

## Deutsche Akkreditierungsstelle

### Annex to the Partial Accreditation Certificate D-PL-14498-01-04 according to DIN EN ISO/IEC 17025:2018

**Valid from:** 17.11.2023

**Date of issue:** 17.11.2023

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

Holder of partial accreditation certificate:

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

with the locations

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

**VKTA - Strahlenschutz, Analytik & Entsorgung Rossendorf e. V.  
Labor für Umwelt- und Radionuklidanalytik  
Am Eiswurmlager 10, 01189 Dresden**

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

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

*This certificate annex is only valid together with the written accreditation certificate and reflects the status as indicated by the date of issue. The current status of any given scope of accreditation can be found in the directory of accredited bodies maintained by Deutsche Akkreditierungsstelle GmbH at <https://www.dakks.de>.*

**Annex to the Partial Accreditation Certificate D-PL-14498-01-04**

Tests in the fields:

**selected analysis of filter dusts;  
local dose rate measurement of gamma radiation;  
determination of surface contamination;  
In- situ gamma spectrometry;  
element and radionuclide determination in solids, liquids, foodstuffs, human excretionsment,  
other biological samples and in the context of emission and immission monitoring and the  
analysis of operational and waste samples**

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

**Within the given testing field marked with \*\*, the testing laboratory is permitted, without being required to inform and obtain prior approval from DAkkS, the modification, development and refinement of testing methods. The listed testing methods are exemplary.**

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

The marking R (Bautzner Landstr. 400, 01328 Dresden) and FK (Am Eiswurmlager 10, 01189 Dresden) behind the testing and sampling procedures indicates the location for which the competence is confirmed.

**1 Selected analysis of filter dusts**

IFA-AM 6015 2018-02	Processing procedure for analysis of metal-containing dusts	R
DIN EN 16171 2017-01	Sludge, treated biowaste and soil - Determination of elements using inductively coupled plasma mass spectrometry (ICP-MS); German version (Modification: <i>extended by matrix filter dusts</i> )	R

Valid from: 17.11.2023

Date of issue: 17.11.2023

**Annex to the Partial Accreditation Certificate D-PL-14498-01-04**

**2 Radioactivity measurement and radionuclide determination**

**2.1 On-site radioactivity measurement on radioactive residues, nuclear facility components and in the environment**

**2.1.1 Measurement of the gamma local dose rate**

FS-78-15-AKU Blatt 3.1.1.2 2017-08	Monitoring of the $\gamma$ - local dose rate in the vicinity of nuclear facilities	R
--	--	---

**2.1.2 Measurement of surface contamination**

DIN 25457-1 2014-12	Activity measurement methods for the clearance of radioactive substances and nuclear facility components - Part 1: Fundamentals <i>(Restriction: applies only to direct and indirect surface total activity measurement, in- situ gamma spectrometry, gamma spectrometry and alpha spectrometry)</i>	R
------------------------	---	---

DIN 25457-4 2013-04	Activity measurement methods in the clearance of radioactive substances and components of nuclear facilities - Part 4: Contaminated and activated metal scrap <i>(Restriction: applies only to surface activity measurement, in- situ gamma spectrometry, gamma spectrometry and alpha spectrometry)</i>	R
------------------------	---	---

DIN 25457-6 2018-07	Activity measurement methods for the clearance of radioactive substances and nuclear facility components - Part 6: Rubble and buildings <i>(Restriction: applies only to direct surface activity measurement, in- situ gamma spectrometry, sampling, gamma spectrometry, liquid scintillation measurement and alpha spectrometry)</i>	R
------------------------	--	---

DIN 25457-7 2017-08	Activity measurement methods for the clearance of radioactive substances and nuclear facility components - Part 7: Ground surfaces and excavated soil <i>(Restriction: applies only to direct surface activity measurement, in- situ gamma spectrometry, sampling, gamma spectrometry, liquid scintillation measurement and alpha spectrometry)</i>	R
------------------------	--	---

