

## Deutsche Akkreditierungsstelle GmbH

**Entrusted according to Section 8 subsection 1 AkkStelleG in connection with Section 1 subsection 1 AkkStelleGBV**

Signatory to the Multilateral Agreements of EA, ILAC and IAF for Mutual Recognition

# Accreditation



The Deutsche Akkreditierungsstelle GmbH attests that the testing laboratory

**Forschungsinstitut für Anorganische Werkstoffe - Glas Keramik GmbH  
Heinrich-Meister-Straße 2, 56203 Höhr-Grenzhausen**

is competent under the terms of DIN EN ISO/IEC 17025:2018 to carry out tests in the following fields:

**mechanical-technological, thermal, physical and chemical testing on selected inorganic nonmetallic products and raw materials;  
physical, physico-chemical and chemical testing on water, aqueous solutions and eluates**

The accreditation certificate shall only apply in connection with the notice of accreditation of 10.03.2021 with the accreditation number D-PL-18634-01. It comprises the cover sheet, the reverse side of the cover sheet and the following annex with a total of 10 pages.


Registration number of the certificate: **D-PL-18634-01-00**

Frankfurt am Main,  
10.03.2021

Dipl.-Ing. (FH) Ralf Egner  
Head of Division

Translation issued:  
20.05.2021

Head of Division



*The certificate together with the annex reflects the status as indicated by the date of issue.  
The current status of any given scope of accreditation may be found respectively in the database of accredited bodies of Deutsche Akkreditierungsstelle GmbH <https://www.dakks.de/en/content/accredited-bodies-dakks>.*

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

See notes overleaf.

# Deutsche Akkreditierungsstelle GmbH

Standort Berlin  
Spittelmarkt 10  
10117 Berlin

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

Standort Braunschweig  
Bundesallee 100  
38116 Braunschweig

The publication of extracts of the accreditation certificate is subject to the prior written approval by Deutsche Akkreditierungsstelle GmbH (DAkKS). Exempted is the unchanged form of separate disseminations of the cover sheet by the conformity assessment body mentioned overleaf.

No impression shall be made that the accreditation also extends to fields beyond the scope of accreditation attested by DAkKS.

The accreditation was granted pursuant to the Act on the Accreditation Body (AkkStelleG) and the Regulation (EC) No 765/2008 of the European Parliament and of the Council setting out the requirements for accreditation and market surveillance relating to the marketing of products. 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 signatories to these agreements recognise each other's accreditations.

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

EA: [www.european-accreditation.org](http://www.european-accreditation.org)

ILAC: [www.ilac.org](http://www.ilac.org)

IAF: [www.iaf.nu](http://www.iaf.nu)

# Deutsche Akkreditierungsstelle GmbH

## Annex to the Accreditation Certificate D-PL-18634-01-00 according to DIN EN ISO/IEC 17025:2018

Valid from: 10.03.2021

Date of issue: 20.05.2021

Holder of certificate:

**Forschungsinstitut für Anorganische Werkstoffe - Glas Keramik GmbH  
Heinrich-Meister-Straße 2, 56203 Höhr-Grenzhausen**

Tests in the fields:

**mechanical-technological, thermal, physical and chemical testing on selected inorganic nonmetallic products and raw materials;  
physical, physico-chemical and chemical testing on water, aqueous solutions and eluates**

**The testing laboratory is permitted, without being required to inform and obtain prior approval from DAkkS, to use standards or equivalent testing methods listed here with different issue dates. The testing laboratory maintains a current list of all testing methods within the flexible scope of accreditation.**

**In house method of the Forschungsinstitut für Anorganische Werkstoffe - Glas/Keramik - GmbH marked with „FGK\_AV“ are excluded of the flexible Scope; only the listed issue dates in this annex are part of the accreditation scope.**

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

*The certificate together with the annex reflects the status as indicated by the date of issue. The current status of any given scope of accreditation may be found respectively in the database of accredited bodies of Deutsche Akkreditierungsstelle GmbH <https://www.dakks.de/en/content/accredited-bodies-dakks>.*

