 Examination of water (raw water, groundwater, wastewater, utility water, drinking water)

1.1 Sampling and sample preparation

DIN EN ISO 5667-1 (A 4) 2007-04	Water quality - Sampling - Part 1: Guidance on the design of sampling programmes and sampling techniques	DU DO
DIN 38402- A 11 2009-02	German standard methods for the examination of water, waste water and sludge - General information (group A) - Part 11: Sampling of waste water	DU DO
DIN 38402- A 13 2021-12	German standard methods for the examination of water, waste water and sludge - General information (group A) - Part 13: Design and performance of the sampling of groundwater	DU DO
DIN ISO 5667-5 (A 14) 2011-02	Water quality - Sampling - Part 5: Guidance on sampling of drinking water from treatment works and piped distribution systems	DU DO
DIN EN ISO 5667-3 (A 21) 2013-03	Water quality - Sampling - Part 3: Preservation and handling of water samples	DU DO
DIN 38402-A 30 1998-07	German standard methods for the examination of water, waste water and sludge - General information (group A) - Part 30: Pretreatment, homogenization and aliquotation of non-homogeneous water samples	DU DO

1.2 Selected rapid tests with ready-to-use reagents

LCK 341 Dr. Lange 2019-10	Nitrit (0,05 - 2,0 mg/l)	DU
LCK 342 Dr. Lange 2019-10	Nitrit (2,0 - 20 mg/l)	DU
LCK 325 Dr. Lange 2020-01	Formaldehyd (Modification: <i>Different measurement range here: 0.01 - 10.0 mg/l</i>)	DU
LCK 314 Dr. Lange 2019-10	CSB (15 - 150 mg/l)	DU
LCK 514 Dr. Lange 2019-10	CSB (100 - 2000 mg/l)	DU

Valid from: 29.11.2023

Date of issue: 12.03.2024

Page 4 of 23

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

Annex to the Partial Accreditation Certificate D-PL-17471-01-02

1.3 Physical and physico-chemical parameters

DIN 38404- C 4 1976-12	German Standard Methods for Analysing of Water, Waste Water and Sludge; Physical and Physical-chemical Parameters (Group C); Determination of Temperature (C4)	DU DO
DIN EN ISO 10523 (C 5) 2012-04	Water quality - Determination of pH (Modification for DU: <i>also for pH measurements in unbuffered aqueous solutions in metallurgical products and refractory materials</i>)	DU DO
DIN EN 27888 (C 8) 1993-11	Water quality; determination of electrical conductivity (ISO 27888:1985)	DU DO
DIN EN ISO 7027-1 (C 21) 2016-11	Water quality - Determination of turbidity - Part 1: Quantitative methods (ISO 7027-1:2016)	DU
DIN EN ISO 7027-2 (C 22) 2019-06	Water quality - Determination of turbidity - Part 2: Semi-quantitative methods for the assessment of transparency of waters (ISO 7027-2:2019)	DU
DIN EN ISO 5814 (G 22) 2013-02	Water quality - Determination of dissolved oxygen - Electrochemical probe method (ISO 5814:2012)	DU DO
DIN ISO 17289 (G 25) 2014-12	Water quality - Determination of dissolved oxygen - Optical sensor method	DU DO
DIN EN ISO 12185 1997-11	Crude petroleum and petroleum products - Determination of density - Oscillating U-tube method (ISO 12185:1996)	DU

1.4 Determination of elements and compounds using photometry, gravimetry, titrimetry and atomic absorption spectrometry

DIN EN ISO 14403-2 (D3) 2012-10	Water quality - Determination of total cyanide and free cyanide using flow analysis (FIA and CFA) - Part 2: Method using continuous flow analysis (CFA) (Modification: <i>Working range narrowed to 0.01-0.50 mg/l</i>)	DU
DIN ISO 11349 (H 56) 2015-12	Water quality - Determination of low-volatility lipophilic substances - Gravimetric method (ISO 11349:2010)	DO
DIN 38405-D 9 2011-09	German standard methods for examination of water, waste water and sludge - Anions (group D) - Part 9: Spectrometric determination of nitrate (D 9)	DU

Valid from: 29.11.2023

Date of issue: 12.03.2024

Page 5 of 23

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

Annex to the Partial Accreditation Certificate D-PL-17471-01-02

DIN EN 26777 (D 10) 1993-04	Water quality; determination of nitrite; molecular absorption spectrometric method (Modification: <i>Working range adjusted to 0.005-0.10 mg/l NO₂-N</i>)	DU
DIN EN ISO 6878 (D 11) 2004-09	Water quality - Determination of phosphorus - Ammonium molybdate spectrometric method (Modification: <i>For wastewater samples, the sample must be taken from the original material while stirring and filtered before coloring</i>)	DU
DIN 38405-D 13 2011-04	Determination of cyanides (Modification: <i>Working range adjusted 0.10 - 4.0 mg/l</i>)	DU
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 (ISO 10304-1:2007)	DU
DIN 38405-D 21 1990-10	Determination of dissolved silicate by spectrometry (D 21) (Modification: <i>Working range adjusted 0.001 - 0.05 mg/l and 0,05 - 0,50 mg/l</i>)	DU
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 (ISO 10304-3:1997)	DU
DIN 38405-D 24 1987-05	photometric determination of chromium(VI) using 1,5-diphenylcarbonohydrazide (D 24) (Modification: <i>Working range adjusted 0.01-0.30 mg/l</i>)	DU
DIN 38405-D 27 2017-10	Determination of readily liberated sulfide (D 27)	DU
DIN EN ISO 18412 (D 40) 2007-02	Water quality - Determination of chromium(VI) - Photometric method for weakly contaminated water (ISO 18412:2005)	DU
DIN ISO 15923-1 (D 49) 2014-07	Water quality - Determination of selected parameters by discrete analysis systems - Part 1: Ammonium, nitrate, nitrite, chloride, orthophosphate, sulfate and silicate with photometric detection (ISO 15923-1:2013)	DU
ISO/TS 15923-2 2017-10	Water quality - Determination of selected parameters by discrete analysis systems - Part 2: Chromium(VI), fluoride, total alkalinity, total hardness, calcium, magnesium, iron, iron(II), manganese and aluminium with photometric detection	DU

Valid from: 29.11.2023

Date of issue: 12.03.2024

Page 6 of 23

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

Annex to the Partial Accreditation Certificate D-PL-17471-01-02

DIN 38406- E 1 1983-05	Determination of iron (Modification: <i>Adjustment of the waiting time (30 instead of 15 minutes) to the spectrophotometer used</i>)	DU
DIN EN ISO 12846 (E 12) 2012-08	Water quality - Determination of mercury - Method using atomic absorption spectrometry (AAS) with and without enrichment (ISO 12846:2012) (Modification: <i>direct thermal extraction</i>)	DU
DIN EN ISO 11732 (E 23) 2005-05	Water quality - Determination of ammonium nitrogen - Method by flow analysis (CFA and FIA) and spectrometric detection (ISO 11732:2005) (Modification: <i>Working range narrowed to 0.01-2.0 mg/l</i>)	DU
DIN EN ISO 7393-2 (G 4-2) 2000-04	Water quality - Determination of free chlorine and total chlorine - Part 2: Colorimetric method using N,N-diethyl-1,4-phenylenediamine, for routine control purposes (ISO 7393-2:1985)	DU
DIN 38408-5 (G 5) 1990-06	German standard methods for the examination of water, waste water and sludge; gaseous components (group G); determination of chlorine dioxide (G 5)	DU
DIN 38409-H 1 1987-01	Determination of total dry residue, filtrate dry residue and residue on ignition	DU
DIN EN 1484 (H 3) 2019-04	Water analysis - Guidelines for the determination of total organic carbon (TOC) and dissolved organic carbon (DOC)	DU
DIN 38409-H 7 2005-12	Determination of acid and base-neutralizing capacities	DU
DIN 38409-H 9 1980-07	German standard methods for the examination of water, waste water and sludge; general measures of effects and substances (group H), determination of the settleable matter by volume in water and waste water (H9)	DU
DIN EN ISO 9562 (H 14) 2005-02	Water quality - Determination of adsorbable organically bound halogens (AOX)	DU
DIN 38409-H 16 1984-06	Determination of the phenol index (Modification: <i>Working range adjusted 0,1-1,0 mg/l</i>)	DU
DIN EN ISO 14402 (H 37) 1999-12	Water quality - Determination of phenol index by flow analysis (FIA and CFA) (ISO 14402:1999) (Modification: <i>Working range narrowed to 0.01-0.50 mg/l</i>)	DU

Valid from: 29.11.2023

Date of issue: 12.03.2024

Page 7 of 23

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

Annex to the Partial Accreditation Certificate D-PL-17471-01-02

DIN 38409-H 41 1980-12	Determination of the Chemical Oxygen Demand (COD) in the Range over 15 mg/l (H41)	DU
DIN 38409-H 44 1992-05	Determination of the chemical oxygen demand (COD), ranging from 5 to 50 mg/l (H 44)	DU
DIN ISO 15705 (H 45) 2003-01	Water quality - Determination of the chemical oxygen demand index (ST-COD) - Small-scale sealed tube method (ISO 15705:2002)	DU
DIN 38413-P 1 1982-03	German standard methods for the analysis of water, waste water and sludge; Individual components (Group P); Determination of hydrazine (P 1) (Modification: <i>Working ranges adjusted to 0.005-0.10 mg/l and 0.10-0.50 mg/l</i>)	DU
DIN 38414-S 17 2017-01	Determination of the organically bound halogens amenable to extraction (EOX) (Modification: <i>Implementation with automatic extraction unit. Determination with hydropyrolysis at the AQF</i>)	DU
DIN 38414-S 18 2019-06	Determination of adsorbed organically bound halogens (AOX)	DU
EPA METHOD 7473 2007-02	Mercury in solids and solutions by thermal decomposition, amalgamation, and atomic absorption spectrophotometry	DU
Einführung in das anorganisch-chemische Praktikum Kapitel 3.4.4.2 Jander Blasius 13. Auflage 1990	Argentometrie, Bestimmung von Chlorid nach Mohr	DU

1.5 Determination of elements and compounds using GC (Gas Chromatography)

DIN EN ISO 9377-2 (H 53) 2001-07	Water quality - Determination of hydrocarbon oil index - Part 2: Method using solvent extraction and gas chromatography	DO
DIN EN ISO 10301 (F 4) 1997-08	Water quality - Determination of highly volatile halogenated hydrocarbons - Gas-chromatographic method	DO
DIN 38407-F 9 1991-05	Determination of benzene and some of its derivatives by gas chromatography	DO

Valid from: 29.11.2023

Date of issue: 12.03.2024

Page 8 of 23

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

Annex to the Partial Accreditation Certificate D-PL-17471-01-02

DIN 38407-F 43 2014-10	German standard methods for the examination of water, waste water and sludge - Jointly determinable substances (group F) - Part 43: Determination of selected easily volatile organic compounds in water - Method using gas chromatography and mass spectrometry by static headspace technique (HS-GC-MS)	DO
DIN ISO 11349 (H 56) 2015-12	Water quality - Determination of low-volatility lipophilic substances - Gravimetric method	DO
DIN 38407-F 39 2011-09	German standard methods for the examination of water, waste water and sludge - Jointly determinable substances (group F) - Part 39: Determination of selected polycyclic aromatic hydrocarbons (PAH) - Method using gas chromatography with mass spectrometric detection (GC-MS) (F 39)	DO

2 Biological examinations in water

DIN EN ISO 11348-2 (L 52) 2009-05	Water quality - Determination of the inhibitory effect of water samples on the light emission of <i>Vibrio fischeri</i> (Luminescent bacteria test) - Part 2: Method using liquid-dried bacteria (Modification: <i>Use of Lumistox by Hach Lange</i>)	DU
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3 Microbiological examinations of water (raw water, groundwater, utility water, and drinking water)

