

Deutsche Akkreditierungsstelle

Anlage zur Akkreditierungsurkunde D-PL-22040-01-00 nach DIN EN ISO/IEC 17025:2018DIN EN ISO/IEC 17025:2018

Gültig ab: 06.02.2024

Ausstellungsdatum: 06.02.2024

Inhaber der Akkreditierungsurkunde:

**TÜV Rheinland Solar GmbH
Am Grauen Stein, 51105 Köln**

Das Prüflaboratorium erfüllt die Mindestanforderungen gemäß DIN EN ISO/IEC 17025:2018Das Prüflaboratorium erfüllt die Mindestanforderungen gemäß DIN EN ISO/IEC 17025:2018 und gegebenenfalls zusätzliche gesetzliche und normative Anforderungen, einschließlich solcher in relevanten sektoralen Programmen, um die nachfolgend aufgeführten Konformitätsbewertungstätigkeiten durchzuführen.

Die Anforderungen an das Managementsystem in der DIN EN ISO/IEC 17025 sind in einer für PrüflaboratorienDIN EN ISO/IEC 17025 sind in einer für Prüflaboratorien relevanten Sprache verfasst und stehen insgesamt in Übereinstimmung mit den Prinzipien der DIN EN ISO 9001.

Prüfungen in den Bereichen:

Regenerative Energien, photovoltaische und solarthermische Systeme und Komponenten, einschließlich Außentestflächen sowie Umweltsimulation

Innerhalb der mit * gekennzeichneten Akkreditierungsbereiche ist dem Prüflaboratorium, ohne dass es einer vorherigen Information und Zustimmung der DAkkS bedarf, die Anwendung der hier aufgeführten genormten Prüfverfahren mit unterschiedlichen Ausgabeständen der Normen gestattet.

Das Prüflaboratorium verfügt über eine aktuelle Liste aller Prüfverfahren im flexiblen Akkreditierungsbereich.

Diese Urkundenanlage gilt nur zusammen mit der schriftlich erteilten Urkunde und gibt den Stand zum Zeitpunkt des Ausstellungsdatums wieder. Der jeweils aktuelle Stand der gültigen und überwachten Akkreditierung ist der Datenbank akkreditierter Stellen der Deutschen Akkreditierungsstelle zu entnehmen (www.dakks.de)

1 Photovoltaik (PV)

Norm / Ausgabedatum Hausverfahren / Version	Titel der Norm oder des Hausverfahrens
IEC 60891* 2021-10	Photovoltaic devices - Procedures for temperature and irradiance corrections to measured I-V characteristics
IEC 60904-1* 2020-09	Photovoltaic devices - Part 1: Measurement of photovoltaic current-voltage characteristics
IEC 60904-1-1* 2017-05	Photovoltaic devices - Part 1-1: Measurement of current-voltage characteristics of multi-junction photovoltaic (PV) devices
IEC 60904-2* 2015-01	Photovoltaic devices - Part 2: Requirements for photovoltaic reference devices
IEC 60904-3* 2019-02	Photovoltaic devices - Part 3: Measurement principles for terrestrial photovoltaic (PV) solar devices with reference spectral irradiance data
IEC 60904-4* 2019-11	Photovoltaic devices - Part 4: Photovoltaic reference devices - Procedures for establishing calibration traceability
IEC 60904-5* 2011-02	Photovoltaic devices - Part 5: Determination of the equivalent cell temperature (ECT) of photovoltaic (PV) devices by the open-circuit voltage method
IEC 60904-7* 2019-08	Photovoltaic devices - Part 7: Computation of the spectral mismatch correction for measurements of photovoltaic devices
IEC 60904-8* 2014-05	Photovoltaic devices - Part 8: Measurement of spectral responsivity of a photovoltaic (PV) device
IEC 60904-8-1* 2017-05	Photovoltaic devices - Part 8-1: Measurement of spectral responsivity of multi-junction photovoltaic (PV) devices
IEC 60904-9* 2020-09	Photovoltaic devices - Part 9: Classification of solar simulator characteristics
IEC 60904-10* 2020-09	Photovoltaic devices - Part 10: Methods of linear dependence and linearity measurements
IEC TS 60904-12* 2016-04	Photovoltaic devices - Part 12: Infrared thermography of photovoltaic modules
IEC TS 60904-13 2018-08	Photovoltaic devices - Part 13: Electroluminescence of photovoltaic modules
IEC 61215-1* ED2 2021-02	Terrestrial photovoltaic (PV) modules- Design qualification and type approval- Part 1: Test requirements Hailtest: Iceball diameter 45mm max. STC: Isc 50A max. Uoc 500V max
IEC 61215-1-1* ED2 2021-02	Terrestrial photovoltaic (PV) modules- Design qualification and type approval - Part 1-1: Special requirements for testing of crystalline silicon photovoltaic (PV) module Hailtest: Iceball diameter 45mm max. STC: Isc 50A max. Uoc 500V max

