DAkkS
Deutsche
Akkreditierungsstelle

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

Deutsche WindGuard Consulting GmbH
Oldenburger Straße 65, 26316

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

Determination of Wind Turbine Power Curves; Execution and Evaluation of Wind Measurements by Anemometer and Remote Sensing; Determination of Site Quality; Determination of Wind Potential and Energy Yields; Determination of Turbulence Intensity by Means of Measurement and Calculation; Determination of Noise Emissions of Wind Turbines; Determination of Shadow Flicker Immission by Calculation; Noise Immission in the neighbourhood; Load Measurement on Wind Turbine; Module Immission Control

The accreditation certificate shall only apply in connection with the notice of accreditation of 18.07.2022 with the accreditation number D-PL-18020-01. It comprises the cover sheet, the reverse side of the cover sheet and the following annex with a total of 8 pages.

Registration number of the certificate: **D-PL-18020-01-00**

Berlin,
18.07.2022

Dipl.-Ing. Gabriel Zrenner
Head of Department

Translation issued:
18.07.2022

Head of Department

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 can be found in the directory of accredited bodies maintained by Deutsche Akkreditierungsstelle GmbH at https://www.dakks.de/en/accredited-bodies-search.html.

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

See notes overleaf.

Deutsche Akkreditierungsstelle GmbH

Office Berlin
Spittelmarkt 10
10117 Berlin

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

Office Braunschweig
Bundesallee 100
38116 Braunschweig

The accreditation was granted pursuant to the Act on the Accreditation Body (AkkStelleG) of 31 July 2009 (Federal Law Gazette I p. 2625) and the Regulation (EC) No 765/2008 of the European Parliament and of the Council of 9 July 2008 setting out the requirements for accreditation and market surveillance relating to the marketing of products (Official Journal of the European Union L 218 of 9 July 2008, p. 30). 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 Cooperation (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
ILAC: www.ilac.org
IAF: www.iaf.nu

Deutsche Akkreditierungsstelle GmbH

Annex to the Accreditation Certificate D-PL-18020-01-00 according to DIN EN ISO/IEC 17025:2018

Valid from: 18.07.2022

Date of issue: 18.07.2022

Holder of certificate:

Deutsche WindGuard Consulting GmbH
Oldenburger Straße 65, 26316

Tests in the fields:

Determination of Wind Turbine Power Curves; Execution and Evaluation of Wind Measurements by Anemometer and Remote Sensing; Determination of Site Quality; Determination of Wind Potential and Energy Yields; Determination of Turbulence Intensity by Means of Measurement and Calculation; Determination of Noise Emissions of Wind Turbines; Determination of Shadow Flicker Immission by Calculation; Noise Immission in the neighbourhood; Load Measurement on Wind Turbine; Module Immission Control

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 methods within the flexible scope of accreditation.

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

Abbreviations used: see last page

1. Determination of Wind Turbine Power Curves

DIN EN 61400-12-1* 2017-12	Power performance measurements of electricity producing wind turbines
DIN EN 61400-12-2* 2014-02	Power performance of electricity producing wind turbines based on nacelle anemometry
FGW TG5, Rev. 8* 2020-03	Determination and application of the reference yields
FGW TG2, Rev. 17* 2018-03	Determination of power performance and standardized energy yields
MEASNET, Version 5 2009-12	MEASNET „Power Performance measurement procedure”
IEC 61400-12 Ed. 1 CDV* 2021-08	Wind energy generation systems - Part 12: Power performance measurements of electricity producing wind turbines - Overview
IEC 61400-12-1 Ed. 3 CDV* 2021-08	Wind turbines - Part 12-1: Power performance measurements of electricity producing wind turbines
IEC 61400-12-2 Ed. 2 CDV* 2021-08	Wind turbines - Part 12-2: Power performance measurements of electricity producing wind turbines based on nacelle anemometry
IEC 61400-12-3 Ed. 1 CDV* 2021-08	Wind energy generation systems – Part 12-3: Power Performance – Measurement based site calibration
IEC 61400-12-5 Ed. 1 CDV* 2021-08	Wind energy generation systems – Part 12-5: Power performance – Assessment of obstacles and terrain
IEC 61400-12-6 Ed. 1 CDV* 2021-08	Wind energy generation systems – Part 12-6: Measurement based nacelle transfer function of electricity producing wind turbines
IEC 61400-50 Ed. 1 CDV* 2021-08	Wind energy generation systems - Part 50: Wind measurements - Overview
IEC 61400-50-1 Ed. 1 CDV* 2021-08	Wind energy generation systems – Part 50-1: Wind measurements Application of meteorological mast, nacelle and spinner mounted instruments
IEC 61400-50-2 Ed. 1 CDV* 2021-08	Wind energy generation systems – Part 50-2: Wind Measurement – Application of ground mounted remote sensing technology

