SCHOTT

Accredited Testing Laboratories SCHOTT

Complete list of all accredited testing methods in the flexible scope according to the conformity assessment body D-PL-14645-01-00

The testing laboratory hereby publishes the list of all testing methods in the flexible scope of accreditation of the CAB with reference to
Working area FB 2.3 Material Testing and Materials Technology (destructive testing),
Partial certificate annex D-PL-14645-01-02

Coding:	01_LIST_00003 (Excerpt)
Version:	18.0
Issue date:	2026-08-18

Newly introduced procedures according to category A, B or C as well as changes are marked in **green**.

Within the marked test scopes, the testing laboratory is permitted to do the following without having to inform and obtain prior approval from DAkkS:

[Flex A] The extension of the scope of accreditation by standardized or equivalent test methods with different issue dates within a defined testing scope.

[Flex B] Includes category A as well as the extension of the scope of accreditation by standardized or equivalent test methods within a defined test scope. Category B includes - where applicable - new specifications for test objects, provided that these can be determined using the procedure within the test scope.

[Flex C] Includes categories A and B as well as the extension of the scope of accreditation by modified as well as further and newly developed test methods (e.g. in-house procedures) within a defined test area.

The original complete certificate and the partial certificates issued by DAkkS for the above-mentioned conformity assessment body can be found at www.dakks.de, Accredited Bodies, D-PL-14645-01-00.
The testing procedures listed there are exemplary.

Certificate holder of the partial certificate annex:

SCHOTT AG
Hattenbergstraße 10, 55122 Mainz

The test procedures are identified by the symbols of the locations listed below, where they are performed:

MZ-HS = Mainz, Hattenbergstr. MZ-OS = Mainz, Otto-Schott-Str. DY-YA = Duryea, York Ave

Tests are carried out in the following working areas:

Testing of the chemical resistance of glasses, glass-ceramics, pharmaceutical packaging materials, decorations on glasses or glass-ceramics and other materials;
Determination of the physical properties (thermal, thermodynamic, elastic, electrical, optical and surface properties) of glasses, glass-ceramics, ceramics and composite materials, as well as the calculation of the parameters derived from these measured variables;
Qualitative and quantitative analysis of element depth profiles in glasses, glass-ceramics, ceramics and thin films;
High-resolution imaging of glasses, glass-ceramics, powders, metals, surfaces, layers and fracture surfaces;
Examination of glasses, glass articles and mold tools, e.g. as part of defect and damage analysis;
Determination of geometric parameters (e.g. pore sizes, particle sizes, layer thicknesses, roughness);

Determination of solid defects in glasses and glass-ceramics in/on surfaces, e.g. for glass defect diagnosis;
Corrosion, leaching and hydration tests;
Strength tests and fracture analysis (fractography) on glasses, glass-ceramics, plastics and composite materials (material and product properties);
Determination of the volume content of gaseous substances in inclusions of oxidic materials such as glasses and glass-ceramics;

Locations:

SCHOTT AG
Accredited Testing Laboratories SCHOTT
Hattenbergstraße 10, 55122 Mainz

SCHOTT AG
Accredited Testing Laboratories SCHOTT
Otto-Schott-Straße 2, 55127 Mainz

SCHOTT AG
Accredited Testing Laboratories SCHOTT
400 York Ave, Duryea/PA 18642 USA

The testing laboratory meets the requirements of DIN EN ISO/IEC 17025:2018 for performing the conformity assessment activities listed in this annex. The testing laboratory fulfills any additional legal and normative requirements, including those in relevant sectoral programs, provided that these are expressly confirmed below.

The requirements for the management system are written in the relevant language and are fully compliant with the principles of DIN EN ISO 9001.