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IEC 61215-1-2* ED2 2021-02	Terrestrial photovoltaic (PV) modules- Design qualification and type approval - Part 1-2: Special requirements for testing of thin-film Cadmium Telluride (CdTe) based photovoltaic (PV) modules Hailtest: Iceball diameter 45mm max. STC: Isc 50A max. Uoc 500V max
IEC 61215-1-3* ED2 2021-02	Terrestrial photovoltaic (PV) modules- Design qualification and type approval - Part 1-3: Special requirements for testing of thin-film amorphous silicon based photovoltaic (PV) modules Hailtest: Iceball diameter 45mm max. STC: Isc 50A max. Uoc 500V max
IEC 61215-1-4* ED2 2021-02	Terrestrial photovoltaic (PV) modules- Design qualification and type approval- Part 1-4: Special requirements for testing of thin-film Cu(In,GA)(S,Se) ₂ based photovoltaic (PV) modules Hailtest: Iceball diameter 45mm max. STC: Isc 50A max. Uoc 500V max
IEC 61215-2* ED2 2021-02	Terrestrial photovoltaic (PV) modules- Design qualification and type approval -Part 2: Test procedures Hailtest: Iceball diameter 45mm max. STC: Isc 50A max. Uoc 500V max
EN 61215-1* 2016-12	Terrestrial photovoltaic (PV) modules - Design qualification and type approval - Part 1: Test requirements Hailtest: Iceball diameter 45mm max. STC: Isc 50A max. Uoc 500V max
EN 61215-1-1* 2016-06	Terrestrial photovoltaic (PV) modules - Design qualification and type approval - Part 1-1: Special requirements for testing of crystalline silicon photovoltaic (PV) Modules Hailtest: Iceball diameter 45mm max. STC: Isc 50A max. Uoc 500V max
EN 61215-1-2* 2017-04	Terrestrial photovoltaic (PV) modules - Design qualification and type approval - Part 1-2: Special requirements for testing of thin-film Cadmium Telluride (CdTe) based photovoltaic (PV) modules Hailtest: Iceball diameter 45mm max. STC: Isc 50A max. Uoc 500V max
EN 61215-1-3* 2017-05	Terrestrial photovoltaic (PV) modules - Design qualification and type approval - Part 1-3: Special requirements for testing of thin-film amorphous silicon based photovoltaic (PV) modules Hailtest: Iceball diameter 45mm max. STC: Isc 50A max. Uoc 500V max

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EN 61215-1-4* 2017-05	Terrestrial photovoltaic (PV) modules - Design qualification and type approval - Part 1-4: Special requirements for testing of thin-film Cu(In,GA)(S,Se) ₂ based photovoltaic (PV) modules Hailtest: Iceball diameter 45mm max. STC: Isc 50A max. Uoc 500V max
EN IEC 61215-2* 2021-04	Terrestrial photovoltaic (PV) modules - Design qualification and type approval - Part 2: Test procedures Hailtest: Iceball diameter 45mm max. STC: Isc 50A max. Uoc 500V max
EN IEC 61730-1* 2018-04	Photovoltaic (PV) module safety qualification - Part 1: Requirements for construction
UL 61730-1* 2022-10	Photovoltaic (PV) module safety qualification - Part 1: Requirements for construction
IEC 61730-1* 2023-04	Photovoltaic (PV) module safety qualification - Part 1: Requirements for construction
IEC 61730-2* 2023-09	Photovoltaic (PV) module safety qualification - Part 2: Requirements for testing
EN IEC 61730-2* 2018-04	Photovoltaic (PV) module safety qualification - Part 2: Requirements for testing
UL 61730-2 2022-10	Photovoltaic (PV) module safety qualification - Part 2: Requirements for testing
IEC 62093* 2022-01	Photovoltaic system power conversion equipment – Design qualification and type approval
IEC 62108* 2016-09	Concentrator photovoltaic (CPV) modules and assemblies - Design qualification and type approval
IEC 62124* 2004-10	Photovoltaic (PV) standalone systems - Design verification
IEC 62759-1* 2022-07	Photovoltaic (PV) modules - Transportation testing - Part 1: Transportation and shipping of module package units
IEC TS 63126* 2020-06	Guidelines for qualifying PV modules, components and materials for operation at high temperatures
IEC TS 63140* 2021-04	Photovoltaic (PV) modules - Partial shade endurance testing for monolithically integrated products
IEC TS 63209-1* 2021-04	Photovoltaic modules - Extended-stress testing - Part 1: Modules