3.1 Microbiological examinations of raw water, groundwater, and drinking water

DIN EN ISO 9308-2 (K 6-1) 2014-06	Water quality - Enumeration of <i>Escherichia coli</i> and coliform bacteria - Part 2: Most probable number method (ISO 9308-2:2012)	DU
DIN EN ISO 11731 (K 23) 2019-03	Water quality - Enumeration of <i>Legionella</i> (ISO 11731:2017); German version EN ISO 11731:2017	DU
ISO 11731 2017-05	Water quality - Enumeration of <i>Legionella</i>	DU
TrinkwV §43 Absatz (3)	Bestimmung der kultivierbaren Mikroorganismen - Koloniezahl bei 22 °C und 36 °C	DU
Enterolert®-DW - Quanti Tray® (Fa. IDEXX) 2019	Quantitativer Nachweis von intestinalen Enterokokken mit Hilfe von Enterolert®-DW - Quanti Tray® der Fa. IDEXX (MPN-Verfahren)	DU

Valid from: 29.11.2023

Date of issue: 12.03.2024

Page 9 of 23

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

Annex to the Partial Accreditation Certificate D-PL-17471-01-02

Pseudalert® - Quanti Tray® (Fa. IDEXX) 2019	Quantitativer Nachweis von <i>Pseudomonas aeruginosa</i> mit Hilfe von Pseudalert®-DW - Quanti Tray® der Fa. IDEXX (MPN-Verfahren)	DU
UBA-Empfehlung 18.12.2018 mit Aktualisierung vom 09.12.2022	Systemische Untersuchungen von Trinkwasser-Installationen auf Legionellen nach Trinkwasserverordnung - Probenahme, Untersuchungsgang und Angabe des Ergebnisses	DU

3.2 Microbiological examinations of utility water

DIN EN ISO 6222 (K 5) 1999-07	Water quality - Enumeration of culturable micro-organisms - Colony count by inoculation in a nutrient agar culture medium (ISO 6222:1999)	DU
DIN EN ISO 11731 (K 23) 2019-03	Water quality - Enumeration of <i>Legionella</i> (ISO 11731:2017)	DU
Empfehlung des Umweltbundesamtes 2020-03	Empfehlung des Umweltbundesamtes zur Probenahme und zum Nachweis von Legionellen in Verdunstungskühlanlagen, Kühltürmen und Nassabscheidern (Einschränkung: <i>hier nur Abschnitte E und F unter Berücksichtigung von Anhang 1 und 2</i>)	DU

4 Examinations according to the Ordinance on the Quality of Water Intended for Human Consumption – “Trinkwasserverordnung” -TrinkwV -of June 20, 2023 (BGBl. 2023 I No. 159, p. 2)

SAMPLING

Method	Title	Location
DIN ISO 5667-5 2011-02	Water quality - Sampling - Part 5: Guidance on sampling of drinking water from treatment works and piped distribution systems	DU, DO
DIN EN ISO 19458 2006-12	Water quality - Sampling for microbiological analysis	DU, DO
UBA Empfehlung 18. Dezember 2018 (Legionellen)	Systemische Untersuchungen von Trinkwasser-Installationen auf Legionellen nach Trinkwasserverordnung - Probennahme, Untersuchungsgang und Angabe des Ergebnisses	DU, DO

Valid from: 29.11.2023

Date of issue: 12.03.2024

Page 10 of 23

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

Annex to the Partial Accreditation Certificate D-PL-17471-01-02

Method	Title	Location
Empfehlung des Umweltbundesamtes 18. Dezember 2018 (gestaffelte Stagnationsbeprobung und Zufallsstichprobe)	Beurteilung der Trinkwasserqualität hinsichtlich der Parameter Blei, Kupfer und Nickel	DU, DO

ANNEX 1: MICROBIOLOGICAL PARAMETERS**Part I: General requirements for Drinking Water**

Parameter	Method	Location
Escherichia coli (E. coli)	DIN EN ISO 9308-2 2014-06	DU
Intestinal enterococci	Enterolert®-DW	DU

Part II: Requirements for drinking water intended for distribution in sealed containers

Parameter	Method	Location
Escherichia coli (E. coli)	DIN EN ISO 9308-2 2014-06	DU
Intestinal enterococci	Enterolert®-DW	DU
Pseudomonas aeruginosa	Pseudalert® /Quanti-Tray	DU

ANNEX 2: CHEMICAL PARAMETERS**Part I: Chemical parameters whose concentration generally does not increase in the distribution network, including the drinking water installation**

Parameter	Method	Location
Acrylamide	not applied	
Benzene	not applied	
Boron	DIN EN ISO 11885 (E 22) 2009-09	DU
Bromate	not applied	
Chromium	DIN EN ISO 11885 (E 22) 2009-09	DU
Cyanide	DIN EN ISO 14403-2 (D 3) 2012-10	DU
1,2-Dichloroethane	not applied	
Fluoride	DIN EN ISO 10304-1 (D 20) 2009-07	DU
Microcystin-LR	not applied	
Nitrate	DIN EN ISO 10304-1 (D 20) 2009-07	DU
Pesticides	not applied	
Total Pesticides	not applied	

Valid from: 29.11.2023

Date of issue: 12.03.2024

Page 11 of 23

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

Annex to the Partial Accreditation Certificate D-PL-17471-01-02

Parameter	Method	Location
Sum of PFAS-20	not applied	
Sum of PFAS-4	not applied	
Mercury	DIN EN ISO 17852 (E 35) 2008-04	DU
Selenium	DIN EN ISO 17294-2 (E 29) 2017-01	DU
Tetrachloroethylene and Trichloroethylene	not applied	
Uranium	DIN EN ISO 17294-2 (E 29) 2017-01	DU

Part II: Chemical parameters whose concentration can increase in the distribution network, including the drinking water installation

Parameter	Method	Location
Antimony	DIN EN ISO 17294-2 (E 29) 2017-01	DU
Arsenic	DIN EN ISO 17294-2 (E 29) 2017-01	DU
Benzo(a)pyrene	not applied	
Bisphenol A	not applied	
Lead	DIN EN ISO 11885 (E 22) 2009-09 DIN EN ISO 17294-2 (E 29) 2017-01	DU
Cadmium	DIN EN ISO 17294-2 (E 29) 2017-01	DU
Chlorate	not applied	
Chlorite	not applied	
Epichlorohydrin	not applied	
Haloacetic Acids (HAA-5)	not applied	
Copper	DIN EN ISO 11885 (E 22) 2009-09	DU
Nickel	DIN EN ISO 11885 (E 22) 2009-09	DU
Nitrite	DIN EN ISO 10304-1 (D 20) 2009-07	DU
Polycyclic Aromatic Hydrocarbons (PAHs)	not applied	
Trihalomethanes (THMs)	not applied	
Vinyl Chloride	not applied	

ANNEX 3: Indicator Parameters**Part I: General Indicator Parameters**

Parameter	Method	Location
Aluminum	DIN EN ISO 11885 (E 22) 2009-09	DU
Ammonium	DIN EN ISO 11732 (E 23) 2005-05	DU
Chloride	DIN EN ISO 10304-1 (D 20) 2009-07	DU

Valid from: 29.11.2023

Date of issue: 12.03.2024

Page 12 of 23

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

Annex to the Partial Accreditation Certificate D-PL-17471-01-02

Parameter	Method	Location
Coliform Bacteria	DIN EN ISO 9308-2 2014-06	DU
Iron	DIN EN ISO 11885 (E 22) 2009-09	DU
Electrical Conductivity	DIN EN 27888 1993-11	DU
Coloration	DIN EN ISO 7887 2012-04	DU
Odor	DIN EN 1622 2006-10 (Anhang C)	DU
Taste	DIN EN 1622 (B3) 2006-10 (Anhang C)	DU
Colony Count at 22°C	TrinkwV §43 Absatz (3)	DU
Colony Count at 36°C	TrinkwV §43 Absatz (3)	DU
Manganese	DIN EN ISO 11885 (E 22) 2009-09	DU
Sodium	DIN EN ISO 11885 (E 22) 2009-09	DU
Total Organic Carbon (TOC)	DIN EN 1484 2019-04	DU
Oxidizability	DIN EN ISO 8467 1995-05	DU
Sulfate	DIN EN ISO 10304-1 (D 20) 2009-07	DU
Turbidity	DIN EN ISO 7027-1 2016-11	DU
Hydrogen Ion Concentration	DIN EN ISO 10523 (C5) 2012-04	DU

Part II: Specific Indicator Parameter for Drinking Water Installation Systems

Parameter	Method	Location
Legionella spec.	DIN EN ISO 11731 2019-03 UBA Empfehlung 18. Dezember 2018 Aktualisierung Dezember 2022 (Bundesgesundheitsblatt 2023 S. 224)	DU

Part III: Specific Indicator Parameter for the Occurrence of certain Microbial Hazards

Not applied

ANNEX 4: REQUIREMENTS FOR DRINKING WATER REGARDING RADIOACTIVE SUBSTANCES

Not applied

PARAMETERS NOT INCLUDED IN ANNEXES 1 TO 3 OF THE DRINKING WATER ORDINANCE**Further Periodic Methods Carried out**

Parameter	Method	Location
Calcium	DIN EN ISO 11885 (E 22) 2009-09	DU
Potassium	DIN EN ISO 11885 (E 22) 2009-09	DU
Magnesium	DIN EN ISO 11885 (E 22) 2009-09	DU
Acid and Base Capacity	DIN 38409-H 7 2005-12	DU

Valid from: 29.11.2023

Date of issue: 12.03.2024

Page 13 of 23

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

Annex to the Partial Accreditation Certificate D-PL-17471-01-02

Parameter	Method	Location
Phosphate	DIN EN ISO 11885 (E 22) 2009-09	DU

5 LIST OF TEST METHODS FOR THE WATER MODULE

Status: LAWA as of 18.10.2018

Section 1: Sampling and General Characteristics

Parameter	Method	Abw	Ofw	Grw	Loc.
Wastewater Sampling	DIN 38402-A 11: 2009-02	☒			DO, DU
Sampling from Flowing Waters	DIN EN ISO 5667-6: 2016-12 (A 15)		☐		
Sampling from Groundwater Aquifers	DIN 38402-A 13: 1985-12			☒	DO, DU
Sampling from Standing Waters	DIN 38402-A 12: 1985-06		☐		
Homogenization of Samples	DIN 38402-A 30: 1998-07	☒	☐		DO, DU
Temperature	DIN 38404-C 4: 1976-12	☒	☐	☒	DO, DU
pH Value	DIN EN ISO 10523: 2012-04 (C 5)	☒	☐	☒	DO, DU
Conductivity (25°C)	DIN EN 27888: 1993-11 (C 8)	☒	☐	☒	DO, DU
Odor	DIN EN 1622: 2006-10 (B 3) Anhang C	☒	☐	☒	DO, DU
Coloration	DIN EN ISO 7887: 2012-04 (C 1), Verfahren A	☒	☐	☒	DO, DU
Turbidity	DIN EN ISO 7027: 2000-04 (C 2)	☒	☐	☒	DO, DU
Oxygen	DIN EN ISO 5814: 2013-03 (G 22)		☐	☒	DO, DU
	DIN ISO 17289: 2014-12 (G 25)		☐	☒	DO, DU
	DIN EN 25813: 1993-01 (G 21)		☐	☐	
Redox Potential	DIN 38404-C 6: 1984-05	☒		☒	DO, DU

