

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Carbon Fibre Products**

with type designation(s)

C-PLY™: Quadri-axial Q (0°/±45°/90°) (400 – 1200 g/m²)

Issued to

CHOMARAT TEXTILES INDUSTRIES SAS**Le Cheylard, Ardeche, France**

is found to comply with

DNV GL class programme DNVGL-CP-0434 – Type approval – Uni- and multi-axial multi-ply fabrics made of carbon fibres**DNV GL rules for classification – High speed and light craft****DNV GL standard DNVGL-ST-0342 – Craft****Det Norske Veritas' Standards for Certification No. 2.20, Lifeboats and Rescue Boats, 2007****Application :****Manufacturing of FRP laminates.****Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.**Issued at **Høvik** on **2019-11-29**This Certificate is valid until **2024-11-28**.for **DNV GL**DNV GL local station: **France CMC**Approval Engineer: **Gisle Hersvik**.....
Gustav Heiberg**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: **262.1-032159-1**
Certificate No: **TAK00001TX**

Product description

C-PLY™: Quadri-axial Q (0°/±45°/90°) (400 – 1200 g/m²); Carbon Fibre Quadri-axials
Fibre material: PAN; 12K, 50K

Manufactured by

CHOMARAT TEXTILES INDUSTRIES SAS, 39 Avenue de Chabannes, 07160 Le Cheylard, France

DNV GL local station: Marseille

CHOMARAT NORTH AMERICA, 160 Alliance Blvd., Williamston, SC 29627, United States

DNV GL local station: Houston

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

Manufacture of FRP components for applications including marine vessels - and rotor blades within wind energy (ref. DNVGL-ST-0376).

The fabric complies with the applicable requirements of DNV GL and is compatible to the laminating resin.

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**.

Laminates:

Process: Resin Transfer Moulding, RTM

Resin system: Araldite LY 564® + Aradur 2954® (100/35)

Curing procedure:

- Q400: 1 hr at 80°C + 6 hrs at 140°C. Fibre content; 55,37%
- Q1200: 1 hr at 80°C + 4 hrs at 140°C. Fibre content: 53,12%

Marking of product

Product/package shall be marked with *manufacturer's name*; **CHOMARAT**, *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.



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Periodical assessments (for Certificate Retention and Certificate Renewal) shall be performed according to DNVGL-CP-0338.

This certificate is only valid if required Periodical assessments are carried out with satisfactory results. To check the validity of this certificate, please look it up in <https://approvalfinder.dnvgl.com>

END OF CERTIFICATE