VKTA FA 02 2009-05	Determination of surface contamination	R
-----------------------	--	---

Valid from: 17.11.2023

Date of issue: 17.11.2023

**Annex to the Partial Accreditation Certificate D-PL-14498-01-04**

**2.1.3 In- situ gamma spectrometry**

DIN EN ISO 18589-7 2016-05	Measurement of radioactivity in the environment - Soil - Part 7: In situ measurement of gamma-emitting radionuclides	R
DIN 25457-1 2014-12	Activity measurement methods for the clearance of radioactive substances and nuclear facility components - Part 1: Fundamentals <i>(Restriction: applies only to direct and indirect surface total activity measurement, in- situ gamma spectrometry, gamma spectrometry and alpha spectrometry)</i>	R
DIN 25457-4 2013-04	Activity measurement methods in the clearance of radioactive substances and components of nuclear facilities - Part 4: Contaminated and activated metal scrap <i>(Restriction: applies only to surface activity measurement, in- situ gamma spectrometry, gamma spectrometry and alpha spectrometry)</i>	R
DIN 25457-6 2018-07	Activity measurement methods for the clearance of radioactive substances and nuclear facility components - Part 6: Rubble and buildings <i>(Restriction: applies only to direct surface activity measurement, in- situ gamma spectrometry, sampling, gamma spectrometry, liquid scintillation measurement and alpha spectrometry)</i>	R
DIN 25457-7 2017-08	Activity measurement methods for the clearance of radioactive substances and nuclear facility components - Part 7: Ground surfaces and excavated soil <i>(Restriction: applies only to direct surface activity measurement, in- situ gamma spectrometry, sampling, gamma spectrometry, liquid scintillation measurement and alpha spectrometry)</i>	R

**2.2 Determination of uranium**

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 <i>(Modification: extended by aqueous digestion solutions of solids)</i>	R
DIN EN 16171 2017-01	Sludge, treated biowaste and soil - Determination of elements using inductively coupled plasma mass spectrometry (ICP-MS) <i>(Modification: extended by building and construction materials)</i>	R

Valid from: 17.11.2023

Date of issue: 17.11.2023

**Annex to the Partial Accreditation Certificate D-PL-14498-01-04**

DIN 25492 1991-02	Determination of the uranium content of nuclear fuels; potentiometric method based on the modified Davies and Gray method	R
MB-315 2018-05	Determination of uranium isotope composition and activity concentrations of uranium isotopes	R

**2.3 Determination of radionuclides in solids, liquids and foodstuffs**

**2.3.1 Determination of radionuclides in solids, liquids and foodstuffs by alpha spectrometry after radiochemical separation \*\***

Parameter	Matrix	Method
<sup>233/234</sup> U, <sup>235</sup> U, <sup>236</sup> U, <sup>238</sup> U	Solids, liquids, foodstuffs	MB-427 (2019-11) MB-701 (2019-11)
	Urine	MB-422 (2018-06)
	Faeces	MB-418 (2019-11)
<sup>238</sup> Pu, <sup>239/240</sup> Pu	Solids, liquids, foodstuffs	MB-427 (2019-11) MB-701 (2019-11)
	Urine	MB-423 (2014-09)
	Faeces	MB-419 (2019-11)
<sup>241</sup> Am, <sup>242</sup> Cm, <sup>243/244</sup> Cm	Solids, liquids, foodstuffs	MB-427 (2019-11) MB-701 (2019-11)
	Urine	MB-424 (2018-06)
	Faeces	MB-420 (2019-11)
<sup>227</sup> Th, <sup>228</sup> Th, <sup>230</sup> Th, <sup>232</sup> Th	Solids, liquids, foodstuffs	MB-406 (2015-06) MB-701 (2019-11)
	Urine	MB-421 (2014-09)
	Faeces	MB-417 (2019-11)
<sup>227</sup> Ac	Solids, liquids, foodstuffs	MB-406 (2015-06) MB-701 (2019-11)
<sup>210</sup> Po	Solids, liquids, foodstuffs, Urine	MB-404 (2018-06) MB-701 (2019-11)

