

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Shaft Seal for Thruster**

with type designation(s)

LEACON compatible design dedicated to SCHOTTEL Thrusters only as listed under Type Designation

Issued to

**SCHOTTEL GmbH
Spay, Rheinland-Pfalz, Germany**

is found to comply with

DNV GL rules for classification – Ships**Application :****Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.**Issued at **Hamburg** on **2018-07-20**This Certificate is valid until **2023-07-19**.DNV GL local station: **Essen**for **DNV GL**Approval Engineer: **Stanislav Avanesov**

**Burkhard Lilienthal
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.



Product description

Steering Shaft and Propeller Shaft Sealing of Ring Type for SCHOTTEL Propulsion / Steering Units
SRP Schottel Ruder Propeller
SRE Schottel Ruder Propeller Eco
STP Schottel Twin Propeller
SCD Schottel Combi Drive
STT Schottel Transverses Thruster
SPJ Schottel Pump Jet

The design of the sealings (mechanical part) is aimed to comfort the LEACON system (void space between oil and water chambers) and is type and size dependable. As main sealing devices / rings only standardized type approved products are to be applied

Application/Limitation

This Type Approval applies particularly for the purpose of issuing a Compliance Confirmation to EPA / VGP 2013 in combination with the LEACON Control System and the following radial rings: Walkersele D7 and D8, Freudenberg Simmering BAC and BAD, catalogues available within "Technical Files".

Type Approval documentation

Tests carried out

Tests carried out (>1000h) since Jan. 2015 and up to March 2016, witnessed test by DNVGL on 11.05.2016 including review of files of long term measurements. The tests were carried out with the complete LEACON system active, leakages were partly simulated, to demonstrate multiple registration of leakages and automatic activation of drainage of void space by underpressure.

Test Report TLV-15-006 with LEACON tank 1215716, LEACON System 1215808, sealing test rig 116705 with rings Freudenberg SIMRIT BAD.

Marking of product

Maker's specification (to fulfil maker's quality / logistic system)

Periodical assessment

For retention of the Type Approval, a DNVGL surveyor shall perform a survey after 2 and 3,5 years after issue of certificate to verify that the conditions of the Type Approval are complied with.

The objective of the Periodical Assessment is to verify that the conditions for the Type Approval are not altered since the Type Approval Certificate was issued. The main scope of the Periodical Assessment will normally include:

- Verification of the Type Approval applicant's production and quality system w.r.t. ensuring continued consistent production of the Type Approved products at the Type Approval applicant's own premises and at other companies that are given the responsibility for manufacturing of the products.
- Review of the Type Approval documentation and that this is still used as basis for the production
- Review of possible changes to the design, the material and the performance of the product
- Verification of the product marking.

In cases where the Type Approved product is manufactured at other companies, the Periodical Assessment shall verify that the Type Approval applicant has a quality control system for consistent



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production at their licensees/subcontractors. Furthermore Periodical Assessment shall be carried out randomly at these companies.

When a Type Approved product is manufactured at other companies, the Type Approval applicant takes the sole responsibility for the conformity of the product to the applicable requirements.