

Deutsche Akkreditierungsstelle GmbH

Annex to the Accreditation Certificate D-PL-20107-01-00 according to DIN EN ISO/IEC 17025:2005

Period of validity: 07.12.2016 to 06.12.2021

Date of issue: 07.12.2016

Holder of certificate:

SOWITEC development GmbH
Löherstraße 24, 72820 Sonnenbühl

Tests in the fields:

Performance, evaluation and analysis of wind measurements with remote sensing (SoDAR and LiDAR) and wind met mast /meteorological measuring systems; Determination of the wind potential and calculation of the expected mean annual energy yield of wind turbine sites; Determination of the 60% reference certificate, Determination of the site quality; Determination of the turbulence intensity and IEC site classification; Prediction of the sound immission of wind turbines; Calculation of the shadow impact of wind turbines; Performance, evaluation and analysis of global irradiance measurements for the determination of the solar irradiance potential; Determination of the irradiance potential and production estimate for PV plants

Abbreviations used: see last page

*Within the scope of accreditation marked with *, 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 standards within the flexible scope of accreditation.

1. Performance, evaluation and analysis of wind measurements for the determination of the wind potential with SoDAR, LiDAR and wind met mast / meteorological measuring systems

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| IEC 61400-1+ A 2010* 2005-08 | Wind turbines – Part 1: Design requirements |
| IEC 61400-12-1 2005-12 | Wind turbines – part 12-1: Power performance measurements of electricity producing wind turbines |
| IEC 61400-12-1* 2014-04 | Wind turbines – part 12-1: Power performance measurements of electricity producing wind turbines |
| FGW TG 6, Rev. 9* 2014-09 | Determination of the Wind Potential and Energy Yields |
| HV_WRM_RS 2016-07 | Performance of remote sensing wind measurements |
| HV_WRM_MM 2015-12 | Performance of wind measurements with wind met mast / meteorological measuring systems |
| HV_WRA_RS 2015-12 | Evaluation and analysis of remote sensing wind measurements for the determination of the wind potential |
| HV_WRA_MM 2015-12 | Evaluation and analysis of wind measurements with wind met mast for the determination of the wind potential / meteorological measuring systems |

2. Determination of the wind potential of wind turbine sites and calculation of the expected mean annual energy yield of wind turbines; Determination of the 60% reference certificate; Determination of the site quality

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| IEC 61400-1+ A 2010* 2005-08 | Wind turbines – Part 1: Design requirements |
| IEC 61400-12-1 2005-12 | Wind turbines – part 12-1: Power performance measurements of electricity producing wind turbines |
| IEC 61400-12-1* 2014-04 | Wind turbines – part 12-1: Power performance measurements of electricity producing wind turbines |
| FGW TG 6, Rev. 9* 2014-09 | Determination of the Wind Potential and Energy Yields |

Annex to the accreditation certificate D-PL-20107-01-00

FGW TG 6, Rev. 9, Appx. C*
2016-09 Determining the site quality for commissioning in accordance with the German Renewable Act (EEG 2017)

HV_WRP
2015-12 Determination of the wind potential of wind turbine sites

HV_AEP_WIND
2016-09 Calculation of the expected mean annual energy yield of wind turbines

3. Determination of the turbulence intensity by means of measurement and IEC site classification

IEC 61400-1+ A 2010*
2005-08 Wind turbines – Part 1: Design requirements

HV_TIA
2016-05 Calculation of turbulence intensities

4. Prediction of the sound immission of wind turbines

DIN ISO 9613-2*
1999-10 Acoustics - Attenuation of sound during propagation outdoors - Part 2: General method of calculation

TA Lärm
1998-08 Sechste allgemeine Verwaltungsvorschrift zum Bundes-Immissionsschutzgesetz: Technische Anleitung zum Schutz gegen Lärm – GMBL. Nr. 26

HV_NIA
2015-12 Calculation of the sound immission of wind turbines

5. Calculation of the shadow impact of wind turbines

HV_SFA
2015-12 Calculation of the shadow impact of wind turbines

LAI
2002-03 Hinweis zur Ermittlung und Beurteilung der optischen Immission von Windenergieanlagen

6. Performance, evaluation and analysis of global irradiance measurements for the determination of the solar irradiance potential

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| IEC 61724 ed. 1* 1998 04 | Photovoltaic system performance monitoring – Guidelines for measurement, data exchange and analysis |
| VDI 3786 Bl. 1* 2013-08 | Environmental Meteorology – Meteorological Measurements - Principles |
| VDI 3786 Bl. 5* 2014-07 | Environmental Meteorology – Meteorological Measurements – Irradiation |
| WMO-No. 8 ed. 7* 2008 | Guide to Meteorological Instruments and Methods of Observation |
| HV_SRM 2015-12 | Performance of global irradiance measurements |
| HV_SRA 2015-12 | Evaluation and analysis of global irradiance measurements for the determination of the solar irradiance potential |

7. Determination of the irradiance potential and production estimate for PV plants

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| HV_AEP_PV 2015-12 | Determination of the solar irradiance potential and production estimate for PV plants |
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Abbreviations used:

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| DIN | German Institute for Standardization |
| FGW | Fördergesellschaft Windenergie e.V. |
| HV_xxx | In house method of SOWITEC development GmbH |
| IEC | International Electrotechnical Commission |
| LAI | Bund/Länder-Arbeitsgemeinschaft für Immissionsschutz |
| LiDAR | Light Detection And Ranging |
| SoDAR | Sound/Sonic Detecting And Ranging |
| TA | Technical Instruction |
| TG | Technical Guideline |
| VDI | Association of German Engineers |
| WMO | World Meteorological Organization |