**2.3.2 Determination of radionuclides in solids, liquids and foodstuffs by liquid scintillation measurement (LSC) \*\***

Parameter	Matrix	Sample pre-treatment	Method
<sup>3</sup> H	Water	Distillation	DIN EN ISO 9698 (2015-12)
	Water	Electrolytic enrichment	MB-408 (2018-06)
	Soil, sediments, mineral building materials	Suspension	MB-426 (2015-05)
	Solids (except metals), foodstuffs	Combustion or bake-out	MB-410 (2018-06)
	Urine	Distillation	DIN EN ISO 9698 (2015-12)
	Non-aqueous liquids	Directly	DIN EN ISO 9698 (2015-12) (Modification: without distillation)
<sup>14</sup> C	Solids (except metals), foodstuffs	Combustion and decomposition	MB-410 (2018-06)
	Liquids	Wet chemical oxidation	MB-411 (2018-06)
	Urine	Directly	MB-701 (2019-11)
<sup>36</sup> Cl	Solids, liquids, foodstuffs	Radiochemical separation	MB-429 (2018-06) MB-701 (2019-11)
<sup>41</sup> Ca	Solids, liquids, foodstuffs	Radiochemical separation	MB-433 (2015-04)
<sup>55</sup> Fe	Solids, liquids, foodstuffs	Radiochemical separation	MB-412 (2015-05) MB-701 (2019-11)
<sup>63</sup> Ni	Solids, liquids, foodstuffs	Radiochemical separation	MB-412 (2015-05) MB-701 (2019-11)
<sup>90</sup> Sr	Solids, liquids, foodstuffs	Radiochemical separation	MB-416 (2015-05) MB-701 (2019-11)
<sup>99</sup> Tc	Solids, liquids, foodstuffs	Radiochemical separation	MB-701 (2019-11)
<sup>222</sup> Rn	Water	Directly or after enrichment	H-Rn-222-TWASS-01 (1994-12)
<sup>241</sup> Pu	Solids, liquids, foodstuffs	Radiochemical separation	MB-428 (2015-05) MB-701 (2019-11)

**2.3.3 Determination of radionuclides in solids, liquids and foodstuffs by alpha-beta measurement with gas flow proportional counter \*\***

Parameter	Matrix	Samle pre-treatment	Method
Total alpha	Solids, liquids, foodstuffs	Preparation	MB-701 (2019-11)
	Water	Evaporation	MB-415 (2019-11) MB-701 (2019-11)
	Filter	Directly	MB-701 (2019-11)
Total beta	Solids, liquids, foodstuffs	Preparation	MB-701 (2019-11)
	Water	Evaporation	MB-415 (2019-11) MB-701 (2019-11)
	Filter	Directly	MB-701 (2019-11)
<sup>210</sup> Pb	Solids, liquids, foodstuffs, urine	Radiochemical separation	MB-404 (2018-06)

**2.3.4 Determination of radionuclides in solids, liquids and foodstuffs by gamma spectrometry \*\***

Parameter	Matrix	Samle pre-treatment	Method
γ-emitter	Solids, liquids, foodstuffs	Directly	MB-402 (2019-11)
<sup>226</sup> Ra, <sup>228</sup> Ra, <sup>224</sup> Ra, <sup>223</sup> Ra, <sup>210</sup> Pb	Liquids	Barium sulphate precipitation	MB-403 (2018-06)

**2.3.5 Determination of radionuclides in solids, liquids and foodstuffs by inductively coupled plasma mass spectrometry (ICP-MS) \*\***

