

TYPE APPROVAL CERTIFICATE

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

with type designation(s)

Quadri-axial stitch combo mat: E-QX (0°/+45°/90°/-45°) (600 - 2100 g/m²)

Issued to

**Zhejiang Hengshi Fiberglass Fabrics Co., Ltd.
TONGXIANG, ZHEJIANG, China**

is found to comply with

**Det Norske Veritas' Rules for Classification of High Speed, Light Craft and Naval Surface Craft
Det Norske Veritas' Type Approval Programme 1-501.9, 2012, Polyester- and Vinylester
Resins, Gelcoats and Topcoats****Det Norske Veritas Standards' for Certification No. 2.21, Craft, 2010****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.**This Certificate is valid until **2019-10-22**.Issued at **Høvik** on **2015-10-23**DNV GL local station: **Shanghai**Approval Engineer: **Gisle Hersvik**for **DNV GL**

**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

E-glass stitched combo mat; E-QX (0°/+45°/90°/-45°) (600 - 2100 g/m²); Quadri-axial fabric, 4 layers, with or without Chopped Strand Mat M225.

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

Property	Test Method	E-QX1900/M225					
		0°	+45°	-45°	90°		
Tensile Strength	ISO 527	274	214	202	219	MPa	mean
Tensile Modulus	ISO 527	10,3	11,3	12,3	9,30	GPa	mean
Tensile Elongation at Break	ISO 527	3,30	2,10	2,30	2,80	%	mean
Flexural Strength	ISO 14125	405	421	332	374	MPa	mean
Flexural Modulus	ISO 14125	12,5	13,1	11,6	11,5	GPa	mean
Deflection	ISO 14125	5,24	4,18	4,42	5,05	%	mean
Glass content	ISO 1172	52,7				%	mean
Resin		TM-107 from Changzhou Huari New Material Co.					
Curing Procedure used for Type Testing		24 hrs at room temperature, 8 hrs at 80°C					

mean = Mean of Type Test results

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*; **Zhejiang Hengshi Fiberglass Fabrics Co., Ltd., Tongxiang, China** 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 two (2) years (Certificate Retention) and at renewal after four (4) 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.



Job Id: **262.1-003277-5**
Certificate No: **TAK000003W**

- Ensure traceability between manufacturer's product marking and the DNV GL Type Approval Certificate.

END OF CERTIFICATE