Valid from: 29.11.2023

Date of issue: 12.03.2024

Page 14 of 23

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

Annex to the Partial Accreditation Certificate D-PL-17471-01-02

Section 2: Photometry, Ion Chromatography, Titrimetry

Parameter	Method	Abw	Ofw	Grw	Loc.
Absorption at 254 nm (SAC 254)	DIN 38404-C 3: 2005-07		☒	☒	DU
Absorption at 436 nm (SAC 436)	DIN EN ISO 7887: 2012-04 (C 1), Verfahren B	☒	☒	☒	DU
Ammonium Nitrogen	DIN EN ISO 11732: 2005-05 (E 23)	☒	☒	☒	DU
	DIN 38406-E 5: 1983-10	☐	☐	☐	
	DIN EN ISO 14911: 1999-12 (E 34)		☐	☐	
	DIN ISO 15923-1: 2014-07 (D 49)	☒	☒	☒	DU
Nitrite Nitrogen	DIN EN 26777: 1993-04 (D 10)	☒	☒	☒	DU
	DIN EN ISO 10304-1: 2009-07 (D 20)	☒	☒	☒	DU
	DIN EN ISO 13395: 1996-12 (D 28)	☐	☐	☐	
	DIN ISO 15923-1: 2014-07 (D 49)	☒	☒	☒	DU
Nitrate Nitrogen	DIN EN ISO 10304-1: 2009-07 (D 20)	☒	☒	☒	DU
	DIN EN ISO 13395: 1996-12 (D 28)	☐	☐	☐	
	DIN 38405-D 9: 2011-09	☒	☒	☒	DU
	DIN 38405-D 29: 1994-11		☐	☐	
	DIN ISO 15923-1: 2014-07 (D 49)	☒	☒	☒	DU
Total Phosphorus (see also Section 3)	DIN EN ISO 6878: 2004-09 (D 11)	☒	☒	☒	DU
	DIN EN ISO 15681-1: 2005-05 (D 45)	☐	☐	☐	
	DIN EN ISO 15681-2: 2005-05 (D 46)	☐	☐	☐	
Orthophosphate	DIN EN ISO 10304-1: 2009-07 (D 20)		☐	☐	
	DIN EN ISO 6878: 2004-09 (D 11)		☒	☒	DU
	DIN EN ISO 15681-1: 2004-07 (D 45)		☐	☐	
	DIN EN ISO 15681-2: 2005-05 (D 46)		☐	☐	
	DIN ISO 15923-1: 2014-07 (D 49)		☒	☒	DU

Valid from: 29.11.2023

Date of issue: 12.03.2024

Page 15 of 23

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

Annex to the Partial Accreditation Certificate D-PL-17471-01-02

Parameter	Method	Abw	Ofr	Grw	Loc.
Fluoride (dissolved)	DIN 38405-D 4-1, 1985-07	☐	☐	☐	
	DIN EN ISO 10304-1: 2009-07 (D 20)	☒	☒	☒	DU
Chloride	DIN EN ISO 10304-1: 2009-07 (D 20)	☒	☒	☒	DU
	DIN EN ISO 15682: 2002-01 (D 31)	☐	☐	☐	
	DIN ISO 15923-1: 2014-07 (D 49)	☒	☒	☒	DU
	DIN EN ISO 10304-4: 1999-07 (D 25)			☐	
	DIN 38405-D 1-1 und D 1-2: 1985-12	☐	☐	☐	
	DIN 38405-D 1-3 und D 1-4: 1985-12		☐	☐	
Sulfate	DIN EN ISO 10304-1: 2009-07 (D 20)	☒	☒	☒	DU
	DIN 38405-D 5-1: 1985-01		☐	☐	
	DIN 38405 D 5-2:1985-01	☐	☐	☐	
	DIN ISO 15923-1: 2014-07 (D 49)	☒	☒	☒	DU
Easily Liberated Cyanide	DIN 38405-D 13-2: 1981-02	☒	☒	☒	DU
	DIN EN ISO 14403-1: 2012-10 (D 2)	☐	☐	☐	
	DIN EN ISO 14403-2: 2012-10 (D 3)	☒	☒	☒	DU
	DIN 38405-D 7: 2002-04		☐	☐	
Total Cyanide	DIN 38405-D 13-1: 1981-02	☒	☒	☒	DU
	DIN EN ISO 14403-1: 2012-10 (D 2)	☐	☐	☐	
	DIN EN ISO 14403-2: 2012-10 (D 3)	☒	☒	☒	DU
	DIN 38405-D 7: 2002-04		☐	☐	
Chromium VI	DIN 38405-D 24: 1987-05	☒	☒	☒	DU
	DIN EN ISO 10304-3: 1997-11 (D 22), Abschn. 6 (gelöstes Chromat)	☐	☐	☐	
	DIN EN ISO 23913: 2009-09 (D 41)	☐	☐	☐	
	DIN EN ISO 18412: 2007-02 (D 40)			☐	
Easily Liberated Sulfide	DIN 38405-D 27: 1992-07	☒	☒	☒	DU

Valid from: 29.11.2023

Date of issue: 12.03.2024

Page 16 of 23

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

Annex to the Partial Accreditation Certificate D-PL-17471-01-02

Section 3: Elemental Analysis

Parameter	Method	Abw	Ofw	Grw	Loc..
Aluminium	DIN EN ISO 11885: 2009-09 (E 22)	☒	☒	☒	DU
	DIN EN ISO 12020: 2000-05 (E 25)	☐	☐	☐	
	DIN EN ISO 17294-2: 2017-01 (E 29)	☐	☐	☐	
	DIN EN ISO 15586: 2004-02 (E 4)		☐	☐	
Arsenic	DIN EN ISO 11969: 1996-11 (D 18)	☐	☐	☐	
	DIN EN ISO 11885: 2009-09 (E 22)	☐			
	DIN EN ISO 17294-2: 2017-01 (E 29)	☒	☒	☒	DU
	DIN EN ISO 15586: 2004-02 (E 4)	☐	☐	☐	
	DIN 38405-D 35: 2004-09	☐	☐	☐	
Lead	DIN EN ISO 11885: 2009-09 (E 22)	☒			DU
	DIN 38406-E 6: 1998-07	☐	☐	☐	
	DIN EN ISO 17294-2: 2017-01 (E 29)	☒	☒	☒	DU
	DIN EN ISO 15586: 2004-02 (E 4)	☐	☐	☐	
Cadmium	DIN EN ISO 11885: 2009-09 (E 22)	☒			DU
	DIN EN ISO 5961: 1995-05 (E 19)	☐	☐	☐	
	DIN EN ISO 17294-2: 2017-01 (E 29)	☒	☒	☒	DU
	DIN EN ISO 15586: 2004-02(E 4)	☐	☐	☐	
Calcium	DIN EN ISO 11885: 2009-09 (E 22)		☒	☒	DU
	DIN 38406-E 3: 2002-03		☐	☐	
	DIN EN ISO 7980: 2000-07 (E 3a)		☐	☐	
	DIN EN ISO 17294-2: 2017-01 (E 29)		☐	☐	
	DIN EN ISO 14911: 1999-12 (E 34)		☐	☐	
Chromium	DIN EN ISO 11885: 2009-09 (E 22)	☒	☒	☒	DU
	DIN EN 1233: 1996-08 (E 10)	☐	☐	☐	
	DIN EN ISO 17294-2: 2017-01 (E 29)	☒	☒	☒	DU
	DIN EN ISO 15586: 2004-02 (E 4)	☐	☐	☐	

Valid from: 29.11.2023

Date of issue: 12.03.2024

Page 17 of 23

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

Annex to the Partial Accreditation Certificate D-PL-17471-01-02

Parameter	Method	Abw	Ofw	Grw	Loc..
Iron	DIN EN ISO 11885: 2009-09 (E 22)	☒	☒	☒	DU
	DIN 38406-E 32: 2000-05	☐	☐	☐	
	DIN EN ISO 15586: 2004-02 (E 4)	☐	☐	☐	
	DIN EN ISO 17294-2: 2017-01 (E 29)	☐	☐	☐	
Potassium	DIN 38406-E 13: 1992-07		☐	☐	
	DIN EN ISO 11885: 2009-09 (E 22)		☒	☒	DU
	DIN EN ISO 17294-2: 2017-01 (E 29)		☐	☐	
	DIN EN ISO 14911: 1999-12 (E 34)		☐	☐	
Copper	DIN EN ISO 11885: 2009-09 (E 22)	☒	☒	☒	DU
	DIN 38406-E 7: 1991-09	☐	☐	☐	
	DIN EN ISO 17294-2: 2017-01 (E 29)	☒	☒	☒	DU
	DIN EN ISO 15586: 2004-02 (E 4)	☐	☐	☐	
Manganese	DIN EN ISO 11885: 2009-09 (E 22)			☒	DU
	DIN EN ISO 17294-2: 2017-01 (E 29)			☐	
	DIN 38406-E 33: 2000-06			☐	
	DIN EN ISO 15586: 2004-02 (E 4)			☐	
	DIN EN ISO 14911: 1999-12 (E 34)			☐	
Sodium	DIN 38406-E 14: 1992-07		☐	☐	
	DIN EN ISO 11885: 2009-09 (E 22)		☒	☒	DU
	DIN EN ISO 17294-2: 2017-01 (E 29)		☐	☐	
	DIN EN ISO 14911: 1999-12 (E 34)		☐	☐	
Nickel	DIN EN ISO 11885: 2009-09 (E 22)	☒	☒	☒	DU
	DIN 38406-E 11: 1991-09	☐	☐	☐	
	DIN EN ISO 17294-2: 2017-01 (E 29)	☒	☒	☒	DU
	DIN EN ISO 15586: 2004-02 (E 4)	☐	☐	☐	
Mercury	DIN EN ISO17852: 2008-04 (E 35)	☒	☒	☒	DU
	DIN EN ISO 12846: 2012-08 (E 12)	☐	☐	☐	

Valid from: 29.11.2023

Date of issue: 12.03.2024

Page 18 of 23

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

Annex to the Partial Accreditation Certificate D-PL-17471-01-02

Parameter	Method	Abw	Ofw	Grw	Loc..
Zinc	DIN EN ISO 11885: 2009-09 (E 22)	☒	☒	☒	DU
	DIN 38406-E 8: 2004-10	☐	☐	☐	
	DIN EN ISO 17294-2: 2017-01 (E 29)	☒	☒	☒	DU
	DIN EN ISO 15586: 2004-02 (E 4)	☐	☐	☐	
Boron	DIN EN ISO 11885: 2009-09 (E 22)	☒	☒	☒	DU
	DIN EN ISO 17294-2: 2017-01 (E 29)	☐	☐	☐	
Magnesium	DIN EN ISO 11885: 2009-09 (E 22)		☒	☒	DU
	DIN 38406-E 3: 2002-03		☐	☐	
	DIN EN ISO 7980: 2000-07 (E 3a)		☐	☐	
	DIN EN ISO 17294-2: 2017-01 (E 29)		☐	☐	
	DIN EN ISO 14911: 1999-12 (E 34)		☐	☐	
Total Phosphorus (see also Section 2)	DIN EN ISO 11885: 2009-09 (E 22)	☒	☒	☒	DU
	DIN EN ISO 17294-2: 2017-01 (E 29)	☐	☐	☐	

