LABORATORY APPROVAL

Certificate No.:	Issued:	Valid until:
LA-DNV-SE-0436-08264-0	2022-01-22	2025-01-21

Issued for:

Mechanical and analytical testing of fibre reinforced materials

Issued to:

SAERTEX GmbH & Co. KG

Brochterbecker Damm 52, 48369 Saerbeck, Germany

According to:

DNV-SE-0436:2021-09 Shop approval in renewable energy

Applying:

DNV-SE-0441:2021-10 Type and component certification of wind turbines

Based on the document:

CR-LA-DNV-SE-0436-08264-0 Certification Report, dated 2022-01-21

This laboratory approval is valid for the test methods listed in Annex 1.

This Laboratory Approval is equivalent to the Approval of Service Supplier AOSS0000FBM and supersedes it.

Changes in the relevant processes (testing and quality) or in responsible personnel as named in this certificate are to be approved by DNV. See Annex 1 for listing of personnel.

Hellerup, 2022-01-22

For DNV Renewables Certification

Bente Vestergaard

Service Line Leader, Type and Component Certification

Hamburg, 2022-01-22

For DNV Renewables Certification

Bernhard Krüger

Project Manager

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Personnel

Heads of Laboratory	Ms. Carolin Solzbacher
	Deputy: Mr. Nils Otte
Additionally authorised to approve test reports:	Dr. Paul Kipke

List of approved test methods

Analytical Tests	**Test Method**
ISO 1172	Textile-glass-reinforced plastics, prepregs, moulding compounds and laminates - Determination of the textile-glass and mineral-filler content - Calcination methods
ISO 1183-1	Methods for determining the density of non-cellular plastics Immersion method, liquid pyknometer method and titration method
ISO 11357-2	Differential scanning calorimetry (DSC) Part 2: Determination of glass transition temperature
ISO 5084	Textiles Determination of thickness of textiles and textile products
ISO 21765	Textiles - Determination of fabric deformability by forced mechanical distension
QM-PA 001 (internal method)	Reinforcement products - Mats and fabrics - Determination of mass per unit area
QM-PA 010 (internal method)	Reinforcement products - Determination of the yarn-add-in

Mechanical and technological tests	**Test Method**
DIN EN 2850	Carbon fibre thermosetting resin unidirectional laminates Compression test parallel to fibre direction
ISO 527-1	Plastics - Determination of tensile properties Part 1: General principles
ISO 527-4	Plastics - Determination of tensile properties Part 4: Test conditions for isotropic and orthotropic fibre-reinforced plastic composites
ISO 527-5	Plastics - Determination of tensile properties Part 5: Test conditions for unidirectional fibre- reinforced plastic composites

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ISO 13003 (Tension – Tension)	Fibre-reinforced plastics - Determination of fatigue properties under cyclic loading conditions
In combination with LA-PA-006	Dauerschwing Eigenschaften nach ISO 13003
ISO 14125	Fibre-reinforced plastic composites Determination of flexural properties
ISO 14126	Fibre-reinforced plastic composites Determination of compressive properties in the in-plane direction
ISO 14129	Fibre-reinforced plastic composites Determination of the in-plane shear stress/shear strain response, including the in-plane shear modulus and strength, by ± 45° tension test method
ISO 14130	Fibre-reinforced plastic composites Determination of apparent interlaminar shear strength by short beam-method
ASTM D2344/D2344M	Standard Test Method for Short-Beam Strength of Polymer Matrix Composite Materials and Their Laminates
ASTM D3518/D3518M	Standard Test Method for In-Plane Shear Response of Polymer Matrix Composite Materials by Tensile Test of a ±45° Laminate
ASTM D6641/D6641M	Standard Test Method for Compressive Properties of Polymer Matrix Composite Materials Using a Combined Loading Compression (CLC) Test Fixture
ASTM D7078/D7078M	Standard Test Method for Shear Properties of Composite Materials by V-Notched Rail Shear Method