Parameter	Matrix	Samle pre-treatment	Method
<sup>99</sup> Tc	Solids, liquids, foodstuffs	Radiochemical separation	DIN EN 16171 (2017-01) DIN EN ISO 17294-2 (2017-01) (Modification: <i>extended by Tc</i> )
U	Solids, liquids, foodstuffs	Digestion	DIN EN 16171 (2017-01) DIN EN ISO 17294-2 (2017-01) MB-701 (2019-11)
	Urine	Directly	DIN EN ISO 17294-2 (2017-01) MB-701 (2019-11)
<sup>234</sup> U, <sup>235</sup> U, <sup>236</sup> U, <sup>238</sup> U	Solids, liquids, foodstuffs	Radiochemical separation	MB-315 (2018-05) MB-701 (2019-11)

Valid from: 17.11.2023

Date of issue: 17.11.2023

**Annex to the Partial Accreditation Certificate D-PL-14498-01-04**

Parameter	Matrix	Samle pre-treatment	Method
			DIN EN 16171 (2017-01) DIN EN ISO 17294-2 (2017-01)
<sup>232</sup> Th	Solids, liquids, foodstuffs	Digestion	DIN EN 16171 (2017-01), DIN EN ISO 17294-2 (2017-01)
	Urine	Directly	DIN EN ISO 17294-2 (2017-01)

**List of methods for 2.3.1 to 2.3.5**

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 <i>(Modification: extended by the elements Tc and Ra; for Annex A: Extended by aqueous digestion solutions of solids)</i>	R
DIN EN ISO 9698 (C 13) 2015-12	Water quality – Determination of tritium activity concentration – Liquid scintillation counting method <i>(Modification: used also for non-aqueous liquids without distillation)</i>	R FK
DIN EN 13656 2003-01	Characterisation of waste – Microwave assisted digestion with hydrofluoric (HF), nitric (HNO <sub>3</sub> ) and hydrochloric (HCl) acid mixture for subsequent determination of elements in waste <i>(Modification: also used for determination of radionuclides)</i>	R
DIN EN 16171 2017-01	Sludge, treated biowaste and soil – Determination of trace elements using inductively coupled plasma mass spectrometry (ICP-MS) <i>(Modification: extended by the elements Tc and Ra; extended by the building and construction materials matrices)</i>	R
MB-315 2018-05	Determination of uranium isotope composition and activity concentrations of uranium isotopes	R
MB - 402 2019-11	Determination of radionuclides in solids and liquids by gamma spectrometry	R FK
MB - 403 2018-06	Determination of Pb-210 and radium isotopes (Ra-223, Ra-224, Ra-226 and Ra-228) in aqueous solutions by gamma spectrometry after radiochemical separation	R FK

Valid from: 17.11.2023

Date of issue: 17.11.2023



**Annex to the Partial Accreditation Certificate D-PL-14498-01-04**

MB - 404 2018-06	Determination of Pb-210 and Po-210 in solids and liquids by beta measurements or alpha-spectrometry	R
MB - 406 2015-06	Determination of Th-228, Th-230, Th-232, Th-227 and Ac-227 in liquids and solids by alpha spectrometry after radiochemical separation	R
MB - 408 2018-06	Electrolytic enrichment of tritium	FK
MB - 410 2018-06	Determination of H-3 and C-14 in solids (except metals) by liquid scintillation counting (LSC) after oxidative digestion	R
MB - 411 2018-06	Determination of C-14 in water by liquid scintillation counting (LSC) after oxidative digestion	R
MB - 412 2015-05	Determination of Fe-55 and Ni-63 by liquid scintillation counting (LSC) after radiochemical separation	R
MB - 415 2019-11	Determination of total alpha and beta in drinking water	R
MB - 416 2015-05	Determination of Sr-90 in solids and liquids by liquid scintillation counting (LSC) after radiochemical separation	R
MB - 417 2019-11	Determination of Th-228, Th-230 and Th-232 in faeces by alpha spectrometry after radiochemical separation	R
MB - 418 2019-11	Determination of U-234, U-235 and U-238 in faeces by alpha spectrometry after radiochemical separation	R
MB - 419 2019-11	Determination of Pu-238 and Pu-239/240 in faeces by alpha spectrometry after radiochemical separation	R
MB - 420 2019-11	Determination of Am-241, Am-243 and Cm-242, Cm-244, Cm-246 and Cm-248 in faeces by alpha spectrometry after radiochemical separation	R
MB - 421 2014-09	Determination of Th-228, Th-230 and Th-232 in urine by alpha spectrometry after radiochemical separation	R
MB - 422 2018-06	Determination of U-234, U-235 and U-238 in urine by alpha spectrometry after radiochemical separation	R