Section 4/5: Group and Sum Parameters

Parameter	Method	Abw	Ofw	Grw	Loc.
Biological Oxygen Demand (BOD5)	DIN EN 1899-1: 1998-05 (H 51)	☒			DU
	DIN EN 1899-2: 1998-05 (H 52)		☒		DU
Chemical Oxygen Demand (COD)	DIN 38409-H 41: 1980-12	☒			DU
	DIN 38409-H 44: 1992-05		☒		DU
	DIN ISO 15705: 2003-01 (H 45)		☒		DU
Phenol Index	DIN 38409-H 16-2: 1984-06	☒	☒	☒	DU
	DIN 38409-H 16-1: 1984-06		☐	☐	
	DIN EN ISO 14402: 1999-12 (H 37) Verfahren nach Abschn. 4	☒	☒	☒	DU
Filterable Substances	DIN EN 872: 2005-04 (H 33)	☒	☒		DU
	DIN 38409-H 2-3: 1987-03		☒		DU
Acid and Base Capacity	DIN 38409-H 7: 2005-12		☒	☒	DU
Total Organic Carbon (TOC)	DIN EN 1484: 1997-08 (H 3)	☒	☒	☒	DU
Dissolved Organic Carbon (DOC)	DIN EN 1484: 1997-08 (H 3)		☒	☒	DU

Valid from: 29.11.2023

Date of issue: 12.03.2024

Page 19 of 23

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

Annex to the Partial Accreditation Certificate D-PL-17471-01-02

Parameter	Method	Abw	Ofw	Grw	Loc.
Total Bound Nitrogen (TN _b)	DIN EN 12260: 2003-12 (H 34)	☒	☒	☒	DU
	DIN EN ISO 11905-1: 1998-08 (H 36)	☐	☐	☐	
Adsorbable Organic Halogens (AOX)	DIN EN ISO 9562: 2005-02 (H 14)	☒	☒	☒	DU

Section 6: Gas Chromatographic Methods

Parameter	Method	Abw	Ofw	Grw	Loc.
Volatile Halogenated Hydrocarbons (VHH)	DIN EN ISO 10301: 1997-08 (F 4)*	☐	☐	☐	
	DIN 38407-F 43: 2014-10	☒	☒	☒	DO
	DIN EN ISO 15680: 2004-04 (F 19)	☐	☐	☐	
	DIN EN ISO 17943: 2016-11 (F 41)		☐	☐	
Benzene and Derivatives (BTEX)	DIN 38407-F 9: 1991-05*	☐	☐	☐	
	DIN 38407-F 43: 2014-10	☒	☒	☒	DO
	DIN EN ISO 15680: 2004-04 (F 19)	☐	☐	☐	
	DIN EN ISO 17943: 2016-11 (F 41)		☐	☐	
Organochlorine Insecticides (OCP)	DIN EN ISO 6468: 1997-02 (F 1)*		☐	☐	
	DIN 38407-F 37: 2013-11		☐	☐	
	DIN EN 16693: 2015-12 (F 51)		☐	☐	
Polychlorinated Biphenyls (PCB)	DIN EN ISO 6468: 1997-02 (F 1)*		☐	☐	
	DIN 38407-F 3: 1998-07		☒	☒	DO
	DIN 38407-F 37: 2013-11		☐	☐	
Mono-, Dichloro-Benzene	DIN EN ISO 15680: 2004-04 (F 19)		☐	☐	
	DIN 38407-F 43: 2014-10		☐	☐	
Tri- to Hexachloro-Benzene	DIN EN ISO 6468: 1997-02 (F 1)*	☐	☐	☐	
	DIN 38407-F 2: 1993-02	☐	☐	☐	
	DIN EN ISO 15680 (F19):2004-04**	☐	☐	☐	
	DIN 38407-F 43: 2014-10**	☐	☐	☐	
	DIN 38407-F 37: 2013-11	☐	☐	☐	
	DIN EN 16693: 2015-12 (F 51)***		☐	☐	
Chlorophenols	DIN EN 12673: 1999-05 (F 15)		☐	☐	

Valid from: 29.11.2023

Date of issue: 12.03.2024

Page 20 of 23

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

Annex to the Partial Accreditation Certificate D-PL-17471-01-02

Parameter	Method	Abw	Ofw	Grw	Loc.
Organophosphorus and Organo-nitrogen Compounds	DIN EN ISO 10695: 2000-11 (F 6) *		☐	☐	
Polycyclic Aromatic Hydrocarbons (PAH) (see also Section 7)	DIN 38407-F 39: 2011-09	☒	☒	☒	DO
	DIN ISO 28540: 2014-05 (F 40)	☐	☐	☐	
	DIN EN 16691: 2015-12 (F 50)		☐	☐	
Hydrocarbon Index	DIN EN ISO 9377-2: 2001-07 (H 53)	☒	☒	☒	DO

* Mass spectrometric detection allowed

** Only applicable for trichlorobenzene

*** Only applicable for hexachlorobenzene

Section 7: HPLC Methods

Not applied

Section 8: Microbiological Methods

Not applied

Section 9.1: Biological Methods, Biotests (Part 1)

Parameter	Verfahren	Abw	Ofw	Grw	St.
Fish egg-test	DIN EN ISO 15088: 2009-06 (T 6)	☐			
Luminescent bacteria inhibition test	DIN EN ISO 11348-1: 2009-05 (L 51)	☐			
	DIN EN ISO 11348-2: 2009-05 (L 52)	☒			DU

Section 9.2: Biological Methods, Biotests (Part 2)

Not Applied

Valid from: 29.11.2023

Date of issue: 12.03.2024

Page 21 of 23

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

Annex to the Partial Accreditation Certificate D-PL-17471-01-02

6 Sampling and Microbiological Investigations of Utility Water According to §3 Paragraph 8, 42nd BImSchV

6.1 Sampling

Method	Title	Location
DIN EN ISO 19458 (K 19) 2006-12	Water quality - Sampling for microbiological analysis	DO, DU
	Empfehlung des Umweltbundesamtes zur Probenahme und zum Nachweis von Legionellen in Verdunstungskühlanlagen, Kühltürmen und Nassabscheidern vom 06.03.2020, Abschnitt C und D	

6.2 Microbiological Investigations

Parameter	Method	Location
Legionella	DIN EN ISO 11731 (K 23) 2019-03	DU
	Empfehlung des Umweltbundesamtes zur Probenahme und zum Nachweis von Legionellen in Verdunstungskühlanlagen, Kühltürmen und Nassabscheidern vom 06.03.2020, Abschnitte E und F unter Berücksichtigung von Anhang 1 und 2	
Colony count at 22°C and 36°C	DIN EN ISO 6222 (K 5) 1999-07	DU

Valid from: 29.11.2023

Date of issue: 12.03.2024

Page 22 of 23

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

Annex to the Partial Accreditation Certificate D-PL-17471-01-02

Abbreviations used:

Abw	für Abwasser (incl. Deponie-Sickerwasser) (Verfahren nach AbwV fett gedruckt)	Wastewater (including landfill leachate) (procedures according to AbwV in bold)
DEV	Deutsches Einheitsverfahren	German Standard Method
DIN	Deutsches Institut für Normung e. V.	German Institute for Standardization
EN	Europäische Norm	European Standard
EP	Eingangs- und Plausibilitätsprüfung	Input and Plausibility Check
EPA	Environmental Protection Agency	Environmental Protection Agency
Grw	Roh- und Grundwasser	Raw and Groundwater
IEC	International Electrotechnical Commission – Internationale Elektrotechnische Kommission	International Electrotechnical Commission
ISO	International Organization for Standardization – Internationale Organisation für Normung	International Organization for Standardization
LAWA	Bund/Länder-Arbeitsgemeinschaft Wasser	Federal/State Working Group on Water
Ofw	Oberflächenwasser	Surface Water
St.	Standort	Location
TKSE	Hausverfahren der ThyssenKrupp Steel Europe AG	In-house Methods of ThyssenKrupp Steel Europe AG
VDI	Verein Deutscher Ingenieure	Association of German Engineers

Valid from: 29.11.2023

Date of issue: 12.03.2024

Page 23 of 23

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

Deutsche Akkreditierungsstelle

Annex to the Partial Accreditation Certificate

D-PL-17471-01-03

according to DIN EN ISO/IEC 17025:2018

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This annex is a part of the accreditation certificate D-PL-17471-01-00.

Holder of partial accreditation certificate:

ThyssenKrupp Steel Europe AG
Kaiser-Wilhelm-Straße 100, 47166 Duisburg

with the locations

ThyssenKrupp Steel Europe AG
Chemie und Werkstoffprüfung
Kaiser-Wilhelm-Straße 100, 47166 Duisburg

ThyssenKrupp Steel Europe AG
Chemie und Werkstoffprüfung
Eberhardstraße 12, 44145 Dortmund

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-17471-01-03

Tests in the areas of:

Physical, physico-chemical, and chemical investigations of sludge, waste and soil;

Sampling of waste;

Investigation of waste according to Annex 4 of the Landfill Ordinance (July 2020);

Module waste

The testing laboratory is permitted to apply standardized or equivalent testing methods with different versions in Chapters 1 and 2 without prior notification and approval from DAkkS.

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

The testing methods are marked with the following symbols of the locations where they are carried out:

DU = Kaiser-Wilhelm-Straße 100, 47166 Duisburg

DO = Eberhardstraße 12, 44145 Dortmund

Table of Contents

1	Examination of Waste.....	3
1.1	Sampling and Sample Preparation.....	3
1.2	Physical and physico-chemical Characteristics	3
1.3	Determination of Elements and Compounds by Photometry, Gravimetry, Titrimetry, Atomic Absorption Spectrometry, and X-Ray Fluorescence Spectrometry	3
1.4	Determination of Elements and Compounds by GC.....	7
2	Examination of Soil	7
2.1	Physical and physico-chemical Characteristics	7
2.2	Determination of Elements and Compounds by Photometry, Gravimetry, Titrimetry, and Atomic Absorption Spectrometry	8
3	List of Test Methods for the Waste Module.....	10
4	Sampling, Sample Preparation, and Examination of Waste according to Landfill Ordinance Annex 4 (July 2020).....	14
	Abbreviations used:.....	18

Valid from: 29.11.2023

Date of issue: 12.03.2024

Page 2 of 18

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

Annex to the Partial Accreditation Certificate D-PL-17471-01-03

1 Examination of Waste

1.1 Sampling and Sample Preparation

LAGA PN 2/98 2019-05	Guidelines for the procedure for physical, chemical and biological investigations in connection with the recycling/disposal of waste	DU DO
DIN EN ISO 54321 2021-04	Soil, treated biowaste, sludge and waste - Digestion of aqua regia soluble fractions of elements	DU

1.2 Physical and physico-chemical Characteristics

DIN EN ISO 10523 (C 5) 2012-04	Water quality - Determination of pH (Modification: <i>Determination in the eluate, also for pH measurements in unbuffered aqueous solutions</i>)	DU
DIN EN 27888 (C 8) 1993-11	Water quality; determination of electrical conductivity (Modification: <i>Determination in the eluate</i>)	DU
DIN ISO 11465 1996-12	Soil quality - determination of dry matter and water content on a mass basis - gravimetric method	DU
DIN EN 14346 2007-03	Characterization of waste - Calculation of dry matter by determination of dry residue or water content	DU

1.3 Determination of Elements and Compounds by Photometry, Gravimetry, Titrimetry, Atomic Absorption Spectrometry, and X-Ray Fluorescence Spectrometry

DIN EN ISO 12846 (E 12) 2012-08	Water quality - Determination of mercury - Method using atomic absorption spectrometry (AAS) with and without enrichment (Modification <i>For solids and water: direct thermal extraction</i>)	DU
DIN EN ISO 14403-2 (D 3) 2012-10	Water quality - Determination of total cyanide and free cyanide using flow analysis (Modification: <i>Determination in the eluate, working range narrowed to 0.01-0.50 mg/l</i>)	DU
DIN ISO 15705 (H 45) 2003-01	Water quality - Determination of the chemical oxygen demand index (ST-COD) - Small-scale sealed tube method (Modification: <i>Determination in the eluate</i>)	DU

