



CERTIFICATE NUMBER
EFFECTIVE DATE
EXPIRY DATE
ABS TECHNICAL OFFICE

20-2054804-1-PDA
15-Nov-2021
10-Dec-2025
Houston ESD - Ship Equipment

CERTIFICATE OF Product Design Assessment

This is to certify that a representative of this Bureau did, at the request of

AEGIR MARINE B.V.

located at

MOLENVLIET 34, WIJK BIJ DUURSTED, Netherlands, 3961 MV

assess design plans and data for the below listed product. This assessment is a representation by the Bureau as to the degree of compliance the design exhibits with applicable sections of the Rules. This assessment does not waive unit certification or classification procedures required by ABS Rules for products to be installed in ABS classed vessels or facilities. This certificate, by itself, does not reflect that the product is Type Approved. The scope and limitations of this assessment are detailed on the pages attached to this certificate.

Product: **Propeller Shaft Seal System**

Model: **PRIME, PRIMAIR Standard and Secure and PRIMAIR Compact types shaft seal units series.**

Endorsements:

Tier: **2 - PDA Issued**

This Product Design Assessment (PDA) Certificate remains valid until 10/Dec/2025 or until the Rules and/or Standards used in the assessment are revised or until there is a design modification warranting design reassessment (whichever occurs first).

Acceptance of product is limited to the "Intended Service" details prescribed in the certificate and as per applicable Rules and Standards.

This Certificate is valid for installation of the listed product on ABS units which exist or are under contract for construction on or previous to the effective date of the ABS Rules and standards applied at the time of PDA issuance. Use of the Product for non-ABS units is subject to agreement between the manufacturer and intended client.

American Bureau Of Shipping

Jessie Godwin Telen, Engineer/Consultant

NOTE: This certificate evidences compliance with one or more of the Rules, Guides, standards or other criteria of ABS or a statutory, industrial or manufacturer's standards. It is issued solely for the use of ABS, its committees, its clients or other authorized entities. Any significant changes to the aforementioned product without approval from ABS will result in this certificate becoming null and void. This certificate is governed by ABS Rules 1-1-A3/5.9 Terms and Conditions of the Request for Product Type Approval and Agreement (2010)

AEGIR MARINE B.V.
MOLENVLIET 34
WIJK BIJ DUURSTEDE
Netherlands 3961 MV
Telephone: [REDACTED]
Fax: [REDACTED]
Email: [REDACTED]@aegirmarine.com
Web: www.aegirmarine.com
Tier: 2 - PDA Issued

Product: Propeller Shaft Seal System
Model: PRIME, PRIMAIR Standard and Secure and PRIMAIR Compact types shaft seal units series.

Endorsements:

Intended Service:
Sealing of oil lubricated propeller shafts.

Description:
PRIME type Standard and Secure aft, with or without AEGIR Protection System (APS), and forward seals series; PRIMAIR type Standard and Secure aft seals series, with AEGIR Protection System (APS). PRIMAIR Compact system is to be used with 3 sealing ring aft seal (PRIME Standard type) and 4 sealing ring aft seal (PRIME Secure type and PRIMAIR Secure type) with AEGIR Protection System (APS). This system creates and maintains an air chamber between the lubrication oil and the seawater in the AFT seal to prevent the seawater from contacting with the lubrication oil.

Rating:
The PRIME type Standard aft and forward seals series may be sized as per table #1101-00000-00 for propeller shaft diameters from 115 mm to 1,150 mm (included in the relevant instruction manual);
The PRIME type Secure aft and forward seals series may be sized as per table #1102-00000-00 for propeller shaft diameters from 145 mm to 1,150 mm (included in the relevant instruction manual);
The PRIMAIR type Standard aft seals series may be sized as per table #A-06-1-0000 for propeller shaft diameters from 426 mm to 1,150 mm (included in the relevant instruction manual);
The PRIMAIR type Secure aft seals series may be sized as per table #A-07-1-0000 for propeller shaft diameters from 426 mm to 1,150 mm (included in the relevant instruction manual).
The PRIMAIR type Standard and Secure forward seals will be sized as per table #1101-20000 for propeller shaft diameters from 426 mm to 1,150 mm (included in the relevant instruction manual).

