DNV·GL

Certificate No:
TAK00001TE

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Carbon Fibre Products

with type designation(s)
Carbon Multiaxial Fabrics, Quadri-axials (0°/±45°/±45°/90) - (400-1600 g/m²)

Issued to
DowAksa Ileri Kompozit Malzemeler San. Ltd. Sti.
Beyoğlu, İstanbul, Turkey

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 :

Manufacture of FRP laminates.

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.

Issued at **Høvik** on **2019-10-23**
This Certificate is valid until **2024-10-22**.
DNV GL local station: **Istanbul**

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

Carbon Multiaxial Fabrics, Quadri-axials (0°/±45°/±45°/90) - (400-1600 g/m²); Quadri-axial Carbon Fibre fabrics.

- Fibre material: 24K
- M-0/90/45/45-XXXX, where 'XXXX' is the areal weight in g/m².

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

Property	**Test Method**	**M-0/90/45/45-700**		
Tensile Strength	DIN EN ISO 527–4,5	612	MPa	mean
Tensile Modulus	DIN EN ISO 527–4,5	45	GPa	mean
Compressive Strength	DIN EN 2850 B	399	MPa	mean
Compressive Modulus	DIN EN 2850 B	42	GPa	mean
Flexural Strength	DIN EN ISO 14125	797	MPa	mean
Flexural Modulus	DIN EN ISO 14125	-	GPa	mean
Fibre content (FVF)	DIN EN 2559	47.7	%	mean
Resin/Hardener		DURATEK 1200. DTE 1200 resin + DTS 1151 hardener.		
Curing Procedure for Type Testing		24 hours at ambient temperature and 8 hours at 100°C		

FVF: Fibre Volum Fraction

Legends:
mean = Mean of Type Test results

Application/Limitation

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

The fabric complies with the applicable requirements of DNV GL and is compatible to the laminating resin.

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;* **DowAksa Ileri Kompozit Malzemeler San. Ltd. Sti., 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.

Periodical assessment

The scope of the Retention/Renewal Survey 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