Valid from: 29.11.2023

Date of issue: 12.03.2024

Page 3 of 18

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

Annex to the Partial Accreditation Certificate D-PL-17471-01-03

DIN EN ISO 6878 (D 11) 2004-09	Water quality - Determination of phosphorus - Ammonium molybdate spectrometric method (Modification: <i>Determination in the eluate</i>)	DU
DIN EN ISO 9562 (H 14) 2005-02	Water quality - Determination of adsorbable organically bound halogens (AOX) (Modification: <i>Determination in the eluate</i>)	DU
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>Working ranges divided, determination in the eluate</i>)	DU
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: <i>Working range narrowed to 0.01-2.0 mg/l, determination in the eluate</i>)	DU
DIN EN ISO 14402 (H 37) 1999-12	Water quality - Determination of phenol index by flow analysis (FIA and CFA) (Modification: <i>Working range narrowed to 0.01-0.50 mg/l, determination in the eluate</i>)	DU
DIN EN 1484 (H 3) 2019-04	Water analysis - Guidelines for the determination of total organic carbon (TOC) and dissolved organic carbon (DOC) (Modification: <i>Working ranges adjusted to the devices from Elementar and Dimatec, determination in the eluate</i>)	DU
DIN EN 12260 (H 34) 2003-12	Water quality. Determination of nitrogen. Determination of bound nitrogen (TNb), following oxidation to nitrogen oxides (Modification: <i>Working ranges adjusted to the devices from Elementar and Dimatec, determination in the eluate</i>)	DU
DIN EN 26777 (D 10) 1993-04	Water quality; determination of nitrite; molecular absorption spectrometric method (Modification: <i>Working range adjusted to 0.005-0.10 mg/l NO₂-N, determination in the eluate</i>)	DU
DIN 38409-7 (H 7) 2005-12	Determination of acid and base capacity (Modification: <i>Implementation of the standard on an automatic titration system, determination in the eluate</i>)	DU
DIN 38405-9 (D 9) 2011-09	Spectrometric determination of nitrate (Modification: <i>Determination in the eluate</i>)	DU

Valid from: 29.11.2023

Date of issue: 12.03.2024

Page 4 of 18

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

Annex to the Partial Accreditation Certificate D-PL-17471-01-03

DIN 38405-13 (D 13) 2011-04	Determination of cyanides (Modification: <i>Working range adjusted to 0.10-4.0 mg/l</i>)	DU
DIN 38405-21 (D 21) 1990-10	Determination of dissolved silicate by spectrometry (Modification: <i>Working range adjusted to 0.001-0.05 mg/l and 0.05-0.50 mg/l, determination in the eluate</i>)	DU
DIN 38405-24 (D 24) 1987-05	Photometric determination of chromium(VI) using 1,5-diphenylcarbonohydrazide	DU
DIN 38405-27 (D 27) 2017-10	Determination of readily liberatet sulfide (Modification: <i>Determination in the eluate</i>)	DU
DIN 38406-1 (E 1) 1983-05	Determination of iron (Modification: <i>Adjustment of the waiting time (30 instead of 15 minutes) to the spectrophotometer used, determination in the eluate</i>)	DU
DIN 38409-16 (H 16) 1984-06	Determination of the phenol index (Modification: <i>Adjustment of the working range to 0.1-1.0 mg/l, determination in the eluate</i>)	DU
DIN 38409-41 (H 41) 1980-12	Determination of the Chemical Oxygen Demand (COD) in the Range over 15 mg/l (Modification: <i>Determination in the eluate</i>)	DU
DIN 38409-44 (H 44) 1992-05	Determination of the chemical oxygen demand (COD), ranging from 5 to 50 mg/l (Modification: <i>Determination in the eluate</i>)	DU
DIN 38413-1 (P 1) 1982-03	Determination of hydrazine (Modification: <i>Working ranges adjusted to 0.005-0.10 mg/l and 0.10-0.50 mg/l, determination in the eluate</i>)	DU
DIN 38414-17 (S 17) 2017-11	Determination of the organically bound halogens amenable to extraction (EOX) (Modification: <i>Implementation with automatic extraction unit. Determination with hydropyrolysis at the AQF</i>)	DU
DIN 38414-18 (S 18) 2019-06	Determination of adsorbed organically bound halogens in sludge and sediments (AOX)	DU
DIN 51723 2002-06	Testing of solid fuels - Determination of fluorine content	DU

Valid from: 29.11.2023

Date of issue: 12.03.2024

Page 5 of 18

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

Annex to the Partial Accreditation Certificate D-PL-17471-01-03

DIN 51727 2011-11	Testing of solid fuels - Determination of chlorine content	DU
DIN 19539 2016-12	Investigation of solids - Temperature-dependent differentiation of total carbon (TOC _{<sub>400</sub>} , ROC, TIC _{<sub>900</sub>})	DU
DIN EN 15936 2022-09	Soil, waste, treated biowaste and sludge - Determination of total organic carbon (TOC) by dry combustion	DU
DIN EN 15170 2009-05	Characterization of sludges - Determination of calorific value	DU
DIN 51577-3 1990-06	Determination of chlorine and bromine content; mass fraction < 1000 mg/kg, analysis by wavelength dispersive X-ray spectrometry (XRS) (Modification: <i>Total halogen according to AltöIV</i>)	DU
DIN 51577-4 1994-02	Testing of mineral oil hydrocarbons and similar products - Determination of chlorine and bromine content - (Modification: <i>Total halogen according to AltöIV</i>)	DU
DIN ISO 15597 2006-01	Petroleum and related products - Determination of chlorine and bromine content - Wavelength-dispersive X-ray fluorescence spectrometry (Modification: <i>Total halogen only according to AltöIV</i>)	DU
DIN ISO 15923-1 (D49) 2014-07	Water quality - Determination of selected parameters by discrete analysis systems - Part 1: Ammonium, nitrate, nitrite, chloride, orthophosphate, sulfate and silicate with photometric detection	DU
ISO/TS 15923-2 (D49) 2017-10	Water quality - Determination of selected parameters by discrete analysis systems - Part 2: Chromium(VI), fluoride, total alkalinity, total hardness, calcium, magnesium, iron, iron(II), manganese and aluminium with photometric detection (Restriction: <i>here only fluoride</i>)	DU
EPA METHOD 7473 2007-02	Mercury in solids and solutions by thermal decomposition, amalgamation, and atomic absorption spectrophotometry	DU
ASTM D 5369 1993	Standard Practice for Extraction of Solid Waste Samples for Chemical Analysis Using Soxhlet Extraction	DU DO

Valid from: 29.11.2023

Date of issue: 12.03.2024

Page 6 of 18

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

Annex to the Partial Accreditation Certificate D-PL-17471-01-03

1.4 Determination of Elements and Compounds by GC

HLUG Handbuch Band 7, Teil 4: 2000	Determination of BTEX/VOCs in solids from contaminated sites	DO
DIN EN ISO 22155 2016-07	Soil quality - Gas chromatographic determination of volatile aromatic and halogenated hydrocarbons and selected ethers - Static headspace method	DO
DIN EN 15308 2016-12	Characterization of waste - Determination of selected polychlorinated biphenyls (PCB) in solid waste by gas chromatography with electron capture or mass spectrometric detection	DO
DIN EN 14039 2005-01	Characterization of waste - Determination of hydrocarbon content in the range of C10 to C40 by gas chromatography	DO
DIN ISO 18287 2006-05	Soil quality - Determination of polycyclic aromatic hydrocarbons (PAH) - Gas chromatographic method with mass spectrometric detection (GC-MS)	DO
LAGA KW/04 2019-09	Determination of the content of hydrocarbons in waste - determination and analysis strategy	DO

2 Examination of Soil

2.1 Physical and physico-chemical Characteristics

DIN EN ISO 10523 (C 5) 2012-04	Water quality - Determination of pH (Modification: <i>Determination in the eluate</i>)	DU
DIN EN 27888 (C 8) 1993-11	Water quality; determination of electrical conductivity (Modification: <i>Determination in the eluate</i>)	DU
DIN ISO 11465 1996-12	Soil quality - Determination of dry matter and water content on a mass basis - Gravimetric method	DU
DIN EN 14346 2007-03	Characterization of waste - Calculation of dry matter by determination of dry residue or water content	DU

Valid from: 29.11.2023

Date of issue: 12.03.2024

Page 7 of 18

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

Annex to the Partial Accreditation Certificate D-PL-17471-01-03

2.2 Determination of Elements and Compounds by Photometry, Gravimetry, Titrimetry, and Atomic Absorption Spectrometry

DIN EN ISO 12846 (E 12) 2012-08	Water quality - Determination of mercury - Method using atomic absorption spectrometry (AAS) with and without enrichment (Modification: <i>direct: thermal extraction</i>)	DU
DIN ISO 15705 (H 45) 2003-01	Water quality - Determination of the chemical oxygen demand index (ST-COD) - Small-scale sealed tube method (Modification: <i>Determination in the eluate</i>)	DU
DIN EN ISO 6878 (D 11) 2004-09	Water quality - Determination of phosphorus - Ammonium molybdate spectrometric method (Modification: <i>Determination in the eluate</i>)	DU
DIN EN ISO 9562 (H 14) 2005-02	Water quality - Determination of adsorbable organically bound halogens (AOX) (Modification: <i>Determination in the eluate</i>)	DU
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>Working ranges divided, determination in the eluate</i>)	DU
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: <i>Working range narrowed to 0.01-2.0 mg/l, determination in the eluate</i>)	DU
DIN EN ISO 14402 (H 37) 1999-12	Water quality - Determination of phenol index by flow analysis (FIA and CFA) (Modification: <i>Working range narrowed to 0.01-0.50 mg/l, determination in the eluate</i>)	DU
DIN EN ISO 14403-2 (D 3) 2012-10	Water quality - Determination of total cyanide and free cyanide using flow analysis (FIA and CFA) - Part 2: Method using continuous flow analysis (CFA) (Modification: <i>Working range narrowed to 0.01-0.50 mg/l, determination in the eluate</i>)	DU
DIN EN 1484 (H 3) 2019-04	Water analysis - Guidelines for the determination of total organic carbon (TOC) and dissolved organic carbon (DOC) (Modification: <i>Determination in the eluate</i>)	DU

Valid from: 29.11.2023

Date of issue: 12.03.2024

Page 8 of 18

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

Annex to the Partial Accreditation Certificate D-PL-17471-01-03

DIN EN 12260 (H 34) 2003-12	Water quality. Determination of nitrogen. Determination of bound nitrogen (TNb), following oxidation to nitrogen oxides (Modification: <i>Working ranges adjusted to devices from Dimatec</i>)	DU
DIN ISO 15923-1 (D49) 2014-07	Water quality - Determination of selected parameters by discrete analysis systems - Part 1: Ammonium, nitrate, nitrite, chloride, orthophosphate, sulfate and silicate with photometric detection	DU
ISO/TS 15923-2 (D49) 2017-10	Water quality - Determination of selected parameters by discrete analysis systems - Part 2: Chromium(VI), fluoride, total alkalinity, total hardness, calcium, magnesium, iron, iron(II), manganese and aluminium with photometric detection (Here: <i>Determination of fluoride only</i>)	DU
DIN EN 26777 (D 10) 1993-04	Water quality; determination of nitrite; molecular absorption spectrometric method (Modification: <i>Working range adjusted to 0.005-0.10 mg/l NO₂-N, determination in the eluate</i>)	DU
DIN 38405-9 (D 9) 2011-09	Spectrometric determination of nitrate (Modification: <i>Determination in the eluate</i>)	DU
DIN 38405-13 (D 13) 2011-04	Determination of cyanides (Modification: <i>Working range adjusted to 0.10-4.0 mg/l, determination in the eluate</i>)	DU
DIN 38405-21 (D 21) 1990-10	determination of dissolved silicate by spectrometry (Modification: <i>Working range adjusted to 0.001-0.05 mg/l and 0.05-0.50 mg/l, determination in the eluate</i>)	DU
DIN 38405-24 (D 24) 1987-05	photometric determination of chromium(VI) using 1,5-diphenylcarbonohydrazide (Modification: <i>Determination in the eluate</i>)	DU
DIN 38405-27 (D 27) 2017-10	Determination of sulfide by gas extraction method (Modification: <i>Determination in the eluate</i>)	DU
DIN 38406-1 (E 1) 1983-05	Determination of iron (Modification: <i>Determination in the eluate</i>)	DU
DIN 38409-7 (H 7) 2005-12	Determination of acid and base-neutralizing capacities (Modification: <i>Automatic titration system, determination in the eluate</i>)	DU

