DNV·GL

Certificate No:
TAK00001HK

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Carbon Fibre Products

with type designation(s)
CYMAX Tri-axial; DBL-Series (300-2400 g/m²) and DBT-Series (300-2400 g/m²) with or without CSM (20-1200 g/m²)

Issued to
Chrong Yi Composite Co. Ltd.
Taoyuan, Taiwan

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 :

For use in marine vessels according to stated Rules/Standards.

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.

Issued at **Høvik** on **2019-01-31**
This Certificate is valid until **2023-02-06**.
DNV GL local station: **Kaohsiung**

Approval Engineer: **Gisle Hersvik**

for **DNV GL**

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.

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Product description

CYMAX Tri-axial Carbon Fibre products of 0°/±45º and of 90°/±45º orientations:
DBL-Series (300-2400 g/m²) and DBT-Series (300-2400 g/m²) with or without CSM (20-1200 g/m²).

Legends:
CSM: Chopped Strand Mat
DB: Double-bias (±45º)
L: Longitudinal (0°)
T: Transverse (90°)

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

Property	**Test Method**	**DBL 900-C**		
Tensile Strength – 0º	ISO 527–4,5	606	MPa	mean
Tensile Modulus – 0º	ISO 527–4,5	46.87	GPa	mean
Compressive Strength – 0º	ISO 604	211	MPa	mean
Compressive Modulus – 0º	ISO 604	51.9	GPa	mean
Flexural Strength – 0º	ISO 14125	624	MPa	mean
Fibre content (volume)	-	46.4[2] / 52.8[1]	%	mean
Resin		SWANCOR 901P – Vinyl Ester Resin		
Curing Procedure for Type Testing		24 hrs at ambient room temperature and pressure		

Note:
Compressive strength is less than value stated in CP-0434, Table 3.

Legend:
mean = Mean of Type Test results

Remarks:
[1] Compressive: Report No. 10754C03083-1-1-02
[2] Tensile + Flexural: Report No. KV-18-06513-1

Application/Limitation

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

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**.

Marking of product

Product shall be marked with *manufacturer's name*; **Chrong Yi Composite Co., Ltd.**, **Taiwan** 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 the DNV GL Type Approval Certificate.

END OF CERTIFICATE