

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Polyester Resins

with type designation(s)

PALATAL™ U 541 T-01, PALATAL™ TV-02, PALATAL™ TV-03, PALATAL™ TV-04, PALATAL™ TV-05, PALATAL™ TV-05 X, PALATAL™ TV-06, PALATAL™ TV-07 V, PALATAL™ TV-08 V, PALATAL™ TV-11, PALATAL™ TV-12 WHITE and PALATAL™ TV-103

Issued to

Aliancys AG
Schaffhausen SH, Switzerland

is found to comply with

DNV GL class programme DNVGL-CP-0083 – Type approval – Polyester resin, vinylester resin, gelcoat and topcoat
DNV GL rules for classification – High speed and light craft
Det Norske Veritas Standards' for Certification No. 2.21, Craft, 2010

Application :

Grade 2 resin for use in marine vessels according to stated Rules/Standards.

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

This Certificate is valid until **2021-08-17**.

Issued at **Høvik** on **2016-08-18**

DNV GL local station: **Augsburg**

Approval Engineer: **Gisle Hersvik**

for **DNV GL**

Martin Strande
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.

Job Id: **262.1-001788-4**
Certificate No: **TAK00000E7**

Product description

PALATAL™ U 541 T-01, PALATAL™ TV-02, PALATAL™ TV-03, PALATAL™ TV-04, PALATAL™ TV-05, PALATAL™ TV-05 X, PALATAL™ TV-06, PALATAL™ TV-07 V, PALATAL™ TV-08 V, PALATAL™ TV-11, PALATAL™ TV-12 WHITE and PALATAL™ TV-103; unsaturated, orthophthalic, LSE (Low Styrene Emission) polyester resins.

The following properties have been verified by Type Testing:

Property	Test Method	U 541 TV-02		
Fracture Elongation	ISO 527	1.81 / 1.43	%	mean / min
Tensile Strength	ISO 527	56.3 / 49.5	MPa	mean / min
Water Absorption	ISO 62	84	mg	msmv (mean)
HDT	ISO 75	60.2	°C	msmv (mean)
Barcol Hardness	BS 4549	47	-	msv
Density	ISO 1675	1.09	g/cm ³	msv
Curing Procedure used for Type Testing		24 hrs at room temperature, 24 hrs at 50°C		

Remark:

The flexural strength of the resin is lower than required in the DNV Rules (requirement min. 80 MPa). Average value of tested samples is only 75.3 MPa, and this should be considered during laminating.

Legends:

msv = Manufacturer's Specified Value, verified to be within $\pm 10\%$ of mean of Type Test results

msmv = Manufacturer's Specified Minimum Value, verified to be below mean - 2 x standard deviation of Type Test results

mean = mean of Type Test results

min. = minimum value from Type Testing

Manufactured by

Aliancys Nederland B.V., Nieuw Amsterdamseweg 31a, 7764 AN Schoonebeek, The Netherlands

DNV GL local station: Rotterdam

Responsibility

The Company (stated on the front page of this Certificate) takes the responsibility that both design and production are in compliance with Rules, Standards and/or Regulations listed on page 1 of this certificate.

Type Approval documentation

- 1.
- 2.
- 3.
- 4.
- 5.

Tests carried out

Type Testing carried out according to **Type Approval documentation**.

Marking of product

Product shall be marked with *manufacturer's name*; **Aliancys Nederland B.V.** and *type designation*.

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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 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 Assessment to be performed after 2 years (Certificate Retention) and at renewal after 5 years (Certificate Renewal).

The main elements of the Periodical Assessment are to:

- Ensure that **Type Approval documentation** is available.
- Review design, materials, production process, and performance with respect to possible changes, in order to ensure compliance with **Type Approval documentation** and/or referenced material specifications.
- Ensure traceability between manufacturer's product marking and the DNV GL Type Approval Certificate.

END OF CERTIFICATE