Valid from: 29.11.2023

Date of issue: 12.03.2024

Page 9 of 18

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

Annex to the Partial Accreditation Certificate D-PL-17471-01-03

DIN 38409-16 (H 16) 1984-06	Determination of the phenol index (Modification: <i>Adjustment of the working range to 0.1-1.0 mg/l, determination in the eluate</i>)	DU
DIN 38409-41 (H 41) 1980-12	Determination of the Chemical Oxygen Demand (COD) in the Range over 15 mg/l (Modification: <i>Determination in the eluate</i>)	DU
DIN 38409-44 (H 44) 1992-05	Determination of the chemical oxygen demand (COD), ranging from 5 to 50 mg/l (Modification: <i>Determination in the eluate</i>)	DU
DIN 38413-1 (P 1) 1982-03	Determination of hydrazine (Modification: <i>Working ranges adjusted to 0.005-0.10 mg/l and 0.10-0.50 mg/l, determination in the eluate</i>)	DU
DIN 38414-17 (S 17) 2017-11	Determination of the organically bound halogens amenable to extraction (EOX) (Modification: <i>Implementation with automatic extraction unit. Determination with hydrolysis at the AQF</i>)	DU
DIN 38414-18 (S 18) 2019-06	Determination of adsorbed organically bound halogens in sludge and sediments (AOX)	DU
DIN 51723 2002-06	Testing of solid fuels - Determination of fluorine content (Modification: <i>Use of AQF device</i>)	DU
DIN 51727 2011-11	Testing of solid fuels - Determination of chlorine content (Modification: <i>Use of AQF device</i>)	DU
EPA METHOD 7473 2007-02	Mercury in solids and solutions by thermal decomposition, amalgamation, and atomic absorption spectrophotometry	DU

3 List of Test Methods for the Waste Module

Status: LAGA as of May 2018

Section 1: Sewage Sludge

not applied

Section 2: Soil

not applied

Section 3: Biowaste

not applied

Valid from: 29.11.2023

Date of issue: 12.03.2024

Page 10 of 18

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

Annex to the Partial Accreditation Certificate D-PL-17471-01-03

Section 4: Waste Oil, Insulating Fluid

	Subsections/ Parameter	Principle/ Method		Location
		§ 5 Abs. 3 AltöIV		
4.1	Sampling	Annex 2 Nr. 1	☐	
		DIN 51750- 1 (08.83)	☐	
		DIN 51750- 1 (12.90)	☒	DU
		DIN 51750- 2 (03.84)	☐	
		DIN 51750- 2 (12.90)	☒	DU
4.2	PCB, Halogen (according to AltöIV)	Annex 2 Nrn. 2, 3		
	PCB	DIN EN 12766- 1 (11.00) in relation to DIN EN 12766- 2 (12.01), Method B	☒	DO
	Gesamthalogen (according to AltöIV)	Annex 2, Nr. 3 AltöIV	☒	DU

Section 5: Landfill Waste

	Subsections/ Parameter	Principle/ Method		Location
		§ 6 Abs. 2, § 8 Abs. 1, 3 und 5 DepV		
5.1	Sampling	LAGA PN 98 (12.01)	☒	DO, DU
5.2	Determination of Total Contents in Solid Material			
	Sample Preparation	DIN 19747 (07.09)	☒	DU
	Digestion Procedure (Aqua Regia)	DIN EN 13657 (01.03)	☒	DU
	Loss on Ignition	DIN EN 15169 (05.07)	☒	DU
	TOC (Total Organic Carbon)	DIN EN 13137 (12.01)	☒	DU
	BTEX (Benzene and Derivatives)	DIN 38407-F9 (05.91) Handbuch Altlasten HLUG, Band 7, Analysenverfahren, Teil 4 (2000)	☒	DO
		DIN EN ISO 22155 (07.16)	☒	DO
	PCB (Polychlorinated Biphenyls)	DIN EN 15308 (05.08)	☒	DO

Valid from: 29.11.2023

Date of issue: 12.03.2024

Page 11 of 18

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

Annex to the Partial Accreditation Certificate D-PL-17471-01-03

	Subsections/ Parameter	Principle/ Method		Location
	Mineral Oil Hydrocarbons	DIN EN 14039 (01.05) in relation to LAGA KW/04 (12.09)	☒	DO
	PAH (Polycyclic Aromatic Hydrocarbons)	DIN ISO 18287 (05.06)	☒	DO
	Density	DIN 18125- 2 (03.11)	☒	DU
	Calorific Value	DIN EN 15170 (05.09)	☒	DU
	Cadmium, Chromium, Copper, Nickel, Lead, and Zinc	DIN ISO 11047 (05.03)	☐	
		DIN EN ISO 11885 (09.09)	☒	DU
		DIN ISO 22036 (06.09)	☐	
	Mercury	DIN EN 12846 (08.12)* a procedure incorrectly specified by the legislator; correct DIN EN ISO 12846 (08.12)	☒	DU
		DIN EN ISO 17852 (04.08)	☒	DU
	Extractable Lipophilic Substances	LAGA KW/04 (12.09)	☒	DO
5.3	Determination of Contents in Eluate			
	Eluate Preparation with Liquid/Solid Ratio 10/1	DIN EN 12457- 4 (01.03)	☒	DU
	Eluate Preparation with Constant pH Values 4 and 11/Acid Neutralization Capacity	LAGA-Richtlinie EW 98 (2002)	☒	DU
	Percolation Test in Upward Flow	DIN CEN/TS 14405 (09.04)	☐	
		DIN 19528 (01.09)	☒	DU
	pH Value of the Eluate	DIN 38404- 5 (07.09)	☒	DU
	DOC	DIN EN 1484 (08.97)	☒	DU
	DOC at a pH Value between 7.5 and 8	LAGA-Richtlinie EW 98 p (2002)	☐	
	Phenols	DIN 38409- 16 (06.84)	☐	
		DIN EN ISO 14402 (12.99)	☒	DU
		DIN 38407- 27 (10.12)	☐	

Valid from: 29.11.2023

Date of issue: 12.03.2024

Page 12 of 18

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

Annex to the Partial Accreditation Certificate D-PL-17471-01-03

	Subsections/ Parameter	Principle/ Method		Location
	Arsenic	DIN EN ISO 11969 (11.96)	☐	
		DIN EN ISO 11885 (09.09)	☐	
		DIN ISO 22036 (06.09)	☐	
		DIN EN ISO 15586 (02.04)	☐	
		DIN EN ISO 17294- 2 (02.05)	☒	DU
		DIN EN ISO 17294-2 (01.17)	☐	
	Lead, Cadmium, Copper, Nickel, Zinc, Chromium	DIN EN ISO 15586 (02.04)	☐	
		DIN EN ISO 17294- 2 (02.05)	☒	DU
		DIN EN ISO 11885 (09.09)	☒	DU
		DIN ISO 22036 (06.09)	☐	
		DIN EN ISO 17294-2 (01.17)	☐	
	Mercury	DIN EN ISO 12846 (08.12)	☒	DU
		DIN EN ISO 17852 (04.08)	☒	DU
	Barium, Molybdenum, Selenium	DIN ISO 22036 (06.09)	☐	
		DIN EN ISO 11885 (09.09)	☒	DU
		DIN EN ISO 17294- 2 (02.05)	☒	DU
		DIN EN ISO 17294-2 (01.17)	☐	
	Antimony	DIN ISO 22036 (06.09)	☐	
		DIN EN ISO 11885 (09.09)	☐	
		DIN EN ISO 15586 (02.04)	☐	
		DIN 38405- 32 (05.00)	☐	
		DIN EN ISO 17294- 2 (02.05)	☒	DU
		DIN EN ISO 17294-2 (01.17)	☐	
	Total Dissolved Solids	DIN EN 15216 (01.08)	☐	
		DIN 38409- 1 (01.87)	☒	DU
		DIN 38409- 2 (03.87)	☒	DU
	Conductivity of the Eluate	DIN EN 27888 (11.93)	☒	DU
	Determination of Dry Residue	DIN EN 14346 (03.07)	☒	DU

Valid from: 29.11.2023

Date of issue: 12.03.2024

Page 13 of 18

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

Annex to the Partial Accreditation Certificate D-PL-17471-01-03

	Subsections/ Parameter	Principle/ Method		Location
	Chloride	DIN EN ISO 10304- 1 (07.09)	☒	DU
		DIN 38405- 1 (12.85)	☐	
		DIN EN ISO 15682 (01.02)	☐	
	Sulfate	DIN EN ISO 10304- 1 (07.09)	☒	DU
		DIN 38405- 5 (01.85)	☐	
	Cyanides, easily released	DIN 38405- 13 (04.11)	☒	DU
		for waste containing sulfide: DIN ISO 17380 (05.06)	☒	DU
		DIN EN ISO 14403- 1 (10.12)	☐	
	Fluoride	DIN 38405- 4 (07.85)	☐	
		DIN EN ISO 10304- 1 (07.09)	☒	DU
5.4	Biological Degradability of the Dry Residue of the Original Substance	Annex 4 Nr. 3.3 DepV		
	Respiratory Activity over 4 Days (AT ₄)	Annex 4 Nr. 3.3.1 DepV	☐	
	Gas Formation over 21 Days (GB ₂₁)	Annex 4 Nr. 3.3.2 DepV	☐	

Section 6: Waste wood
not applied

4 Sampling, Sample Preparation, and Examination of Waste according to Landfill Ordinance Annex 4 (July 2020)

Sampling

DepV, Ann. 4	Parameter	§ 8 Abs. 1, 3 and 5 DepV		Location
2	Sampling	LAGA PN 98 (May 2019)	☒	DU, DO
		DIN 19698-1 (May 2014) & DIN 19698-2 (December 2016) & DIN 19698-5 (June 2018) & DIN 19698-6 (January 2019) & - optionally additional -	☐	

Valid from: 29.11.2023

Date of issue: 12.03.2024

Page 14 of 18

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

Annex to the Partial Accreditation Certificate D-PL-17471-01-03

Determination of Total Contents in Solid Material and the Elutable Fraction

Determination of Total Contents in Solid Material

DepV, Ann. 4	Parameter	§ 8 Abs. 1, 3 und 5 DepV		Location
3.1.1	Sample preparation	DIN 19747 (July 2009)	☒	DU
3.1.2	Digestion procedure (Aqua Regia)	DIN EN 13657 (January 2003)	☒	DU

