

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Vinyl Ester Resins

with type designation(s)
R-802

Issued to

Yong Shun Chemical Co., Ltd.
Taoyuan City, Taiwan

is found to comply with

DNV GL rules for classification – High speed and light craft
Det Norske Veritas' Type Approval Programme 1-501.9, 2012, Polyester- and Vinylester
Resins, Gelcoats and Topcoats
Det Norske Veritas Standards' for Certification No. 2.21, Craft, 2010

Application :

Grade 1 vinyl ester 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 **2021-02-17**.

Issued at **Høvik** on **2016-02-22**

DNV GL local station: **Kaohsiung**

Approval Engineer: **Helene Bjerke**

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.

Product description

Vinyl Ester Resin; **R-802**

The following properties have been verified by Type Testing of cured resin:

Property	Test Method	Results		
Fracture Elongation	ISO 527	3.8	%	mean
Tensile Strength	ISO 527	73.6	MPa	mean
Water Absorption	ISO 62	32.4	mg	mean
HDT	ISO 75	80	°C	mean
Barcol Hardness	ASTM D2583	50	-	msv
Density	ISO 1675	1.157	g/cm ³	msv
Curing Procedure used for Type Testing ¹⁾		24 hrs at room temperature, 3 hrs at 80°C		

¹⁾ The curing procedure used is different from the procedure described in DNV GL's Type Approval Programme.

Legends:

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

Type Approval documentation Tests carried out

Type Testing carried out in accordance with **Type Approval documentation**.

Marking of product

Product shall be marked with *manufacturer's name*; **Yong Shun Chemical Co., Ltd., Taiwan**, 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 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.

Assessment to be performed after 2.5 years (Certificate Retention) and at renewal after 5 years (Certificate Renewal).

The main elements of the Periodical Assessment are:

- 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