DNV·GL

Certificate No:
TAK000014K

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Carbon Fibre Products

with type designation(s)
CYMAX Uni-axial; L-Series (200-1200 g/m²) and T-Series (200-1200 g/m²) with or without CSM (20-600 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 **2018-02-07**
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 Uni-axial Carbon Fibre products, of 0° and 90° orientation:
L-Series (200-1200 g/m²) and T-Series (200-1200 g/m²) with or without CSM (20-600 g/m²).

Legends:
CSM: Chopped Strand Mat
L: Longitudinal (0°)
T: Transverse (90°)

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

Property	**Test Method**	**L-450C**		
Tensile Strength – 0°	ISO 527–4	1103	MPa	msmv
Tensile Modulus – 0°	ISO 527–4	65.5	GPa	msv
Tensile Elongation – 0°	ISO 527–4	1.76 / 1.66	%	mean / msmv
Compressive Strength – 0°	ISO 604	182	MPa	msmv
Compressive Modulus – 0°	ISO 604	26.0	GPa	msv
Compressive Elongation – 0°	ISO 604	5.78 / 4.89	%	mean / msmv
Fibre content	-	29.2	%	mean
Resin		SWANCOR CHEMPULSE 901 – Epoxy Vinyl Ester Resin		
Curing Procedure for Type Testing		24 hrs at ambient room temperature and pressure		

Legends:
msmv = Manufacturer's Specified Minimum Value (verified to be below mean - 2 standard deviation of Type Test results)
msv = Manufacturer's Specified Value (verified to be within mean ±10% of Type Test results)
mean = Mean of Type Test results

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 DNV GL Type Approval Certificate.

END OF CERTIFICATE