Contents

1 Determination of the chemical resistance of glasses, glass ceramics, decorations on glasses or glass ceramics and other materials 5

1.1 Determination of resistance to liquid media - Mass loss and/or time needed for defined removal in µm by differential weighing and visual inspection [Flex C] 5

1.2 Staining, Color and Gloss changes, Abrasion Resistance - Visual Inspection [Flex C] 6

2 Thermal Characterization of glasses, glass ceramics, ceramics, sinter glasses, composites with glass or glass ceramic as well as raw materials of glass industry 6

2.1 Testing of thermal expansion (static, dynamic) of glasses, glass ceramics and plastics by inductive and optical methods for a temperature range of -180°C to 1300°C [Flex C] 6

2.2 Determination of viscosity of glasses for a viscosity range of 100-5 x 1013 dPa s [Flex C] 7

2.3 Determination of the rheological parameters of solids, slurries and highly viscous liquids [Flex C] 7

2.4 Determination of the density of glasses, glass ceramics, ceramics and other materials [Flex B] ... 8

2.5 Thermal analysis (differential thermal analysis (DTA), differential scanning calorimetry (DSC) and calorimetry (specific heat)) on glasses, glass ceramics, ceramics and raw materials (powders) [Flex C] 8

2.6 Determination of the thermal diffusity of solids by flash method and calculation of the thermal conductivity [Flex B] 8

2.7 Determination of seal stress in glass by polarization microscopy [Flex A] 8

2.8 Determination of crystallization properties of glasses by gradient furnace method [Flex C] 9

2.9 Determination of Young`s Modulus, Shear Modulus and Poisson`s constant of glass, glass ceramic and ceramic by resonance method [Flex C] 9

3 Electrical characterization of glasses, glass-ceramics, ceramics and other materials 9

3.1 Determination of the electrical contact resistance of glasses, glass-ceramics, ceramics and other materials [Flex C] 9

3.2 Determination of dielectric properties of glasses, glass ceramics, ceramics and other materials in the GHz range [Flex A] 10

4 Optical characterization of glasses, glass ceramics, ceramics, sintered glasses, composites with glass or glass ceramics as well as raw materials of the glass industry 10

4.1 Determination of transmission, reflection, remission, scattered light/haze, solarization, spectral color measurement, refractive index and dispersion, fluorescence of glasses, glass ceramics, liquids by spectroscopy [Flex C] 10

4.2 Ellipsometric characterization of coatings and uncoated materials [Flex B] 11

4.3 Stress measurements and stress-optical coefficient [Flex C] 11

5 Characterization of glasses, glass ceramics, ceramics, metals, plastics and composite materials in micro and surface area 11

5.1 by Scanning Electron Microscopy/Energy Dispersive X-ray spectroscopy (SEM/EDX) [Flex C] 11

5.2 by topographic methods (WLI, AFM, Laser-Interferometry) [Flex C] 11

5.3 by Light Microscopy [Flex C] 12
5.4 by Time-of-Flight-Secondary Ion Mass Spectrometry (ToF-SIMS) [Flex C] 12
5.5 by Vibrational Spectroscopy [Flex A] 12
6 Strength tests on glases, glass ceramics, plastics and composites, Determination of material and product properties by pressure and tensile tests [Flex C] 12
7 Fracture analysis (fractography) on glasses, glass ceramics, ceramics and plastics by light microscopic methods [Flex C] 13
8 Determination of the volume fractions of gaseous substances in inclusions of glasses, glass ceramics, oxide materials and stones by mass spectrometry and Raman spectroscopy [Flex C] 13

Laboratory location Otto-Schott-Straße 2, 55127 Mainz

1 Determination of the chemical resistance of glasses, glass ceramics, decorations on glasses or glass ceramics and other materials

1.1 Determination of resistance to liquid media - Mass loss and/or time needed for defined removal in µm by differential weighing and visual inspection [Flex C]

ISO 8424 2023-07	Raw optical glass - Resistance to attack by aqueous acidic solutions - Test method and classification	MZ-OS
ISO 9689 2025-09	Raw optical glass - Testing of the resistance to attack by aqueous alkaline phosphate-containing solutions at 50°C - Testing and classification	MZ-OS
ISO 10629 1996-07	Raw optical glass - Resistance to attack by aqueous alkaline solutions at 50°C - Test method and classification	MZ-OS
ISO 695 1991-05	Glass; resistance to attack by a boiling aqueous solution of mixed alkali; method of test and classification	MZ-OS
DIN 12116 2001-03	Testing of glass - Resistance to attack by a boiling aqueous solution of hydrochloric acid - Method of test and classification	MZ-OS
JOGIS 2007-03	Japanese Optical Glass Industrial Standards - Measuring Method for Chemical Durability of Optical Glass (Powder Method)	MZ-OS
YBB00342004-2015 2015-00	Test for Resistance to Attack of Glass by Boiling Hydrochloric Acid	MZ-OS
YBB00352004-2015 2015-00	Test for Resistance to Attack of Glass by Boiling Aqueous Solution of Mixed Alkali	MZ-OS
01_SOP_00472 2025-08	Determination of the chemical resistance of glasses, glass ceramics and other materials after chemical stresses by differential weighing and visual inspection	MZ-OS

