Certificate No.

IECRE.WE.CC.19.0022-R2

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

COMPONENT CERTIFICATE

Wind Turbine Rotor Blade

This certificate is issued to	LM Wind Power A/S Jupitervej 6 DK-6000 KOLDING
for the component	Rotor blade LM 71.0 P
wind turbine class (class, standard, year)	unspecific, IEC 61400-1, Edition 3 with Amendment 1

This certificate attests compliance with IECRE OD-501 Ed. 2.0 as specified in subsequent pages. It is based on the following reference documents:

Design basis evaluation conformity statement Dated	190022-CS-DB-01-1 11/06/2020
Design evaluation conformity statement Dated	190022-CS-DE-01-1 11/06/2020
Type test conformity statement Dated	190022-CS-TY-01-2 11/12/2020
Manufacturing conformity statement Dated	190022-CS-MA-01-3 11/06/2020
Final evaluation report Dated	190022-FI-BLA-01-2 11/12/2020

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 and consists of 2 pages.

Changes in the system design or the manufacturer's quality system are to be approved by the Bureau Veritas Certification. Without approval, the certificate loses its validity.

This conformity statement is valid until: 10-12-2025

Approved for issue on behalf of the IECRE Certification Body:

Laurent Croguennec / pp. Eric Rouaix
President / Wind turbine certification Manager
Paris 11-12-2020

Bureau Veritas Certification France
Le Triangle de l'Arche
9 Cours du Triangle
92937 Paris La Défense – France

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Wind Turbine Rotor Blade

Designer:

Rotor blade designer	LM Wind Power
Certificate for Quality Management system acc. to ISO 9001	Bureau Veritas Certification No. DK010197 version 3

Model

Blade name	LM 71.0 P
Blade specification	BS-00690/A4 (Gen A) BS-00889/A1 (Gen B)
Main drawing	BD-012497/A2
Main material	Glass fiber reinforced polyester
Blade length	71031 mm ± 0.1%
Design life time	20 years

Main blade data

Mass incl. flange, excl. stay bolts	21,129 kg ± 3% (Gen A) 21,164 kg ± 3 % (Gen B)
Static moment to blade root	4630.69 kNm ±4.5% (Gen A) 4643.85 kNm ±4.5% (Gen B)
First eigenfrequency flapwise	0.438 Hz ± 5% (Gen A) 0.437 Hz ± 5% (Gen B)
First eigenfrequency edgewise	0.777 Hz ± 5% (Gen A) 0.778 Hz ± 5 (Gen B)

Interface

Root flange outer diameter	2869 mm ± 1 mm
Average bolt circle diameter	2743 mm ± 2.7 mm
Number of bolts x bolt size	108 x M36

External conditions

Load report	TR-10279/A2 (Gen A) TR-10279/A3 (Gen B)
Characteristic turbulence intensity	Within the limitations of loads defined in load report
Annual average wind speed at hub height Vave	Within the limitations of loads defined in load report
Air density	Within the limitations of loads defined in load report
Outside survival temperature	-30 °C to 40 ºC

Corrosion class for external parts (acc. to DS/EN ISO 12944-2 ed. 2)	C5-M

Lightning protection system

Lightning protection level (I, II, III, IV)	I
Lightning protection system	Safe Receptor ILPS
Lightning protection system Component Certificate	CC-DNVGL-SE-0074-04682-2

Limits for the validity of the assessment

The conditions of validity of this certificate are listed in section 3.5 of the Final Evaluation report n°190022-FI-BLA-01-2.

The requirements to integrate the LM 71.0 P rotor blade Component Certificate in a wind turbine Type Certificate are given in section 3.4 of the Final Evaluation report n°190022-FI-BLA-01-2.

Other related certificates

The following certificates shall be maintained as part of the present certificate:

- Certificate of Quality Management System according to ISO 9001:2015
- SAFE receptor ILPS component certificate, DNVGL Renewables