Abbreviations used: see last page

Page 1 of 10

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

## 1 Testing on ceramic products and raw materials

### 1.1 Mechanical-technological tests

|                                |   |
|--------------------------------|---|
| DIN EN ISO 10545-2<br>2019-01  | Ceramic tiles - Part 2: Determination of dimensions and surface quality   |
| DIN EN ISO 10545-6<br>2012-05  | Ceramic tiles - Part 6: Determination of resistance to deep abrasion for unglazed tiles   |
| DIN EN ISO 10545-7<br>1999-03  | Ceramic tiles - Part 7: Determination of resistance to surface abrasion for glazed tiles  |
| DIN EN ISO 10545-11<br>1996-09 | Ceramic tiles - Part 11: Determination of crazing resistance for glaze tiles  |
| DIN EN ISO 13383-1<br>2016-11  | Fine ceramics (advanced ceramics, advanced technical ceramics) - Microstructural characterization - Part 1: Determination of grain size and size distribution   |
| DIN EN 843-1<br>2008-08        | Advanced technical ceramics - Mechanical properties of monolithic ceramics at room temperature - Part 1: Determination of flexural strength   |
| DIN EN 843-2<br>2007-03        | Advanced technical ceramics - Mechanical properties of monolithic ceramics at room temperature - Part 2: Determination of Young's modulus, shear modulus and Poisson's ratio<br>(here only: <i>determination of Young's modulus according to method A.1</i> ) |
| DIN EN 843-4<br>2005-08        | Advanced technical ceramics - Mechanical properties of monolithic ceramics at room temperature - Part 4: Vickers, Knoop and Rockwell superficial hardness<br>(here only: <i>Vickers superficial hardness</i> )  |
| DIN EN 12875-1<br>2005-08      | Mechanical dishwashing resistance of utensils - Part 1: Reference test method for domestic articles   |
| DIN EN 12875-2<br>2002-03      | Mechanical dishwashing resistance of utensils - Part 2: Inspection of non-metallic articles   |
| DIN EN 12875-4<br>2006-06      | Mechanical dishwashing resistance of utensils - Part 2: Inspection of non-metallic articles   |

Valid from: 10.03.2021  
Date of issue: 20.05.2021

**Annex to the accreditation certificate D-PL-18634-01-00**

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|---|---|
| DIN EN 12875-5<br>2006-06                         | Mechanical dishwashing resistance of utensils - Part 5: Rapid test for ceramic catering articles  |
| DIN EN 13310<br>2019-02                           | Kitchen sinks - Functional requirements and test methods<br>(here only: <i>Chapter 5.6 Resistance to scratching,</i><br><i>Chapter 5.7 Resistance to abrasion</i> ) |
| DIN EN 14231<br>2003-07                           | Natural stone test methods - Determination of the slip resistance by means of the pendulum tester   |
| DIN EN 15771<br>2010-07                           | Vitreous and porcelain enamels - Determination of surface scratch hardness according to the Mohs scale  |
| DIN CEN/TS 16165<br>DIN SPEC 51132<br>2016-12     | Determination of slip resistance of pedestrian surfaces - Methods of evaluation   |
| BS 7976-2<br>2002-08-20 +<br>A1:2013              | Pendulum testers. Part 2: Method of operation   |
| BS 7976-3<br>2002-08-20 +<br>A1:2013              | Pendulum testers. Part 3: Method of calibration   |
| DIN 51097<br>1992-11                              | Testing of floor coverings - Determination of the anti-slip properties - Wet-loaded barefoot areas - Walking method - Ramp test                                     |
| DIN 51130<br>2014-02                              | Testing of floor coverings - Determination of the anti-slip property - Workrooms and fields of activities with slip danger - Walking method - Ramp test             |
| DIN 51131<br>2014-02                              | Testing of floor coverings - Determination of the anti-slip property - Method for measurement of the sliding friction coefficient                                   |
| FGK-AV-TBF<br>2006-05                             | Determination of dry bending strength, testing of ceramic raw materials   |
| FGK-AV Reinigungsverhalten von Fliesen<br>2018-03 | Application-technological investigation of the cleaning behaviour of tile surfaces  |

