

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Glass Fibre Products

with type designation(s)

Tri-axial: (0°/±45°) (360-2815 g/m²) with and without chopped strand mats (100-500 g/m²),

Tri-axial: (90°/±45°) (300-2225 g/m²) with and without chopped strand mats (100-500 g/m²)

Issued to

**Telateks Tekstil Urunleri Sanayi Ve Ticaret A.S.
(METYX Composites)
Tuzla, Istanbul, Turkey**

is found to comply with

DNV GL rules for classification – High speed and light craft

DNV GL class programme DNVGL-CP-0467 – Type approval – Uni- and multi-axial multi-ply fabrics made of glass fibres

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.

Issued at **Høvik** on **2021-01-21**

This Certificate is valid until **2026-01-20**.

for **DNV GL**

DNV GL local station: **Istanbul**

Approval Engineer: **Gisle Hersvik**

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Gustav Heiberg
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.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV GL AS, its parent companies and subsidiaries as well as their officers, directors and employees ("DNV GL") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.



Job Id: **262.1-011606-8**
Certificate No: **TAK000007N**
Revision No: **1**

Product description

METYX® Glass Fibre Reinforcements:

Tri-axial: (XL) (0°/±45°) (360-2815 g/m²) with and without (M) (100-500 g/m²),
Tri-axial: (XT) (90°/±45°) (300-2225 g/m²) with and without (M) (100-500 g/m²)

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

Property – Orientation	Test Method	XT 704	XT 900		
Tensile Strength - 90°	ISO 527	240	304	msmv	MPa
Tensile Modulus - 90°	ISO 527	17 844	17 128	msv	MPa
Tensile Elongation - 90°	ISO 527	2.4	3.2	msmv	%
Glass content	ISO 1172	52.7	53.3	mean	%
Flexural Strength - 90°	ISO 14125	407	514	msmv	MPa
Flexural Modulus - 90°	ISO 14125	16 618	15 195	msv	MPa
Flexural Elongation - 90°	ISO 14125	3.3	5.4	msmv	%
Glass content	ISO 1172	52.1	52.8	mean	%
Resin	CE 266 N12 ISO Polyester				
Curing Procedure for Type Testing	24 hrs at room temperature, post-cured 3 hrs at 80°C				

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

XL: 0/+45/-45 Tri-axial

XT: +45/90/-45 Tri-axial

M: Chopped Strand Mat

Application/Limitation

Manufacture of FRP components for applications including marine vessels - and rotor blades within wind energy (ref. DNVGL-ST-0376).

The approval covers the weight ranges stated above.

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*: **Telateks Tekstil Urunleri San. ve A.S. (Metyx®), Tuzla / Istanbul, Turkey** 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.

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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 assessments (for Certificate Retention and Certificate Renewal) shall be performed according to DNVGL-CP-0338.

This certificate is only valid if required Periodical assessments are carried out with satisfactory results. To check the validity of this certificate, please look it up in <https://approvalfinder.dnvgl.com>

END OF CERTIFICATE