

**TYPE APPROVAL CERTIFICATE****This is to certify:****That the Carbon Fibre Products**with type designation(s)  
**C-TAPE™ U300 to U1000**

Issued to

**CHOMARAT TEXTILES INDUSTRIES S.A.S.**  
**LE CHEYLARD, 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****Det Norske Veritas' Type Approval Programme 1-501.19, 2009, Carbon Fibre Reinforcements****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 :****For use in marine vessels according to stated Rules/Standards and Manufacturer's recommendations. Area of application will be evaluated during approval of classified objects.****Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.**Issued at **Høvik** on **2017-10-09**for **DNV GL**This Certificate is valid until **2022-10-08**.DNV GL local station: **Marseille**Approval Engineer: **Gisle Hersvik****Martin Strande**  
**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.



## Product description

**C-TAPE™ U300 to U1000**; Carbon Tape.

- Weight range: 300 - 1000 g/m<sup>2</sup>
- 0°-direction (warp): carbon fiber (12K or 24K >90%)
- 90°-direction (weft): coated fiberglass or fiberglass (34-136 tex) <10%

C=Carbon fibre

TAPE=Ruban

U=Uni-directional

The following indicative properties have been verified by Type Testing of laminates:

Property	Test Method	C-TAPE™ U300P 12K HS		
Tensile Strength - Warp	NF EN ISO 527-4,5	2088	mean	MPa
Tensile Modulus - Warp	NF EN ISO 527-4,5	112	mean	GPa
Tensile Elongation - Warp	NF EN ISO 527-4,5	1,89	mean	%
Compressive Strength - Warp	NF EN ISO 14126	416	mean	MPa
Compressive Modulus - Warp	NF EN ISO 14126	87	mean	GPa
Compressive Elongation - Warp	NF EN ISO 14126	0,53	mean	%
Flexural Strength - Warp	NF EN ISO 14125	986	mean	MPa
Fiber ratio (volume)	NF EN 2564	58,4	mean	%
Resin	SICOMIN SR8100/ SD8822 (epoxy resin)			
Curing Procedure used for Type Testing	24 hrs at room temperature, 24 hrs at 43°C			

mean = Mean of Type Test results

Property	Test Method	C-TAPE™ U990P/F 24K		
Tensile Strength - Warp	NF EN ISO 527-4,5	1555	mean	MPa
Tensile Modulus - Warp	NF EN ISO 527-4,5	101	mean	GPa
Tensile Elongation - Warp	NF EN ISO 527-4,5	1,56	mean	%
Compressive Strength - Warp	NF EN ISO 14126	531	mean	MPa
Compressive Modulus - Warp	NF EN ISO 14126	110	mean	GPa
Compressive Elongation - Warp	NF EN ISO 14126	2,16	mean	%
Flexural Strength - Warp (*)	NF EN ISO 14125	865	mean	MPa
Fiber ratio (weight)	NF EN ISO 1172	52	mean	%
Resin	SICOMIN SR8100/ SD8822 (epoxy resin)			
Curing Procedure used for Type Testing	24 hrs at room temperature, 24 hrs at 43°C			

mean = Mean of Type Test results

\* less than 900 MPa as per DNVGL-CP, but due to coated fiberglass in weft direction.

## Application/Limitation

The Type Approval is valid for the above-mentioned weight range.

Area of application will be evaluated during approval of classified objects.

## Type Approval documentation

1. Previous Type Approval Certificate No. K-5001.
2. Assessment Report from DNV GL Marseille of 2017-07-13.

Job Id: **262.1-001506-10**  
Certificate No: **TAK00000YT**

3. Application for Type Approval of 2017-07-21.
4. CHOMARAT Report No. CR E 17-069 (C-TAPE™ U300P 12K HS) of 2017-06-20.
5. CHOMARAT Report No. CR E 17-115 (C-TAP™ U990P/F 24K) of 2017-06-20.

## Tests carried out

Type Testing carried out according to **Type Approval documentation**.

## Marking of product

Product/package shall be marked with *manufacturer's name*; **CHOMARAT TEXTILES INDUSTRIES S.A.S., France** 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).

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 DNV GL Type Approval Certificate.

END OF CERTIFICATE