



Certificate no.:
TAK000028C

TYPE APPROVAL CERTIFICATE

This is to certify:
that the Vinyl Ester Resins

with type designation(s)
CRYSTIC® VE 671PAT including variants:
CRYSTIC® VE 671-03PA, CRYSTIC® VE 661PAT and CRYSTIC® VE 661-03PA

issued to
SCOTT BADER COMPANY LIMITED
Wellingborough, Northamptonshire, United Kingdom

is found to comply with
DNV class programme DNV-CP-0083 – Type approval – Polyester resin, vinylester resin, gelcoat and topcoat
DNV rules for classification – High speed and light craft
DNV standard DNV-ST-0342 – Craft

Application:
Grade 1 resin for construction of laminates made of fibre reinforced plastics.

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

Issued at **Hamburg** on **2024-06-05**
This Certificate is valid until **2029-06-04**.
DNV local unit: **UK & Ireland CMC & VMC**

for **DNV**

Approval Engineer: **Gisle Hersvik**

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.



Form code: TA 251

Revision: 2023-09

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Product description

CRYSTIC® VE 671PAT Epoxy Vinyl Ester Based Resin: a pre-accelerated Bisphenol A epoxy, thixotropic vinyl ester-based resin.

Approved variants

CRYSTIC® VE 671-03PA Low viscosity variant and geltime for vacuum infusion
CRYSTIC® VE 661PAT Preaccelerated, thixotropic
CRYSTIC® VE 661-03PA Low viscosity and geltime variant for vacuum infusion

The following properties have been verified by type testing:

Property	Test Method	CRYSTIC® VE 671PAT	Unit	
Fracture Elongation	ISO 527-1,2	4,5	%	mean
Tensile Strength	ISO 527-1,2	71,2	MPa	mean
Tensile Modulus	ISO 527-1,2	3400	MPa	msv
Water Absorption	ISO 62	66,0	mg	mean
HDT	ISO 75-2	71,63	°C	mean
Barcol Hardness	ASTM D2583, EN59	33	-	msv
Density	ISO 1183-1	1,19	g/cm ³	msv
Curing Procedure used for type testing: 24hrs at 23°C followed by 24hrs at 50°C				
msv = Manufacturer's Specified Value, verified to be within ±10% of mean of Type Test results mean = mean of Type Test results Note: Specified Barcol hardness is lower than the minimum Barcol hardness stated in DNV-CP-0083.				

Manufactured by

Scott Bader Middle East, PO Box 16785, Dubai, United Arab Emirates

DNV local station: Abu Dhabi

Responsibility

The company stated on the front page of this certificate takes the responsibility that both design and production are following Rules, Standards and/or Regulations listed on page 1 of this certificate.

Application/Limitation

Grade 1 vinyl ester resin for fabrication of fibre reinforced composites by contact moulding.

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, place of manufacture and type designation, batch number, date of manufacture*.

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.



Job ID: **262.1-037433-1**
Certificate no.: **TAK000028C**

Periodical assessments (for Certificate Retention / Certificate Renewal) shall be performed according to DNV-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.dnv.com>

END OF CERTIFICATE