-Translation-

Abbreviations used: see last page

Valid from: 18.07.2022
Date of issue: 18.07.2022

IEC 61400-50-3 Ed. 1* 2022-01	Wind energy generation systems – Part 50-3: Use of nacelle mounted lidars for wind measurements

2. Execution and Evaluation of Wind Measurements by Anemometer and Remote Sensing

IEC 61400-12-1, Ed. 2* 2017	Wind turbines - Part 12-1: Power performance measurements of electricity producing wind turbines
IEC 61400-12-3 Ed. 1 CDV* 2021-08	Wind energy generation systems – Part 12-3: Power Performance – Measurement based site calibration
IEC 61400-12-5 Ed. 1 CDV* 2021-08	Wind energy generation systems – Part 12-5: Power performance – Assessment of obstacles and terrain
IEC 61400-12-6 Ed. 1 CDV* 2021-08	Wind energy generation systems – Part 12-6: Measurement based nacelle transfer function of electricity producing wind turbines
IEC 61400-50 Ed. 1 CDV* 2021-08	Wind energy generation systems - Part 50: Wind measurements - Overview
IEC 61400-50-1 Ed. 1 CDV* 2021-08	Wind energy generation systems – Part 50-1: Wind measurements Application of meteorological mast, nacelle and spinner mounted instruments
IEC 61400-50-2 Ed. 1 CDV* 2021-08	Wind energy generation systems – Part 50-2: Wind Measurement – Application of ground mounted remote sensing technology
DIN EN 61400-12-1* 2017-12	Wind turbines - part 12-1: Power performance measurements of electricity producing wind turbines
FGW TG6, Rev. 11 * 2020-09	Determination of wind potential and energy yields
MEASNET, Version 2 2016-04	Evaluation of Site Specific Wind Conditions

-Translation-

Abbreviations used: see last page

Valid from: 18.07.2022
Date of issue: 18.07.2022

3. Determination of Site Quality; Determination of Wind Potential and Energy Yields

FGW TR 6, Rev. 11* 2020-09	Determination of wind potential and energy yields
MEASNET, Version 2 2016-04	Evaluation of Site Specific Wind Conditions
D5871, Rev. 10 2018-11	Standard Operating Procedure VA EE-Energy Yield Evaluation
FGW TG10 Rev. 2* 2021-03	Determination of site quality following commissioning

4. Determination of Noise Emissions of Wind Turbines

IEC 61400-11, Ed. 3* 2012 + Amendment 1 2018	Wind turbines - Part 11: Acoustic noise measurement techniques
DIN EN 61400-11* 2019-05	Wind turbines - Part 11: Acoustic noise measurement techniques
FGW TG 1, Rev. 18* 2008-02	Determination of noise emission
FGW TG 1, Rev. 19* 2021-03	Determination of noise emission
IEC 61400 -14* 2005	Wind turbine generator systems - Part 14: Declaration of sound power level and tonality values of wind turbines
MEASNET, V.3 2011	Acoustic Noise Measurement Procedure

5. Determination of Shadow Flicker Immission by Calculation

DIN 5034-2* 1985-02	Daylight in interiors; principles
D5885, Rev. 3 2020-05	Standard Operating Procedure VA PS-Forecast of Shadow Flicker
LAI 2020-01	Notes on determination and assessment of optical immissions of wind turbines (German federal commitee for immission protection)
VDI 3789 Blatt 2 1994-10	Environmental meteorology - Interactions between atmosphere and surfaces - Calculation of spectral short-wave and long-wave radiation