DepV, Ann. 4	Parameter	§ 8 Abs. 1, 3 und 5 DepV		Location
3.1.3.1	Loss on Ignition	DIN EN 15169 (May 2007)	☒	DU
3.1.3.2	TOC (Total Organic Carbon)	DIN EN 15936 (November 2012)	☒	DU
3.1.4	BTEX (Benzene and Derivatives)	DIN EN ISO 22155 (July 2016)	☒	DO
3.1.5	PCB (Polychlorinated Biphenyls)	DIN EN 15308 (December 2016)	☒	DO
3.1.6	Mineral Oil Hydrocarbons	DIN EN 14039 (January 2005) in relation to LAGA KW/04 (September 2019)	☒	DO
3.1.7	PAH (Polycyclic Aromatic Hydrocarbons)	DIN ISO 18287 (May 2006)	☒	DO
3.1.8	Density	DIN 18125-2 (March 2011)	☒	DU
3.1.9	Calorific Value	DIN EN 15170 (May 2009)	☒	DU
3.1.10	Cadmium, Chromium, Copper, Nickel, Lead, Zinc	DIN EN ISO 17294-2 (January 2017)	☒	DU
		DIN ISO 22036 (June 2009)	☐	
		DIN EN ISO 11885 (September 2009)	☒	DU
3.1.11	Mercury	DIN EN ISO 12846 (August 2012)	☒	DU
		DIN EN ISO 17852 (April 2008)	☒	DU
3.1.12	Extractable lipophilic substances	LAGA KW/04 (September 2019)	☒	DO

Determination of the contents in the eluate

DepV, Ann. 4	Parameter	§ 8 Abs. 1, 3 und 5 DepV		Location
3.2.1.1	Eluate Preparation with Liquid/Solid Ratio 10/1	DIN EN 12457-4 (January 2003)	☒	DU

Valid from: 29.11.2023

Date of issue: 12.03.2024

Page 15 of 18

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

Annex to the Partial Accreditation Certificate D-PL-17471-01-03

DepV, Ann. 4	Parameter	§ 8 Abs. 1, 3 und 5 DepV		Location
3.2.1.2	Eluate Preparation with Constant pH Values 4 and 11/Acid Neutralization Capacity	LAGA-Richtlinie EW 98 (September 2017)	☒	DU
3.2.2	Percolation Test in Upward Flow	DIN 19528 (January 2009)	☒	DU
		DIN EN 14405 (May 2017)	☐	
3.2.3	pH Value of the Eluate	DIN EN ISO 10523 (April 2012)	☒	DU

DepV, Ann. 4	Parameter	§ 8 Abs. 1, 3 und 5 DepV		Location
3.2.4.1	DOC	DIN EN 1484 (April 2019)	☒	DU
3.2.4.2	DOC at a pH Value between 7.5 and 8	LAGA-Richtlinie EW 98 (September 2017)	☒	DU
3.2.5	Phenols	DIN 38409-16 (June 1984)	☐	
		DIN EN ISO 14402 (December 1999)	☒	DU
3.2.6	Arsenic	DIN EN ISO 17294-2 (January 2017)	☒	DU
		DIN EN ISO 11885 (September 2009)	☐	
		DIN ISO 22036 (June 2009)	☐	
3.2.7	Lead	DIN EN ISO 17294-2 (January 2017)	☒	DU
		DIN ISO 22036 (June 2009)	☐	
		DIN EN ISO 11885 (September 2009)	☐	
3.2.8	Cadmium	DIN EN ISO 17294-2, (January 2017)	☒	DU
		DIN ISO 22036 (June 2009)	☐	
		DIN EN ISO 11885 (September 2009)	☐	
3.2.9	Copper	DIN EN ISO 17294-2 (January 2017)	☒	DU
		DIN ISO 22036 (June 2009)	☐	
		DIN EN ISO 11885 (September 2009)	☐	
3.2.10	Nickel	DIN EN ISO 17294-2 (January 2017)	☒	DU
		DIN ISO 22036 (June 2009)	☐	
		DIN EN ISO 11885 (September 2009)	☐	
3.2.11	Mercury	DIN EN ISO 12846 (August 2012)	☒	DU
		DIN EN ISO 17852 (April 2008)	☒	DU

Valid from: 29.11.2023

Date of issue: 12.03.2024

Page 16 of 18

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

Annex to the Partial Accreditation Certificate D-PL-17471-01-03

DepV, Ann. 4	Parameter	§ 8 Abs. 1, 3 und 5 DepV		Location
3.2.12	Zinc	DIN EN ISO 17294-2 (January 2017)	☒	DU
		DIN ISO 22036 (June 2009)	☐	
		DIN EN ISO 11885 (September 2009)	☐	
3.2.13	Chloride	DIN EN ISO 10304-1 (July 2009)	☒	DU
		DIN EN ISO 15682 (January 2002)	☐	
3.2.14	Sulfate	DIN EN ISO 10304-1 (July 2009)	☒	DU
3.2.15	Cyanide, easily released	DIN 38405-13 (April 2011)	☒	DU
		for waste containing sulfide: DIN ISO 17380 (May 2006)	☒	DU
		DIN EN ISO 14403-1 (October 2012)	☐	
		DIN EN ISO 14403-2 (October 2012)	☒	DU
3.2.16	Fluoride	DIN 38405-4 (July 1985)	☐	
		DIN EN ISO 10304-1 (July 2009)	☒	DU
3.2.17	Barium	DIN ISO 22036 (June 2009)	☐	
		DIN EN ISO 11885 (September 2009)	☐	
		DIN EN ISO 17294-2 (January 2017)	☒	DU
3.2.18	Chromium, total	DIN ISO 22036 (June 2009)	☐	
		DIN EN ISO 11885 (September 2009)	☐	
		DIN EN ISO 17294-2 (January 2017)	☒	DU
3.2.19	Molybdenum	DIN ISO 22036 (June 2009)	☐	
		DIN EN ISO 11885 (September 2009)	☐	
		DIN EN ISO 17294-2 (January 2017)	☒	DU
3.2.20	Antimony	DIN ISO 22036 (June 2009)	☐	
		DIN EN ISO 11885 (September 2009)	☐	
		DIN 38405-32 (May 2000)	☐	
		DIN EN ISO 17294-2 (January 2017)	☒	DU
3.2.21	Selenium	DIN ISO 22036 (June 2009)	☐	
		DIN EN ISO 11885 (September 2009)	☐	
		DIN EN ISO 17294-2 (January 2017)	☒	DU

Valid from: 29.11.2023

Date of issue: 12.03.2024

Page 17 of 18

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

Annex to the Partial Accreditation Certificate D-PL-17471-01-03

DepV, Ann. 4	Parameter	§ 8 Abs. 1, 3 und 5 DepV		Location
3.2.22	Total Dissolved Solids	DIN EN 15216 (January 2008)	☐	
		DIN 38409-1 (January 1987)	☒	DU
		DIN 38409-2 (March 1987)	☒	DU
3.2.23	Conductivity of the Eluate	DIN EN 27888 (November 1993)	☒	DU
3.2.24	Determination of Dry Residue	DIN EN 14346 (March 2007)	☒	DU

Biodegradability of the Dry Residue of the Original Substance
not applied

Abbreviations used:

AltöIV	Altölverordnung - Waste Oil Ordinance
ASTM	American Society for Testing and Materials
DepV	Deponieverordnung - Landfill Ordinance
DIN	Deutsches Institut für Normung e. V. - German Institute for Standardization
EN	Europäische Norm - European Standard
EPA	Environmental Protection Agency
IEC	International Electrotechnical Commission – Internationale Elektrotechnische Kommission
ISO	International Organization for Standardization – Internationale Organisation für Normung
LAGA	Bund/Länder-Arbeitsgemeinschaft Abfall - Federal/State Working Group on Waste

Valid from: 29.11.2023

Date of issue: 12.03.2024

Page 18 of 18

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

Deutsche Akkreditierungsstelle

Annex to the Partial Accreditation Certificate

D-PL-17471-01-04

according to DIN EN ISO/IEC 17025:2018

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This annex is a part of the accreditation certificate D-PL-17471-01-00.

Holder of partial accreditation certificate:

ThyssenKrupp Steel Europe AG
Kaiser-Wilhelm-Straße 100, 47166 Duisburg

with the locations

ThyssenKrupp Steel Europe AG
Chemie und Werkstoffprüfung
Kaiser-Wilhelm-Straße 100, 47166 Duisburg

ThyssenKrupp Steel Europe AG
Chemie und Werkstoffprüfung
Eberhardstraße 12, 44145 Dortmund

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-17471-01-04

Tests in the areas of:

**Mechanical-technological, metallographic, and metallurgical investigations of metallic materials;
Corrosion and durability investigations;
Investigations of polymers, paints, and films;
Investigation of organic coatings;
Investigation of coatings on metallic materials.**

The testing laboratory is permitted to apply standardized or equivalent testing procedures with different editions without prior information and approval from DAkkS.

The listed testing procedures are exemplary. The testing laboratory has a current list of all testing procedures in the flexible accreditation scope.

The testing procedures are marked with the symbols of the locations listed below where they are carried out:

DU = Kaiser-Wilhelm-Straße 100, 47166 Duisburg

DO = Eberhardstraße 12, 44145 Dortmund

Valid from: 29.11.2023

Date of issue: 19.11.2024

Page 2 of 10

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

Annex to the Partial Accreditation Certificate D-PL-17471-01-04

1	Mechanical-technological investigations of metallic materials	3
1.1	Tensile test.....	3
1.2	Charpy impact test.....	4
1.3	Roughness test.....	5
1.4	Hardness test	5
1.5	Corrosion and durability investigations.....	5
2	Metallographic and metallurgical investigations	6
2.1	Non-destructive testing	6
2.2	Microstructure investigations.....	6
3	Investigation of organic coatings.....	7
3.1	Non-destructive testing	7
3.2	Determination of elements and compounds using FTIR, IR, and Raman spectroscopy.....	7
3.3	Thermal investigations.....	7
4	Investigation of coatings on metallic materials.....	7
4.1	Determination of elements using spectroscopic methods.....	7
4.2	Determination of coating thickness using gravimetry, light microscopy, and XRF	8
4.3	Physical and physico-chemical investigations	9
4.4	Determination of elements and compounds using FTIR, IR, and Raman spectroscopy.....	9
4.5	Thermal investigations.....	9

1 Mechanical-technological investigations of metallic materials

1.1 Tensile test

DIN EN ISO 10113 2021-06	Metallic materials - Sheet and strip - Determination of plastic strain ratio	DU DO
DIN EN ISO 10275 2020-12	Metallic materials - Sheet and strip - Determination of tensile strain hardening exponent	DU DO
DIN EN ISO 6892-1 2020-06	Metallic materials - Tensile testing - Part 1: Method of test at room temperature	DU DO
DIN EN 10325 2006-10	Steel - Determination of yield strength increase by the effect of heat treatment (Bake-Hardening-Index)	DU DO

Valid from: 29.11.2023

Date of issue: 19.11.2024

Page 3 of 10

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

Annex to the Partial Accreditation Certificate D-PL-17471-01-04

ASTM A653/A653M 2020	Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process	DU
ASTM E8/E 8M 2022	Standard test methods for tension testing of metallic materials	DU DO
JIS G 3135 2018-08	Cold-reduced high strength steel sheet and strip with improved formability for automobile structural uses	DU DO
JIS Z 2241 2011-02	Metallic materials - Tensile testing - Method of test at room temperature	DU DO
SEP 1240 2006-07	Testing and Documentation Guideline for the Experimental Determination of Mechanical Properties of Steel Sheets for CAE-Calculations	DU

1.2 Charpy impact test

DIN EN ISO 148-1 2017-05	Metallic materials - Charpy pendulum impact test - Part 1: Test method (Modification : <i>Exclusively 2mm fin radius</i>)	DU
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Valid from: 29.11.2023

Date of issue: 19.11.2024

Page 4 of 10

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

Annex to the Partial Accreditation Certificate D-PL-17471-01-04

1.3 Roughness test

DIN EN 10049 2014-03	Measurement of roughness average Ra and peak count RPc on metallic flat products; German version EN 10049:2013	DU DO
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1.4 Hardness test