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Norm / Ausgabedatum Hausverfahren / Version	Titel der Norm oder des Hausverfahrens
ANSI/UL 1703* 2014-11 Third Edition 05.20	Flat-plate photovoltaic modules and panels
IEC 61701* 2020-06	Photovoltaic (PV) modules - Salt mist corrosion testing
IEC 62716* 2013-06 Corrigendum 1 2014-05	Photovoltaic (PV) modules - Ammonia corrosion testing
2 PfG 1911/03.11 2011-03	Specification for requirements for resistance of Photovoltaic Components against ammonia atmosphere
2 PfG 2764/03.21 2021-03	Accelerated Energy Yield Rating of Photovoltaic (PV) Modules in Different Climates
IEC 62446-1* 2016-01	Photovoltaic (PV) systems - Requirements for testing, documentation and maintenance - Part 1: Grid connected systems - Documentation, commissioning tests and inspection
EN 13583* 2012-07	Flexible sheets for waterproofing - Bitumen, plastic and rubber sheets for roof waterproofing - Determination of hail resistance
EN 14437* 2004-11	Determination of the uplift resistance of installed clay or concrete tiles for roofing - Roof system test method
EN 50380* 2017-09	Marking and documentation requirements for Photovoltaic Modules
2 PfG 1795/10.15 2015-10	Power Controlled for Photovoltaic (PV) modules
2 PfG 2376/02.14 2014-02	Shipping units of Photovoltaic (PV) modules - Design qualification and type approval
2 PfG 2387/11.14 2018-01	System voltage durability qualification test for crystalline silicon modules (Potential Induced Degradation (PID))
2 PfG 1793/10.10 2010-10	Requirements for Flexible Front and Back Sheets for Photovoltaic Modules
IEC 61853-1* 2011-01	Photovoltaic (PV) module performance testing and energy rating - Part 1: Irradiance and temperature performance measurements and power rating
IEC 61853-2* 2016-09	Photovoltaic (PV) module performance testing and energy rating - Part 2: Spectral responsivity, incidence angle and module operating temperature measurements
IEC 61853-3* 2018-08	Photovoltaic (PV) module performance testing and energy rating - Part 3: Energy rating of PV modules
CEN/TR 15601* 2012-03	Hygrothermal performance of buildings - Resistance to wind-driven rain of roof coverings with discontinuously laid small elements - Test methods