1.2 Staining, Color and Gloss changes, Abrasion Resistance - Visual Inspection [Flex C]

USP <211> 2023-06	Arsenic <211> Method I	MZ-OS
01_SOP_00476 2025-08	Determination of staining, color and gloss changes, abrasion resistence of glasses, glass ceramics and other materials after chemical stresses by visual inspection	MZ-OS

2 Thermal Characterization of glasses, glass ceramics, ceramics, sinter glasses, composites with glass or glass ceramic as well as raw materials of glass industry

2.1 Testing of thermal expansion (static, dynamic) of glasses, glass ceramics and plastics by inductive and optical methods for a temperature range of -180°C to 1300°C [Flex C]

DIN 51045-1 2005-08	Determination of the thermal expansion of solids - Part 1: Basic rules	MZ-HS MZ-OS
ISO 7991 1987-12	Glass - Determination of coefficient of mean linear thermal expansion	MZ-HS MZ-OS
YBB00202003-2015 2015-00	Test for Coefficient of Mean Linear Thermal Expansion	MZ-OS
01_SOP_00470 2025-07	Determination of the static and dynamic thermal expansion behaviour of solids by dilatometry and thermomechanical analysis	MZ-HS MZ-OS
01_SOP_00469 2025-07	Determination of the compaction of glasses and glass ceramics by length comparison measurement	MZ-OS

2.2 Determination of viscosity of glasses for a viscosity range of 10^0-5 x 10^{13} dPa s [Flex C]

ISO 7884-1 1987-12	Glass - Viscosity and viscometric fixed points; Part 1: Principles for determining viscosity and viscometric fixed points	MZ-OS
ISO 7884-2 1987-12	Glass - Viscosity and viscometric fixed points; Part 2: Determination of viscosity by rotation viscometers	MZ-OS
ISO 7884-3 1987-12	Glass - Viscosity and viscometric fixed points; Part 3: Determination of viscosity by fibre elongation viscometer	MZ-OS
ISO 7884-4 1987-12	Glass - Viscosity and viscometric fixed points; Part 4: Determination of viscosity by beam bending	MZ-OS
ISO 7884-7 1987-12	Glass - Viscosity and viscometric fixed points; Part 7 : Determination of annealing point and strain point by beam bending	MZ-OS
ISO 7884-8 1987-12	Glass - Viscosity and viscometric fixed points; Part 8: Determination of (dilatometric) transformation temperature	MZ-OS
01_SOP_00471 2025-07	Determination of the viscosity properties of glasses by beam bending, fibre elongation and rotation viscosimeters as well as dilatometric transformation temperature	MZ-OS

2.3 Determination of the rheological parameters of solids, slurries and highly viscous liquids [Flex C]

01_SOP_00671 2025-08	Determination of rheological and mechanical properties of solids, liquids, and suspensions using rheometric measurement methods	MZ-OS
01_SOP_00715 2025-08	Determination of rheological parameters in suspensions and liquids using rheometric measurement methods	MZ-OS

2.4 Determination of the density of glasses, glass ceramics, ceramics and other materials [Flex B]

ISO 2781 2018-06	Rubber, vulcanized or thermoplastic – Determination of density	MZ-OS
ASTM C 693 2024	Standard Test Method for Density of Glass by Buoyancy (Modification: Use of a surfactant additive as well as smaller sample mass)	MZ-OS

2.5 Thermal analysis (differential thermal analysis (DTA), differential scanning calorimetry (DSC) and calorimetry (specific heat)) on glasses, glass ceramics, ceramics and raw materials (powders) [Flex C]

