



TYPE APPROVAL CERTIFICATE

Certificate No:
TAK00000R9
Revision No:
1

This is to certify:

That the Carbon-Glass Hybrid Fibre Products

with type designation(s)

Bi-axial; (0°/90°) (200-2000 g/m²) and (+45°/-45°) (200-2000 g/m²) with or without chopped strand mats (50-500 g/m²),

Bi-axial; (0°/90°) (200-2000 g/m²) and (+45°/-45°) (200-2000 g/m²) with or without veil (15-100 g/m²)

Issued to

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

is found to comply with

**DNV rules for classification – High speed and light craft
DNV standard DNV-ST-0342 – Craft**

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.

Issued at **Høvik** on **2022-12-21**

This Certificate is valid until **2027-12-20**.

DNV local unit: **Istanbul**

Approval Engineer: **Gisle Hersvik**

for **DNV**

**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 AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") 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.



Product description

METYX® Carbon-Glass Fibre Reinforcements.

Bi-axial Combined Carbon Fibre/Glass Fibre products of 0°/90° orientations and Double-bias Combined Carbon Fibre/Glass Fibre products of ±45° orientations

(LT,0°/90°) (200-2000 g/m²) and (X,+45°/-45°) (200-2000 g/m²) with or without CSM (50-500 g/m²)
 (LT,0°/90°) (200-2000 g/m²) and (X,+45°/-45°) (200-2000 g/m²) with or without veil (15-100 g/m²)

Legends:

C: Carbon
 G: Glass
 CSM: Chopped Strand Mat
 L: Longitudinal (0°)
 T : Transverse (90°)
 X : Double-bias (+45°/-45°)

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

Property	Test Method	CGLT600		
Tensile Strength – 0°	ISO 527 – 4	639	MPa	msmv
Tensile Modulus – 0°	ISO 527 – 4	39	GPa	msv
Tensile Elongation – 0°	ISO 527 – 4	2.0 / 1.7	%	mean/msmv
Tensile Strength – 90°	ISO 527 – 4	490	MPa	msmv
Tensile Modulus – 90°	ISO 527 – 4	37	GPa	msv
Tensile Elongation – 9 0°	ISO 527 – 4	2.3 / 1.6	%	mean/msmv
Compressive Strength – 0°	ASTM D695	127	MPa	msmv
Compressive Modulus – 0°	ASTM D695	25	GPa	msv
Compressive Elongation – 0°	ASTM D695	1.2 / 0.8	%	mean/msmv
Compressive Strength – 90°	ASTM D695	200	MPa	msmv
Compressive Modulus – 90°	ASTM D695	30	GPa	msv
Compressive Elongation – 90°	ASTM D695	1.5 / 0.5	%	mean/msmv
Fibre content (by weight)	-	69	%	mean
Resin	Scott Bader Crystic VE676-03 Vinyl Ester Resin			
Curing Procedure for Type Testing	24 hrs at room temperature, 3 hrs at 80°C			

Legends:

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

Application/Limitation

The approval covers the weight ranges stated above.

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 according to **Type Approval documentation**.

The approval testing is based on the class programmes for both carbon and glass fibre reinforcements.

Marking of product



Job Id: **262.1-037515-1**
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Product shall be marked with *manufacturer's name*: **Telateks Tekstil Urunleri Sanayi Ve Ticaret 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 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 assessments (for Certificate Retention / Certificate Renewal) shall be performed according to DNV-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.dnv.com>

END OF CERTIFICATE