Valid from: 10.03.2021  
Date of issue: 20.05.2021

## 1.2 Thermal tests

|                                |  |
|--------------------------------|--|
| DIN EN ISO 6872<br>2019-01     | Dentistry - Ceramic materials<br>(here only: <i>Chapter 7.4 Linear thermal expansion coefficient,<br/>Chapter 7.5 Glass transition temperature</i> )   |
| DIN EN ISO 7459<br>2004-05     | Glass containers - Thermal shock resistance and thermal shock<br>endurance - Test methods  |
| DIN EN ISO 10545-8<br>2014-09  | Ceramic tiles - Part 8: Determination of linear thermal<br>expansion   |
| DIN EN ISO 10545-9<br>2013-12  | Ceramic tiles - Part 9: Determination of resistance to thermal shock   |
| DIN EN ISO 10545-10<br>1997-12 | Ceramic tiles - Part 10: Determination of moisture expansion   |
| DIN EN 13310<br>2019-02        | Kitchen sinks - Functional requirements and test methods<br>(here only: Chapter 5.3 Dry heat resistance)   |
| DIN EN 15284<br>2007-07        | Materials and articles in contact with food stuffs - Test method for<br>the resistance to microwave heating of ceramic, glass, glass-<br>ceramic or plastic cookware                                     |
| DIN 51006<br>2005-07           | Thermal analysis (TA) - Thermogravimetry (TG) - Principles   |
| DIN 51007<br>2019-04           | Thermal analysis - Differential thermal analysis (DTA) and<br>differential scanning calorimetry (DSC) - General Principles<br>(here without: <i>Chapter 8 Purity determination of eutectic systems</i> ) |
| DIN 51045-1<br>2005-08         | Determination of the thermal expansion of solids - Part 1: Basic<br>rules  |
| DIN 51045-2<br>2009-04         | Determination of linear thermal expansion of solids - Part 2:<br>Testing of fired fine ceramic materials using the dilatometer<br>method   |
| DIN 51045-3<br>2009-04         | Determination of linear thermal expansion of solids - Part 3:<br>Testing of non-fired fine ceramic materials using the<br>dilatometer method   |

Annex to the accreditation certificate D-PL-18634-01-00

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| DIN 51045-4<br>2007-01                               | Determination of linear change of solids by thermal effect using the dilatometer method - Part 4: Testing of fired heavy ceramic materials     |
| DIN 51045-5<br>2007-01                               | Determination of linear change of solids by thermal effect using the dilatometer method - Part 5: Testing of non-fired heavy ceramic materials |
| DIN 51068<br>2008-11                                 | Testing of ceramic raw and basic materials - Determination of resistance to thermal shock - Water quenching method for refractory bricks       |
| DIN 51730<br>2007-09                                 | Testing of solid fuels - Determination of fusibility of fuel ash   |
| FGK-AV Reinigungsverhalten<br>von Fliesen<br>2018-03 | Determination of moisture expansion using a dilatometer  |

**1.3 Physical tests**

|                                |   |
|--------------------------------|---|
| DIN EN ISO 6872<br>2019-01     | Dentistry - Ceramic materials<br>(here only: <i>Chapter 7.3.1 Three-point- and four-point bending tests</i> )   |
| DIN EN ISO 10545-3<br>2018-06  | Ceramic tiles - Part 3: Determination of water absorption, apparent porosity, apparent relative density and bulk density  |
| DIN EN ISO 10545-16<br>2012-05 | Ceramic tiles - Part 16: Determination of small colour differences  |
| DIN EN ISO 18757<br>2006-01    | Fine ceramics (advanced ceramics, advanced technical ceramics) - Determination of specific surface area of ceramic powders by gas adsorption using the BET method |
| DIN ISO 9277<br>2014-01        | Determination of the specific surface area of solids by gas adsorption - BET method   |
| ISO 18754<br>2013-03           | Fine ceramics (advanced ceramics, advanced technical ceramics) - Determination of density and apparent porosity   |
| DIN EN 623-2<br>1993-11        | Advanced technical ceramics - monolithic ceramics - General and textural properties - Part 2: determination of density and porosity                               |

Valid from: 10.03.2021  
Date of issue: 20.05.2021

|                           |   |
|---------------------------|---|
| DIN EN 725-5<br>2007-04   | Advanced technical ceramics - Methods of test for ceramic powders - Part 5: Determination of the particle size distribution   |
| DIN EN 993-1<br>2019-03   | Methods of test for dense shaped refractory products - Part 1: Determination of bulk density, apparent porosity and true porosity   |
| DIN EN 1183<br>1997-08    | Materials and articles in contact with foodstuffs - Test methods for thermal shock endurance  |
| DIN EN 1184<br>1997-08    | Materials and articles in contact with foodstuffs - Test methods for translucency of ceramic articles   |
| DIN EN 1217<br>1998-01    | Materials and articles in contact with foodstuffs - Test methods for water absorption of ceramic articles   |
| DIN EN 12980<br>2015-02   | Materials and articles in contact with foodstuffs - Non-metallic articles for catering and industrial use - Method of test for the determination of impact resistance         |
| DIN EN 13258<br>2003-07   | Materials and articles in contact with foodstuffs - Test methods for crazing resistance of ceramic articles   |
| DIN EN 13925-2<br>2003-07 | Non-destructive testing - X-ray diffraction from polycrystalline and amorphous material - Part 2: Procedures  |
| DIN 53019-1<br>2008-09    | Viscometry - Measurement of viscosities and flow curves by means of rotational viscometers - Part 1: Principles and measuring geometry<br>(here only: <i>Chapter 8</i> )      |
| DIN 53019-2<br>2001-02    | Viscometry - Measurement of viscosities and flow curves by means of rotation viscometers - Part 2: Viscometer calibration and determination of the uncertainty of measurement |
| DIN 66133<br>1993-06      | Determination of pore volume distribution and specific surface area of solids by mercury intrusion<br>( <i>withdrawn standard</i> )   |
| DIN 66165-2<br>2016-08    | Particle size analysis - Sieving analysis - Part 2: Procedure   |

