Certificate no.:
TAS0000510

TYPE APPROVAL CERTIFICATE

This is to certify:

that the Rudder Bearing Bushing Material, Synthetic

with type designation(s)
Norden 788 Marine

issued to
Norden Maritim AS
Os, **Norway**

is found to comply with
DNV class programme DNV-CP-0081 – Type approval – Synthetic bearing bushing materials
DNV rules for classification – Ships

Application:

Maximum surface pressure 10 N/mm² for the synthetic rudder bearing bushing material against steel/metal, water/oil/grease lubricated or self-lubricated. The Type Approval is valid only when the installation/application of the product is according to the DNV Rules and the Manufacturer's recommendations.

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

Issued at **Høvik** on **2025-10-07**
This Certificate is valid until **2030-10-06**.
DNV local unit: **Bergen**

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 USD 300 000.

Product description

Norden 788 Marine: A fibre-reinforced thermosetting resin material with additional lubricant.

Place of Manufacture

Norden Maritim AS, Industriveien 13, N-5210, Os, Norway

Application/Limitation

Fields of Application:	- Rudder Neck Bearings - Rudder Pintle Bearings - Rudder Carriers - Fin stabilizers
Lubricants:	- Water, grease, oil - Self-lubrication (dry running)
Surface Pressure:	- 10.0 MPa, maximum (lubricated) - 10.0 MPa, maximum (self-lubricated)
Installation:	- Press fit - Freeze fit - Adhesive bonded
Dimensions:	- As per DNV Rules and Manufacturer's recommendations. - Min – max diameters (OD): 50 – 2500 mm - Min – max thicknesses (WT): 8 – 120 mm - Optimum wall thickness, Ref. Norden Maritim's "Rudder Bearing Engineering Manual, Chapter 3.2.

The Type Approval is valid only when the installation/application of the product is according to the specified DNV Rules and the Manufacturer's recommendations.

Area of application will be evaluated during approval of classified objects if the surface pressure exceeds 5.5 MPa, and/or for dry running (self-lubrication) applications.

The maximum surface pressure of 10 N/mm² will be subject to evaluation w.r.t. service experience etc. in connection with renewal of the certificate.

In accordance with DNV Rules for Ships, Pt.3 Ch.14, the bushing shall be effectively secured to the bearing.

Bushing should be effectively secured in accordance with Manufacturer's recommendation. Physical stopper should be arranged to prevent the bushing from shifting in vertical direction.

Any significant changes in design and/or quality of the material will render the approval invalid.

Type Approval documentation

Tests carried out

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

Marking of product

Product shall be marked with *manufacturer's name*: **Norden Maritim AS, Os, Norway**, *type designation*: **Norden 788 Marine**, *item number* and *dimensions*.

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.

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