



Certificate No.

IECRE.WE.CC.19.0007-R0

IECRE - IEC System for Certification
to Standards Relating to Equipment
for Use in Renewable Energy
Applications

COMPONENT CERTIFICATE

Wind Turbine

This certificate is issued to

Siemens Gamesa Renewable Energy A/S

Borupvej 16
7330 Brande
Denmark

for the component

Tubular steel tower T85.0-1198

wind turbine class (class, standard, year)

S, IEC 61400-1:2005 + Amendment 1, 2010-10

This certificate attests compliance with IEC 61400 Series as specified in subsequent pages. It is based on the following reference documents:

Design basis evaluation conformity statement
Dated

Included in the design evaluation conformity statement.

Design evaluation conformity statement
Dated

IECRE.WE.CS.19.0019-R0
12.08.2019

Type test conformity statement
Dated

Not applicable for towers, see final evaluation report.

Manufacturing conformity statement
Dated

44 220 19520043-CM-IEC Rev.0
03.05.2019

Final evaluation report
Dated

8116 520 043-20 E I Rev.0
12.08.2019

The conformity evaluation was carried out in accordance with the rules and procedures of the IECRE System www.iecre.org

The component specification begins on page 2 of this certificate.

Changes in the system design or the manufacturer's quality system are to be approved by the TÜV NORD CERT GmbH. Without approval, the certificate loses its validity.

This certificate is valid until:
11.08.2024

Approved for issue on behalf of the IECRE
Certification Body:



Dipl.-Ing., Dr. M. Broschart
Deputy of Specialist Manager Wind Energy
Essen, 2019-08-12

TÜV NORD CERT GmbH
Langemarckstraße 20
45141 Essen



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Machine parameters :

Hub height(s):	85 m
Design life time:	25 y (SWT-DD-120) 20 y (SWT-DD-130)

Wind conditions :

Characteristic turbulence intensity I_{ref} at $V_{hub} = 15$ m/s:	Site specific, see Annex 1
Annual average wind speed at hub height V_{ave} :	Site specific, see Annex 1
Reference wind speed V_{ref} :	Site specific, see Annex 1
Mean flow inclination:	Site specific, see Annex 1
Hub height 50-year extreme wind speed V_{e50} :	Site specific, see Annex 1

Other environmental conditions (where taken into account):

Normal and extreme temperature ranges:	-20 °C to +40 °C (normal, operation) -30 °C to +50 °C (extreme, survival) (details on climate specifics in Annex 1)
Relative humidity of the air:	Max. 95 %
Air density:	Site specific, see Annex 1
Earthquake model and parameters (standard and key parameters e.g. spectrum, model, seismic zone, soil class, etc.):	Not considered

Interfaces:

Design loads for the component, SWT-DD-120:	SGRE ON TE GE GPE FUNC LOAD2-40-0000-100000014148-02, Rev.2, dated 2019-06-14 (Note: A material safety factor for blade deflection γ_m of 1.05 is considered.)
Design loads for the component, SWT-DD-130:	SGRE ON TE SYSE-DK LACS OL-40-JP00049-1234-00, Rev.0, dated 2018-12-12 (Note: A material safety factor for blade deflection γ_m of 1.05 is considered.)
Interface assumptions, conditions and requirements:	See Annex 1
Other interface conditions:	See Annex 1



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Tower:

Type: Tubular steel tower (design by SGRE A/S)
Manufacturer: See Component Manufacturing Conformity Statement
Sections: 4
Length: 82.62 m
Drawing / Data sheet / Part No.: D2047437-C01063437, Rev. 001 (main drawing)

Manuals:

See TC-DNVGL-SE-0074-04163-1 (SWT-DD-130)
See IECRE.WE.CC.19.0010-R0 (SWT-DD-120)

Annex 1: Application and other interfaces

Application: The component is applicable for the SGRE wind turbines of the Onshore Direct Drive Platform 2nd Generation (D3 Mk II):
(1) SWT-DD-120 (site: Tahara, component lifetime 25 years)
(2) SWT-DD-130 (site: Hamasoto, component lifetime 20 years)
Note: A material safety factor for blade deflection γ_m of 1.05 is considered.

RNA Component Certificates of turbines: (1) SWT-DD-120: IECRE.WE.CC.19.0010-R0
(2) SWT-DD-130: TC-DNVGL-SE-0074-04163-1

First natural frequency: 0.301 Hz / 0.323 Hz with elastic / rigid constraint
Weight: 242.237 to (incl. flanges, without internals)
Climate specifics: $T_{ED} = -30^{\circ}\text{C}$ (corresponding ambient temperature of -25°C assuming a delta T_r of -5°C as proposed in DIN EN 1991-1-5/NA)
Wind conditions and air densities: Site specific with IEC wind class S as defined in DNV GL load approval letters
(1) LTR-04419-20190710 for SWT-DD-120
(2) LTR-04419-20190705 for SWT-DD-130

Materials:
Tower purchase specification: See below
Foundation specification: ZPS 1040407-C01041242
Parameters given in the foundation loads
SWT-DD-120: WP TE 30-0000-100000014183-00, Rev.0, dated 2019-03-12
SWT-DD-130: WP TE 30-JP00122-15745-00, Rev.0, dated 2019-05-20

Materials:

Tower wall: JIS G3106 SM490YB
Door frame: JIS G3106 SM490YB
Flanges: METI Ministry Approved SF520
(SHSF520 / DYSF520 / TWSF520 / IRSF520)
Tower bolts: METI Ministry Approved UGW10T / THBZ
Bolt extender: JIS G3106 SM490C