DIN 51006 2024-02	Thermal analysis (TA) - Thermogravimetry (TG) - Principles	MZ-OS
DIN 51007-1 2024-08	Thermal analysis - Differential thermal analysis (DTA) and differential scanning calorimetry (DSC) - General Principles	MZ-OS
01_SOP_00156 2025-06	Determination of the true and average specific heat capacity of solids by calorimetric methods	MZ-OS

2.6 Determination of the thermal diffusity of solids by flash method and calculation of the thermal conductivity [Flex B]

ASTM E 1461 2013	Standard Test Method for Thermal Diffusivity by the Flash Method	MZ-OS

2.7 Determination of seal stress in glass by polarization microscopy [Flex A]

ISO 4790 1992-05	Glass-to-glass sealings; determination of stresses	MZ-OS

2.8 Determination of crystallization properties of glasses by gradient furnace method [Flex C]

ASTM C 829 1981	Standard Practices for Measurement of Liquidus Temperature of Glass by the Gradient Furnace Method	MZ-OS
01_SOP_00486 2025-07	Determination of the crystallization properties of glasses and glass ceramics by the gradient furnace method	MZ-OS

2.9 Determination of Young`s Modulus, Shear Modulus and Poisson`s constant of glass, glass ceramic and ceramic by resonance method [Flex C]

ASTM C 1259 2021	Standard Test Method for Dynamic Youngs Modulus, Shear Modulus, and Poissons Ratio for Advanced Ceramics by Impulse Excitation of Vibration	MZ-OS
01_SOP_00502 2025-07	Determination of the dynamic Young`s modulus, shear modulus and Poisson`s coefficient of glasses, glass ceramics, ceramics and metals by impulse excitation of vibrations	MZ-OS

3 Electrical characterization of glasses, glass-ceramics, ceramics and other materials

3.1 Determination of the electrical contact resistance of glasses, glass-ceramics, ceramics and other materials [Flex C]

DIN 52326 1986-05	Testing of glass; determination of electrical resistivity	MZ-OS
01_SOP_00511 2025-07	Determination of the specific electric volume resistance of glasses and glass ceramics by current and voltage measurements	MZ-OS

3.2 Determination of dielectric properties of glasses, glass ceramics, ceramics and other materials in the GHz range [Flex A]

IEC 61189-2-721 2015-04	Test methods for electrical materials, printed boards and other interconnection structures and assemblies – Part 2-721: Test methods for materials for interconnection structures – Measurement of relative permittivity and loss tangent for copper clad laminate at microwave frequency using split post dielectric resonator	MZ-OS

4 Optical characterization of glasses, glass ceramics, ceramics, sintered glasses, composites with glass or glass ceramics as well as raw materials of the glass industry

4.1 Determination of transmission, reflection, remission, scattered light/haze, solarization, spectral color measurement, refractive index and dispersion, fluorescence of glasses, glass ceramics, liquids by spectroscopy [Flex C]

ISO 15368 2021-03	Optics and optical instruments - Measurement of reflectance of plane surfaces and transmittance of plane parallel elements	MZ-HS MZ-OS
01_SOP_00487 2025-08	Determination of the spectral transmission, remission, reflection, scattering, color value and solarization of solids, especially glasses and glass ceramics, plastics and liquids by optical spectroscopy	MZ-HS MZ-OS
01_SOP_00488 2025-08	Determination of the refractive index and dispersion of glasses, glass ceramics, plastics and solids by prism coupler method	MZ-OS
01_SOP_00490 2025-08	Determination of the spectral fluorescence properties, decay time and quantum yield of glasses, glass ceramics, solids and liquids by fluorescence spectroscopy	MZ-OS
01_SOP_00510 2025-07	Determination of the refractive index and dispersion of glasses with standard and/or precision accuracy by optical refractography	MZ-HS
Anal. Chem. 2010, 82, p. 2129-2133 2010-00	Recommendations for Fluorescence Instrument qualification: The new ASTM Standard Guide	MZ-OS

4.2 Ellipsometric characterization of coatings and uncoated materials [Flex B]

DIN EN ISO 23131 2023-01	Ellipsometry - Principles	MZ-OS

4.3 Stress measurements and stress-optical coefficient [Flex C]

ASTM C 770 2016	Standard Test Method for Measurement of Glass Stress - Optical Coefficient	MZ-OS
ASTM C 1422/ C1422 M 2020a	Standard Specification for Chemically Strengthened Flat Glass	MZ-OS
01_SOP_00509 2025-07	Determination of mechanical tensions, birefringence and the stress-optical coefficient of transparent solids by polarization-optical measurement methods	MZ-OS

