DNV·GL

Certificate No:
TAM00000R2

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Stern Tube Bearing Material

with type designation(s)
WCS01 (G127)

Issued to
Wartsila UK Ltd.
HAVANT HAMPSHIRE, United Kingdom

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

Application :

Synthetic water lubricated propeller shaft bearing material. The Type Approval is valid only when the installation/application of the product is according to the DNV GL Rules and the Manufacturer's recommendations. Maximum nominal bearing pressure: 0.6 MPa.

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

Issued at **Høvik** on **2017-11-13**
This Certificate is valid until **2022-11-12**.
DNV GL local station: **Southampton**

Approval Engineer: **Gisle Hersvik**

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.

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Product description

WCS01 (G127): Polyester filament wound resin sterntube bearing material.

Place of Manufacture

Wartsila UK Ltd., 810 Oxford Avenue, Slough Trading Estate, Berkshire, SL1 4LN, United Kingdom

DNV GL local station: Southampton

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.

Application/Limitation

Fields of Application:	- Stern Tube/Propeller Shaft Bearings - Propeller Shaft Bracket Bearings
Lubricants;	- Water
Surface Pressure;	- 0.6 MPa, maximum, for minimum length to diameter (L/D) ratio of 2:1 for the bearing next to propeller. For all the other positions, L/D ratio as per Manufacturer's recommendations.
Installation;	- Press fit - Freeze fit - Adhesive bonded - Tapered keyset
Dimensions;	- As per DNV GL Rules and Manufacturer's recommendations. - Min – max diameters (OD): 22 – 1200 mm - Min – max thicknesses (WT): 8 – 120 mm - Optimum wall thickness: [(0.045 x Ds) + 10] mm. Ref. Wartsila's "Envirosafe – WCS01 Water Lubricated Propeller Bearings Design & Procedure Manual", DPM-01, Issue 6, 14/09/2016.

The Type Approval is valid only when the installation/application of the product is according to the specified DNV GL Rules and the Manufacturer's recommendations, ref. Wartsila's "Envirosafe – WCS01 Water Lubricated Propeller Bearings Design & Procedure Manual", DPM-01, Issue 6, 14/09/2016.

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 according to **Type Approval documentation**.

Marking of product

Product shall be marked with *manufacturer's name*; **Wartsila UK Ltd.** or *trademark* and *type designation*; **WCS01**.

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 2 and 3.5 years (Certificate Retention) and at renewal after 5 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 DNV GL Type Approval Certificate.

END OF CERTIFICATE