

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Protective Coating Systems**

with type designation(s)
Jotatop BC100 - Polyurethane Topcoat with Primer

Issued to

Jotun A/S
SANDEFJORD, Norway

is found to comply with
DNV GL class programme DNVGL-CP-0424 – Type Approval – Coatings for protection of FRP structures with heavy rain erosion loads

Application :

Rotor blade surface coating except for leading edge protection purposes.

Issued at **Høvik** on **2019-03-13**

This Certificate is valid until **2024-03-12**.

DNV GL local station: **Sandefjord**

Approval Engineer: **Gisle Hersvik**

for **DNV GL**

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Rikard Törnqvist
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid. The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.



Job Id: **262.1-030820-1**
Certificate No: **TAK00001JJ**

Product description

Jotatop BC100; A two-component polyurethane coating for use as Single-Layer Coating System for polyester- and epoxy-based Fibre Reinforced Plastics (FRP). Jotatop BC100 is applied on top of a Primer, either Jotacote Universal or Jotatop BC100.

Approved layer structures:

Layer structure	Layer structure
Jotacote Universal (Primer)	Jotatop BC100 (as Primer)
Jotatop BC100 (Topcoat)	Jotatop BC100 (Topcoat)

Manufactured by

Jotun Coatings (Zhangjiagang) Co., Ltd., No. 15 Changjiang Road, Jiangsu Yangtse River, International Chemical Industry Park, Zhangjiagang Free Trade Zone, Jiangsu 215634, China

DNV GL local station: Jiangyin

Responsibility

The Company (stated on the front page of this certificate) takes the responsibility that both design and production are in compliance with Rules, Standards and/or Regulations listed on page 1 of this certificate.

Application/Limitation

The coating complies with the applicable requirements of DNV GL and is compatible to the base laminate.

Any significant changes in design and / or quality of the material will render the approval invalid.

Type Approval documentation

Tests carried out

Type Testing carried out in accordance with **Type Approval documentation**.

The following test results have been verified by testing:

Test	Test Conditions	Unit	Results
Mandrel Bend Test, according to ISO 1519	- 8 mm at RT - 8 mm at -40°C	—	No damages
Pull-off test, according to ISO 4624	- at RT - after UV-B radiation ^[2] - after humidity effects ^[3] - after alternating climate ^[4]	[MPa]	≥ 5
Determination of specular gloss, according to ISO 2813	60°	—	< 30
Taber Abraser, according to ASTM D4060	CS 10, 1000g 2000 rotations	Loss of weight [mg]	≤ 100
UV-B testing, according to ISO 11507 ^[1]	Method A, 1000h	Colour deviation ^[2] [dE]	≤ 1
Resistance to humidity ^[3]	1000h	—	No changes visible 0(S0)

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Alternating climate test ^[4]	1000h	—	No changes visible 0(S0)
[1] 4h UV-exposure at 60°C and 4h moisture condensation at 50°C, 1000h. [2] Colour deviation according to DIN 6174 [3] According to ISO 6270-2 CH at 40°C and 100% humidity [4] Alternating climate test with the following test cycle: 2h at 50°C > cool down in 2h to -40°C • 6h at -40°C heat up in 2h to 5°C, 2h at 5°C > heat up in 2h to 60°C and 98% humidity • 6h at 60°C and 98% humidity > cool down to 5°C.			

Marking of product

Product/package shall be marked with *manufacturer's name, place of production* and *type designation*.

The marking is to be carried out in such a way that it is visible, legible and indelible. The marking of product is to enable traceability to the DNV GL Type Approval Certificate.

Periodical assessment

The scope of the Periodical Assessment is to verify that the conditions stipulated for the Type Approval is complied with and that no alterations are made to the product design or choice of materials.

Periodical Assessment to be performed after 2 and 3.5 years (Certificate Retention) and at renewal after 5 years (Certificate Renewal).

A production site with a valid Approval of Manufacturer (AoM) certificate for material in question is exempted from the obligation concerning retention and renewal assessments.

For a manufacturer without a valid AoM the stated periodical assessments are required.

The main elements of the Periodical Assessment are to:

- Ensure that **Type Approval documentation** is available.
- Review design, materials, production process, and performance with respect to possible changes, in order to ensure compliance with **Type Approval documentation** and/or referenced material specifications.
- Ensure traceability between manufacturer's product marking and the DNV GL Type Approval Certificate.

END OF CERTIFICATE