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EN 50583-1* 2016-01	Photovoltaics in buildings – Part 1: BIPV modules
EN 50583-2* 2016-01	Photovoltaics in buildings – Part 2: BIPV systems
ISO 813* 2010-08	Rubber, vulcanized or thermoplastic – Determination of adhesion to a rigid substrate – 90° peel method
ISO 4587* 2003-03	Adhesives – Determination of tensile lap-shear strength of rigid-to-rigid bonded assemblies
ISO 10147* 2011-09	Pipes and fittings made of crosslinked polyethylene (PE-X) - Estimation of the degree of crosslinking by determination of the gel content
IEC 62670-1* 2013-09	Concentrator photovoltaic (CPV) - performance testing - Part 1: Standard conditions
IEC 62670-2* 2015-05	Photovoltaic concentrators (CPV) - Performance testing - Part 2: Energy measurement
IEC 62688 2017-09	Concentrator photovoltaic (CPV) modules and assemblies Safety qualification
IEC TS 62548* 2013-07	Design requirements for photovoltaic (PV) arrays
UL 8703 Ed. 3 2015-10	Concentrator photovoltaic modules and assemblies
IEC 61829* 2015-10	Photovoltaic (PV) array - On-site measurement of current-voltage characteristics
QMA 2.581.90 Ed. 3 2012-11	Durchführung von Elektrolumineszenzaufnahmen
QMA 2.581.94 Ed. 5 2020-01	Peel-Test
QMA 2.581.101 Ed. 2 2016-11	Messung der Winkelcharakteristik von Solargläsern und PV-Minimodulen im Labor
QMA 2.581.102 Ed. 2 2016-03	Optische Transmissions- und Reflexionsmessung
IEC 62817* 2014-08	Photovoltaic systems – Design qualification of solar trackers
DIN EN 62817* 2018-09	Photovoltaische Systeme - Bauarteignung für Sonnen-Nachführeinrichtungen
IEC/TS 62804-1* 2015-08	Photovoltaic (PV) modules - Test methods for the detection of potential-induced degradation - Part 1: Crystalline silicon
IEC TS 62804-1-1* 2020-01	Photovoltaic (PV) modules. Test methods for the detection of potential-induced degradation – Part 1-1: Crystalline silicon - Delamination

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IEC TS 62804-2 2022-03	Photovoltaic (PV) modules - Test methods for the detection of potential-induced degradation – Part 2 Thin-film
IEC TS 62915* 2023-09	Photovoltaic (PV) modules - Type approval, design and safety qualification – Retesting
IEC 62805-2* 2017-08	Method for measuring photovoltaic (PV) glass – Part 2: Measurement of transmittance and reflectance
IEC 62938* 2020-05	Photovoltaic (PV) modules - Non-uniform snow load testing
DIN 52348* 1985-02	Testing of glass and plastics; abrasion test; sand trickling method
2 Pfg 2715/11.19 2019-11	Quality controlled PV Quality Control System for Crystalline Silicon Photovoltaic (PV) Module Manufacturing Part 1: Extended Stress Test Part 2: Regular Surveillance Monitoring Part 3: Suppliers and Materials Monitoring
IEC 63092-1* 2020-09	Photovoltaics in buildings - Part 1: Requirements for building-integrated photovoltaic modules
IEC 63092-2* 2020-09	Photovoltaics in buildings - Part 2: Requirements for building-integrated photovoltaic systems
2Pfg 2788/12.21 2021-12	Classification of Turn-Key Solar Simulator Systems for PV Module and Solar Cell Measurements
2Pfg 2796/02.22 2022-02	Qualification requirements for photovoltaic modules in buildings (BIPV modules)
2Pfg 2930/02.23 2023-02	Inshore Photovoltaic Modules: Testing and Qualification
2Pfg 2940/06.23 2023-06	Extended Bankability Testing for PV Modules
2Pfg 2944/07.23 2023-07	Ultraviolet-Induced Degradation (UVID) testing for PV Modules

2 Solarthermie (ST)

Norm / Ausgabedatum Hausverfahren / Version	Titel der Norm oder des Hausverfahrens
AS/NZS 2712* 2007-09 + Amendment No. 1 2011-03 + Amendment No. 2 2011-11	Solar and heat pump water heaters – Design and construction (nur Section 4 und Appendix B bis G)
ABNT NBR 15747-1* 2009-08	Thermal solar systems and components - Solar collectors - Part 1: General requirements
EN 12975* 2022-03	Solar collectors – General requirements
EN 12975-2* 2006-03	Thermal solar systems and components - Solar collectors - Part 2: Test methods
ABNT NBR 15747-2* 2009-08	Thermal solar systems and components - Solar collectors - Part 2: Test methods
EN 12976-1* 2017-01	Thermal solar systems and components - Factory made systems - Part 1: General requirements
EN 12976-2* 2019-03	Thermal solar systems and components - Factory made systems - Part 2: Test methods
EN 12977-1* 2012-04	Thermal solar systems and components - Custom built systems - Part 1: General requirements for solar water heaters and combisystems
EN 12977-2* 2012-04	Thermal solar systems and components - Custom built systems - Part 2: Test methods for solar water heaters and combisystems
EN 12977-3* 2018-07	Thermal solar systems and components - Custom built systems - Part 3: Performance test methods for solar water heater stores
EN 12977-4* 2012-04	Thermal solar systems and components - Custom built systems - Part 4: Performance test methods for solar combistores
EN 12977-5* 2012-04	Thermal solar systems and components - Custom built systems - Part 5: Performance test methods for control equipment
EN 15332* 2007-11	Heating Boilers - Energy assessment of hot water storage systems
ISO 9459-2* 1995-08	Solar heating – Domestic water heating systems - Part 2: Outdoor test methods for system performance characterization and yearly performance prediction of solar-only systems
ISO 9459-4* 2013-02	Solar heating – Domestic water heating systems – Part 4: System performance characterization by means of component tests and computer simulation (nur Appendix, C und F)

