Certificate no.:
TAM00001DC

TYPE APPROVAL CERTIFICATE

This is to certify:

that the Steering Gear Bearing Material

with type designation(s)
Norden NNF

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:

Axial thrust ring material for Rotary Vane Steering Gear.

Issued at **Hamburg** on **2024-07-03**
This Certificate is valid until **2029-07-02**.
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 300,000 USD.

Product description

Norden NNF

A composite bearing material made of a special needle felt fibre which is impregnated with a thermosetting resin. The composite includes special solid lubricant fillers.

Place of Manufacture

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

Application/Limitation

Fields of Application:	- Rotary Vane Steering Gear
Lubricants:	- Oil
Surface Pressure:	- 10 MPa, maximum, as per Manufacturer's recommendations.
Dimensions / tolerances:	- As per steering gear manufacturer's specification.

For information about material properties and physical properties of the material, please refer to manufacturer's Technical Specifications for Norden NNF.

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

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**.

The approval is based on a combination of material testing and performance testing including comparison testing with a well-proven reference material.

Marking of product

Product/Package shall be marked with *manufacturer's name*: **Norden Maritim AS, Os, Norway**, *type designation*: **Norden NNF**, *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