DNV·GL

Certificate No:
TAK000003M

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Vinyl Ester Resins

with type designation(s)
Atlac E-Nova MA 6215

Issued to
DSM COMPOSITE RESINS AG
Schaffhausen SH, Switzerland

is found to comply with
Det Norske Veritas' Rules for Classification of High Speed, Light Craft and Naval Surface Craft, Grade 2
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 :

For use in marine vessels in accordance with 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 **2019-10-05**.

Issued at **Høvik** on **2015-10-06**

for **DNV GL**

DNV GL local station: **Augsburg**

Approval Engineer: **Gisle Hersvik**

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: **262.1-002983-5**
Certificate No: **TAK000003M**

Product description

Atlac E-Nova MA 6215.

Pre-accelerated, low viscosity, epoxy bisphenol A vinyl ester modified resin.

The following properties have been verified by Type Testing:

Atlac E-Nova MA 6215			
Property	**Test method**	**Manufacturer's specification**	
Density	ISO 1675	1,051 g/m³	msv
Volumetric curing shrinkage	ISO 3521	7,5 %	msv
Barcol hardness	BS 4549 App. A	36	msv
HDT	ISO 75-2	60,1 ºC	msv
Water absorption	ISO 62	67,3 mg	msv
Ultimate tensile strength	ISO 527-1,2	58,8/49 MPa	mean/min
Tensile modulus	ISO 527-1,2	3100 MPa	msv
Fracture elongation	ISO 527-1,2	1,95/1,6 %	mean/min
Ultimate flexural strength	ISO 178	99,4/79,2 MPa	mean/msmv
Flexural modulus	ISO 178	3690 MPa	msv

Curing conditions for Type Testing: 100 ppw Atlac E-Nova MA 6215, 2 ppw Butanox M 50 (AKZO-Nobel), cured at 24 h at room temperature and 16 h at 40 ºC.

Legend:
msv: manufacturer's specified value
msmv: manufacturer's specified minimum value (verified to be ≤ mean – 2 standard deviations)
mean: mean value of test results
min: minimum value of test results

Manufactured by

DSM Composite Resins Italia Srl, Via Rodi, 5, 24040 Filago, Bergamo (BG), Italy

DNV GL local station: Milan

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
Tests carried out

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

Marking of product

Product shall be marked with *manufacturer's name*; **DSM Composite Resins Italia Srl, Filago, Italy**, 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.

Periodical Assessment to be performed after two (2) years (Certificate Retention) and at renewal after four (4) 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