FGK-AV Heliumpycnometer  
2017-10

Determination of true and bulk density using a Helium  
pycnometer

#### 1.4 Chemical tests

DIN EN ISO 4531  
2018-12

Vitreous and porcelain enamels - Release from enamelled  
articles in contact with food - Methods of test and limits

DIN EN ISO 6872  
2019-01

Dentistry - Ceramic materials  
(here only: *Chapter 7.6 Chemical solubility*)

DIN EN ISO 10545-13  
2017-04

Ceramic tiles - Part 13: Determination of chemical resistance

DIN EN ISO 10545-14  
2016-02

Ceramic tiles - Part 14: Determination of resistance to stains

DIN EN ISO 10545-15  
1997-12

Ceramic tiles - Part 15: Determination of lead and cadmium -given  
off by glazed tiles

DIN EN ISO 13356  
2011-08

Implants for surgery - Ceramic materials based on yttria-stabilized  
tetragonal zirconia (Y-TZP)  
(here only: *Chapter 4.3 Chemical Composition*)

DIN EN ISO 28706-1  
2011-08

Vitreous and porcelain enamels - Determination of resistance to  
chemical corrosion - Part 1: Determination of resistance to  
chemical corrosion by acids at room temperature

DIN EN ISO 28706-2  
2017-07

Vitreous and porcelain enamels - Determination of resistance to  
chemical corrosion - Part 2: Determination of resistance to  
chemical corrosion by boiling acids, boiling neutral liquids,  
alkaline liquids and/or their vapours  
(here only: *Chapter 11 Boiling citric acid,*  
*Chapter 12 Boiling sulfuric acid,*  
*Chapter 14 Boiling distilled or demineralized water,*  
*Chapter 15 Standard detergent solution*)

DIN EN ISO 28706-3  
2018-04

Vitreous and porcelain enamels - Determination of resistance  
to chemical corrosion - Part 3: Determination of resistance to  
chemical corrosion by alkaline liquids using a hexagonal vessel  
or a tetragonal glass bottle

Annex to the accreditation certificate D-PL-18634-01-00

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| DIN EN ISO 28706-4<br>2016-07        | Vitreous and porcelain enamels - Determination of resistance to chemical corrosion - Part 4: Determination of resistance to chemical corrosion by alkaline liquids using a cylindrical vessel  |
| ISO 10694<br>1995-03                 | Soil quality - Determination of organic and total carbon after dry combustion (elementary analysis)  |
| DIN EN 993-16<br>1995-09             | Dense shaped refractory products - Methods of test - Part 16: Determination of resistance to sulphuric acid  |
| DIN EN 1388-1<br>1995-11             | Materials and articles in contact with foodstuffs - Silicate surfaces - Part 1: Determination of the release of lead and cadmium from ceramic ware   |
| DIN EN 1388-2<br>1995-11             | Materials and articles in contact with foodstuffs - Silicate surfaces - Part 2: Determination of the release of lead and cadmium from silicate surfaces other than ceramic ware  |
| DIN EN 13310<br>2019-02              | Kitchen sinks - Functional requirements and test methods<br>(here only: <i>Chapter 5.5 Resistance to chemicals and staining agents</i> )   |
| DIN 51001<br>2003-08                 | Testing of oxidic raw materials and basic materials - General bases of work for X-ray fluorescence method (XRF)  |
| DIN 51001<br>Supplement 1<br>2010-05 | Testing of oxidic raw materials and basic materials - General bases of work for X-Ray fluorescence method (XRF) - General survey on disintegration methods referred to groups of materials for the determination of test specimens for XRF |
| DIN 51081<br>2002-12                 | Testing of oxidic raw materials and materials - Determination of change in mass on ignition  |
| DIN 51084<br>2008-11                 | Testing of oxidic raw and basic materials for ceramic, glass and glazes - Determination of fluoride content  |
| DIN 51085<br>2015-01                 | Testing of oxidic raw and basic materials - Determination of total sulphur content   |