DIN EN ISO 6507-1 2018-07	Metallic materials - Vickers hardness test - Part 1: Test method (Restriction: only test loads HV1 / HV 0.5 / HV 0.1, HV5, HV10, HV30)	DU DO
DIN EN ISO 6508-1 2016-12	Metallic materials - Rockwell hardness test - Part 1: Test method (Modification: <i>Testing procedures HRB and HRC</i>)	DU
DIN EN ISO 6506-1 2015-02	Metallic materials - Brinell hardness test - Part 1: Test method	DU

1.5 Corrosion and durability investigations

DIN EN ISO 9227 2017-07	Corrosion tests in artificial atmospheres - Salt spray tests	DO
DIN EN 10229 1998-11	Evaluation of resistance of steel products to hydrogen induced cracking (HIC); German version EN 10229:1998	DU
DIN 38405-D 1 1985-12	German standard methods for the examination of water, waste water and sludge; anions (group D); determination of chloride ions (D 1) (Modification: <i>For analysis of the corrosion medium</i>)	DO
ARAMCO 01-SAMSS-16 2013-12	Qualification of Storage Tanks and Pressured Equipment of Resistance to Hydrogen Induced Cracking	DU
NACE TM0284 2016	Standard Test Method; Evaluation of Pipeline and Pressure Vessel Steels for Resistance to Hydrogen-Induced Cracking (Restriction: <i>without NDT according to Annex A</i>)	DU
TKSE 12842 2022-06	Computerunterstützte Ultraschallprüfung (Compus) an HIC-Proben	DU

Valid from: 29.11.2023

Date of issue: 19.11.2024

Page 5 of 10

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

Annex to the Partial Accreditation Certificate D-PL-17471-01-04

2 Metallographic and metallurgical investigations

2.1 Non-destructive testing

DIN EN 13925-2 2003-07	Non-destructive testing - X-ray diffraction from polycrystalline and amorphous material - Part 2: Procedures; German version EN 13925-2:2003 (Modification: <i>Matrix silica stones (in powder form)</i> <i>Test parameter: Residual quartz</i>)	DU
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2.2 Microstructure investigations

DIN EN ISO 643 2020-06	Steels - Micrographic determination of the apparent grain size (Modification: <i>ere only testing according to 7.1.2, evaluation by comparison with standardized image series plates</i>)	DU DO
DIN EN 10247 2017-09	Micrographic examination of the non-metallic inclusion content of steels using standard pictures	DU
DIN 50601 1985-08	Metallographic examination; determination of the ferritic or austenitic grain size of steel and ferrous materials (Modification: <i>Only testing according to 7.1, comparison with the image series plate</i>)	DU DO
DIN 50602 1985-09	Metallographic examination; microscopic examination of special steels using standard diagrams to assess the content of non-metallic inclusions	DU
ASTM E45 2018	Standard Test Methods for Determining the Inclusion Content of Steel	DU
ASTM E112 2013	Standard Test Methods for Determining Average Grain Size (Modification: <i>Here only testing according to 4.1.1 Comparison Procedure</i>)	DU DO
ISO 4967 N EN 2013-07	Steel - Determination of content of non-metallic inclusions - Micrographic method	DU

Valid from: 29.11.2023

Date of issue: 19.11.2024

Page 6 of 10

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

Annex to the Partial Accreditation Certificate D-PL-17471-01-04

3 Investigation of organic coatings

3.1 Non-destructive testing

DIN EN ISO 2178 2016-11	Non-magnetic coatings on magnetic substrates - Measurement of coating thickness - Magnetic method (Modification: <i>Measurement process according to device operating instructions</i>)	DO
DIN EN ISO 2360 2004-04	Non-conductive coatings on non-magnetic electrically conductive base metals - Measurement of coating thickness - Amplitude-sensitive eddy-current method (ISO 2360:2017); German version EN ISO 2360:2017 (Modification: <i>Measurement process according to device operating instructions</i>)	DO

3.2 Determination of elements and compounds using FTIR, IR, and Raman spectroscopy

TKSE 15934 2021-04	Qualitative Charakterisierung von Roh-, Hilfs-, Einsatz- und Betriebsstoffen sowie Produkten in und aus dem Umfeld der Metallindustrie mittels der Raman-Spektroskopie	DU
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3.3 Thermal investigations

DIN 51006 2005-07	Thermal analysis; principles of thermogravimetry	DU
ASTM E 2105 2016	Standard Practice for General Techniques of Thermogravimetric Analysis (TGA) coupled with Infrared Analysis (TGA/IR) (Modification: <i>Sample supply via skimmer and capillary coupling</i>)	DU

4 Investigation of coatings on metallic materials

4.1 Determination of elements using spectroscopic methods

ISO 11505 2012-12	Surface chemical analysis - General procedures for quantitative compositional depth profiling by glow discharge optical emission spectrometry	DU
ISO 14707 2021-03	Surface chemical analysis - Glow discharge optical emission spectrometry (GD-OES) - Introduction to use	DU

Valid from: 29.11.2023

Date of issue: 19.11.2024

Page 7 of 10

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

Annex to the Partial Accreditation Certificate D-PL-17471-01-04

ISO 16962 2017-02	Surface chemical analysis - Analysis of zinc- and/or aluminium-based metallic coatings by glow-discharge optical-emission spectrometry (Modification: <i>Matrix extension to conversion layers and other inorganic coatings</i>)	DU
DIN EN ISO 11885 (E 22) 2009-09	Water quality - Determination of selected elements by inductively coupled plasma optical emission spectrometry (ICP-OES) (ISO 11885:2007); German version EN ISO 11885:2009 (Modification for coatings: <i>Sample preparation using potentiostatic detachment in inhibited hydrochloric acid</i>)	DU
DIN EN 62321-7-1 2016-09	Determination of certain substances in electrotechnical products - Part 7-1: Determination of the presence of hexavalent chromium (Cr(VI)) in colorless and colored corrosion-protected coatings on metals by the colorimetric method (IEC 62321-7-1:2015); German version EN 62321-7-1:2015	DU

4.2 Determination of coating thickness using gravimetry, light microscopy, and XRF

DIN EN ISO 3497 2001-12	Metallic coatings - Measurement of coating thickness - X-ray spectrometric methods (ISO 3497:2000); German version EN ISO 3497:2000	DO
DIN EN ISO 10111 2019-04	Metallic and other inorganic coatings - Measurement of mass per unit area - Review of gravimetric and chemical analysis methods (ISO 10111:2019); German version EN ISO 10111:2019 (Modification: <i>Deviating conversion layers S, Si, and Co, side-differentiated detachment using the electrochemical potential for endpoint detection</i>)	DU
DIN EN ISO 1463 2021-08	Metallic and oxide coatings - Measurement of coating thickness - Microscopical method	DU, DO

Valid from: 29.11.2023

Date of issue: 19.11.2024

Page 8 of 10

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

Annex to the Partial Accreditation Certificate D-PL-17471-01-04

4.3 Physical and physico-chemical investigations

DIN EN 10209 2013-09	Cold rolled low carbon steel flat products for vitrious enamelling - Technical delivery conditions A.2 Fischeschuppen-Testemail	DO
DIN ISO 9277 2014-01	Determination of the specific surface area of solids by gas adsorption - BET method (ISO 9277:2010)	DO

4.4 Determination of elements and compounds using FTIR, IR, and Raman spectroscopy

TKSE 15934 2021-04	Qualitative Charakterisierung von Roh-, Hilfs-, Einsatz- und Betriebsstoffen sowie Produkten in und aus dem Umfeld der Metallindustrie mittels der Raman-Spektroskopie	DU
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4.5 Thermal investigations

DIN 51007 1994-06	Thermal analysis; differential thermal analysis; principles	DU
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Annex to the Partial Accreditation Certificate D-PL-17471-01-04

Abbreviations used:

AbfKlärV	Klärschlammverordnung	Sewage Sludge Ordinance
Abw	für Abwasser (incl. Deponie-Sickerwasser) (Verfahren nach AbwV fett gedruckt)	for Wastewater (incl. Landfill Leachate) (Procedures according to AbwV in bold)
AltöIV	Altölverordnung	Waste Oil Ordinance
ARAMCO	Arabian American Oil Company	Arabian American Oil Company
ASTM	American Society for Testing and Materials	American Society for Testing and Materials
AWS	American Welding Society	American Welding Society
BioAbfV	Bioabfallverordnung	Bio-Waste Ordinance
DepV	Deponieverordnung	Landfill Ordinance
DEV	Deutsches Einheitsverfahren	German Standard Method
DIN	Deutsches Institut für Normung e. V.	German Institute for Standardization
EN	Europäische Norm	European Standard
EP	Eingangs- und Plausibilitätsprüfung	Input and Plausibility Check
EPA	Environmental Protection Agency	Environmental Protection Agency
Grw	Roh- und Grundwasser	Raw and Groundwater
IEC	International Electrotechnical Commission – Internationale Elektrotechnische Kommission	International Electrotechnical Commission
ISO	International Organization for Standardization – Internationale Organisation für Normung	International Organization for Standardization
JIS	Japan Industrial Standard	Japan Industrial Standard
LAGA	Bund/Länder-Arbeitsgemeinschaft Abfall	Federal/State Working Group on Waste
LAWA	Bund/Länder-Arbeitsgemeinschaft Wasser	Federal/State Working Group on Water
NACE	Nomenclature des Activités économiques dans les Communautés Européennes	Nomenclature of Economic Activities in the European Communities
Ofw	Oberflächenwasser	Surface Water
SEP	Stahleisenprüfblatt	Steel Iron Test Sheet
St.	Standort	Location
TKSE	Hausverfahren der ThyssenKrupp Steel Europe AG	In-house Procedures of ThyssenKrupp Steel Europe AG
VDEW	Vereinigung Deutscher Elektrizitätswerke	Association of German Electric Utilities
VDI	Verein Deutscher Ingenieure	Association of German Engineers
VDLUFA	Verband der landwirtschaftlichen Untersuchungs- und Forschungsanstalten e. V.	Association of Agricultural Testing and Research Institutes

Valid from: 29.11.2023

Date of issue: 19.11.2024

Page 10 of 10

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

Deutsche Akkreditierungsstelle

Annex to the Partial Accreditation Certificate D-PL-17471-01-05 according to DIN EN ISO/IEC 17025:2018

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This annex is a part of the accreditation certificate D-PL-17471-01-00.

Holder of partial accreditation certificate:

ThyssenKrupp Steel Europe AG
Kaiser-Wilhelm-Straße 100, 47166 Duisburg

with the locations

ThyssenKrupp Steel Europe AG
Chemie und Werkstoffprüfung
Kaiser-Wilhelm-Straße 100, 47166 Duisburg

ThyssenKrupp Steel Europe AG
Chemie und Werkstoffprüfung
Eberhardstraße 12, 44145 Dortmund

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-17471-01-05

Tests in the areas of:

Investigations of metallurgical products and refractory materials

The testing laboratory is permitted to apply standardized or equivalent testing methods with different versions without prior notification and approval from DAkkS.

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

Determination of compounds using light microscopy

VDI 3866 Blatt 4
2002-02

Determination of asbestos in technical products - Phase contrast
optical microscopy method

Abbreviations used:

DIN	Deutsches Institut für Normung e. V.	German Institute for Standardization
EN	Europäische Norm	European Standard
IEC	International Electrotechnical Commission – Internationale Elektrotechnische Kommission	International Electrotechnical Commission
ISO	International Organization for Standardization – Internationale Organisation für Normung	International Organization for Standardization
VDI	Verein Deutscher Ingenieure	Association of German Engineers

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Page 2 of 2

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