

TYPE APPROVAL CERTIFICATE**This is to certify:****That the Class A Bulkhead**

with type designation(s)

Dynamic Shaft Penetration ProfiSeal Series 500 fire resistant A-60 Bulkhead Seal

Issued to

**ProfiSeal GmbH
Schornsheim, Germany**

is found to comply with

GL Rules for Classification and Construction I - Ship Technology**GL Rules for Classification and Construction VI - Additional Rules and Guidelines Part 7 -
Guidelines for the Performance of Type Approvals Chapter 4 - Test Requirements for Sealing
Systems of Bulkhead and Deck Penetrations****Application :****Approved for installation in a Class A-60 bulkhead for a shaft diameter from 50 mm up to
500 mm. See limitations regarding maximum shaft penetration diameter under
Application/Limitation****Product(s) approved by this certificate is/are accepted for installation on all vessels classed
by DNV GL.**This Certificate is valid until **2020-07-12**.Issued at **Hamburg** on **2017-01-27**DNV GL local station: **Augsburg**Approval Engineer: **Pavel Golyshev**for **DNV GL**

Digitally Signed By: Priebe, Roland

Location: DNV GL Hamburg, Germany

Signing Date: 2017-02-07, on behalf of

**Antje Fleischhauer
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

"Dynamic Shaft Penetration ProfiSeal Series 500 fire resistant A-60 Bulkhead Seal"

The ProfiSeal Series 500 fire resistant A-60 Bulkhead Seal is a sealing ring assembly consisting of two stainless steel split housings with grooves in which split carbon sealing rings are fitted. The sealing ring assembly is fitted around the shaft, bolted to the class A-60 bulkhead and covered from both sides of the bulkhead with fire insulated split linings. The construction and installation of the bulkhead seal is illustrated in the drawing in Appendix A, Fig. 1.1 to Fig. 5.1 of the test report.

On the side of the bulkhead exposed to the fire hazard the bulkhead seal is fully covered with a fire insulated split lining. This lining consists of Firemaster Marine Plus Insulation covered with a perforated steel sheet of 1.5 mm in thickness. From the opposite side of the bulkhead (unexposed to the fire hazard) a fire insulated split lining is mounted to the other side of the sealing ring housing through the cut out in the bulkhead.

Insulation material used for fire insulated split lining:

"Firemaster Marine Plus Blanket 38/50" made by Morgan Thermal Ceramics with a density of 128 kg/m³:

- The nominal thickness is 38 mm for shaft penetrations up to Ø400 mm. For total insulation thickness and other details see assessment 20140917.1.
- For shaft penetrations' range of larger than Ø400 mm and up to Ø500 mm, thicker thermal insulation (used nominal thicknesses are 38 mm and 50 mm) combined with minimum 40 mm thick mounting flange on the bulkhead to be used. For total insulation thickness and other details see assessment No. 20170057.

Application/Limitation

Approved for installation in bulkhead of Class A-60. Other applications are subject to case-by-case approval.

The sealing has been successfully tested according to water tightness for shaft penetrations up to Ø400 mm only. For details see test report No. N14062F2 dated 9th of February 2015 issued by DNV GL.

Type Approval documentation

Test report No. 20140917 (for shaft penetrations: up to Ø340 mm) and assessment No. 20140917.1 (up to Ø400 mm) both dated 3rd of March 2015 and assessment No. 20170057 dated 11th of January 2017 (up to Ø500 mm) all issued by MPA Dresden, Freiberg, Germany.

Tests carried out

Tested according to IMO 2010 FTP Code Part 3.

Marking of product

The product or packing is to be marked with name and address of manufacturer, type designation and fire-technical rating.

Periodical assessment

DNV GL's surveyor is to be given permission to perform Periodical Assessments at any time during the validity of this certificate and at least every second year. The arrangement is to be in accordance with procedure described in DNVGL-CP-0338 Section 4.