

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Vinyl Ester Resins**with type designation(s)
ETERSET 2960 Series

Issued to

Eternal Materials Co., Ltd.
Kaohsiung, Taiwan

is found to comply with

Det Norske Veritas Standards' for Certification No. 2.21, Craft, 2010**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****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 **2021-03-06**.Issued at **Høvik** on **2016-03-07**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.

Job Id: **262.1-013055-2**
Certificate No: **TAK000008H**

Vinyl Ester Resins: **ETERSET 2960 Series**, including **ETERSET 2960-S** and **ETERSET 2960PT**.

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

Property	Test Method	ETERSET 2960		
Fracture Elongation	ISO 527	5,6	%	msv
Tensile Strength	ISO 527	80,7	MPa	msv
Tensile Modulus	ISO 527	3329	MPa	msv
Flexural Strength	ISO 178	130,4	MPa	msv
Flexural Modulus	ISO 178	3809	MPa	msv
Water Absorption	ISO 62	39,3	mg	msv
HDT	ISO 75	104	°C	msv
Barcol Hardness	ASTM D2583	35,0	-	msv
Density	ISO 1675	1,052	g/cm ³	msv
Curing Procedure used for Type Testing		24 hrs at 23 °C + post cure 24 hrs at 80 °C		

Legend:

msv: manufacturer's specified value, verified to be within $\pm 10\%$ of mean of Type Test results.

Type Approval documentation Tests carried out

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

Marking of product

Product/Package shall be marked with *manufacturer's name*; **Eternal Materials Co. Ltd., Taiwan** and *type designation*.

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 two (2) years (Certificate Retention) and at renewal after five (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