Certificate No:
TAK000025D

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Adhesive

with type designation(s)
Nautic VE-S (Vinylester Adhesive)

Issued to
NOVOL Sp. z o. o.
Komorniki, **Poland**

is found to comply with
DNV class programme DNV-CP-0086 – Type approval – Adhesive systems

Application :

Bonding of fibre reinforced plastics.

Issued at **Hamburg** on **2022-11-25**
This Certificate is valid until **2027-11-24**.
DNV local station: **Gdansk CMC**

Approval Engineer: **Joachim Rehbein**

for **DNV**

Thorsten Lohmann
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

Nautic VE-S: Vinylester rigid adhesive
Hardener: Methyl ethyl ketone peroxide

Assessed production site
Novol sp. z o.o.
ul. Żabikowska 7/9
62-052 Komorniki
Poland

The following properties have been established by type testing of cured resin:

Property	Test Method	Value[1]	
Tensile lap shear strength[3]	DIN EN 1465	9.9	MPa
Tensile lap-shear strength after immersion in water[4]	DIN EN 1465	10.1	MPa
Tensile lap-shear strength at 50°C[3]	DIN EN 1465	11.3	MPa
Tensile strength[3]	DIN EN 527-2 1B	51.1	MPa
Tensile modulus[3]	DIN EN 527-2 1B	2946	MPa
Heat deflection temperature after immersion in water[4]	ISO 75-1,2 method A	60	°C
Glass transition temperature[2, 3]	DIN EN ISO 6721	74	°C

Note: Lap shear test results (bond line thickness 3.0mm) and HDT are lower than values stated in DNV-CP-0086
1) Mean values
2) Temperature at max. loss modulus
3) Curing procedure 24h at 23°C + 1h at 60°C
4) Curing procedure 24h at 23°C

Application/Limitation

The adhesive complies with the applicable requirements of DNV and is compatible to the adherends.

Approved substrates:

- Glass fibre reinforced vinylester

For applications subject to dynamical loads additional testing may be required.

Any significant changes in design and/or quality will render the approval invalid.

Type Approval documentation

Marking of product

Product shall be marked with *manufacturer's name*, *place of production, date of production* 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

Periodical assessments are required after two years and after 3.5 years (retention survey) and for renewal after 5 years (renewal survey). Refer to DNV-CP-0338, Sec.4.

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

This certificate is only valid if required 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