

TYPE APPROVAL

Certificate No.:
TA-GL-II-2-05377-0

Issued:
2019-10-14

Valid until:
2023-10-13

Issued for:

Coating System

Multi-layer system (Repair version) for wind turbine generator rotor blades with layer structure as described in annex 1.

Issued to:

Mankiewicz Gebr. & Co. (GmbH & Co. KG)

Georg-Wilhelm-Straße 189, 21107 Hamburg, Germany

According to:

DNVGL-SE-0436:2018-04 Shop approval in renewable energy

and

Rules for Classification and Construction, II- Material and Welding Technology Part 2 Non-Metallic Materials

Applying:

DNVGL-SE-0441:2016-06 Type and component certification of wind turbines

Based on the documents listed in Annex 1:

This Type Approval supersedes the Type Approval WP1520020HH and consists of this page and Annex 1 which is integral part of the approval.

Any significant change in design and / or quality of the material will render this Type Approval invalid.

Hellerup, 2019-10-14



For DNV GL Renewables Certification
Bente Vestergaard
Service Line Leader

Hamburg, 2019-10-14



For DNV GL Renewables Certification
Caroline Cröpelin
Project Manager

TYPE APPROVAL – ANNEX 1

Certificate No.: TA-GL-II-2-05377-0

Page 2 of 2

Layer structure

- ALEXIT BladeRep Profile Filler 3 or ALEXIT BladeRep Profile Filler 3K
- ALEXIT BladeRep Pore Filler 6
- ALEXIT BladeRep LEP 9
- ALEXIT BladeRep Topcoat 12

Application:

Surface coating for FRP, on condition that the coating system comply with the applicable requirements of the Germanischer Lloyd and are compatible to the fibres and the laminating resins.

Type Approval documentation

Technical data sheets 491, 442 and 471

Several material safety data sheets

Test Report No. TP26665, TP32076 and TP36096

Several CoAs

Quality management system certificate no. 1221054611/01TMS, TÜV SÜD Management Service GmbH, dated 2017-11-17

Material properties

Test Method	Test Conditions	Results	Unit
Mandrel Bend test according to ASTM D522	0.8" at RT 2.5" at -40°C	no damages	-
Pull-off test according to ISO 4624	at RT	≥ 5	[MPa]
Determination of specular gloss according to ISO 2813	Angle: 60°	< 30	-
Taber Abraser according to ASTM D4060	CS 10, 1000g 1000 rotations	≤ 150	Loss of weight [mg]
UV-B testing according to ASTM D4587	Method A ^[1] 1000h	≤ 2.5	Color deviation ^[2] [dE]
Resistance to humidity according to ISO 6270-2	1000h at condensation climate CH	No changes visible 0 (S0)	-

[1] 4h UV-exposure at 60°C and 4h moisture condensation at 50°C, 1000h

[2] Color deviation according to DIN 6174

Manufacturing Sites covered by evaluation

Mankiewicz Gebr. & Co. (GmbH & Co. KG)

Georg-Wilhelm-Straße 189
21107 Hamburg, Germany

Next inspection due May 2020

Periodical assessment

2.5 years after the last workshop inspection, the client shall inform DNV GL about any modifications in production. An intermediate inspection might be needed based on the implemented changes.