DNV·GL

Certificate No:
TAK00001BR

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Glass Fibre Products

with type designation(s)
Bi-axials (0º/90º). Woven Rovings (EWR) (300-800 g/m²)

Issued to
Taishan Fiberglass Inc.
TAIAN, SHANDONG, China

is found to comply with
DNV GL class programme DNVGL-CP-0467 – Type approval – Uni- and multi-axial multi-ply fabrics made of glass fibres
Det Norske Veritas' Type Approval Programme 1-501.8, 2009, Glass 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 in accordance with 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 **2018-09-10**
This Certificate is valid until **2023-09-09**.
DNV GL local station: **Qingdao**

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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Job Id: **262.1-007040-5**
Certificate No: **TAK00001BR**

Product description

EWR; Woven Roving glass fibre mats (0º/90º); EWR300, EWR400, EWR500, EWR570, EWR600 and EWR800.

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

Property	**Test Method**	**EWR570**		
Tensile Strength	ISO 527	307,0	msmv	MPa
Tensile Modulus	ISO 527	17,6	msv	GPa
Tensile Elongation	ISO 527	1,9	msmv	%
Flexural Strength	ISO 14125	489,0	msmv	MPa
Flexural Modulus	ISO 14125	16,2	msv	GPa
Flexural Deflection	ISO 14125	3,1	msmv	%
Glass Fibre content	ISO 1172	54,5	mean	%
Resin		TM-189 (Unsaturated polyester resin)		
Curing Procedure for Type Testing		24 hrs at room temperature, 3 hrs at 60°C, 3 hrs at 110°C		

Note:
Curing procedure is different from what is given in DNV Type Approval Programme No. 1-501.8.

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

Application/Limitation

The Type Approval is valid for the nominal weight variants; 300 to 800 g/m^2.

Type Approval documentation

Tests carried out

Type Testing carried out in accordance with **Type Approval documentation**, ref. Test Report No. 20090827 from Testing Center of Shanghai FRP Research Institute Co., Ltd. (TCSHFRP) & FRP Industry Test Point of Shanghai Testing Center, China of 2009-12-25.

Note that the DNV GL Class Programme DNVGL-CP-0467 – Type approval – Uni- and multi-axial multi-ply fabrics made of glass fibres, is not dedicated for woven roving products, hence the DNV TAP No. 1-501.8 may be used as reference for this kind of products until a specific DNVGL-CP is established for woven roving products.

Marking of product

Product shall be marked with *manufacturer's name*: **Taishan Fiberglass Inc., Shandong, 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 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