6. Determination of Turbulence Intensity by Means of Measurement and Calculation

IEC 61400-1 2019-02	Wind turbines - Part 1: Design Requirements
DIN EN 61400-1 2019-02	Wind turbines - Part 1: Design requirements
MEASNET Procedure Version 2 2016-04	Evaluation of Site Specific Wind Conditions
ESDU 87034 2012-03	World-wide extreme wind speeds. Part 1: origins and methods of analysis
ESDU 88037 2012-03	World-wide extreme wind speeds. Part 2: examples using various methods of analysis.
DIBt Richtlinie Für Windenergieanlagen 2012-10	Impacts on and proof of structural safety of tower and foundation
D5896, Rev. 5 2020-05	Standard Operating Procedure VA Site Suitability Studies

-Translation-

Abbreviations used: see last page

Valid from: 18.07.2022
Date of issue: 18.07.2022

7. Load Measurement on Wind Turbine

D5877, Rev. 4 2018-06	Standard Operating Procedure VA Load Measurement
IEC 61400-13 Ed.1 * 2015-12	Wind turbines - Part 13: Measurement of mechanical loads
IEC 61400-22 Ed. 1* 2010-05	Wind turbines - Part 22: conformity testing and verification Chapters: 8.4 Type testing 8.8 Type characteristics measurements 9.11 Project characteristics measurements Annex C Minimum requirements for load measurements Annex D Requirements for safety and function tests
DIN EN 61400-13 * 2017-06	Wind turbines - Part 13: Measurement of mechanical loads
DIN EN 61400-22* 2011-10	Wind turbines - Part 22: Conformity testing and certification Chapter: 8.4 Type testing 8.8 Type characteristics measurements 9.11 Project characteristics measurements Annex C Minimum requirements for load measurements Annex D Requirements for safety and function tests
DNV-ST-0437 2021-11	Loads and site conditions for wind turbines Section 5. Measurements
DNV-ST-0438 2021-11	Control and protection systems for wind turbines Section 6. Test of the wind turbine behavior Appendix C Test of turbine behavior, specification

8. Determination of Noise Immission in the neighbourhood

8.1 Fields of activity regulated by immission control law

Specifications according to immission control module and DIN 45688:2014

Group V: Determination of Noise Immission (here: only Wind Turbines)		
Standard / Guideline / Technical Rule		QM-Document
Titel	Description	
TA Lärm 1998-08 (State 2017)	Sixth general administrative regulation of the Federal Immission Control Act - Technical instruction for the protection against noise - TA Noise	D5878, PA Emission Control 16.02.2017 D5878, PA Immission Control. 16.02.2017
TA Lärm 1968-07	General administrative regulation on installations requiring licensing according to the German Industrial Code - Technical instructions on protection against noise - TA Noise (in connection with: VDI 2058 Blatt 1:1985-09 “Assessment of work noise in the neighborhood”)	

8.2 Determination of noise in the neighbourhood

DIN 45645-1* 1996-07	Determination of rating levels from measurement data - Part 1: Noise immission in the neighborhood
DIN 45680* 1997-03 + Supplement	Measurement and assessment of low-frequency noise immissions in the neighborhood
DIN 45681* 2005-03 + Correction 2 2006-08	Acoustics - Determination of tonal components of noise and determination of a tone adjustment for the assessment of noise immissions
IEA R&D Wind Recommended Practices 10, 1st Edition 1997-01	Recommended Practices for Wind Turbine Testing 10. Measurement of Noise Immission from Wind Turbines at Noise Receptor Locations

-Translation-

Abbreviations used: see last page

Valid from: 18.07.2022
Date of issue: 18.07.2022

The named procedures under 8.1 correspond to the requirements of the "special proof of competence in the area of Immission control" "LAI Module Immission Control" (Version updated by the L/W/V dated 30.01.2018)

Competence is confirmed in the legally regulated technical fields of activity

Group V

Abbreviations used:

BImSchV	Bundes-Immissionsschutz-Verordnung
BWE	Bundesverband Wind Energie
FGW	Fördergesellschaft Windenergie
IEA	International Energy Agency
IEC	International Electrotechnical Commission
MEASNET	International Network for Harmonised and Recognised Measurements in Wind Energy
D…	In house procedure of WindGuard Consulting GmbH
ESDU	Engineering Sciences Data Unit
DNV GL	Det Norske Veritas-Germanischer Lloyd

-Translation-

Abbreviations used: see last page

Valid from: 18.07.2022
Date of issue: 18.07.2022