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Norm / Ausgabedatum Hausverfahren / Version	Titel der Norm oder des Hausverfahrens
ISO 9459-5* 2007-05	Solar heating – Domestic water heating systems – Part 5: System performance characterization by means of whole-system tests and computer simulation
EN 12897* 2006-07	Water supply - Specification for indirectly heated unvented (closed) storage water heaters
SANS 6210* 2013-07	Domestic solar water heaters – Mechanical qualification tests
SANS 6211-1* 2012-04	Domestic solar water heaters – Part 1: Thermal performance using an outdoor test method
AS/NZS 2535.1* 2007-03	Test methods solar collectors – thermal performance of glazed liquid heating collectors incl. pressure drop
EN ISO 9806* 2017-11	Solar energy - Solar thermal collectors - Test methods

3 Umweltprüfungen

Norm / Ausgabedatum Hausverfahren / Version	Titel der Norm oder des Hausverfahrens
IEC 60068-2-1* 2007-03	Environmental testing - Part 2-1: Tests - Test A: Cold
IEC 60068-2-2* 2007-07	Environmental testing - Part 2-2: Tests - Test B: Dry heat
IEC 60068-2-5* 2018-04	Environmental testing - Part 2-5: Tests - Test S: Simulated solar radiation at ground level and guidance for solar radiation testing and weathering
IEC 60068-2-11* 2021-03	Environmental testing - Part 2-11: Tests - Test Ka: Salt mist
IEC 60068-2-21* 2006-06	Environmental testing - Part 2-21: Tests - Test U: Robustness of terminations and integral mounting devices
IEC 60068-2-30* 2005-08	Environmental testing - Part 2-30: Tests - Test Db: Damp heat, cyclic (12 h + 12 h cycle)
IEC 60068-2-52* 2017-11	Environmental testing – Part 2-52: Tests – Test Kb: Salt mist, cyclic (sodium chloride solution)
IEC 60068-2-75* 2014-09	Environmental testing - Part 2: Tests; test Eh: Hammer tests

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Norm / Ausgabedatum Hausverfahren / Version	Titel der Norm oder des Hausverfahrens
IEC 60068-2-78* 2012-10	Environmental testing - Part 2-78: Tests; Test Cab: Damp heat, steady state
IEC 62892* 2019-04	Extended thermal cycling of PV modules - Test procedure
DIN 50018* 2013-05	Prüfung im Kondenswasser-Wechselklima mit schwefeldioxidhaltiger Atmosphäre
ISO 9227* 2017-03	Corrosion tests in artificial atmospheres - Salt spray tests
DIN EN ISO 6988* 1997-03	Metallische und andere anorganische Überzüge – Prüfung mit Schwefeldioxid unter allgemeiner Feuchtigkeitskondensation
ASTM G87* 2002-10	Standard Practice for Conducting Moist SO ₂ Tests
2 PfG 2763/07.21 2021-07	Sand and dust abrasion qualification test for PV modules and components (Sand abrasion) - Sand trickling

Verwendete Abkürzungen:

ANSI	American National Standards Institute
AS/NZS	Standards Australia
ASTM	American Society for Testing and Materials
CSA	Canadian Standards Association
PfG, QMA u. QMV	Hausverfahren des Solar Energy Assessment Center (SEACC)
UL	Underwriters Laboratories