Valid from: 17.11.2023

Date of issue: 17.11.2023

Page 9 of 11

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-14498-01-04**

MB - 423 2014-09	Determination of Pu-238 and Pu-239/240 in urine by alpha spectrometry after radiochemical separation	R
MB - 424 2018-06	Determination of Am-241, Am-243 and Cm-242, Cm-244, Cm-246 and Cm-248 in urine by alpha spectrometry after radiochemical separation	R
MB - 426 2019-11	Determination of exchangeable tritium in solids by liquid scintillation counting (LSC) after suspension	R
MB - 427 2019-11	Determination of Pu-238, Pu-239/240, Am-241, Cm-242, Cm-243/244, U-233/234, U-235 and U-238 in liquids and solids by alpha spectrometry after radiochemical separation	R
MB - 428 2015-05	Determination of Pu-241 in liquids and solids by liquid scintillation counting (LSC) after radiochemical separation	R
MB - 429 2018-06	Determination of Cl-36 in liquids and solids by liquid scintillation counting (LSC) after radiochemical separation	R
MB - 433 2015-04	Determination of Ca-41 in solids and liquids by liquid scintillation counting (LSC) after radiochemical separation	R
MB - 701 2019-11	Determination of radionuclides in solids and liquids using alpha spectrometry, gamma spectrometry, liquid scintillation counting (LSC) or mass spectrometry with inductively coupled plasma (ICP-MS) after radiochemical separation (Modular method description including for determination of H-3, C-14, Ca-41, Fe-55, Co-60, Ni-63, Sr-90, Tc-99, Cs-137, U-232, U-234, U-235, U-236, U-238, Np-237, Pu-236, Pu-238, Pu-239/240, Pu-241, Pu-242, Am-241, Am-243, Cm-242 and Cm-243/244)	R FK
BMU-Messanleitung H-Rn-222-TWASS-01 1994-12	Rapid procedure for determining water radon-222 in drinking water	R

Valid from: 17.11.2023

Date of issue: 17.11.2023

Page 10 of 11

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-14498-01-04**

**Abbreviations used:**

DIN	Deutsches Institut für Normung e. V. (German Institute for Standardization)
EN	Europäische Norm (European standard)
IEC	International Electrotechnical Commission
IFA-AM	Institut für Arbeitsschutz der Deutschen Gesetzlichen Unfallversicherung – Arbeitsmappe (Institutions of the German accident insurance system – workbook)
ISO	International Organization for Standardization
FS-78-15-AKU	„Recommendations for monitoring environmental radioactivity“ Publisher: Fachverband für Strahlenschutz e.V. (professional association radiation protection)
MB	Method Description - Labor für Umwelt- und Radionuklidanalytik des VKTA -Strahlenschutz, Analytik & Entsorgung Rossendorf e. V. - In-house specification
BMU-Messanleitung	Procedures manual for monitoring of radioactive substances in the environment and of external radiation Publisher: Federal Ministry of the Environment, Nature Conservation and Nuclear Safety, 1995
VKTA FA	Technical Instruction of VKTA – Radiation Protection, Analytics & Disposal Rossendorf Inc. (VKTA)

Valid from: 17.11.2023

Date of issue: 17.11.2023

**Page 11 of 11**

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