DNV·GL

Certificate No:
TAK00001VR

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Polyester Resins

with type designation(s)
ESTROMAL 11.LM Series

Issued to
LERG S.A.
Pustkow, Poland

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
DNV GL standard DNVGL-ST-0342 – Craft

Application :

Grade 2 polyester resin 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.

Issued at **Høvik** on **2020-05-29**
This Certificate is valid until **2025-05-28**.
DNV GL local station: **Katowice CMC**

Approval Engineer: **Gisle Hersvik**

for **DNV GL**

Gustav Heiberg
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.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV GL AS, its parent companies and subsidiaries as well as their officers, directors and employees ("DNV GL") 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.

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Job Id: **262.1-032976-1**
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Product description

ESTROMAL 11.LM Series; Unsaturated Ortophthalic Polyester Resin

Non-LSE variants: ESTROMAL 11.LM-XXXXXXX
LSE variants: ESTROMAL 11.LM-XXXXXXX (LSE)

Base:
ESTROMAL 11.LM-02 BAZA / ESTROMAL 11.LM-02G/BAZA+.

The following properties have been established by type testing of cured base resin.

Property	**Test Method**	**Value** *	
Tensile strength	ISO 527-1,2	66,1	MPa
Tensile modulus	ISO 527-1,2	3863	MPa
Elongation at break	ISO 527-1,2	1,8	%
Density	ISO 1183-1	1,209	g/cm^3
Barcol hardness	EN 59	53	-
Water absorption	ISO 62	100	mg (max)
** mean values*			

Application/Limitation

For use in construction of FRP laminates of components, on condition that fibre reinforcement comply with the applicable requirements of DNV GL and are compatible with the resin.

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 in accordance with **Type Approval documentation**.

Marking of product

Product/package shall be marked with *manufacturer's name;* ***LERG S.A.****, place of production, type designation, batch number, production date, net weight, gross weight* and *shelf life*.

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 assessments (for Certificate Retention and Certificate Renewal) shall be performed according to DNVGL-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.dnvgl.com

END OF CERTIFICATE