Certificate no.:
TAK00002JJ

TYPE APPROVAL CERTIFICATE

This is to certify:

that the Carbon Fibre Products

with type designation(s)
SIGRATEX® BIAX (0°/90°; -/+45°; +/-45°) - Series

issued to
SGL Composites Materials Germany GmbH
Wackersdorf, Bayern, **Germany**

is found to comply with
DNV class programme DNV-CP-0434 – Type approval – Uni- and multi-axial multi-ply fabrics made of carbon fibres
DNV rules for classification – Ships
DNV rules for classification – High speed and light craft

Application:

Production of FRP laminates.
Type of sizing: Vinyl ester

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

Issued at **Hamburg** on **2025-07-28**
This Certificate is valid until **2030-07-27**.
DNV local unit: **Augsburg**

for **DNV**

Approval Engineer: **Joachim Rehbein**

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 USD 300 000.

Product description
Biaxial carbon fabric made from continuous tows, non-crimped, stitched, with or without chemical binder or with thermoplastic adhesive middle layer (Spunfab, only for -/+45°, +/-45°).

Approved variants
Fibre orientation: 0°/90°, -/+45°, +/-45°

Total mass per unit area: 200 – 650 g/m²

Max. width: 3022 mm

Type of fibre: SIGRAFIL® CT50-4.6/260

Type of sizing: Vinyl Ester

Application/Limitation
Manufacture of components made of FRP. For marine vessels and rotor blades within wind energy.

The fabric complies with the applicable requirements of DNV 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

Marking of product
Product shall be marked with *manufacturer's name:* **SIGRATEX** 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.

Assessed production site
SGL Composites Materials Germany GmbH
Oskar-von-Miller-Straße 18,
D-92442 Wackersdorf
Germany

Periodical assessment
The scope of the retention and 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 / Certificate Renewal) shall be performed according to DNV-CP-0338.

A production site with a valid Approval of Manufacturer (AoM) certificate for material in question is exempted from the obligation concerning retention and renewal assessments.

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