|   |   |
|---|---|
| DIN 51086-2<br>2004-07  | Testing of oxidic raw materials and materials for ceramics, glass and glazes - Part 2: Determination of Ag, As, B, Ba, Be, Bi, Ca, Cd, Ce, Co, Cr, Cu, Er, Eu, Fe, La, Mg, Mn, Mo, Nd, Ni, P, Pb, Pr, S, Sb, Se, Sn, Sr, Ti, V, W, Y, Yb, Zn, Zr by optical emission spectrometry with inductively coupled plasma (ICP OES) |
| FGK-AV Blei- und Cadmiumbestimmung im Na <sub>2</sub> CO <sub>3</sub> -Schmelzaufschluss<br>2017-12 | Determination of lead and cadmium by means of ICP-OES in digests based on DIN EN ISO 21078-1  |
| FGK-AV Borbestimmung im Na <sub>2</sub> O <sub>2</sub> /NaOH-Schmelzaufschluss<br>2014-07           | Determination of boron by means of ICP-OES in digests based on DIN 51086-1, method II   |
| FGK-AV Cu-KAK<br>2014-07  | Determination of cation exchange capacity of clayey raw materials using the Cu-Triethylenetetramine complex method  |
| FGK-AV Glühverlust<br>2012-12   | Determination of loss on ignition (LOI) at 1050 °C  |
| FGK-AV Lithiumbestimmung im Na <sub>2</sub> CO <sub>3</sub> - Schmelzaufschluss<br>2017-12          | Determination of lithium by means of ICP-OES in digests based on DIN EN ISO 21078-1   |
| FGK-AV Lithiumbestimmung im Na <sub>2</sub> O <sub>2</sub> _NaOH-Schmelzaufschluss<br>2017-12       | Determination of lithium by means of ICP-OES in Na <sub>2</sub> O <sub>2</sub> /NaOH digests based on DIN 51086-1, method II  |
| FGK-AV-ZrO <sub>2</sub><br>2017-09  | Determination of Al <sub>2</sub> O <sub>3</sub> , CaO, Fe <sub>2</sub> O <sub>3</sub> , HfO <sub>2</sub> , MgO, SrO, TiO <sub>2</sub> , and Y <sub>2</sub> O <sub>3</sub> in ZrO <sub>2</sub> by means of standard addition and ICP-OES   |

## 2 Physical, physico-chemical and chemical testing on water, aqueous solutions and eluates

|                               |  |
|-------------------------------|--|
| DIN EN ISO 10304-1<br>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 |
| DIN EN ISO 10523<br>2012-04   | Water quality - Determination of pH  |

**Annex to the accreditation certificate D-PL-18634-01-00**

|                               |   |
|-------------------------------|---|
| DIN EN ISO 11885<br>2009-09   | Water quality - Determination of selected elements by inductively coupled plasma optical emission spectrometry (ICP-OES)  |
| DIN EN ISO 17294-1<br>2007-02 | Water quality - Application of inductively coupled plasma mass spectrometry (ICP-MS) - Part 1: General guidelines   |
| DIN EN ISO 17294-2<br>2017-01 | Water quality - Application of inductively coupled plasma mass spectrometry (ICP-MS) - Part 2: Determination of selected elements including uranium isotopes<br>(here without: <i>determination of Uranium isotopes</i> )   |
| DIN EN ISO 17294-2<br>2017-01 | Water quality - Application of inductively coupled plasma mass spectrometry (ICP-MS) - Part 2: Determination of selected elements including uranium isotopes<br>(here only: <i>deviating matrix: 3 and 4 per cent acetic acid (without determination of Uranium isotopes)</i> ) |
| DIN EN 27888<br>1993-11       | Water quality - Determination of electrical conductivity  |
| DIN 38404-4<br>1976-12        | German Standard Methods for Analysing of Water, Waste Water and Sludge - Physical and Physical-chemical Parameters (Group C) - Determination of Temperature (C4)  |
| DIN 38409-6<br>1986-01        | German standard methods for the examination of water, waste water and sludge - summary indices of actions and substances (group H) - water hardness (H 6)   |

**Abbreviations used:**

|        |   |
|--------|---|
| BS     | British Standard  |
| DIN    | German Institute for Standardization  |
| EN     | European Standard   |
| IEC    | International Electrotechnical Commission   |
| ISO    | International Organization for Standardization  |
| FGK-AV | In house method of the Forschungsinstitut für Anorganische Werkstoffe - Glas/Keramik - GmbH |