Air-Sealing System (Air Management Unit and Electrical Cabinet) PRIMAIR Compact
Air Supply: 6-9 bar
Electrical Power Supply (Input/output): 230Vac, 10A, 50 Hz/24Vdc, 4.2A
Operating temperature: 5°C to 55°C
Relative Humidity: 25% to 95%
Degree of Ingress Protection: IP54 (Electrical Cabinet)
Inclination (Static/Dynamic): Max 22.5° in each direction

Service Restriction:

1. Unit Certification is not required for this product
2. If the manufacturer or purchaser request an ABS Certificate for compliance with a specification or standard, the specification or standard, including inspection standards and tolerances, must be clearly defined.
3. This product is suitable for installation on ice class vessels.
4. Air Management Unit and Electrical Cabinet are to be installed in engine room.

Comments:

1. The Manufacturer has provided a declaration about the control of, or the lack of Asbestos in this product.
2. The PRIMAIR Compact is a system engineered to convert existing AFT seal to an air-sealing system. The related diagram showing the combination of PRIMAIR Compact system and lubrication oil gravity system with the Procedure for returning from PRIMAIR Compact to gravity system in emergency situation (air-sealing system fail) are subject to review on a basis of case by case.
3. The final versions of the instruction manuals of the subject seals series and those of the stern tube installations lube oil piping diagrams included in such manuals are subject to review on a case by case basis.

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4. Software is not covered in the subject PDA certificate.

Notes/Drawing/Documentation:

19P04468.XX, AEGIR-Marine E-cabinet PRIMAIR Compact, Revision: - (Edit date 6-10-2021)
Alarm list PRIMAIR Compact, Version 1.0
PRIMAIR Compact leaflet-PRIMAIR Compact leaflet
A-06-0-0000-352-00-A, ECU PRIMAIR Compact, Rev. A
Procedure for emergency AJO
Appendix B - Updating of PLC and HMI_20200414, Published: 28-01-2020
PRIMAIR Compact Instruction manual, Published: 13-01-2020
PRIMAIR Compact installation manual, Published: 28-01-2020
FMEA (RISK ASSESSMENT) PRIMAIR Compact, Date: 21-02-2020
SDX686-C-001, CABINET AMU3.1 Rev. B.
A-06-0-0000-353-22-A, AMU PNEUMATIC DIAGRAM (Emptying the drain tank)
AEGIR Marine Primair Compact (V2-V2)-Factory Acceptance Test AEGIR Marine PRIMAIR Compact
A-06-0-0000-350-05-B, PRIMAIR Compact Schematic, Rev. B
22532247.50 DEKRA Test Report – Environmental tests
Test Report - PRIMAIR Standard & PRIMAIR Secure, 16-05-2014

Terms of Validity:

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STANDARDS

ABS Rules:

Rules for Conditions of Classification, Part I - 2021 - 1-1-4/7.7, 1-1-A3, 1-1-A4, which covers the following:
Marine Vessels Rules (2021): 4-1-1/9 TABLE 7, 4-1-1/Table 8, 4-3-2/5.13, 4-3-2/13, 4-3-8/11.1*, 4-3-9/5.5, 4-9-1/7.3.9, 4-9-2/7.13, 6-1-3/11.9.10, 6-1-6/27.11.4; 4-8-3/1.3, 4-8-3/1.17, 4-8-3/Table 2, 4-8-3/9, 4-9-9/13.
Guide for Vessels Operating in Low Temperature Environments (2016): 4/1.4, 4/3.1, A4/1.4, A4/3.1.

* The requirements of these Rules for the shaft seals of podded propulsion units being of a redundant design based on double failure criteria are only complied with in the case of a 4 seal executed AFT seal with an additional protection, AEGIR Protection System (APS) or similar and of the PRIMAIR Standard and Secure seals series

National:
NA

International:

ISO standards on rubber, vulcanized or thermoplastic:
34-2:2015 - Determination of tear strength -- Part 2: Small (Delft) test pieces;
37:2011 - Determination of tensile stress-strain properties;
48:2010 - Determination of hardness (hardness between 10 IRHD and 100 IRHD);

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188:2011 - Accelerated ageing and heat resistance tests;

815-1:2014 - Determination of compression set -- Part 1: At ambient or elevated temperatures;

1817:2015 - Determination of the effect of liquids;

2781:2008 + Amd 1:2010 - Determination of density;

3384-2:2012 - Determination of stress relaxation in compression -- Part 2: Testing with temperature cycling

4649:2010 - Determination of abrasion resistance using a rotating cylindrical drum device;

6914:2013 - Determination of ageing characteristics by measurement of stress relaxation in tension;

7619-1:2010 - Determination of indentation hardness -- Part 1: Durometer method (Shore hardness).

Government:

NA

EUMED:

NA

OTHERS:

NA