



TYPE APPROVAL CERTIFICATE

Certificate No:
TAK00000CA
Revision No:
2

This is to certify:

That the Glass Fibre Products

with type designation(s)
Woven Rovings (270-1800 g/m²) with or without CSM (50-600 g/m²)

Issued to
Vitrulan Composites Oy, Mikkeli Plant
Mikkeli, Finland

is found to comply with
DNV GL class programme DNVGL-CP-0467 – Type approval – Uni- and multi-axial multi-ply fabrics made of glass fibres
Det Norske Veritas' Type Approval Programme 1-501.8, 2009, Glass Fibre Reinforcements
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 :

Manufacturing of FRP laminates.

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

Issued at **Høvik** on **2021-08-19**

This Certificate is valid until **2026-08-18**.

DNV local station: **Helsinki FIS**

Approval Engineer: **Gisle Hersvik**

for **DNV**

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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 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

Woven Rovings (270-1800 g/m²) with/without Chopped Strand Mat (50-600 g/m²).

The product group contains product numbers starting with 96, 97, 98, 99, e.g. 96xx, 97xx, 98xx, 99xx.

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

Properties	Test Method	9816M300 [0°]	9816M300 [90°]		
Tensile strength	ISO 527	160	268	MPa	msmv
Tensile modulus	ISO 527	14 790	16 582	MPa	msmv
Flexural strength	ISO 14125	161	383	MPa	msmv
Flexural modulus	ISO 14125	10 414	10 696	MPa	msmv
Glass content	ISO 1172	50,5	50,5	%	mean
Resin:		Reichhold's 720-800			
Curing procedure used for Type Testing:		24 hrs at room temperature, 3 hrs at 80 °C			

Legends:

msmv: Manufacturer's Specified Minimum Value (less than mean – 2 standard dev.)

mean: Mean of Type Test results

Application/Limitation

The approval covers the weight ranges listed above.

Due attention should be given to wetting out/impregnating properties of products with a high weight per unit area (e.g. 9816/M450 and 9819/M450).

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**.

Marking of product

Product shall be marked with *manufacturer's name*: **Vitrulan Composites Oy, Mikkeli Plant, Finland** 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 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