5 Characterization of glasses, glass ceramics, ceramics, metals, plastics and composite materials in micro and surface area

5.1 by Scanning Electron Microscopy/Energy Dispersive X-ray spectroscopy (SEM/EDX) [Flex C]

ISO 22309 2011-10	Microbeam analysis – Quantitative analysis using energy-dispersive spectrometry (EDS) for elements with an atomic number of 11 (Na) or above	MZ-OS DY-YA
01_SOP_00491 2025-12	High-resolution morphological surface characterization on glasses, glass ceramics, ceramics, metals, solid and composite materials by SEM as well as qualitative and quantitative analysis of surface composition by EDX	MZ-OS DY-YA

5.2 by topographic methods (WLI, AFM, Laser-Interferometry) [Flex C]

01_SOP_00489 2025-08	Topographic determination on glasses, glass ceramics, ceramics, metals, plastics and composite materials by white-light interference microscopy	MZ-OS

01_SOP_00752 2025-08	Measurement of wavefront deformation and determination of the derived parameters TTV and flatness of solids by Fizeau phase laser interferometry	MZ-OS

5.3 by Light Microscopy [Flex C]

01_SOP_00501 2025-09		MZ-OS DY-YA

5.4 by Time-of-Flight-Secondary Ion Mass Spectrometry (ToF-SIMS) [Flex C]

01_SOP_00493 2025-08	Qualitative analysis of the surface composition of glasses, glass ceramics, ceramics, metals, plastics, composite materials and solids by ToF-SIMS	MZ-OS

5.5 by Vibrational Spectroscopy [Flex A]

JIS K 0137 2010-05	General rules for Raman spectrometry	MZ-OS
USP <1854> 2015-05	Mid-infrared spectroscopy - Theory and practice	MZ-OS

6 Strength tests on glases, glass ceramics, plastics and composites, Determination of material and product properties by pressure and tensile tests [Flex C]

ISO 14704 2016-04	Fine ceramics (advanced ceramics, advanced technical ceramics) - Test method for flexural strength of monolithic ceramics at room temperature	MZ-OS
ISO 7458 2004-03	Glass containers - Internal pressure resistance - Test methods	MZ-OS
ISO 8113 2004-03	Glass containers - Resistance to vertical load - Test method	MZ-OS
DIN EN 843-1 2008-08	Advanced technical ceramics - Mechanical properties of monolithic ceramics at room temperature Part 1: Determination of flexural strength	MZ-OS

ISO 1288-5 2016-02	Glass in building - Determination of the bending strength of glass - Part 5: Coaxial double ring test on flat specimens with small test surface areas	MZ-OS
01_SOP_00495 2025-07	Determination of the strength of brittle materials, plastics and composite materials by tensile and pressure tests with universal testing machines	MZ-OS

7 Fracture analysis (fractography) on glasses, glass ceramics, ceramics and plastics by light microscopic methods [Flex C]

DIN EN 843-6 2009-12	Advanced technical ceramics - Mechanical properties of monolithic ceramics at room temperature - Part 6: Guidance for fractographic investigation	MZ-OS
ASTM C 1256 2025a	Standard Practice for Interpreting Glass Fracture Surface Features	MZ-OS
01_SOP_00496 2025-09	Fractography/Fracture analysis on brittle materials	MZ-OS

8 Determination of the volume fractions of gaseous substances in inclusions of glasses, glass ceramics, oxide materials and stones by mass spectrometry and Raman spectroscopy [Flex C]

JIS K 0137 2010-05	General rules for Raman spectrometry	MZ-OS
01_SOP_00497 2025-05	Determination of volume fractions of gaseous substances in inclusions of glasses, glass ceramics, oxide materials and stones by mass spectrometry	MZ-OS
01_SOP_00504 2025-07	Determination of volume fractions of gaseous substances in inclusions of glasses, glass ceramics, oxide materials and stones by Raman spectroscopy	MZ-OS